

KFRI Research Report No. 246

ISSN 0970-8103

## FLORISTIC STUDIES IN PARAMBIKULAM WILDLIFE SANCTUARY

**N Sasidharan**



**KERALA FOREST RESEARCH INSTITUTE  
PEECHI, THRISSUR**

November 2002

## ABSTRACT OF PROJECT PROPOSAL

Code : KFRI/301/1998

Title : Floristic studies in Parambikulam Wildlife Sanctuary

Objectives :

- » To make an inventory of the plants in the study area.
- » To make floristic analysis, with emphasis on dominant plant groups, endemics, rare and threatened plants.
- » To find out areas with respect to species richness

Date of commencement : September, 1998

Scheduled date of completion : August, 2001

Funding Agency : Kerala Forest Department (Wildlife Wing)

Investigator : N Sasidharan

Research Fellow : P Sujanapal

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## ACKNOWLEDGEMENTS

I am grateful to Dr KSS Nair, former Director, Dr JK Sharma, Director and Dr R Gnanaharan, Research Co-ordinator, KFRI for their interest and support during the study. I wish to express my sincere thanks to Shri PK Surendranathan Asari, IFS, Principal Chief Conservator of Forests for the initiation of floristic studies in Protected Areas of Kerala, Shri. TM Manoharan, IFS; Shri VK Sinha, IFS and Shri V Gopinathan, IFS, Chief Conservator of Forests for their support during the study. The financial support and facilities extended by Kerala Forest Department (Wildlife) are gratefully acknowledged. I also place on record of my thanks to Shri Rajan Sehgal, IFS, former Wildlife Warden and Shri P Pugazhendi, IFS, Wildlife Warden, Parambikulam Wildlife Sanctuary for providing facilities and support during the field work. Thanks are also due to Shri K Gopalakrishnan; Shri M Prasad; Shri Ashok Kumar and Shri Thomas Nelson, Assistant Wildlife Wardens for providing various helps during the field work.

The Joint Director, Botanical Survey of India, Southern Circle, Coimbatore, provided facilities and help for consulting the Madras Herbarium. Thanks are due to Dr Paul Wilkins, Kew Herbarium; Dr Dianxiang Zhang, South China Institute of Botany; Dr JF Veldkamp, Leiden Herbarium; Dr Henrick Ærunlund Pederson, University of Copenhagen; Dr Jayasree Bhattacharya, Kew Herbarium and Dr C Sathish Kumar, TBGRI for their help in the identification of some doubtful specimens. Editorial comments received from Dr KV Sankaran, Dr K Balasubramanyan, Dr C Renuka are gratefully acknowledged. The help rendered by Dr Jomy Augustine; Dr KP Rajesh; Shri KK Sajeev; Shri MM Roy, Shri VB Sajeev and Shri Subash Kuriakose for the preparation of report is gratefully acknowledged. I am thankful to Shri M Karthikeyan, for his service during the field work. Shri Kesavan; Shri Murukesan and Shri Chinnaraj, tribes in the Sanctuary, are acknowledged for their assistance in the field.

## ABSTRACT

Situated on the lap of Anamalai hills, in the revenue district of Palakkad, the Parambikulam Wildlife Sanctuary occupies an area of 274 km<sup>2</sup>. The sanctuary abodes all the major vegetation types of the Western Ghats. Teak is the major plantation species covering about 87 km<sup>2</sup>. During the study, specimens with 2165 field numbers were collected from the diverse habitats of the sanctuary representing 1434 species belonging to 755 genera under 142 families, including two gymnosperms. Among the angiosperms, dicotyledons dominate with 1119 species under 587 genera and 120 families while monocotyledons with 313 species under 166 genera and 20 families. Fabaceae, represented by 116 species under 52 genera, is the largest family followed by Poaceae with 86 species under 58 genera. Thirty-four families and 62 genera are represented by a single species in each.

The sanctuary is situated in the Anamalai-High Range centre of endemism. Three hundred and sixty species recorded from the sanctuary are endemic to Peninsular India of which 28 are exclusive to the Anamalai-High Range centre. One genus (*Haplothismia* Airy Shaw) and four species are so far known only from the sanctuary. Out of the 359 tree species, 25 per cent are endemic species. Among the 57 endemic genera of Peninsular India, 13 were recorded from the sanctuary.

The sanctuary abodes 109 species belonging to various threatened categories of which 10 are considered as 'possibly extinct'. *Haplothismia exannulata* Airy Shaw and *Syzygium palghatense* Gamble were collected for the first time after their type collections. Endangered species like *Atuna travancorica* (Bedd.) Kosterm., *Piper barberi* Gamble, *Pothos crassipedunculatus* Sivad. et al., *Morinda reticulata* Gamble, *Smithia venkobarrowii* Gamble, considered restricted to southern Kerala, have now been recorded from the sanctuary.

Two new species viz. *Medinilla anamalaiana* Sasidh. & Sujanapal and *Pteroceras monsooniae* Sasidh. & Sujanapal could be described from the sanctuary. Species such as *Argyreia osyrensis* (Roth) Choisy, *Chlorophytum malabaricum* Baker, *Cocculus hirsutus* (L.) Diels, *Dalechampia scandens* L. var. *velutina* (Wight) Muell.-Arg., *Heliotropium bracteatum* R. Br., *Heterophragma roxburghii* DC., *Meyenia hawtayneana* (Wall.) Nees, *Monothecium aristatum* (Wall. ex Nees) T. Anders. and *Triumfetta rotundifolia* Lam. are additions to the flora of Kerala. Though the sanctuary occupies only about 6 per cent of the total area of Palakkad district, the number of flowering plants collected during the study is more than the number of flowering plants recorded in the flora of Palakkad district.

## 1. INTRODUCTION

Man has surveyed remote galaxies and has stood on the surface of moon but has not so far come anywhere near to completing a taxonomic catalogue of the fewer than half a million species of higher plants that grow on our planet (Burmmit *et al.*, 2001). Botanists were exploring the floristic regions of the world for several centuries and their efforts have succeeded only in preparing a more realistic taxonomic account of the plants of Europe. The gravity of the situation is so severe in the tropics due to variety of reasons, the foremost being habitat destruction at an alarming rate leading to loss of biodiversity, essential for the sustenance of life on earth. Thus, conservation of biodiversity has gained prime consideration all over the world since the earth summit at Rio de Janeiro in 1992. The first and foremost process in ascertaining the biodiversity is the taxonomic treatment of living organisms. This can be achieved only through the process involving extensive exploration, identification and documentation. Earlier works in this branch of science in the Indian subcontinent resulted in the preparation of national and provincial floras. Further studies on local and regional floras paid increased attention at ecological level in addition to taxonomic treatment, which proved to be more beneficial in the management practices.

In spite of the accelerated floristic studies in Peninsular India during the last three decades, several parts of the dense forest areas in the Western Ghats are yet to be thoroughly explored. The Western Ghats is one of the megadiversity centres in India and is also a biodiversity hotspot. The forests of Kerala are along the Southern Western Ghats, which is a rich region with respect to species diversity and endemism in the Western Ghats. This region is under severe biotic pressure and conserving the biodiversity is a challenging task. The state of Kerala has a relatively higher percentage of protected areas. About 24 per cent of the forests have been brought under protected areas by establishing 12 Wildlife Sanctuaries and two National Parks. The floras of most of the protected areas have been studied recently (Manilal, 1988; Sasidharan & Sivarajan, 1996; Sasidharan, 1997, 1998 and 1999; Mohanan, 1995) or under investigation resulting in the discovery of several new as well as threatened species. Parambikulam Wildlife Sanctuary is the third largest protected area in Kerala. Though, the flora of Palakkad district has been studied recently (Vajravelu, 1990), several endemic as well as threatened species reported earlier from this region could not be relocated. Silent Valley National Park and Parambikulam Wildlife Sanctuary are the protected areas in the Palakkad district. The flora of Silent Valley National Park has been studied by Manilal (1988). Parambikulam Wildlife Sanctuary is part of the Anamalai Hills, one of the centres of endemism in the Western Ghats. The study on the flora of Parambikulam Wildlife Sanctuary was taken up with the financial support of the Wildlife Wing of Kerala Forest Department. The objectives of the study are i) to prepare an inventory of the plants in the study area, ii) to analyze the flora with emphasis on dominant plant groups, endemics, rare and threatened plants and iii) to find out areas with respect to species richness.

## 2. REVIEW OF LITERATURE

Major contributions to the floristic studies in India were made by the Britishers. Among the Botanists who worked on the flora of Peninsular India, the contributions of Robert Wight are the most outstanding. His major publications are *Illustrations of Indian Botany* (1840) and *Icones Plantarum Indiae Orientalis* (1838-1853). Wight together with Arnott published *Prodromus Florae Peninsulae Indiae Orientalis* (1834) in which several new taxa were described. The other notable contributions during the 19<sup>th</sup> century were *The Flora Sylvatica for Southern India* (Beddome 1869-1874), *Icones Plantarum Indiae Orientalis* (Beddome, 1868-1874), *Flora Indica* (Roxburgh, 1820, 1824). *Flora of British India* was published by J.D Hooker during 1872-1897. This seven volume publication dealt with the phanerogams of the erstwhile British India with phytogeographical information. Subsequently regional floras like *Flora of the Presidency of Bombay* (Cooke, 1901-1908) and *Flora of the Presidency of Madras* (Gamble, 1915-1936) were published and the latter work is adjudged as the best among the regional floras.

*The Forest Trees of Travancore* by Bourdillon (1908) is the first comprehensive work on the tree flora of Travancore and it dealt with 582 indigenous trees. The other important works on the flora of Peninsular India are: *Flowering Plants of Travancore* (Rama Rao, 1914), *Flora of Anamalai Hills Coimbatore District, Madras Presidency* (Fischer, 1921) and *Flora of South Indian Hill Stations* (Fyson, 1932). Since then, the work on regional as well as local floras were undertaken with the view of preparing a complete and comprehensive flora of India and major work was done by the Botanical Survey of India. *Flora of Tamil Nadu, India* (Nair & Henry, 1983; Henry *et. al.*, 1987 and 1989) and *Flora of Karnataka* (Sharma, 1984) were published as part of the aforementioned project. A few Universities and Research Institutions also conducted floristic studies in South India. The floras of most of the districts and Protected areas in Kerala have either been completed or in the process of completion. The notable publications on the flora of Kerala are: *Flora of Calicut* (Manilal & Sivarajan, 1982), *Flora of Cannanore* (Ramachandran & Nair, 1988), *Flora of Silent Valley* (Manilal, 1988), *Flora of Palghat* (Vajravelu, 1990), *Flora of Kerala: Grasses* (Sreekumar and Nair, 1991), *Flora of Thiruvananthapuram District* (Mohanan & Henry, 1994), *Flora of Thenmala Division* (Subramamiyan, 1995), *Flora of Nilambur* (Sivarajan & Philip Mathew, 1997) and *Flowering Plants of Thrissur Forests* (Sasidharan & Sivarajan, 1996). Floristic studies of the following places have been completed as Ph. D. programmes: *Flora of Quilon District* (C. N. Mohanan, 1984); *Flora of Kottayam District* (Antony, 1989) and *Flora of Pathanamthitta District* (Anil Kumar, 1993). The flora of protected areas such as *Agasthyamala* (N. Mohanan, 1995); *Shenduruny Wildlife Sanctuary* (Sasidharan, 1997); *Periyar Tiger Reserve* (Sasidharan, 1998), *Chinnar Wildlife Sanctuary* (Sasidharan 1999) have been studied recently. Besides these general floristic studies revisionary studies of several genera and families were also carried out.

The flora of Palakkad district has not been thoroughly explored in the past. Wight, Clerghorn, Beddome, Lawson, Barber, Fischer, Rangachariar, Jacob and Raju & Rathinavelu made sporadic collections from different parts of the district during the late 19<sup>th</sup> and early 20<sup>th</sup> centuries (Vajravelu 1990). During 1990's two floras were

published on the angiosperms of Palakkad district. The *Flora of Silent valley* National park by Manilal (1988) dealt with 966 species of angiosperms. The *Flora of Palghat* (Vajravelu, 1990) dealt with 1355 species of flowering plants from the entire Palakkad district. From literature it is seen that the flora of Parambikulam Wildlife Sanctuary has not been studied in detail when compared to other parts of the district. Some exiguous information is available in the form of a few publications. Airy Shaw (1952) described the monotypic genus *Haplothismia* based on the collections of KC Jacob from the study area. Ramamurthy & Joseph (1964) discovered a new taxon from the rivers of Parambikulam. Sebastine & Ramamurthy (1966) published brief accounts on the flora of Parambikulam and Aliyar submergible area.

### 3. STUDY AREA

Parambikulam Wildlife Sanctuary is part of the Anamalai Hills, one among the three centres of endemism in Kerala. The sanctuary lying between 76°35' and 76°51' E longitude and between 10°20' and 10°32' N latitude in the Palakkad revenue district of Kerala and has an area of 274 km<sup>2</sup>. It is the third largest protected area in Kerala and is best known for its faunal diversity. The sanctuary is bordered by Vazhachal forest division in the south, Chalakkudy in the west, Nelliampathi Ghats continuous to the Palghat gap on the north and Indira Gandhi Wildlife Sanctuary on the east. During 1960s, three reservoirs at Parambikulam, Thunakadavu and Peruvareppallam, occupying an area of 24 km<sup>2</sup> were commissioned. Major part of the water from these reservoirs drains into Tamil Nadu.

#### 3.1. Topography

The sanctuary is located immediate south of Palghat gap, exhibits undulating terrain interspersed with dry or moist valleys. The altitude ranges from 440 m at Chalakkudy river basin to 1438 m at Karimalagapuram. The conspicuous peaks are Kuchimudi (1180 m), Vengoli (1224 m), Pandaravarai (1190 m), Karimalagapuram (1438 m), Shekkal mudi (1210 m) and Peza (1200 m).

Most of the streams originate from the forests of Nelliampathi Ghats and drain to the Parambikulam river. During summer Thekkady, Tellickal, Bagapallam, Veeti and Pullickal rivers dry up. The perennial streams like Kuriarkutty and Thunacadavu join with Parambikulam river at Kuriarkutty and flow westwards. This river converges with Karappara river at Orukombankutty and finally drains into Chalakkudy river.

#### 3.2. Geological features

Generally the mountain ridges are devoid of tree cover. Considerable extent of rocky blanks are found at Karimalagapuram, Vengoli, Pezha, Pandaravarai and Kuchimudi. Boulders are conspicuous in the hills along the eastern boundary of the sanctuary. At low altitude places, the rock formations are covered by grass growth. The main geological formations in the area are hornblende-biotite gneisses, garnetiferous-biotite-gneisses, charnockites that had been intruded by garnitic-ortho-gyneisses and plagioclase porphyry-dykes. Major constituents of the rocks are quartz, biotite, orthoclase and plagioclase feldspar.

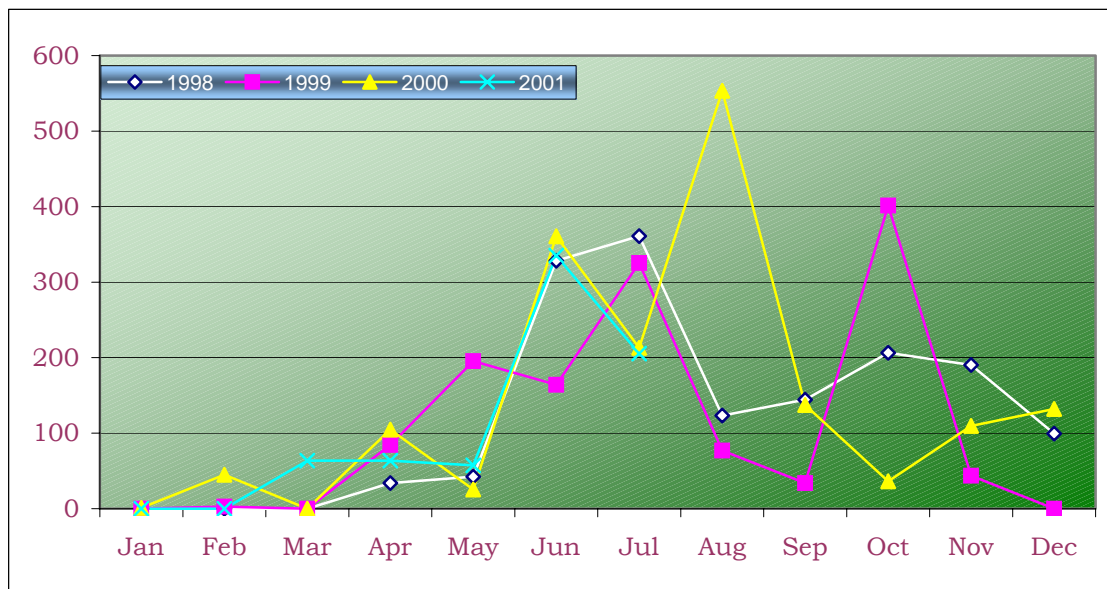


Soil formation differs from valleys to hills and slopes. In hilly areas soil is chocolate coloured, sandy loam and rich in ferruginous minerals formed by the disintegration of charnokite rock. The characteristic vaval formation is due to the clayey soil in the vavals, which prevents the percolation of water resulting in poor drainage.

### 3.3. Climate

Physiographical features of the sanctuary strongly influence the climate. Mountain cliffs separate the moist windward valleys and hills from the eastern dry locality. Major part of the sanctuary is along the windward region and receives high rainfall. The area gets both the southwest and northeast monsoons, southwest being the most active. Life span of the herbaceous flora and phenology of arborescent species largely depend on the rainy season. Therefore, there are slight seasonal variations in the annual flowering and fruiting. The monthly distribution of rainfall during 1998-01 are given in Figure 1.

**Figure 1. Rainfall during 1998-2001**



Source: PAP, Parambikulam

The atmospheric humidity is always high in the evergreen and mixed deciduous forests along the slopes, than in the teak plantation. February and April are the hottest months and the temperature fluctuates between 24 °C and 35 °C. The minimum temperature varies between 18 °C and 23 °C during November and December. In the hills the minimum temperature is still lower during night.

### 4. ETHNIC GROUPS

The sanctuary is inhabited by four tribal groups. They are Malayar, Muthuvar, Kadar and Mala-malasar. Muthuvars are still residing in the interior areas of the sanctuary. Muthuvars consider themselves as a superior cast and do not mingle with

other tribal groups. They are traditionally agriculturists. Most other tribes frequently go into the forests for collecting fuelwood, Non-Wood Forest Products (NWFPs), fishing, etc. They are also engaged in various forestry works carried out by the Forest Department.

## 5. VEGETATION

The most outstanding feature of the Western Ghats is the formation of tropical rain forests along the windward sides facing the Arabian Sea. The sanctuary lies along the Sungam and Parambikulam valleys, and these valleys are well known for the valuable teak. Substantial teak bearing forests have been felled for extraction of teak in the past. Most of the clear felled forest areas were replanted with teak subsequently. For the construction of Parambikulam-Aliyar dams, pristine virgin forests were also cleared during 1960s. The plantation activities in the Nelliampathi Hills also caused further erosion to the plant diversity of the region. In spite of the large scale conversion of forests into plantations, the existing natural forests hold an amazingly rich floristic diversity.

Following Chandrasekharan (1962) and Champion & Seth (1968) the natural vegetation of the sanctuary can be broadly classified into the following types (Map 1).

- ⇒ West coast tropical evergreen forests
- ⇒ West coast semi-evergreen forests
- ⇒ Southern moist mixed deciduous forests
- ⇒ Southern dry mixed deciduous forests

Apart from the above mentioned vegetation types, certain edaphic types such as Reed brakes, Cane brakes, Secondary evergreen forest, Moist bamboo brakes, Tropical thorn forests, Grasslands (Pseudo wet temperate grasslands) and Low altitude marshy grasslands (Vayals) are also present.

Moist deciduous forest is the dominant type in Sungam and Parambikulam Ranges and is continuous with the forests of Anamalai Wildlife Sanctuary. Evergreen forest is the major vegetation type in Orukomban Range. The sanctuary doesn't possess typical montane forest types such as shola and grasslands. However the evergreen forests and grasslands at Karimalagapuram, Pandaravarai and Kariamchola are at times referred to as *shola forests* and *montane grasslands*.

### 5.1. West coast tropical evergreen forests

Evergreen forests support luxuriant growth of trees and woody climbers, and the canopy is closed. High humidity, shade and sheltered condition provide ideal habitat for epiphytic as well as terrestrial orchids, ferns, mosses and other herbaceous plants. Epiphytes and mosses tend to increase with altitude while woody climbers decrease. The trees usually follow a three-tier stratification.

Selection felling has been carried out in the past in most of the evergreen forest areas. Virgin forests exist only in hilly areas because of the inaccessibility or difficult terrain. Evergreen forest in the southern side of the sanctuary is contiguous with the Vazhachal forest division. Evergreen forests are also found within the moist deciduous

forests in places such as Parambikulam, Vengoli, Karianchola and Pulikkal. In Kottayali evergreen forests occur along the banks of the Parambikulam river.

The important tree associations noted at higher altitudes in Orukomban and Karimala Ranges are *Mesua-Cullenia-Calophyllum*, *Palaquium-Calophyllum*, *Mesua-Cullenia* and *Palaquium-Mesua*. But at lower altitudes *Vateria-Calophyllum* and *Hopea-Diospyros* associations are prevailing. *Dysoxylum malabaricum* is dominant at low altitude places in Orukomban. In Parambikulam, Vengoli and Karianchola *Vateria-Calophyllum*, *Palaquium-Mesua* and *Hopea-Diospyros-Mesua* associations are the dominant formations. These areas are with least discernible stratification and generally trees attain comparatively lesser height and girth.

The general species composition is given below.

### **Top storey**

The lofty trees of the top storey attain a height of 35 m or more. Common species in this storey are: *Palaquium ellipticum*, *Calophyllum polyanthum*, *Mesua ferrea*, *Mesua thwaitesii*, *Cullenia exarillata*, *Dipterocarpus indicus*, *Artocarpus hirsuta*, *Mangifera indica*, *Vateria indica*, *Hopea parviflora*, *Dysoxylum malabaricum*, *Myristica malabarica*, *Syzygium gardneri*, *Persea macrantha*, *Paracroton pendulous*, etc.

### **Middle storey**

Common trees in the middle stratum are: *Aglaia lawii*, *Diospyros* spp., *Elaeocarpus serratus*, *Garcinia gummi-gutta*, *G. spicata*, *Hydnocarpus pentandra*, *Knema attenuata*, *Otonophelium stipulaceum*, *Actinodaphne malabarica*, *Drypetes oblongifolia*, *Glochidion ellipticum*, *Litsea* spp., *Mallotus* spp., *Meliosma simplicifolia*, *Paracroton pendulous*, etc.

### **Lower storey**

This layer usually consists of small trees and shrubs. The general composition of this layer is *Atalantia recemosa*, *Baccaurea courtallensis*, *Meiogyne ramarowii*, *Syzygium laetum*, *Orophea erythrocarpa*, *O. uniflora*, *Aporusa acuminata*, *Ardisia pauciflora*, *Dendrocnide sinuata*, *Gomphandra coriacea*, *Lepisanthes erecta*, *Laportea crenulata*, *Lasianthus acuminatus*, *Strobilanthes* spp., etc.

### **Climbers**

The common climbers are: *Acacia sinuata*, *Artabotrys zeylanicus*, *Derris brevipes*, *Desmos lawii*, *Entada rheedei*, *Strychnos colubrina*, *Ventilago bombaiensis*, etc. The gymnosperm *Gnetum edule* is of rare occurrence.

### **Epiphytic and herbaceous ground flora**

The epiphytes mostly belong to sciophytic group, adapted to the cooler, darker and moist microclimate within the forest canopy. The common epiphytes are: *Huperzia* spp., *Aeschynanthus perrottetii*, *Remusatia vivipara* and orchids. The common parasites are: *Helixanthera intermedia*, *Scurrula parasitica*, etc.

The species diversity among ground vegetation is poor but it is the ideal habitat of some interesting saprophytes like, *Burmannia championii*, *Epipogium roseum*, *Balanophora fungosa*, etc. Terrestrial orchids and aroids are common along with *Strobilanthes* spp.

#### **Montane forests** (Pseudo shola)

Shola forests are unique montane vegetation occupying temperate habitats in tropical latitude and are regarded as relictual communities restricted to valleys and depressions especially along the folds of hills. In this sense the forests restricted to Karimala hills and Pandaravarai are not typical shola forests. However it shows important characteristics of shola plants like, stunted, short boled, highly branched trees, clothed with mosses and other epiphytes. Climbers are few. There is no stratification for trees and generally leaves are small. Common species are *Cinnamomum sulphuratum*, *Euonymus indicus*, *Ligustrum perrottetii*, *Maesa indica*, *Symplocos cochinchinensis*, etc. The common epiphytes are *Lycopodium phlegmaria*, *Huperzia phyllantha*, *Bulbophyllum fischeri*, *Eria reticosa*, *Impatiens parasitica*, *Oberonia* spp., *Dendrobium* spp., *Peperomia tetraphylla*, etc.

#### **Reed brakes**

Reed brakes are also known as wet bamboo brakes, which are considered as edaphic type of evergreen forests. Important reeds in the area are *Ochlandra travancorica* and *Pseudoxytenanthera bourdillonii* along the slopes at Pooppara, Karimala and Orukomban. Dense growth of *Ochlandra scriptoria* occurs in riverine areas. Trees associated are *Acrocarpus fraxinifolius*, *Mesua ferrea*, *Syzygium cumini*, *Aglaiia barberi*, *Aglaiia lawii*, etc

#### **Cane brakes**

Canes are sparsely distributed in the sanctuary and occur in the evergreen forests at Kothala in the Karimala Range and Kuriarkutty in Orukomban Range. Profuse growth of *Calamus thwaitesii* is found in the adjacent teak plantations of the above area. Common rattans in the sanctuary are *Calamus thwaitesii* and *C. pseudotenuis*. *C. vattayila* and *C. gamblei* are sparsely distributed in Kuriarkutty area.

### **5. 2. West coast semi-evergreen forests**

The semi evergreen forest is transitional stage between evergreen and moist deciduous forests and dominated with evergreen trees. This forest type is restricted to localities such as Vengoli, Karimala and Orukomban Ranges where felling of evergreen trees has been carried out in the past. Reeds, canes and bamboos are comparatively few. Common trees are *Actinodaphne malabarica*, *Schleichera oleosa*, *Xanthophyllum arnotianum*, *Atuna travancorica*, *Tetrameles nudiflora*, *Bombax insigne*, *Litsea* spp., *Heritiera papilio*, *Cinnamomum malabattrum*, *Bischofia javanica*, *Lagerstroemia microcarpa*, *Garcinia gummi-gutta*, *Elaeocarpus serratus*, *Syzygium cumini*, *Ixora brachiata*, *Chukrasia tabularis*, *Hydnocarpus pentandra*, etc.

### 5.3. Southern moist mixed deciduous forests

Moist deciduous forests in the sanctuary exhibit marked differences with respect to species composition from the western side to the east. These forests are well known for valuable timber yielding species including teak. Substantial moist deciduous forests in Parambikulam and Sungam valley were clear felled. The Kannimara Teak in the moist deciduous forests of Parambikulam is regarded as one of the largest teak in the world. The important tree associations are *Terminalia-Schleichera-Lagerstroemia*, *Bombax-Terminalia* and *Anogeissus-Tectona-Dalbergia*. *Pterocarpus-Tectona*. Towards the eastern side the dominant trees are *Anogeissus latifolia*, *Cleistanthus collinus*, *Shorea roxburghii*, *Madhuca indica*, *Holoptelea integrifolia*, *Semecarpus anacardium*, *Lannea coromandelica*, *Cassine glauca*, etc. Thorny species like *Zizyphus* and *Catunaregam* are the dominant undergrowth here.

#### Moist bamboo brakes

*Bambusa bambos* is growing profusely at Vengoli, Seechali and Padippara along the banks of rivers and reservoirs. Associated trees are *Terminalia elliptica*, *Tectona grandis*, *Albizia odoratissima*, etc. Keerappadi, which is a dry locality in Sungam Range, gregarious flowering of *Bambusa bambos* occurred during 2001.

### 5.4. Southern dry mixed deciduous forests

Very small area around Kuchimudi and along the eastern slopes of Pandaravarai is covered by dry deciduous forests. *Anogeissus latifolia* is the dominant tree and other trees are *Tectona grandis*, *Givotia molucanna*, *Pterocarpus marsupium*, *Cleistanthus collinus*, *Strychnos potatorum*, *Premna tomentosa*, etc. Trees like *Schrebera swietenoides*, *Heterophragma roxburghii* are sparsely distributed along the rocky slopes.

#### Southern tropical thorn forests

A small extent of area at Keerappadi in Sungam Range, which is the continuation of Coimbatore plateau is composed of this forest type. Areas have some degree of *Eucalyptus* coppice growth. *Prosopis juliflora* is the common species. *Capparis sepiaria*, *C. grandis* and *Catunaregam spinosa*, *Carissa spinarum*, *Tarenna asiatica* are the other dominant species in the area.

#### Grasslands

The grasslands are confined to the hilltops at Karimalagapuram, Vengoli and Pandaravarai. Vegetation is dominated by grasses, herbs and sub-shrubs. The palm *Phoenix loureirii* is frequent. Common grasses are *Arundinella leptochloa*, *Chrysopogon hackelii*, *Cymbopogon flexuosus*, *Sacciolepis indica*, *Themeda triandra*, *Zenkeria elegans*, etc. The herbs are *Aeginetia pedunculata*, *Andrographis neesiana*, *Arisaema tortuosum*, *Cajanus lineatus*, *Drosera peltata*, *Eriocaulon* spp., *Habenaria* spp., *Pogostemon rotundatus*, *Peucedanum anamallayense* etc. Sub-shrubs like *Hypericum mysorensense*, *Lobelia nicotianifolia* var. *trichandra*, *Osbeckia* spp., etc. are also frequent.

### **Low altitude marshy grasslands (Vayals)**

Presence of *low altitude marshy grasslands* is a unique feature of the sanctuary. Grasses and sedges are the important components. Vayals are the feeding ground for the herbivores during the dry season. The important vayals are at Anakkal, Thellickal, Kannimara, Seechali, and Pooppara. The common species are *Axonopus compressus*, *Paspalum* spp., *Eragrostis* spp., *Lipocarpa chinensis*, *Fuirena umbellata*, *Fimbristylis* spp., *Cyperus* spp., etc. A non-palatable species *Rhynchospora corymbosa* is getting established in some of the vayals. Herbaceous plants like, *Justicia*, *Ludwigia*, *Hygrophila*, *Ageratum*, etc. are also seen in the vayals. Trees like *Butea monosperma*, *Careya arborea*, *Mitragyna parviflora*, *Haldina cordifolia*, *Terminalia paniculata*, *T. elliptica* are getting established in most of the vayals.

### **Teak plantations**

Teak is the major plantation species in the sanctuary occupying an area of 87 km<sup>2</sup>. The oldest plantations were raised in 1916 and the youngest in 1983. Though regeneration of indigenous species is taking place in the plantations, the number of established seedlings and saplings is very few. However, in the plantations at Kothala and Kuriarkutty, regeneration of indigenous species is progressing well due to the proximity of the plantations to evergreen/semi-evergreen forests. In most of the plantations, the undergrowth is dominated by exotic weeds like *Eupatorium* and *Lantana*.

## **6. METHODOLOGY**

Intensive seasonal floristic collections were made from different habitats of the sanctuary during 1998-2001. Field data including height, colour and nature of bark (inside and outside), colour of latex and other exudates, presence of buttress, odour and colour of vegetative and floral parts were recorded. Separate collections were made for dioecious plants. For parasites, details of the host plants were also recorded. Delicate materials were pressed immediately. In the absence of generative stage, live specimens were collected and grown in the garden of Kerala Forest Research Institute (KFRI). The collected specimens were preserved or pressed immediately. Flowers and fruits of interesting specimens were preserved in Kew mixture. The herbarium specimens were prepared as per the standard specification (Fosberg & Sachet, 1965; Bridson & Forman, 1991). Processed herbarium specimens are deposited in the Kerala Forest Research Institute Herbarium (KFRI).

The specimens were critically studied with pertinent literatures and comparing with authentic specimens available in the Kerala Forest Research Institute Herbarium (KFRI) and Madras Herbarium (MH). Literature on phytogeography and endemism were referred to assess the distribution and endemism of each species. For confirming identity of doubtful specimens they were referred to concerned experts in India and abroad.

## 7. FORMAT AND PRESENTATION

The families are arranged following the classification by Bentham & Hooker (1862-1883) with delimitation to certain families according to Hutchinson (1959, 1964, 1967 & 1973) and their current concept. Dichotomous parallel keys are provided for the identification of genera under family and species under genera. The keys were prepared with more emphasis on vegetative or morphological characters to facilitate easy identification. The genera and species are arranged in alphabetical sequence under respective families and genera. Illustrations and photographs are provided for rare and interesting species.

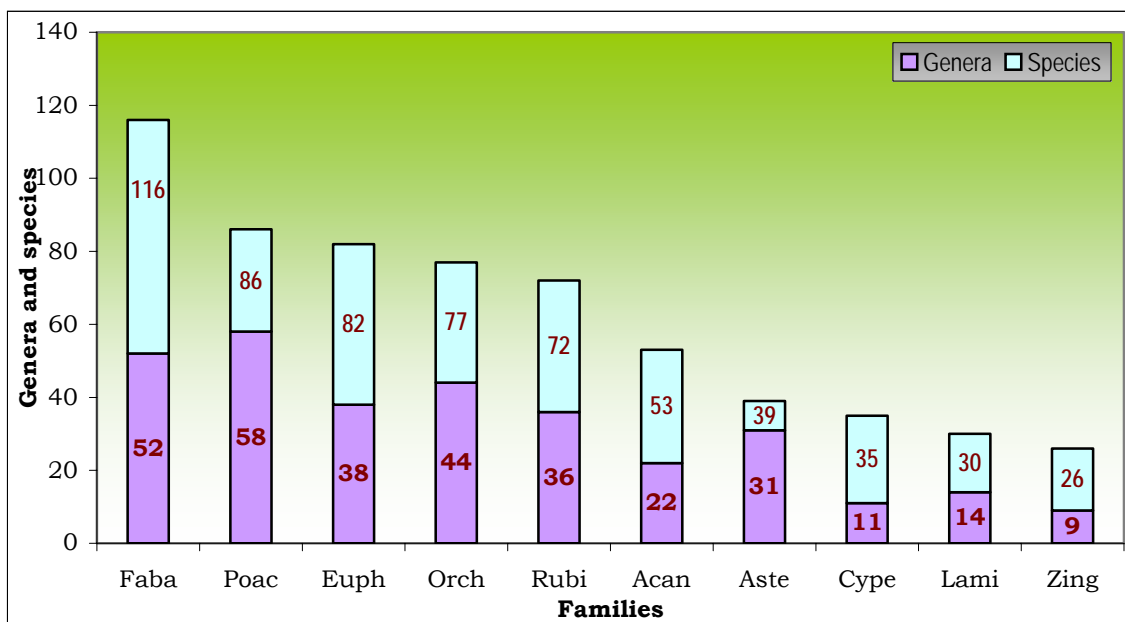
The correct name of the species is followed by the author/s name and original publication. Basionym (if any) and relevant synonyms are also provided. Generic monographs/revisions are also cited. Exhaustive citation of the floras has been avoided due to paucity of space. The floras cited along with names are in abbreviated form. The description of the species is in the following sequence: 'habit, leaves, inflorescence, flower, calyx, corolla, stamens, ovary, fruit and seed'. The flowering and fruiting periods are also given. Geographical distribution, status of the species in relation to conservation, occurrence in the study area and vegetation type(s) etc. are followed by name(s) of the collector(s) in abbreviated form with collection number(s) and locality(ies). Abbreviations used in the text are: FBI-*Flora of British India* (J. D. Hooker, 1872-1897), FPM-*Flora of the Presidency of Madras* (Gamble, 1915-1936), and FTSR-*Flowering Plants of Thrissur Forests* (Sasidharan, 1996), FPL-*Flora of Palghat District* (Vajravelu 1990). MSPI-*Malvaceae of Southern Peninsular India* (Sivarajan & Pradeep, 1996), FKG-*Flora of Kerala grasses* (Sreekumar & Nair, 1991), PMK-*Palms of Kerala* (Renuka, 1990), JBI-*Bladderworts of India*, *Flora of India: series 4* (Janarthanan & Henry, 1992), JBNHS-*Journal of Bombay Natural History Society*, JETB-*Journal of Economic and Taxonomic Botany*, Distr.-distribution, Fl.-Flowering, Fr.-Fruiting, KFRI-Kerala Forest Research Institute Herbarium, PS-P. Sujanalpal, NS-N. Sasidharan.

## 8. RESULTS

### 8.1. Floristic analysis

The sanctuary is situated in the northern end of the Anamalai subunit of the Western Ghats, the most hotspot region with respect to species diversity and endemism. During the study 1432 species of angiosperms under 753 genera belonging to 140 families were collected, which form about 35 per cent of the estimated flora of Kerala. Dicotyledons are represented by 1119 species under 587 genera and 120 families, while monocotyledons by 313 species under 166 genera and 20 families. Fabaceae, with 116 species (52 genera), is the largest family followed by Poaceae (58 genera, 86 species); Euphorbiaceae (35 genera, 82 species); Orchidaceae (44 genera, 77 species); Rubiaceae (36 genera, 72 species); Acanthaceae (22 genera, 53 species); Asteraceae (31 genera, 39 species); Cyperaceae (11 genera, 35 species); Lamiaceae (14 genera, 30 species) and Zingiberaceae (9 genera, 26 species) [Figure 2].

**Figure 2. Relative abundance of top 10 families in Parambikulam WLS**



Among the 140 families, 31 dicot and three monocot families are represented by a single species each. As many as 62 genera are also represented by one species each. *Ficus* with 20 species is the largest genus followed by *Impatiens* with 18 species. *Strobilanthes*, *Justicia* and *Crotalaria* have 11 species in each. The family Poaceae has 58 genera, of which 36 are represented by a single species. Most of the grasses were recorded from Grasslands and Vayals, which are high-density feeding ground for the herbivores.

Among the 1432 species, 653 are herbs including epiphytes, parasites and saprophytes. Trees are represented by 359 species, shrubs are 268 and climbers with 152 species. The endangered medicinal plant *Coscinium fenestratum* (Maramanjil), though frequent in Karimala and Orukomban Ranges, mature plants are extremely rare and no flowering could be observed during the study period.



Based on the number of specimens collected and exploration coefficient, maximum collections were recorded from the Sungam Range followed by Karimala Range, due to the diverse habitats in these two Ranges (Table 1). About 15 km<sup>2</sup> area of Sungam Range is occupied by dry deciduous forests and most the species recorded from this area do not occur elsewhere in the sanctuary. Because of the altitudinal variations and topographical peculiarity, the species combination in the Karimalagopuram (1438 m) and surrounding areas is unique. Though Karimala Range abodes diverse habitats, about 50 per cent of the area is occupied by teak plantation.

**Table 1. Range wise analysis and number of specimens collected**

Range	Natural forest (km <sup>2</sup> )	Plantation (km <sup>2</sup> )	Total (km <sup>2</sup> )	Number of collections
Sungam	63.49	18.29	81.78	708
Parambikulam	35.01	17.17	52.18	415
Orukomban	54.59	17.25	71.84	450
Karimala	33.61	34.76	68.37	592
<b>Total</b>	<b>186.70</b>	<b>87.47</b>	<b>274.14</b>	<b>2165</b>

## 8.2. Endemism

The endemic species in the flora of a geographical region reveal the biogeography of the area, centre of speciation and adaptive evolution (Nayar, 1996 and 1997). The Western Ghats is considered as one among the 18 centres in the world where megadiversity exists. Among the 4,000 species of flowering plants in the Western Ghats 1,500 species are endemics. In the Western Ghats, Southern Western Ghats consisting Southern Karnataka, Kerala and part of Tamil Nadu is considered as the most species rich region with respect to endemism. Nayar (1997) recognised three hotspots of endemic centres in Kerala viz. Agasthyamala, Anamalai High Ranges and Silent valley-Wayanad. Parambikulam Wildlife Sanctuary comes under the Anamalai-High Range centre. Among the 60 endemic genera of peninsular India, 13 were collected from the sanctuary. *Haplothismia*, *Utleria* and *Pseudoglochidion* are confined to Anamalai hills. During the study both *Haplothismia* and *Utleria* were collected and the former is exclusive to the study area. *Proteroceras* earlier considered as a monotypic genus of Southern Western Ghats is now treated as congeneric with *Pteroceras*. A new species, *Pteroceras monsooniae* was collected from the sanctuary during the study period. *Phlebophyllum*, *Nilgirianthus*, *Taeniandra* and *Xenacanthus*, the splinter genera of *Strobilanthes* are now merged under it following the wider concept of the genus.

Nayar (1997) estimated that there are 1272 Western Ghats endemic species in Kerala and 94 species are exclusive to the Anamalai High Ranges. During the study 28 species belonging to this centre have been collected from the sanctuary. Among the 1432 species 360 are South Indian endemics belonging to 223 genera. Orchidaceae has the highest number of 34 endemic species, followed by Rubiaceae with 26 species, Acanthaceae with 22 species, Lauraceae with 20 species and Euphorbiaceae with 19 species.

The genus *Impatiens* has 12 endemic species *Strobilanthes* and *Litsea* have eight species in each, *Syzygium*, *Osbeckia* and *Habenaria* with six species in each. Species like *Syzygium palghatense*, *Pteroceras monsooniae*, *Haplothismia exannulata*, *Strobilanthes dupenii* are known only from the study area. *Piper barberi* and *Pothos crassipedunculatus* earlier considered restricted to Agasthyamala region are now recorded from the sanctuary. *Heterophragma roxburghii* considered endemic to northern region of Deccan plateau is also collected from the sanctuary.

### 8.3. Rare and threatened plants

Among the 460 species of rare and threatened flowering plants recorded from Kerala (Nayar, 1997), 109 were collected during the study. The forests in the Karimala and Orukomban Ranges are contiguous with the evergreen forests of Chalakkudi and Vazhachal forest divisions and harbor 85 species of threatened plants. Forests along the eastern side, bordering Tamilnadu, from north Kuchimudi to south Shekkalmudi is very unique. The monotypic genus *Haplothismia*, considered as 'extinct', was recollected from the evergreen forests of Parambikulam Range. The distribution of this species is very much restricted and the existing population is under threat. Species such as *Syzygium palghatense*, *Desmos viridiflorus*, *Acranthera anamallica*, *Kalanchoe olivacea*, *Casearia rubescens*, *Ceropegia omissa*, *Ophiorrhiza brunonis*, *Osbeckia aspera* var. *travancorica*, *Smithia venkobarrowii*, *Taeniophyllum scaberulum* collected during the study belong to the category 'possibly extinct'. *Syzygium palghatense* is collected for the first time after its type collection. The rare and threatened species recorded in the four Ranges of the sanctuary are provided in Tables 2, 3, 4 and 5.

**Table 2. List of rare and threatened species in Karimala Range**

No.	SPECIES	FAMILY	STATUS	REFERENCE
1.	<i>Acranthera anamallica</i> Bedd.	RUBIACEAE	Rare	Nayar, 1997
2.	<i>Actinodaphne malabarica</i> Balakr.	LAURACEAE	Rare	Nayar, 1997
3.	<i>Aglaiia simplicifolia</i> (Bedd.) Harms	MELIACEAE	Near Threatened	IUCN, 2000
4.	<i>Anaphyllum wightii</i> Schott	ARACEAE	Threatened	Nayar, 1997
5.	<i>Anisochilus argenteus</i> Gamble	LAMIACEAE	Vulnerable	Nayar & Sastry, 1987
6.	<i>Ardisia sonchifolia</i> Mez	MYRSINACEAE	Endangered	IUCN, 2000
7.	<i>Arisaema attenuatum</i> Barnes & Fischer	ARACEAE	Threatened	Nayar, 1997
8.	<i>Arisaema barnesii</i> Fischer	ARACEAE	Threatened	Nayar, 1997
9.	<i>Arisaema murrayi</i> (Graham) Hook.	ARACEAE	Rare & Threatened	Ahmedullah & Nayar, 1987
10.	<i>Belosynapsis vivipara</i> (Dalz.) Fischer	COMMELINACEAE	Vulnerable	Nayar & Sastry, 1987
11.	<i>Blepharistemma serratum</i> (Dennst.) Suresh	RHIZOPHORACEAE	Vulnerable	Nayar, 1997
12.	<i>Bulbophyllum aureum</i> (Hook. f.) Sm.	ORCHIDACEAE	Endangered	Nayar, 1997
13.	<i>Ceropegia metziana</i> Miq.	ASCLEPIADACEAE	Rare	Nayar, 1997

No.	SPECIES	FAMILY	STATUS	REFERENCE
14.	<i>Crotalaria clarkei</i> Gamble	FABACEAE	Rare & Threatened	Ahmedullah & Nayar, 1987
15.	<i>Cyclea fissicalyx</i> Dunn	MENISPERMACEAE	Rare & Threatened	Nayar & Sastry, 1987
16.	<i>Derris benthamii</i> (Thw.) Thw.	FABACEAE	Endangered	Nayar, 1997
17.	<i>Desmos viridiflorus</i> (Bedd.) Safford	ANNONACEAE	Endangered	Nayar, 1997
18.	<i>Drypetes wightii</i> (Hook. f.) Pax & Hoffm.	EUPHORBIACEAE	Vulnerable	IUCN, 2000
19.	<i>Eugenia indica</i> (Wight) Chithra	MYRTACEAE	Endangered	IUCN, 2000
20.	<i>Glycosmis macrocarpa</i> Wight	RUTACEAE	Rare	Nayar, 1997
21.	<i>Habenaria barnesii</i> Summerh. ex Fischer	ORCHIDACEAE	Endangered	Nayar & Sastry, 1987
22.	<i>Impatiens acaulis</i> Arn.	BALSAMINACEAE	Threatened	Nayar, 1997
23.	<i>Impatiens herbicola</i> Hook. f.	BALSAMINACEAE	Vulnerable	Nayar, 1997
24.	<i>Impatiens viridiflora</i> Wight	BALSAMINACEAE	Rare & Threatened	Ahmedullah & Nayar, 1987
25.	<i>Impatiens viscosa</i> Bedd.	BALSAMINACEAE	Rare	Ahmedullah & Nayar, 1987
26.	<i>Impatiens wightiana</i> Bedd.	BALSAMINACEAE	Endangered	Nayar, 1997
27.	<i>Isachne setosa</i> Fischer	POACEAE	Threatened	Nayar, 1997
28.	<i>Isonandra stocksii</i> Clarke	SAPOTACEAE	Endangered	IUCN, 2000
29.	<i>Lasianthus strigillosus</i> Hook.f.	RUBIACEAE	Vulnerable	Nayar, 1997
30.	<i>Morinda reticulata</i> Gamble	RUBIACEAE	Rare	Nayar, 1997
31.	<i>Nostolachma crassifolia</i> (Gamble) Deb & Lahiri	RUBIACEAE	Endangered	IUCN, 2000
32.	<i>Ophiorrhiza brunonis</i> Wight & Arn.	RUBIACEAE	Possibly extinct	Nayar & Sastry, 1988
33.	<i>Orophea thomsonii</i> Bedd.	ANNONACEAE	Endangered	IUCN, 2000
34.	<i>Orophea uniflora</i> Hook. f. & Thoms.	ANNONACEAE	Vulnerable	IUCN, 2000
35.	<i>Pavetta laeta</i> Bremek.	RUBIACEAE	Rare	Nayar, 1997
36.	<i>Peucedanum anamallayense</i> Clarke	APIACEAE	Endangered	Nayar, 1997
37.	<i>Pothos armatus</i> Fischer	ARACEAE	Threatened	Nayar, 1997
38.	<i>Premna glaberrima</i> Wight	VERBENACEAE	Rare	Nayar, 1997
39.	<i>Psychotria anamalayana</i> Bedd.	RUBIACEAE	Rare	Nayar, 1997
40.	<i>Sageraea laurifolia</i> (Graham) Blatt.	ANNONACEAE	Near Threatened	IUCN, 2000
41.	<i>Sauropus saksenianus</i> Manilal <i>et al.</i>	EUPHORBIACEAE	Vulnerable	Nayar, 1997
42.	<i>Schizostachyum beddomei</i> Fischer	POACEAE	Threatened	Nayar, 1997
43.	<i>Semecarpus travancorica</i> Bedd.	ANACARDIACEAE	Rare	Nayar, 1997
44.	<i>Vepris bilocularis</i> (Wight & Arn.) Engl.	RUTACEAE	Rare	Ahmedullah & Nayar, 1987
45.	<i>Zehneria maysorensis</i> (Wight & Arn.) Arn. <i>var. umbellata</i> (Chakrav.) Kumari	CUCURBITACEAE	Rare	Ahmedullah & Nayar, 1987

**Table 3. List of rare and threatened species in Orukomban Range**

No.	SPECIES	FAMILY	STATUS	REFERENCE
1.	<i>Aglaia barberi</i> Gamble	MELIACEAE	Rare & Threatened	Ahmedullah & Nayar, 1987
2.	<i>Aglaia lawii</i> (Wight) Saldanha	MELIACEAE	Rare	Ahmedullah & Nayar, 1987
3.	<i>Aglaia perviridis</i> Hiern	MELIACEAE	Vulnerable	IUCN, 2000
4.	<i>Allophylus concanicus</i> Radlk.	SAPINDACEAE	Rare	Nayar & Sastry, 1988
5.	<i>Anaphyllum wightii</i> Schott	ARACEAE	Threatened	Nayar, 1997
6.	<i>Arenga wightii</i> Griff.	ARECACEAE	Vulnerable	IUCN, 2000
7.	<i>Atuna travancorica</i> (Bedd.) Kosterm.	CHRYSOBALANACEAE	Endangered	IUCN, 2000
8.	<i>Blachia reflexa</i> Benth.	EUPHORBIACEAE	Rare & Threatened	Ahmedullah & Nayar, 1987
9.	<i>Capparis rheedei</i> DC.	CAPPARACEAE	Rare	Nayar & Sastry, 1987
10.	<i>Cryptocarya beddomei</i> Gamble	LAURACEAE	Vulnerable	IUCN, 2000
11.	<i>Dipterocarpus indicus</i> Bedd.	DIPTEROCARPACEAE	Endangered	IUCN, 2000
12.	<i>Dysoxylum beddomei</i> Hiern	MELIACEAE	Endangered	IUCN, 2000
13.	<i>Epithema carnosum</i> (G. Don) Benth. <i>var. hispida</i> Clarke	GESNERIACEAE	Rare	Nayar, 1997
14.	<i>Euonymus paniculatus</i> Wight ex Lawson	CELASTRACEAE	Endangered	IUCN, 2000
15.	<i>Garcinia wightii</i> T. Anders.	CLUSIACEAE	Vulnerable	IUCN, 2000
16.	<i>Holigarna grahamii</i> (Wight) Kurz	ANACARDIACEAE	Rare	Ahmedullah & Nayar, 1987
17.	<i>Impatiens dasysperma</i> Wight	BALSAMINACEAE	Rare & Threatened	Ahmedullah & Nayar, 1987
18.	<i>Ixora monticola</i> Gamble	RUBIACEAE	Vulnerable	Nayar, 1997
19.	<i>Lasianthus rostratus</i> Wight	RUBIACEAE	Vulnerable	IUCN, 2000
20.	<i>Litsea quinqueflora</i> (Dennst.) Suresh ( <i>L. ligustrina</i> (Nees) Hook.f.)	LAURACEAE	Vulnerable	IUCN, 2000
21.	<i>Mallotus atrovirens</i> Muell.-Arg.	EUPHORBIACEAE	Vulnerable	IUCN, 2000
22.	<i>Memecylon lawsonii</i> Gamble	MELASTOMATAACEAE	Vulnerable	IUCN, 2000
23.	<i>Mycetia acuminata</i> (Wight) O. Ktze.	RUBIACEAE	Rare	Nayar, 1997
24.	<i>Oberonia brachyphylla</i> Blatt. & McCann	ORCHIDACEAE	Rare	Nayar & Sastry, 1987
25.	<i>Ophiorrhiza brunonis</i> Wight & Arn.	RUBIACEAE	Possibly extinct	Nayar & Sastry, 1988
26.	<i>Orophea uniflora</i> Hook. f. & Thoms.	ANNONACEAE	Vulnerable	IUCN, 2000
27.	<i>Pavetta calophylla</i> Bremek.	RUBIACEAE	Rare	Nayar, 1997
28.	<i>Piper barberi</i> Gamble	PIPERACEAE	Rare & Threatened	Ahmedullah & Nayar, 1987
29.	<i>Polypleurum filifolium</i> (Ramam. & Joseph) Nagend. <i>et al.</i>	PODOSTEMACEAE	Endangered	Nayar, 1997
30.	<i>Premna glaberrima</i> Wight	VERBENACEAE	Rare	Nayar, 1997
31.	<i>Pseudoxytenanthera bourdillonii</i> (Gamble) Naithani	POACEAE	Rare	Ahmedullah & Nayar, 1987
32.	<i>Psychotria globicephala</i> Bedd.	RUBIACEAE	Endangered	IUCN, 2000
33.	<i>Psychotria johnsoni</i> Hook.f.	RUBIACEAE	Vulnerable	Nayar, 1997

No.	SPECIES	FAMILY	STATUS	REFERENCE
34.	<i>Psychotria keralensis</i> Deb & Gangop.	RUBIACEAE	Rare	Nayar, 1997
35.	<i>Smilax wightii</i> A. DC.	SMILACACEAE	Rare	Nayar, 1997
36.	<i>Smithia venkobarrowii</i> Gamble	FABACEAE	Possibly extinct	Nayar, 1997
37.	<i>Solenocarpus indicus</i> Wight & Arn.	ANACARDIACEAE	Rare	Nayar, 1997
38.	<i>Syzygium occidentale</i> (Bourd.) Gandhi	MYRTACEAE	Vulnerable	IUCN, 2000
39.	<i>Tabernaemontana gamblei</i> Subram. & Henry	APOCYNACEAE	Conservation Dependent	IUCN, 2000
40.	<i>Tarenna monosperma</i> (Wight & Arn.) Raju	RUBIACEAE	Endangered	IUCN, 2000
41.	<i>Utleria salicifolia</i> Bedd. ex Hook. f.	ASCLEPIADACEAE	Endangered	Nayar, 1997
42.	<i>Willisia selaginoides</i> (Bedd.) Warming ex Willis	PODOSTEMACEAE	Rare	Nayar, 1997

**Table 4. List of rare and threatened species in Parambikulam Range**

No.	SPECIES	FAMILY	STATUS	REFERENCE
1.	<i>Aralia malabarica</i> Bedd.	ARALIACEAE	Vulnerable	IUCN, 2000
2.	<i>Blepharistemma serratum</i> (Dennst.) Suresh	RHIZOPHORACEAE	Vulnerable	Nayar, 1997
3.	<i>Casearia rubescens</i> Dalz.	FLACOURTIACEAE	Possibly extinct	Nayar, 1997
4.	<i>Cayratia pedata</i> (Lam.) Juss. ex Gagn. var. <i>glabra</i> Gamble	VITACEAE	Vulnerable	Nayar, 1997
5.	<i>Ceropegia omissa</i> Hubber	ASCLEPIADACEAE	Possibly extinct	Nayar, 1997
6.	<i>Cleome burmannii</i> Wight & Arn.	CAPPARACEAE	Indeterminate	Nayar & Sastry, 1987
7.	<i>Cyanotis burmanniana</i> Wight	COMMELINACEAE	Rare	Nayar & Sastry, 1987
8.	<i>Glochidion hohenackeri</i> (Muell.-Arg.) Bedd. var. <i>johnstonei</i> (Hook. f.) Chakrab. & Gangop. ( <i>G. johnstonei</i> Hook.f.)	EUPHORBIACEAE	Vulnerable	IUCN, 2000
9.	<i>Glochidion zeylanicum</i> (Gaertn.) Juss. var. <i>tomentosum</i> (Dalz.) Chakrab. & Gangop. ( <i>G. tomentosum</i> Dalz.)	EUPHORBIACEAE	Endangered	IUCN, 2000
10.	<i>Glycosmis macrocarpa</i> Wight	RUTACEAE	Rare	Nayar, 1997
11.	<i>Haplothysmia exannulata</i> Airy Shaw	BURMANNIACEAE	Extinct	Nayar, 1997
12.	<i>Osbeckia aspera</i> (L.) Blume var. <i>travancorica</i> (Bedd. ex Gamble) Hansen	MELASTOMACEAE	Possibly extinct	Nayar, 1997
13.	<i>Pterospermum reticulatum</i> Wight & Arn.	STERCULIACEAE	Vulnerable	IUCN, 2000
14.	<i>Smilax wightii</i> A. DC.	SMILACACEAE	Rare	Nayar, 1997
15.	<i>Solenocarpus indicus</i> Wight & Arn.	ANACARDIACEAE	Rare	Nayar, 1997
16.	<i>Symplocos macrophylla</i> Wall. ex A. DC ssp. <i>rosea</i> (Bedd.) Nooteb.	SYMPLOCACEAE	Rare	Gopalan & Henry, 2000
17.	<i>Typhonium bulbiferum</i> Dalz.	ARACEAE	Threatened	Nayar, 1997

**Table 5. List of rare and threatened species in Sungam Range**

No.	SPECIES	FAMILY	STATUS	REFERENCE
1.	<i>Actinodaphne malabarica</i> Balakr.	LAURACEAE	Rare	Nayar, 1997
2.	<i>Aglaiia barberi</i> Gamble	MELIACEAE	Rare & Threatened	Ahmedullah & Nayar, 1987
3.	<i>Aglaiia lawii</i> (Wight) Saldanha	MELIACEAE	Rare	Ahmedullah & Nayar, 1987
4.	<i>Arisaema barnesii</i> Fischer	ARACEAE	Threatened	Nayar, 1997
5.	<i>Beilschmiedia wightii</i> (Nees) Benth. ex Hook. f.	LAURACEAE	Rare & Threatened	Ahmedullah & Nayar, 1987
6.	<i>Casearia wynaadensis</i> Bedd.	FLACOURTIACEAE	Vulnerable	IUCN, 2000
7.	<i>Commelina wightii</i> Rao	COMMELINACEAE	Threatened	Nayar, 1997
8.	<i>Corymborkis veratrifolia</i> (Reinw.) Blume	ORCHIDACEAE	Rare	Nayar & Sastry, 1987
9.	<i>Drypetes malabarica</i> (Bedd.) Airy Shaw	EUPHORBIACEAE	Critically endangered	Gopalan & Henry, 2000
10.	<i>Glochidion zeylanicum</i> (Gaertn.) Juss. var. <i>tomentosum</i> (Dalz.) Chakrab. & Gangop. ( <i>G. tomentosum</i> Dalz.)	EUPHORBIACEAE	Endangered	IUCN, 2000
11.	<i>Holigarna grahamii</i> (Wight) Kurz	ANACARDIACEAE	Rare	Ahmedullah & Nayar, 1987
12.	<i>Kalanchoe olivacea</i> Dalz. & Gibs.	CRASSULACEAE	Endangered	Nayar, 1997
13.	<i>Nostolachma crassifolia</i> (Gamble) Deb & Lahiri	RUBIACEAE	Endangered	IUCN, 2000
14.	<i>Oberonia brachyphylla</i> Blatt. & McCann	ORCHIDACEAE	Rare	Nayar & Sastry, 1987
15.	<i>Shorea roxburghii</i> G. Don	DIPTEROCARPACEAE	Endangered	IUCN, 2000
16.	<i>Solenocarpus indicus</i> Wight & Arn.	ANACARDIACEAE	Rare	Nayar, 1997
17.	<i>Syzygium chavarani</i> (Bourd.) Gamble	MYRTACEAE	Endangered	IUCN, 2000
18.	<i>Syzygium palghatense</i> Gamble	MYRTACEAE	Critically endangered	IUCN, 2000
19.	<i>Taeniophyllum scaberulum</i> Hook. f.	ORCHIDACEAE	Possibly extinct	Nayar, 1997

## 9. DISCUSSION

Owing to the geographical location, the sanctuary experiences the Deccan plateau climate along the eastern side and gradually changing to wet Malabar climate in the western side. The sanctuary abodes all the major vegetation types of the Western Ghats except Montane Sholas and Grasslands. However low altitude shola and grassland formations are found at Karimalagopuram. The Parambikulam valley is well known for its valuable teak. One of the world's largest teak 'Kannimara Teak' is in the sanctuary. In the past, large scale clearing of the teak bearing moist deciduous forests has been carried out for extracting timber. These clear-felled forest areas were planted with teak, which occupies about 87 km<sup>2</sup> area of the sanctuary.

Among the 1432 species of flowering plants recorded during the study, 109 belong to the threatened categories. The foremost task in the implementation of conservation

measures is the demographic evaluation of the endangered species. The population of the critically endangered species like *Haplothismia exannulata*, *Syzygium palghatense* and *Desmos viridiflorus* is extremely low, the former two are so far known only from the sanctuary. Though profuse flowering in *Syzygium palghatense* was observed during the study period, fruit setting is rare; seedlings and saplings are practically absent. Only three mature trees could be seen. *Haplothismia exannulata* occurs at Vengoli and Parambikulam. The evergreen forest patch near the temple at Parambikulam where a few individuals of *Haplothismia* were observed, is under severe biotic pressure. The distribution of the new orchid *Pteroceras monsooniae* is restricted to less than 1 km<sup>2</sup> area, thus it is also critically endangered.

The evergreen forests of Karimala and Orukomban Ranges abode most of the species belonging to the threatened categories as well as the endemics. The forests along the eastern side of the sanctuary boarding Tamil Nadu have several species characteristic of the Deccan-Carnatic region. The two new species viz. *Medinilla anamalaiana* and *Pteroceras monsooniae* reported during the study were collected from this region.

An analysis with respect to the occurrence of endemic as well as threatened species shows that eastern side of the Sungam Range, evergreen forests in Parambikulam Range, Karimalagopuram (Karimala Range) and evergreen forests from Pezha to Nelliampathi (Orukomban Range) are crucial for conservation of the endemic and threatened species (Map 2).

The construction of dams had adversely affected the aquatic flora of the river system. Threatened aquatic plants like *Willisia selaginoides* and *Polypleurum filifolium* are now seen only in the west flowering undisturbed Karappara river. Natural riparian vegetation along the Parambikulam river has been cleared at several places and planted with teak. It will be appropriate to restore the natural vegetation of the river banks through enrichment planting with characteristic species.

The diverse habitats and geographic location of the sanctuary made it one of the faunastically rich areas in Kerala. Studies on the habitat utilization of animals revealed that the moist deciduous forest interspersed with marshy vayals are the most preferred habitats (Balakrishnan and Easa, 1986; Easa, 1998). The vayals play an important role with regard to fodder for herbivores. Now most of vayals are inside the teak plantations and these dry up with the beginning of summer. Further, the species composition of vayals within the natural forests and those inside the plantations is different. More non-palatable species are getting established in the latter.

Like other parts of Western Ghats, the sanctuary possesses wild relatives of economically important plants. According to Velayudhan *et al.* (1999) diversity of crop species is higher than that of Silent Valley. The sanctuary is relatively free from human disturbance, the major threat being the collection of Non-Wood Forest Products. However the forests around settlements are under biotic pressure. In areas like Kothala (Karimala Range) and Kuriarkutty (Orukomban Range) regeneration of indigenous evergreen species is progressing well in the teak plantations, due to the proximity of these plantations to semi-evergreen/evergreen forests (Sasidharan *et al.*, 2002).

The present study has brought out the diversity of flowering plants, which is amazingly rich, despite large scale clearing of forests carried out in the past. It will be appropriate to study the Cryptogamic flora also to have a complete knowledge on the plant diversity of the sanctuary.

## 10. RECOMMENDATIONS

Among the 109 species belonging to the rare and threatened categories, four species are exclusive to the sanctuary. The population of the monotypic genus *Haplothismia* is restricted to two localities viz. Vengoli and Parambikulam. The evergreen forest patch around the temple at Parambikulam where a few plants of *Haplothismia* were located needs protection from firewood collection and grazing.

The population of *Syzygium palghatense* and *Desmos viridiflorus* is extremely low. Only three trees of *Syzygium palghatense* could be located at Pandaravarai. Fruit setting is very rare in spite of profuse flowering. Only four plants of *Desmos viridiflorus* could be located at Pooppara. No fruit setting was noticed. Reproductive biological studies of these species are needed for enhancing their population.

In the teak plantations at Kothala (Karimala Range) and Kuriarkutty (Orukomban Range), the regeneration of indigenous species is progressing well. Preference may be given to these plantations for promoting the growth of indigenous species.

The small patch of grassland at Karimalagopuram supports several herbaceous rare and threatened species. Therefore, the burning of grasslands for promoting fresh grass growth will adversely affect the survival of rare and endangered species in the grasslands.



## 12. SYSTEMATIC TREATMENT

### RANUNCULACEAE

1. Terminal leaflet modified into tendril; filaments ligulate ..... **Naravelia**
1. Terminal leaflet normal; filaments linear ..... **Clematis**

#### CLEMATIS Linnaeus

**Clematis gouriana** Roxb. ex DC., Syst. Nat. 1: 138. 1817; FBI 1: 4. 1872; FPM 3. 1915; FPL 43. 1990; Rau, Fl. Ind. 1:64.1993; FTSR 24. 1996.

Climbing herbs; young branches pubescent. Leaflets 3-7, 4-6 x 1.5-3 cm, ovate, acute at apex, rounded at base, nerves tomentose below. Panicles drooping, terminal and axillary, tomentose. Flowers white, 1 cm across; sepals 7 x 4 mm, oblong, obtuse, pubescent; stamens many, filaments 8 mm long, glabrous; carpels 10-15, pubescent. Achenes 3 x 1 mm, ovoid, hairy; style persistent, *ca.* 30 mm long.

*Fl. & Fr.* December-April

*Distr.* Indo-Malesia. Common in moist deciduous and semi-evergreen forests; *PS 19186* Rockpoint

#### NARAVELIA Adanson

**Naravelia zeylanica** (L.) DC., Syst. Nat. 1: 167. 1817; FBI 1: 7. 1872; FPM 3. 1915; FPL 44. 1990; Rau, Fl. Ind. 1:106.1993; FTSR 24. 1996. *Atragene zeylanica* L., Sp. Pl. 542. 1753.

Climbing tomentose shrubs. Leaves trifoliolate; leaflets 9-10 x 8-9 cm, broadly ovate, rounded at base, acute at apex, entire or serrate, 5-ribbed from base, terminal leaflets modified into a trifid tendril; petiole 5-10 cm long, petiolule 2 cm long. Inflorescence a terminal or axillary panicles, 5-15 cm across; pedicels to 2.5 cm long; sepals 4, 6 x 6 mm, ovate, pubescent outside; petals 10, *ca.* 7 mm long, clavate, green; stamens many, filaments flat, connective produced beyond the anthers; carpels 8, densely hairy. Achenes few, 7 x 1 mm, stalked, ellipsoid, with long feathery stigma, to 5 cm long.

*Fl. & Fr.* December-March

*Distr.* South East Asia. Common in moist deciduous forests; *PS 19841* Vengoli

### DILLENACEAE

#### DILLENIA Linnaeus

**Dillenia pentagyna** Roxb., Pl. Corom. t. 20. 1795; FBI 1: 38. 1872; FPM 8. 1915; FPL 44. 1990; Majumdar, Fl. Ind. 1:156.1993; FTSR 25. 1996.

Medium trees. Leaves alternate, 20-50 x 8-25 cm, obovate, obtuse, serrulate; nerves 40-60 pairs, regular, parallel; petiole 6 cm long, sheathing at base. Flowers fascicled on old branches, to 3 cm across; pedicel 4 cm long; sepals 5, 10 mm long, obovate, glabrous; petals yellow, 10-15 x 7-12 mm, obovate, obtuse; stamens many, filaments unequal, to 9 mm long, yellow; carpels 6-10, united; ovules many. Fruits 1.5 cm across, fleshy, globose, yellow, subtended by persistent sepals; seeds many, 5 x 3 mm, angular.

*Fl. & Fr.* February-May

*Distr.* Indo-Malesia. Common in moist deciduous forests; *PS 18874* Orukomban

### ANNONACEAE

1. Inner petals clawed, lozenge-shaped ..... **Orophea**
1. Inner petals without claw, not lozenge-shaped ..... 2

2. Carpels 3-5.....	<b>Sageraea</b>
2. Carpels 10 or more.....	3
3. Flowers on hooked peduncles; inner petals constricted at base.....	<b>Artabotrys</b>
3. Flowers not on hooked peduncles; inner petals without constriction at base.....	4
4. Connective prolonged; widened above the anther.....	5
4. Connective hardly prolonged, not widened above the anther.....	6
5. Flowers subsessile; pedicels less than 3 mm long.....	<b>Meiogyne</b>
5. Flowers pedicellate; pedicels over 1 cm long.....	<b>Polyalthia</b>
6. Petals ovate-orbicular, connate at base.....	<b>Uvaria</b>
6. Petals otherwise, free.....	7
7. Woody climber; inner petals as long as the outer petals.....	<b>Desmos</b>
7. Erect shrubs or trees; inner petals much longer than the outer petals.....	<b>Milium</b>

#### ARTABOTRYS R. Brown ex Ker-Gawler

**Artabotrys zeylanicus** Hook. f. & Thoms., Fl. Ind. 128. 1855 & Hook. f., FBI 1: 54. 1872; FPM 14. 1915; FPL 46. 1990; Debika, Fl. Ind. 1:253.1993; FTSR 26. 1996.

Woody climbers. Leaves to 18 x 7 cm, oblong, acute at both ends, nerves 10-12 pairs; petiole striate. Flowers 1-few; pedicels 1-2 cm long, stout with 4 bracts at base; sepals 3, 8 x 6 mm, broadly ovate, pubescent; petals 6, similar, 2.5-3 x 0.7 cm, oblong-lanceolate, concave at base inside, pubescent, yellow; stamens many, anthers oblong, concealed by flat and broad connectives; carpels few, tomentose, ovules paired in each cell. Fruitlets sessile, globose, 15-22 mm across, obovoid obtusely ridged, densely packed, tomentose.

*Fl. & Fr.* August-November

*Distr.* Peninsular India and Sri Lanka. Rare in evergreen forests; *PS 18822* Parambikulam

#### DESMOS Loureiro

1. Bracts broadly ovate; petals more than 1 cm broad.....**D. viridiflorus**

1. Bracts narrowly ovate; petals to 5 mm broad..... **D. lawii**

**Desmos lawii** (Hook. f. & Thoms.) Safford, Bull. Torrey Bot. Club 39: 506. 1912; Debika, Fl. Ind. 1:261.1993; FTSR 27. 1996. *Unona lawii* Hook. f. & Thoms., Fl. Ind. 132. 1855 & Hook. f., FBI 1: 59. 1872; FPM 15. 1915.

Large climbers, young shoots sericeous tomentose. Leaves to 12 x 4 cm, ovate-oblong, acute at apex, rounded at base with two glands, glaucous below, nerves 8 pairs, hairy below. Flowers solitary, axillary; pedicels 4 cm long, slender, bracteate; sepals 9 x 6 mm, obovate, pubescent; petals 6, biseriate, similar, 5 x 0.5 cm, linear-oblong, pubescent; stamens many, 1 mm long, connectives produced above concealing the anthers; ovaries many, densely hairy, stigma globose, red. Fruitlets 7 x 6 mm, globose-oblong, stipitate, beaked; seeds 1-3, globose; stipe 1 cm long, slender.

*Fl. & Fr.* March-September

*Distr.* South India and Sri Lanka. Common in evergreen and semi-evergreen forests; *PS 30189* Kottayali

**Desmos viridiflorus** (Bedd.) Safford, Bull. Torrey Bot. Club 39: 506. 1912; Debika, Fl. Ind. 1:262.1993; FTSR 27. 1996. *Unona viridiflora* Bedd., Ic. t. 158. 1868-1874; FBI 1: 60. 1872; FPM 15. 1915.

Young shoots rufous. Leaves ovate-lanceolate, acuminate, base rounded or cordate, 7-15 x 3 cm; petiole 0.6-0.8 cm long. Flowers solitary, pedicels 2-4 cm long, slender; bracts 1.5-2 cm across, ovate, cordate at base, attached a little below in middle on pedicel; sepals ovate-lanceolate, 2 x 1.2 cm, dark green; outer petals 4.5 x 1.5 cm; inner petals narrower, silky pubescent, green.

*Fl.* March-April

*Distr.* Endemic to Southern Western Ghats. Rare in evergreen forests; *PS 30263* Pooppara

**Note:** This critically endangered species was not recorded from Palakkad district

#### MEIOGYNE Miquel

1. Petals to 2 x 0.5 cm; leaves more than 6 cm long ..... **M. ramarowii**
1. Petals to 3 x 1 cm; leaves less than 5 cm long..... **M. pannosa**

**Meiogyne pannosa** (Dalz.) Sinclair, Sarawak Mus. J. 5: 604. 1951; Debika, Fl. Ind. 1:266.1993; FTSR 27. 1996. *Unona pannosa* Dalz. in Hook.'s J. Bot. Kew. Gard. Misc. 3: 207. 1851; FBI 1: 58. 1872; FPM 14. 1915.

Small trees; branchlets hirsute. Leaves ovate, apex acuminate, base rounded, nerves 6 or 7 pairs, hirsute below; glabrous above; petioles 5 mm long. Flowers axillary, sessile, dull yellow; sepals 6 x 4 mm, ovate, acute, fulvous tomentose; outer petals spreading; inner erect, ovate-lanceolate, fulvous tomentose; carpels densely hairy. Fruitlets 12 x 8 mm, obovoid, fulvous tomentose; seeds 2-few, globose.

*Fl. & Fr.* July-December

*Distr.* Endemic to Western Ghats. Common in evergreen forests; *PS 19125* Kariamchola; *NS 19428* Pooppara

**Meiogyne ramarowii** (Dunn) Gandhi in Sald. & Nicols., Fl. Hassan Dist. 38. 1976; FPL 46. 1990; Debika, Fl. Ind. 1:266.1993; FTSR 27. 1996. *Unona ramarowii* Dunn, Kew Bull. 1914: 183. 1914; FPM 15. 1915. *Desmos ramarowii* (Dunn) Das, Bull. Bot. Surv. India 5: 42. 1963.

Large shrubs to small trees; branchlets, hirtus. Leaves oblong, acuminate, hirsute below, nerves to 9 pairs, nervules parallel; petiole 8 mm long. Flowers dull white, sessile; sepals 12 x 6 mm, ovate, acute, hispid; petals lanceolate, saccate at base, densely hispid; ovaries densely villous. Fruitlets 1-2.5 x 1 cm, oblong, shortly stalked, tomentose, depressed between seeds; seeds 1-3, globose.

*Fl. & Fr.* December-March

*Distr.* Endemic to Southern Western Ghats. Rare in evergreen forests; *PS 18826* Parambikulam

#### MILIUSA Leschenault ex A. P. de Candolle

1. Trees; carpels 4-6 ovuled ..... **M. tomentosa**
1. Shrubs; carpels 2-ovuled..... **M. indica**

**Miliusa indica** Lesch. ex A. DC., Mem. Soc. Phys. Geneve 5: 213, t. 3, 1832; FPM 21. 1915; Debika, Fl. Ind. 1:217.1993; FTSR 28. 1996. *Miliusa montana* Gard. ex Hook. f. & Thoms., Fl. Ind. 148. 1855. *Miliusa indica* var. *montana* (Gard. ex Hook. f. & Thoms.) Hook. f. & Thoms. in Hook.f., FBI 1: 86. 1872.

Branchlets radiating, pubescent. Leaves to 9 x 4 cm, ovate, acute at apex, rounded to subcordate at base, pubescent; nerves 8-10 pairs. Flowers solitary or paired; pedicel 7 mm long, slender; sepals 2 x 1.5 mm, ovate, ciliate; outer petals 2.5 x 1.5 mm, ovate, acute, glabrous; inner petals ovate, acute, saccate at base, dotted with red glands; torus hairy; anthers curved, filaments pubescent, glandular; ovaries curved, pubescent, 1-celled; ovules 2; style absent; stigma ovoid.

*Fl.* April

*Distr.* India and Sri Lanka. Rare in evergreen forests at higher altitudes; *NS 5662* Karimalagapuram

**Miliusa tomentosa** (Roxb.) Sinclair, Gard. Bull. Singapore 14: 378. 1955; Debika, Fl. Ind. 1:221.1993. *Uvaria tomentosa* Roxb., Pl. Corom. t. 35. 1795. *Saccopetalum tomentosum* (Roxb.) Hook. f. & Thoms., Fl. Ind. 152. 1855 & Hook. f., FBI 1: 88. 1872; FPM 22. 1915.

Medium trees; branchlets tomentose. Leaves to 14 x 6 cm, ovate, apex acute, base rounded, nerves 8-10 pairs; petiole 5 mm long, hispid. Flowers in axillary fascicles; pedicels 3-5 cm long; sepals 3, 5 x 1.5 mm, lanceolate, hispid; outer petals 8 x 1.5 mm, linear-oblong, tomentose; inner petals ovate, acute, hispid; torus densely hispid; ovary curved, hispid, ovules 4-6; style absent; stigma oblong. Fruitlets 2.5 cm across, globose, glabrous; stipe 2-3 cm long.

*Fl. & Fr.* December-May

*Distr.* India, Nepal and Sri Lanka. Fairly common in moist deciduous forests; *PS 30456* Vengoli

#### OROPHEA Blume

- |   |                        |
|---|------------------------|
| 1. Outer 6 stamens sterile; carpels hirsute .....             | <b>O. erythrocarpa</b> |
| 1. All stamens perfect; carpels glabrous .....                | 2                      |
| 2. Petals 5-10 mm long; leaves glabrous .....                 | <b>O. uniflora</b>     |
| 2. Petals less than 3 mm long; midrib tomentose beneath ..... | <b>O. thomsonii</b>    |

**Orophea erythrocarpa** Bedd., Trans. Linn. Soc. Lond. 20: 5. 1846 & Madras J. Lit. Sci. 22: 71. 1861 & Ic. t. 68. 1868-1874; FBI 1: 91. 1872; FPM 24. 1915; Kessler, Blumea 33: 47. 1988; Debika, Fl. Ind. 1:224.1993; FTSR 29. 1996.

Small trees. Leaves to 10 x 4 cm, ovate, acute at both ends, scarcely pubescent, nerves 8 pairs, nervules parallel. Flowers 7 mm across, 3-7 together, in peduncled cymes; peduncles to 10 mm long, hispid; sepals broadly ovate, ciliate; outer petals orbicular, ciliate, inner petals rhomboid, curved inward, pubescent at tips, nectaries, free, oblong, horizontal; stamens 12, curved; connective produced into short point; ovaries 6, densely strigose. Fruitlets oblong, reddish, tomentose.

*Fl. & Fr.* February-August

*Distr.* Western Ghats and Sri Lanka. Common in evergreen forests; *PS 18835* Kottayali; *NS 19120* Kariamchola

**Orophea thomsonii** Bedd., Trans. Linn. Soc. Lond. 20: 5. 1846 & Madras J. Lit. Sci. 22: 72. 1861 & Ic. t. 68. 1868-1874; FBI 1: 91. 1872; FPM 24. 1915 Kessler, Blumea 33: 66. 1988; Debika, Fl. Ind. 1:228.1993; FTSR 32. 1996.

Large shrubs or small trees; young shoots tomentose. Leaves ovate-oblong, obtusely acuminate, base acute, glabrous except on midrib beneath, to 6 x 3.5 cm; lateral nerves ca. 5 pairs; pedicels very short. Flowers creamy white, solitary or in 2-3 flowered cymes, peduncle very short. Outer petals strigose, inner pubescent inside, nectaries oblong, horizontal. Stamens 10-12. Carpels 5 or 6. Fruitlets globose, 8 mm across, stalked.

*Fl. & Fr.* March-May

*Distr.* Endemic to Western Ghats. Rare in evergreen forests; *PS 30113* Karimala

**Note:** This species was described by Beddome (1861) based on the collection from Anamalai Hills. After the type collection it was recently reported from Thrissur. The present collection is a relocation from its type locality.

**Orophea uniflora** Hook. f. & Thoms., Fl. Ind. 111. 1855 & Hook. f., FBI 1: 90. 1872; FPM 24. 1915; Keblar, Blumea 33: 63. 1988; FPL 47. 1990; Debika, Fl. Ind. 1:229.1993; FTSR 32. 1996.

Large shrubs to small trees; bark black. Leaves to 9 x 3 cm, ovate, acuminate at apex, glabrous, pale below, nerves 7-10 pairs, faint; petiole to 4 mm long, tomentose. Flowers 8-10 mm across, in axillary fascicles; pedicels 3-5 mm long, tomentose; sepals 1.5 mm across, orbicular, ciliate; outer petals 5 mm across, orbicular, ciliate; inner petals 9 x 4 mm, rhomboid, glabrous; stamens 9-12, glabrous; ovaries 6, glabrous. Fruitlets 8 mm across, globose, glabrous; seed one.

*Fl. & Fr.* February-May

*Distr.* Endemic to Southern Western Ghats. Common in evergreen forests at low altitudes; *PS 30012* Kottayali; *19464* Pooppara; *18995* Orukomban; *NS 19440* Pooppara

**POLYALTHIA Blume**

- |   |                      |
|---|----------------------|
| 1. Young shoots and leaves tomentose below.....                     | <b>P. cerasoides</b> |
| 1. Young shoots and leaves glabrous .....                           | 2                    |
| 2. Leaves narrow lanceolate, margins undulate.....                  | <b>P. longifolia</b> |
| 2. Leaves ovate-oblong or elliptic, margins not undulate .....      | 3                    |
| 3. Flowers solitary or in fascicles; fruitlets stalk 1-1.15 cm..... | <b>P. coffeoides</b> |
| 3. Flowers in cymes; fruitlets stalks 3.5-5 cm long.....            | <b>P. fragrans</b>   |

**Polyalthia cerasoides** (Roxb.) Bedd., Fl. Sylv. t. 1. 1869; FPM 17. 1915; FPL 48. 1990; Debika, Fl. Ind. 1:270.1993. *Uvaria cerasoides* Roxb., Pl. Corom. 33. 19. 1795. *Guatteria cerasoides* (Roxb.) Dunal, Monogr. Anonac. 127. 1817; FBI 139. 1855.

Small trees; branchlets tomentose. Leaves 6-13 x 3-4 cm, oblong-lanceolate, pubescent, thinly coriaceous, apex acuminate or acute; petioles to 3 mm. Flowers axillary, solitary, bracteolate; pedicels 2.5 cm, pubescent; sepals 6 x 3 mm, ovate, pubescent; petals similar, 8 x 4 mm, coriaceous, slightly inflexed, greenish-yellow; anthers flat topped; carpels stalked, pubescent.

*Fl.* February-March

*Distr.* India to South East Asia. Rare in dry deciduous forests; *PS 19998* Kuchimudi

**Polyalthia coffeoides** (Thw. ex Hook. f. & Thoms.) Hook. f. & Thoms. in Hook.f., FBI 1: 62. 1872; FPM 16. 1915; FPL 48. 1990; Debika, Fl. Ind. 1:270.1993; FTSR 33. 1996. *Guatteria coffeoides* Thw. ex Hook. f. & Thoms., Fl. Ind. 141. 1855.

Tall trees, bark black; young parts glabrous. Leaves to 20 x 7 cm, ovate-oblong, acuminate, base acute, nerves 15 pairs, regular, nervules parallel; petiole 1 cm long, stout. Flowers few together; pedicels 3 cm long, stout; sepals 2 x 5 mm, suborbicular, glabrous; petals 5 x 1 cm, oblong, acuminate, hispid, greenish-yellow; stamens 1 mm long. Fruitlets 2.5 x 1.5 cm, obovoid, puberulus, smooth.

*Fl. & Fr.* December-May

*Distr.* South India and Sri Lanka. Common in evergreen forests; *PS 18859* Kanthalppara

**Polyalthia fragrans** (Dalz.) Bedd., Fl. Sylv. t. 74. 1871; FBI 1: 63. 1872; FPM 16. 1915; FPL 48. 1990; Debika, Fl. Ind. 1:271.1993; FTSR 33. 1996. *Guatteria fragrans* Dalz. in Hook.'s J. Kew Gard. Misc. 3: 200. 1851.

Tall trees; bark grey; young parts pubescent. Leaves to 24 x 9 cm, elliptic, apex acute, base rounded, nerves 17 pairs. Pedicels stout, bracteate above the middle. Sepals 4 x 5 mm, orbicular, pubescent; petals 6, 5.5 x 0.5 cm, linear-oblong, with a broad, curved base, acuminate, greenish-yellow; ovaries hairy; stamens many, connective forms a truncate hood. Fruitlets 2.5 cm across, globose, long-stalked.

*Fl. & Fr.* January-May

*Distr.* Endemic to Southern Western Ghats. Common in evergreen forests; *PS 30168* Orukomban

**Polyalthia longifolia** (Sonner.) Thw., Enum. Pl. Zeyl. 398.1864; FBI 1: 62. 1872; FPM 11. 1915; FPL 49. 1990; Debika, Fl. Ind. 1:274.1993. *Uvaria longifolia* Sonner., Voy. Aux. Indes 2: 233. pl. 131.1782.

Large trees. Leaves to 20 x 5 cm, ovate-lanceolate, acuminate, base rounded; petiole to 6 mm, margin undulate. Inflorescence axillary, racemose or umbellate; flowers many; pedicels to 4 cm; bracts *ca.* 1.5 x 0.3 cm in the middle of the pedicel, narrowly lanceolate, thinly puberulus, greenish-yellow; stamen 1 mm, carpels few, one ovuled; stigma sessile. Fruitlets to 2.5 x 1.5 cm, ovoid.

*Fl. & Fr.* March-August

*Distr.* Native of Sri Lanka; introduced to many Tropical countries. Planted in gardens; *PS 30289* Parambikulam

## SAGERAEA Dalzell

**Sageraea laurifolia** (Graham) Blatt., JBNHS 34: 294. 1930; Debika, Fl. Ind. 1:282.1993. *Guatteria laurifolia* Graham, Cat. 4. 1839. *Sageraea laurina* Dalz. in Hook.'s J. Bot. Kew. Gard. Misc. 3: 207. 1851. *S. dalzellii* Bedd., Ic. t. 42. 1868-1874; FTSR 33. 1996. *Bocagea dalzellii* (Bedd.) Hook. f. & Thoms. in Hook.f., FBI 1: 92. 1872, p. p.

Medium trees, greyish brown, smooth. Leaves to 35 x 12 cm, oblong, acute at apex and base, coriaceous, shining above, glabrous, nerves 10-14 pairs, irregular, faint; petioles 2 cm long. Flowers fascicled, 10-30-together, axillary or on woody tubercles; pedicels to 2.5 cm long; sepals 3, 3 x 5 mm, orbicular, ciliate; outer petals yellow, 13 x 8 mm, orbicular, concave; inner petals similar but smaller than the outer, glabrous; stamens 12, anthers oblong, connectives produced, not concealing the anthers. Carpels 3-6, glabrous, ovules few; style absent; stigma globose. Fruitlets 3.5 cm across, globose, smooth.; seed one.

*Fl. & Fr.* February-June

*Distr.* Endemic to Western Ghats. Rare in evergreen forests at lower altitudes; *PS 30183* Kottayali

## UVARIA Linnaeus

**Uvaria narum** (Dunal) Wall. ex Wight & Arn., Prodr. 9. 1834; FBI 1: 50. 1872; FPM 13. 1915; FPL 49. 1990; Debika, Fl. Ind. 1:292.1993; FTSR 34. 1996. *Unona narum* Dunal, Monogr. Anon. 99. 1817, p. p.

Scandent shrubs; branchlets sparsely hairy. Leaves 11-16 x 3-5 cm, elliptic, lanceolate, apex acuminate, thin coriaceous, lower surface brownish. Flowers solitary, leaf opposed; pedicels to 1 cm, tomentose; sepals 8 x 5 mm, broadly ovate, tomentose, basally connate; petals fleshy, outer 2 x 1.5 cm; inner 2 x 1 cm, obovate, tomentose, apex in curved, golden-brown; anthers concealed by connectives; carpels numerous, 5 mm, oblong, tomentose.

*Fl. & Fr.* March-April

*Distr.* South India and Sri Lanka. Rare in moist deciduous forests; *PS 19033* Kannimara

## MENISPERMACEAE

1. Leaves below greyish-white pubescent; stem deep yellow inside ..... **Coscinium**
1. Leaves surface glabrous or tomentose; stem otherwise ..... 2
2. Leaves with hairy domatia in nerves axils ..... **Anamirta**
2. Leaves without domatia in the nerve axils ..... 3
3. Inflorescence from old wood ..... **Diploclisia**
3. Inflorescence axillary or from leaf scars ..... 4
4. Male flowers in racemes ..... **Tinospora**
4. Male flowers in axillary panicles or in umbels ..... 5
5. Male flowers in umbels ..... **Stephania**
5. Male flowers in panicles ..... 6
6. Female flowers 3-6 together in the axils of large orbicular bracts ..... **Cissampelos**
6. Female flowers otherwise ..... 7
7. Leaves peltate; stamens connate ..... **Cyclea**
7. Leaves not peltate; stamen free ..... **Cocculus**

## ANAMIRTA Colebrooke

**Anamirta cocculus** (L.) Wight & Arn., Prodr. 446. 1834; FBI 1: 93. 1872; FPM 28. 1915; FPL 50. 1990; Pramanik, Fl. Ind. 1:311.1993; FTSR 35. 1996. *Menispermum cocculus* L., Sp. Pl. 340. 1753. *Anamirta paniculata* Colebr., Trans. Linn. Soc. London 13: 66. 1822.

Large climbers; stem smooth. Leaves alternate, to 25 x 19 cm, broadly ovate, acute at apex, truncate at base, 5-ribbed, coriaceous; petiole to 13 cm long. Flowers unisexual, many, in large drooping panicles on old branches; sepals 6 in 2 rows, ovate, 3 x 2 mm, yellow; petals absent; stamens 9, combined into a globose staminal column, anthers sessile; staminodes 9 in female flowers, obovate, scaly; carpels 3, free; style absent; stigma recurved. Fruit of 1-3 drupes, 1 cm across, obliquely ovoid, gibbous, black, smooth; seeds 1, black, glabrous.

*Fl. & Fr.* August-October

*Distr.* Indo-Malesia. Common in moist deciduous and semi-evergreen forests; *PS 30107* Kuriarkutty

#### CISSAMPELOS Linnaeus

**Cissampelos pareira** L. var. **hirsuta** (Ham. ex DC.) Forman, Kew Bull. 22: 356. 1968; FPL 50. 1990; Gangop., Fl. Ind. 1:317.1993; FTSR 35. 1996. *Cissampelos hirsuta* Ham. ex DC., Syst. 1: 535. 1817. *Cissampelos convolvulacea* Willd. var. *hirsuta* (Ham. ex DC.) Hassk., Pl. Jav. Rar. 171. 1848. *Cissampelos pareira* L., Sp. Pl. 1031. 1753 p.p.; FBI 1: 103. 1872; FPM 30. 1915.

Slender climbers; stem pubescent. Leaves to 4 x 6 cm, broadly ovate, obtuse or emarginate at apex, cuspidate, cordate at base, petiole 5 cm long. Male flowers in axillary cymes, sessile, 3 mm across; sepals 4, orbicular, hairy inside; petals 4, connate into a truncate cup, glabrous; stamens 4, connate in a peltate head. Female flowers in bracteate racemes, 3-8 together in the axial of each bract; bracts 1 x 1 cm, orbicular, pubescent; sepals 2; petals absent; ovary densely hairy; styles 3. Fruit a globose drupe, 3 mm across, glabrous; seeds 1, black.

*Fl. & Fr.* August-October

*Distr.* Indo-Malesia. Rare in dry deciduous forests; *PS 30488* Kuchimudi

#### COCCULUS A. P. de Candolle

1. Erect shrubs or small tree; peduncle glabrous ..... **C. laurifolius**
1. Climbing herb; peduncle densely pubescent..... **C. hirsutus**

**Cocculus hirsutus** (L.) Diels in Engl., Pflanzenr. ser. 4. 94. 236: 1910; FPM 29. 1915; Gangop., Fl. Ind. 1:318.1993. *Menispermum hirsutum* L., Sp. Pl. 341. 1753. *Cocculus villosus* DC., Prodr. 1: 98. 1824; FBI 1: 101. 1872.

Stranglers. Leaves to 7 x 4 cm, ovate, cordate, obtuse, hirsute; petiole to 1 cm; male flowers in axillary panicles; sepals 6, obovate, free; petals 6, obovate bifid, free, base auricled; stamens 6, free, included; female flowers in axillary fascicles or racemes; sepals 6, obovate, biseriolate; petals 6, oblanceolate, hairy, carpels 3. Drupe to 8 mm, globose, purple.

*Fl. & Fr.* Throughout the year

*Distr.* Africa and Asia. Common in dry deciduous forests; *PS 30067* Kuchimudi

**Note:** Present collection is the new record for the flora of Kerala.

**Cocculus laurifolius** DC., Syst. Nat. 1: 530. 1817; FBI 1: 101. 1872; FPM 29. 1915; FPL 51. 1990; Gangop., Fl. Ind. 1:319.1993.

Large shrubs to small trees with drooping branches. Leaves to 11 x 3.5 cm, oblanceolate, 3-ribbed, abruptly acuminate at apex, glabrous, shining above. Flowers unisexual, in axillary panicles; sepals 4, 1.2 x 1 mm, ovate, obtuse; petals 4, 2 x 1.5 mm, broadly ovate, obtuse, glabrous; stamens 6 in male flowers, free, anthers ovate, dehiscence horizontal; staminodes 12 in female flowers, 2-seriate, outer staminodes ovate, trilobed, with a small middle-lobe; inner smaller, cup-shaped; staminodes 6 in male flowers, broadly ovate, with incurved margins; ovaries 5-6, free, curved, 1-ovuled; stigma sessile, curved out. Drupes 5 mm across, globose, glabrous; seeds 1, ovoid, depressed at either ends, tubercled.

*Fl. & Fr.* November

*Distr.* Indo-Malesia and East Asia. Rare in evergreen forests; *NS 30239* Pezha

## COSCINIUM Colebrooke

**Coscinium fenestratum** (Gaertn.) Colebr., Trans. Linn. Soc. London 13: 65. 1822; FBI 1: 99. 1872; Pramanik, Fl. Ind. 1:313.1993; FTSR 36. 1996. *Menispermum fenestratum* Gaertn., Fruct. 1: 219, t. 45, f.5. 1788.

Bark surface greyish; stem deep yellow inside; young shoots hoary. Leaves ovate, acuminate, base truncate, deltoid, glabrous above and hoary below, to 18 x 15 cm; basally 5-7 ribbed; petiole 8-12 cm long.

*Fl. & Fr.* not observed

*Distr.* Indo-Malesia. Rare in evergreen forests; *PS 30047* Kanthalppara

## CYCLEA Arnott ex R. Wight

1. Leaves glabrous..... **C. fissicalyx**
1. Leaves variously hairy..... 2
2. Panicles sparsely hairy; leaves ciliate along the margin ..... **C. arnottii**
2. Panicle densely hairy; leave not as above ..... **C. peltata**

**Cyclea arnottii** Miers, Ann. Mag. Nat. Hist. ser. 3, 18: 19. 1866; FPM 31. 1915. *C. peltata* sensu Hook. f. & Thoms. in Hook. f., FBI 1: 104. 1872, non Hook.f. & Thoms. 1855; Gangop., Fl. Ind. 1: 325.1993.

Leaves to 18 x 7.5 cm, ovate-oblong, acuminate at apex, widely cordate at base, pubescent below, pilose along the nerves above; petiole to 6.5 cm long, glabrous. Panicle 14 x 5 cm, drooping, branches adpressed hairy; flowers many-together, pedicels 1 mm long, sparsely hispid; sepals 1 mm long, obtuse, densely hairy; petals glabrous; ovary sparsely hairy. Drupe 5.5 x 4.5 mm, obovoid, glabrous, brown.

*Fl. & Fr.* March-April

*Distr.* Endemic to Peninsular India. Rare along the margins of evergreen forests; *PS 19439* Pooppara

**Cyclea fissicalyx** Dunn in Gamble, FPM 31. 1915 & Kew Bull. 1916: 60. 1916; Gangop., Fl. Ind. 1:324.1993. *Cyclea peltata* Miers, Contr. Bot. 3: 236. 1871, non Hook. f. & Thoms. 1855.

Glabrous twiners; stem striate. Leaves to 10 x 5 cm, ovate, sharply long acuminate, truncate at base, 5-nerved, reticulate; petiole 2.5 cm long. Flowers 2 mm across, in large drooping panicles, glabrous, shortly pedicelled; peduncles slender; bracts foliar; calyx campanulate, glabrous.

*Fl.* April

*Distr.* Endemic to Southern Western Ghats (Kerala). Rare in evergreen forests; *PS 30271* Pooppara

**Cyclea peltata** (Poir.) Hook. f. & Thoms., Fl. Ind. 201. 1855 & in Hook. f., FBI 1: 104. 1872, *p.p.*; FPM 31. 1915; Gangop., Fl. India 1: 325. 1993; FTSR 36. 1996. *Menispermum peltatum* Poir. in Lam., Encycl. 4: 96. 1797. *Cyclea burmannii* Hook. f. & Thoms., Fl. India 201. 1885.

Young branches pubescent. Leaves to 15 x 8 cm, ovate, acute-acuminate at apex, base round to smoothly cordate, pubescent below, glabrous above, palmately 11-nerved. Panicles axillary, to 20 x 7 cm, rachis pubescent. Flowers densely packed towards the branch tips, sessile, densely hairy; male flowers 1.5 mm across; sepals hairy outside; petals glabrous; stamens 4-5-6. Female flowers smaller; sepal-1, hairy; petal-1, hairy; ovary-1, densely hairy. Drupe 4.5 x 4 mm, subglobose, white, pilose; seeds 4.5 x 4 mm, subglobose, tubercled along striated lines, black.

*Fl. & Fr.* August-March

*Distr.* India and Sri Lanka. Common in semi-evergreen and moist deciduous forests; *PS 19084* Padippara



### DIPLOCLISIA Miers

**Diploclisia glaucescens** (Blume) Diels in Engl., Pflanzenr. 46: 226. 1910; FPM 28. 1915; Pramanik, Fl. Ind. 1:327.1993; FTSR 36. 1996. *Cocculus glaucescens* Blume, Bijdr. 25. 1825. *C. macrocarpus* Wight & Arn., Prodr. 13. 1834; FBI 1: 101. 1872.

Lianas; old stem with 4-6 concentric rings of secondary wood. Leaves 6 x 6 cm, broadly ovate to orbicular, obtuse at apex, truncate at base, glaucous below, membranous; nerves few from the base; petiole to 3 cm long. Flowers unisexual, in large drooping panicles on old branches, bright yellow; sepals 6 in two whorls, 3 mm long, obovate; petals 6, smaller than sepals concave with incurved margins, 2 mm long, obovate, emarginate; stamens 6 in male flowers, staminodes absent; carpels 3 in female flowers, free; style cylindrical. Drupe compressed, curved, tubercled.

*Fl. & Fr.* February-April

*Distr.* Indo-Malesia and China. Common in semi-evergreen forests; *PS 19394* Karimala

### STEPHANIA Loureiro

**Stephania japonica** (Thunb.) Miers, Ann. Mag. Nat. Hist. ser.3, 13: 14. 1866; FPM 29. 1915; Gangop., Fl. Ind. 1:335.1993; FTSR 37. 1996. *Menispermum japonicum* Thunb., Fl. Japan 193. 1784. *Cissampelos hernandifolia* Willd., Sp. Pl. 4: 861. 1806. *Stephania hernandifolia* (Willd.) Walp., Repert. 1: 96. 1842; FBI 1: 103. 1872. *Cyclea hernandifolia* (Willd.) Wight & Arn., Prodr. 14. 1834 [Figure 3].

Twining herbs. Leaves to 9 x 7 cm, truncate to cordate at base, acute at apex, palmately 9-nerved; petiole to 9 cm long. Umbel peduncled, axillary; peduncle 3-5 cm long, erect, slender; flowers many, 2 mm across, sessile; sepals 5, free, glabrous; petals 5, oblong, glabrous, greenish-yellow. Drupe to 5 x 4 mm, curved, oblong to obovoid, shortly stalked, glabrous.

*Fl. & Fr.* October-December

*Distr.* Indo-Malesia and East Asia. Common in secondary forests; *PS 30326* Pezha; *30515* Orukomban

### TINOSPORA Miers

1. Branchlets glabrous ..... **T. cordifolia**  
1. Branchlets tomentose ..... **T. sinensis**

**Tinospora cordifolia** (Willd.) Hook.f. & Thoms. in Hook.f., FBI 1: 97. 1872; FPM 19. 1915; FPL 52. 1990; Pramanik, Fl. Ind. 1:347.1993. *Menispermum cordifolium* Willd., Sp. Pl. 4: 826. 1806. *Cocculus cordifolius* (Willd.) DC., Syst. 1: 517. 1817.

Climbing shrubs, sap watery, bark corky and grooved in older branches, glabrous. Leaves 5-9 x 5-10 cm, glabrous, 5-nerved at base, deeply cordate; petioles to 6 cm long. Racemes cauliflorous; male flowers-outer sepals smaller; petals shorter than the inner sepals; stamens 6, free, opposite to petals, female flowers-staminodes 6, carpels 3, stigma forked. Drupes 6 x 5 mm, sessile; seeds grooved vertically.

*Fl. & Fr.* January-February

*Distr.* India, Sri Lanka, Myanmar and Bangladesh. Rare in moist deciduous forests; *PS 19325* Kothala

**Tinospora sinensis** (Lour.) Merr., Sunyatsenia 1:139.1934 & in Trans. Am. Phil. Soc. Philad. 24.158.1935; FPL 52. 1990; Pramanik, Fl. Ind. 1:349.1993; FTSR 39. 1996. *Campylus sinensis* Lour., Fl. Cochinch. 113.1790. *Tinospora malabarica* (Lamk.) Hook. f. & Thoms. in Fl. India 183.1855 & in Hook. f., FBI 1:96.1872. *Menispermum malabaricum* Lam., Encycl. 4: 96. 1797.

Small climbing shrubs; stem succulent. Leaves to 14 x 11 cm, broadly ovate, cordate at base, 5-7-nerved from base, scabrous above, densely white tomentose below. Flowers in racemes on old leafless branches, precocious, dioecious; raceme 10-25 cm long. Flowers 3-5 together, pedicelled; sepals 6 in 2 whorls, outer smaller, inner 2 x 1.5 mm, obovate; petals 6, smaller;

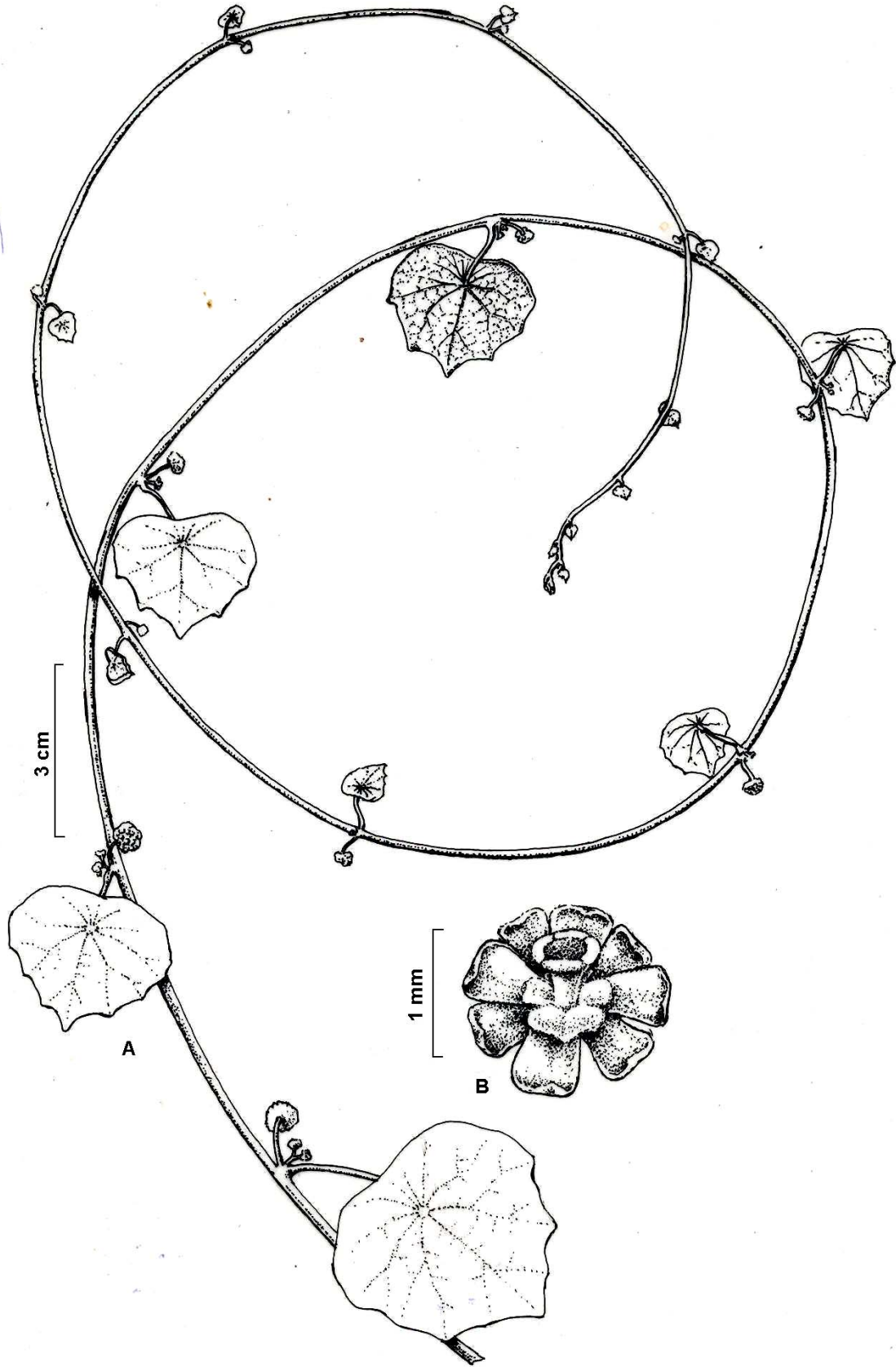


Figure 3. *Stephania japonica* (Thunb.) Miers. **A.**- flowering branch; **B.** - male flower

stamens 6, free, anthers orbicular. Female flowers: sepals and petals similar to male flowers; carpels 3; stigma bilobed; staminodes 6, clavate. Drupe 8 mm long, 1 or 2 together, ovoid, red, glabrous.

*Fl. & Fr.* February-April

*Distr.* India Sri Lanka, China to Cambodia. Rare in moist deciduous and semi-evergreen forests; *PS 30796* Sungam

## BRASSICACEAE

- 1. Diffuse herbs; leaves lyrate ..... **Cardamine**
- 1. Erect herbs; leaves entire ..... **Brassica**

### BRASSICA Linnaeus

**Brassica juncea** (L.) Czern. & Coss. in Czern., *Consp. Pl. Chark.* 8. n. 5. 1859; *FBI* 1: 157. 1872; *FPM* 38. 1915; *FPL* 54. 1990; Hajra *et al.*, *Fl. Ind.* 2:134.1993. *Sinapis juncea* L., *Sp. Pl.* 668. 1753.

Small herbs. Leaves alternate, lyrate, to 15 x 7 cm, glabrous. Flowers many, 8 mm across, in terminal racemes; sepals 4, oblong, glabrous; petals 4, yellow; stamens 6, free; ovary stipitate, ovules 10-20, style short, stigma capitate. Fruit a subterete silique.

*Fl. & Fr.* Throughout the year

*Distr.* Central and East Asia and Europe, cultivated. Occasional in marshy areas and river beds; *PS 30346* Vengoli

### CARDAMINE Linnaeus

**Cardamine trichocarpa** Hochst. ex A. Rich, *Tent. Fl. Abyss.* 1: 18. 1847; *FPM* 38. 1915; Debnath, *Fl. Ind.* 2:117.1993. *Cardamine subumbellata* Hook. ex Hook. f. & Anders. in Hook.f., *FBI* 1: 138. 1872. *Cardamine borbonica* Pers., *Syn. Pl.* 2: 195. 1807.

Diffuse branched herbs; stem sparsely hairy. Leaves to 5 cm long; leaflets orbicular, deeply crenate, sparsely hairy. Flowers white, in terminal racemes, 3 mm across, pedicels 6 mm long; sepals 4, oblong; stamens 4. Pods 2.5 x 0.15 cm, flat; seeds 1-seriate, 2 x 1 mm, oblong, smooth, brown.

*Fl. & Fr.* January-May

*Distr.* India and Sri Lanka. Rare in grasslands; *PS 19338* Thenkudippara

## CAPPARACEAE

- 1. Annuals herbs; fruit a capsule ..... **Cleome**
- 1. Shrubs or trees; fruit a berry..... 2
- 2. Leaves simple; stipules spinescent ..... **Capparis**
- 2. Leaves 3-foliolate; stipules absent ..... **Crataeva**

### CAPPARIS Linnaeus

- 1. Trees; unarmed; young shoots greyish-white tomentose..... **C. grandis**
- 1. Erect or scandent shrubs or small trees; armed; young shoots not greyish-white tomentose..... 2
- 2. Flowers in terminal or axillary umbels ..... **C. sepiaria**
- 2. Inflorescence otherwise..... 3
- 3. Flowers in supra-axillary rows ..... **C. zeylanica**
- 3. Flowers solitary or in axillary or terminal racemes ..... 4
- 4. Flower solitary, axillary; young shoot and leaves brown tomentose ..... **C. rheedei**
- 4. Flowers in apparent terminal corymbs; young shoots glabrous..... **C. moonii**

**Capparis grandis** L.f., Suppl. Pl. 263. 1781; FBI 1: 176. 1872; FPM 46. 1915; Sundara Raghavan, Fl. Ind. 2:274.1993. *Capparis bisperma* Roxb., Fl. Ind. 2: 568. 1832.

Small trees; branchlets densely tomentose. Leaves to 5 x 4 cm, ovate, slightly emarginate, tomentose on both sides; petioles 1 cm, densely tomentose. Corymbs terminal, lower with leaves, upper with small bracts, flowers 2 cm across, white; peduncles 3 cm, tomentose, pedicels 2.5 cm, buds tomentose. Berry 2.5 cm across, globose.

*Fl. & Fr.* February-May

*Distr.* Indo-Malesia. Common in dry deciduous forests; *PS 30413* Kuchimudi

**Capparis moonii** Wight, Ill. 1: 35. 1840; FBI 1: 175. 1872; FPM 45. 1915; FPL 56. 1990; Sundara Raghavan, Fl. Ind. 2:277.1993; FTSR 40. 1996.

Scandent shrubs; stem glabrous, spines, conical, slightly recurved, base decurrent on either side of petiole. Leaves to 12 x 4 cm, elliptic-oblong, acute at both ends, glabrous, shining above; petiole 1.5 cm long, slender. Flowers 8-10 cm across, solitary or 3-5 together, terminal or in axils of upper leaves, spreading; sepals 1.8 cm across, orbicular, puberulus; petals to 5 x 3 cm, obovate, white, cottony hairy; filaments 7.5 cm long, glabrous. Berry 6-8 cm across, globose, glabrous; gynandrophore 4-10 cm long, stout.

*Fl. & Fr.* January-May

*Distr.* South West India and Sri Lanka. Occasional in semi-evergreen forests; *PS 18867* Karimthalappara; *30533* Pandaravarai

**Capparis rheedei** DC., Prodr. 1: 246. 1824 'rheedii'; Sundara Raghavan, Fl. Ind. 2:285.1993; FTSR 40. 1996. *Capparis heyneana* Wall. ex Wight & Arn., Prodr. 25. 1834; FBI 1: 174. 1872; FPM 45. 1915. *C. baducca* sensu Jacobs, Blumea 12: 435. 1965, non L. 1753.

Large shrubs to small trees; young shoots and leaves reddish brown tomentose, becoming glabrous. Leaves ovate or elliptic, oblong, acuminate or acute, mucronate, base acute or truncate, to 14 x 6 cm; lateral nerves 3 or 4 pairs; petiole 2-2.5 cm long. Flowers solitary, axillary. Petals pale blue changing to white, with yellow blotches at the base of upper pair. Stamens 80-100. Berry ovoid, *ca.* 4 cm long.

*Fl. & Fr.* February-June

*Distr.* Endemic to Western Ghats. Rare in evergreen forests; *PS 30151* Muthuvarachal

**Capparis sepiaria** L., Syst. Nat. (ed.10) 2: 1071. 1759; FBI 1: 177. 1872; Sundara Raghavan, Fl. Ind. 2:289.1993. *Capparis incanescens* DC., Prodr. 1: 247. 1824.

Stragglers; branchlets thinly pubescent. Leaves 2-3 x 0.5-2 cm, oblong, lanceolate, emarginate, pubescent; petioles *ca.* 0.5 cm, stipular spines in pairs, small recurved. Umbels corymbose, terminal and axillary; peduncles 1 cm; flowers 1 cm across, white; pedicels 1.5 cm; sepals ovate, margin ciliate.

*Fl.* April-May

*Distr.* Pantropical. Common in dry deciduous forests; *PS 19540* Thekkady

**Capparis zeylanica** L., Sp. Pl. (ed.2) 720. 1762; FPM 46. 1915; Sundara Raghavan, Fl. Ind. 2:298.1993. *C. horrida* L.f., Suppl. Pl. 264. 1781; FBI 1: 178. 1872.

Stragglers, branchlets adpressed tomentose. Leaves 5-9 x 4-6 cm, ovate, truncate, mucronate, entire, pubescent; petioles to 1 cm, densely pubescent, stipular spines small, in pairs, recurved. Flowers in supra axillary rows, 3-4 cm across, white, buds densely pubescent; pedicels 4 cm, pubescent; stamens numerous, long exerted, white, turns to brown, gynandrophore as long as or longer than filaments; ovary 2.5 mm, ellipsoid.

*Fl. & Fr.* March-April

*Distr.* Indo-Malesia and China. Rare in dry deciduous forests; *PS 30641* Vengoli

## CLEOME Linnaeus

- |   |                      |
|---|----------------------|
| 1. Leaves simple .....                                  | <b>C. monophylla</b> |
| 1. Leaves 3-9 foliolate.....                            | 2                    |
| 2. Petiole with scattered spines on the lower side..... | <b>C. spinosa</b>    |
| 2. Petiole without spines.....                          | 3                    |
| 3. Whole plant viscous; flowers yellow .....            | <b>C. viscosa</b>    |
| 3. Plant not viscous; flowers bluish-purple .....       | <b>C. burmannii</b>  |

**Cleome burmannii** Wight & Arn., Prodr. 22. 1834; FBI 1: 170. 1872; FPM 41. 1915; Sundara Raghavan, Fl. Ind. 2:304.1993.

Decumbent herbs. Leaves alternate, trifoliolate, leaflets 2-4 x 1.5-2 cm, obovate, acute; petiole to 2-3.5 cm. Flowers *ca* 7 mm across, solitary, axillary, pedicel 1.5-2.5 cm; stamens 6; gynophore to 7 mm long, ovary *ca* 6 mm. Capsule linear.

*Fl. & Fr.* October-January

*Distr.* South India, Sri Lanka and Indonesia. Occasional in degraded forest areas; *PS 19379* Vengoli

**Cleome monophylla** L., Sp. Pl. 672. 1753; FBI 1: 168. 1872; FPM 41. 1915; FPL 57. 1990; Sundara Raghavan, Fl. Ind. 2:312.1993; FTSR 42. 1996.

Erect herbs; densely glandular hairy. Leaves to 4.5 x 1.5 cm, oblong-lanceolate, acute at apex, rounded or cordate at base, pubescent; petiole 8 mm long. Raceme terminal; bracts ovate-triangular, cordate at base; pedicel 1 cm long. Flowers many; sepals 6 mm long, oblong, acuminate; petals 4 mm long, obovate; stamens 6, filaments glabrous. Capsule 8-11 cm long, pubescent; seeds 2 x 1.5 mm, strongly reniform, rugose along transverse ridges.

*Fl. & Fr.* November-February

*Distr.* Tropical Asia. Common in wet rocky areas; *NS 18971* Vengoli

**Cleome spinosa** Jacq., Enum. Pl. Craib. 26. 1760; Sundara Raghavan, Fl. Ind. 2:321.1993; Sivar. & Sunil, Rheede 5:184.1995.

Herbs, branchlets glandular hairy. Leaves alternate, palmately 5-9 foliolate, petiole 6-10 cm, with scattered spines; leaflets 5-10 x 2-3 cm, elliptic-lanceolate, acute, narrowed towards base, margin serrulate, pubescent, mid veins spiny beneath. Flowers solitary in upper axils and in apparent terminal bracteate racemes; bracts 2.5-4.5 cm, foliaceous, crescent shaped, sepals 4, 5-8 mm, lanceolate, petals 4, 1.5-2 x 1 cm, clawed, elliptic-obovate, pink; stamens 6, filaments equally or longer than petal; gynophore to 4 cm, pink, accrescent, ovary 8-10 mm, linear, stigma capitate. Capsule 4-7 cm, cylindric, seeds globose, reniform.

*Fl. & Fr.* March-December

*Distr.* Native of South America, cultivated in many parts of Asia. Rare along the riverine areas; *PS 19329* Thenkudippara

**Cleome viscosa** L., Sp. Pl. 672. 1753; FBI 1: 170. 1872; FPM 41. 1915; FPL 57. 1990; Sundara Raghavan, Fl. Ind. 2:317.1993; FTSR 42. 1996. *Polanisia icosandra* Wight & Arn., Prodr. 22. 1834.

Herbs. Leaves 3-5-foliolate; leaflets 2.5 x 1.5 cm, obovate, acute at apex and base, glandular hairy; petiole to 3 cm long. Flowers axillary, solitary; pedicels 1.5 cm long; sepals 4 mm long, oblong, glandular hairy; petals yellow, 7 mm long, obovate; stamens 12-18, filaments straight. Capsule 6-8 cm long terete; seeds 1.2 x 1.2 mm, striate-ridged along the margins.

*Fl. & Fr.* May-December

*Distr.* Pantropical. Occasional in moist habitats of rocky areas; *PS 18975* Vengoli

## CRATEVA Linnaeus

- |   |                                       |
|---|---------------------------------------|
| 1. Leaflets abruptly acuminate; berry smooth, red .....             | <b>C. adansonii</b> ssp. <i>odora</i> |
| 1. Leaflet caudate, acuminate; berry scurfy tomentose, yellow ..... | <b>C. magna</b>                       |

**Crataeva adansonii** DC. ssp. **odora** (Buch.-Ham.) Jacobs, Blumea 12: 198. 1964; Sundara Raghavan, Fl. Ind. 2:322.1993. *C. odora* Buch.-Ham., Trans. Linn. Soc. London 15: 118. 1827. *C. religiosa* var. *roxburghii* (R. Br.) Hook.f. & Thoms. in Hook.f., FBI 1: 172. 1872. *C. roxburghii* R. Br. in Benth. & Clapp., Narr. Trav. Disc. Afr. App. 224. 1826. *C. religiosa* sensu Dunn in Gamble, FPM 47. 1918, non Forst.f. 1786.

Small trees. Lateral leaflets 7-15 x 1-3.5 cm, ovate-lanceolate, glabrous; petiole to 6 cm. Corymbs terminal, to 10 cm; pedicels 5 cm, sepals 5 mm, oblong; petals 1.5 cm, obovate, white, long clawed; stamens less than 30, filaments shorter than gynandrophore; ovary 3 mm, ovoid, many ovuled, stigma discoid. Berry 2.5 x 2 cm, globose.

*Fl. & Fr.* February-April

*Distr.* South Asia. Common in dry deciduous forests; *PS 30341, NS 30574* Keerappadi

**Crataeva magna** (Lour.) DC., Prodr. 1: 243. 1824; FPL 58. 1990; Sundara Raghavan, Fl. Ind. 2:324.1993; FTSR 42. 1996. *Capparis magna* Lour., Fl. Cochinch. 330. 1790. *Crataeva nurvala* Buch.-Ham., Trans. Linn. Soc. London 15: 121. 1827. *C. religiosa* var. *nurvala* (Buch.-Ham.) Hook. f. & Thoms. in Hook.f., FBI 1: 172. 1872. *C. religiosa* sensu Bedd., Fl. Sylv. t. 116. 1871; FPM 47. 1915, non G. Forst. 1786.

Small trees; bark white. Leaflets to 11 x 5 cm, ovate, acute at apex, acute or rounded at base, glabrous. Flowers in terminal corymbs; pedicel to 5 cm long; sepals 4, free, 3 mm long, oblong, adnate to the disc; petals long-clawed, limb 2 x 1.8 cm, orbicular, white, claw 1 cm long, slender; stamens many, filaments 3.3 cm long, free; gynophore 4.5 cm long, slender; ovary 1-2-celled; stigma sessile, capitate. Berry globular, 2-2.5 cm across, rough.

*Fl. & Fr.* February-May

*Distr.* Indo-Malesia and China. Common along the riverine areas; *PS 19367* Pezha

## COCHLOSPERMACEAE

### COCHLOSPERMUM Humboldt, Bonpland et Kunth

**Cochlospermum religiosum** (L.) Alston in Trimen, Handb. Fl. Ceylon 6 (Suppl.): 14. 1931; FPL 58. 1990; Balakr., Fl. Ind. 2:383.1993; FTSR 43. 1996. *Bombax religiosum* L., Sp. Pl. 512. 1753. *Cochlospermum gossypium* DC., Prodr. 1: 527. 1824; FBI 1: 90. 1872; FPM 50. 1915.

Small trees; bark greyish-brown. Leaves to 20 cm across, palmately 5-7-lobed, lobes elliptic, acute to acuminate, densely tomentose below; petiole to 18 cm long, densely hairy. Flowers in terminal cymes, subsessile, 3-7 together; calyx 5-partite, lobes 2.5 x 1.5 cm, obtuse, densely tomentose; petals yellow, 5, 5 x 3 cm, obovate; stamens many, free; filaments 2.2 cm long; ovary 1-celled, ovules many, 3-5-parietal; style-1, filiform. Capsule 8 x 5.5 cm, obovoid, 5-angled, many-ridged, 3-5-valved; seeds many, globose, with woolly hairs.

*Fl. & Fr.* January-May

*Distr.* Indo-Malesia. Common in rocky areas. *PS 18829* Vengoli

## FLACOURTIACEAE

- |   |                    |
|---|--------------------|
| 1. Trunk armed with branched or unbranched thorns ..... | 2                  |
| 1. Trunk unarmed .....                                  | 3                  |
| 2. Flowers unisexual; petals absent.....                | <b>Flacourtia</b>  |
| 2. Flowers bisexual; petals present.....                | <b>Scolopia</b>    |
| 3. Fruits large more the 4 cm dia.; hard rinded.....    | <b>Hydnocarpus</b> |
| 3. Fruits to 2 cm dia.; rind thin .....                 | 4                  |
| 4. Flowers in racemes or panicles .....                 | <b>Homalium</b>    |
| 4. Flowers in axillary or extra axillary clusters.....  | <b>Casearia</b>    |

## CASEARIA N. J. Jacquin

- |  |                      |
|--|----------------------|
| 1. Leaves hairy; margin crenate-serrate .....                                  | 2                    |
| 1. Leaves glabrous; margins entire or sub entire .....                         | 3                    |
| 2. Leaves coriaceous; petiole reddish; capsule yellow.....                     | <b>C. tomentosa</b>  |
| 2. Leaves membranous; petiole greenish yellow; capsule orange .....            | <b>C. wynadensis</b> |
| 3. Leave thick coriaceous, blackish in drying; reticulation not prominent..... | <b>C. ovata</b>      |
| 3. Leaves membranous, yellowish on drying; reticulation prominent.....         | <b>C. rubescens</b>  |

**Casearia ovata** (Lam.) Willd., Sp. Pl. 2: 629. 1799; FTSR 44. 1996. *Anavinga ovata* Lam., Encycl. 1: 148. 1789. *Vareca zeylanica* Gaertn., Fruct. 290, t. 60. 1788. *Casearia esculenta* Roxb., Fl. Ind. 2: 422. 1832; FBI 2: 592. 1879, p.p; FPM 521. 1915; FPL 59. 1990. *C. bourdillonii* Mukherjee, Bull. Bot. Soc. Bengal 19:109. 1965(1967). *C. zeylanica* (Gaertn.) Thw., Enum. Pl. Zeyl. 19. 1858.

Small trees, young shoots glabrous. Leaves ovate or elliptic, acuminate, acumen twisted and folded, base acute or rounded, to 13 x 6 cm; lateral veins 6-8 pairs, reticulation faint, glabrous and shining; petiole ca. 0.5 cm long. Tepals glabrous. Capsule orange yellow, 1.2-1.8 cm long.

*Fl. & Fr.* April-August

*Distr.* India and Sri Lanka. Common in moist deciduous and semi-evergreen forests, and fairly in plantations; *PS 30344* Vengoli

**Casearia rubescens** Dalz. in Hook.'s J. Bot. Kew Gard. Misc. 4: 108. 1852; FPM 520. 1919; Balakr., Fl. Ind. 2:396.1993; FTSR 44. 1996.

Medium trees, branchlets lenticellate. Leaves to 14 x 6 cm, oblong, rounded at base, acute or obtuse at apex, glabrous, nerves ca. 15 pairs, midrib; nerves and petiole reddish; petiole 1.5 cm long. Flowers 2-6 together, 5 mm across; pedicel 3.5 mm long, tomentose; sepals 2 x 1.5 mm, ovate obtuse, tomentose outside, ciliate; stamens 10, filaments 1 mm long, sparsely hairy; staminodes 0.6 x 1 mm, triangular, sparsely hairy at base; ovary 2 x 2 mm, globular, ovules 9; stigma hardly wider than style. Capsule 15 x 8 mm, ellipsoidal, smooth, narrowly 3-furrowed, not prominently ridged, glabrous.

*Fl. & Fr.* April-May.

*Distr.* Endemic to Southern Western Ghats. Rare in evergreen forests at higher altitudes; *PS 18958* Vengoli

**Casearia tomentosa** Roxb., Fl. Ind. 2: 421. 1832; FBI 2: 593. 1879; FPM 521. 1919; FPL 59. 1990; Balakr., Fl. Ind. 2:397.1993; FTSR 44. 1996. *Casearia elliptica* Willd., Sp. Pl. 2: 628. 1800, *nom. superfl.*

Young shoots tomentose. Leaves elliptic-lanceolate, acuminate, base acute, margins serrate, pubescent below, to 12 x 3.5 cm; lateral nerves 7 or 8 pairs, reticulation faint; petiole 1 cm long, pubescent. Tepals and pedicels tomentose. Capsule greenish-yellow, oblong, ribbed, to 2 x 1.2 cm.

*Fl. & Fr.* March-May

*Distr.* Indo-Malesia to Australia. Rare in moist deciduous forests; *PS 19094* Padippara

**Casearia wynadensis** Bedd., Ic. t. 160. 1868-1874; FBI 2: 594. 1879; FPM 521. 1919; FPL 60. 1990; Balakr., Fl. Ind. 2:399.1993.

Small trees. Leaves 15-18 x 4.5-5.5 cm, acuminate, base acute, serrate, rufous below, glabrous above; petiole to 0.5-1 cm. Flowers 6-8, fascicled on axils of older leaves; peduncle ca 4 mm, pubescent; calyx 5-lobed, 3 mm, ovate, glabrous within; stamens 8, staminodes hairy, ca 2 mm; ovary oblong; style to 3 mm, hairy; stigma 4-lobed.

*Fl. & Fr.* November-April

*Distr.* Endemic to Western Ghats. Common in moist deciduous forests and fairly in plantations; *PS 19404* Thellikkal

## FLACOURTIA Commerson ex L' Heritier de Brutelle

1. Shoot apex thorny; leaves to 2 cm across, fascicled at apex ..... **F. indica**
1. Shoot apex not thorny; leaves more than 3 cm across, distinctly alternate..... 2
2. Drupe few, purple; racemes lax..... **F. ramontchi**
2. Drupe clustered bright red; racemes dense ..... **F. montana**

**Flacourtia indica** (Burm. f.) Merr., Interpr. Rumph. Herb. Amb. 377. 1917; FPL 60. 1990; Balakr., Fl. Ind. 2:402.1993. *Gmelina indica* Burm. f., Fl. Ind. 132. t.39, f. 5. 1768. *Flacourtia sepiaria* Roxb., Pl. Corom. t. 68. 1795; FBI 1: 194. 1872; FPM 54. 1915.

Small weak shrubs, sparsely spiny. Leaves alternate, clustered at the apex of branchlets, 5 x 2.5 cm, obovate, margins crenulate at the apex; petiole less than 5 mm. Flowers axillary, greenish; sepals 4, imbricate, 1.5 x 1.5 mm, broadly ovate, ciliate; petals absent; disc lobed; stamens more than 20, filaments up to 3 mm; anthers versatile.

*Fl.* July-September

*Distr.* Indo-Malesia and Africa. Rare in rocky areas of moist deciduous forests; *PS 19301* Karimala; *NS 19645* Vengoli

**Flacourtia montana** Graham, Cat. Pl. Bombay 10. 1839; Fl. Ind. 1: 192. 1872; FPM 54. 1915; Balakr., Fl. Ind. 2:406.1993; FTSR 44. 1996.

Small trees, trunk armed with unbranched thorns. Leaves alternate, to 15 x 6 cm, elliptic, acuminate at either ends, crenate-serrate, nerves 4-6 pairs, erose, reticulate. Flowers unisexual, dioecious, densely packed in axillary congested cymes; sepals 4 or 5, 1.5 mm long, ovate, pubescent; stamens in male flowers many; pistillode absent; ovary in female flowers 1-celled; ovules few, parietal; styles 5; stigma bifid at apex. Fruit 1.5 cm across, berry, bright red; seeds few, reddish.

*Fl. & Fr.* March-May

*Distr.* Endemic to Western Ghats. Common in evergreen forests at low altitudes; *PS 19115* Kariamchola; *19354* Kariyilathodu

**Flacourtia ramontchi** L'Herit., Strip. Nov. 3: 59. tt. 30 & 30 B. 1786; Hook. f. & Thoms. in Hook. f., FBI 1: 193. 1872; FPM 54. 1915. *F. sapida* Roxb., Pl. Cor. t. 69. 1796; Wight & Arn., Prodr. Fl. Ind. 29. 1834.

Small armed trees, branchlets terete, pubescent, bark whitish. Leaves to 6 x 4.5 cm, ovate-elliptic, chartaceous, 3-nerved from slightly above the base, crenate; petioles 1.5 cm, pubescent. Flowers yellow, 4 mm across; stamens many, disc extra-staminal, glandular, pistillode absent.

*Fl.* February-May

*Distr.* Paleotropics. Rare in evergreen forests at low altitudes; *PS 30643* Vengoli

## HOMALIUM N. J. Jacquin

**Homalium zeylanicum** (Gard.) Benth., J. Linn. Soc. Bot. 4: 35. 1860; FBI 2: 596. 1879; FPM 522. 1915; FPL 61. 1990; Balakr., Fl. Ind. 2:410.1993; FTSR 45. 1996. *Blackwellia zeylanica* Gard., Calcutta J. Nat. Hist. 7: 452. 1847. *Homalium tetrandra* Wight, Ic. t. 1851. 1852.

Medium trees; branchlets puberulus. Leaves to 14 x 7 cm, broadly elliptic abruptly acuminate, crenate, membranous; nerves 8 pairs; petiole to 2 cm long. Racemes 10-25 cm long, solitary or 2-3 together, axillary, drooping, slender. Flowers clustered, pedicellate, 5 mm across; sepals 4, ovate-lanceolate, pubescent; petals 4, oblanceolate, pubescent; stamens 4, antipetalous; staminodes globular; ovary 1-celled; ovules few; style 4. Capsule globose, 2-4-valved; seeds few.

*Fl. & Fr.* March-May

*Distr.* South India and Sri Lanka. Fairly common in evergreen forests; *PS 30364* Kariamchola



## HYDNOCARPUS Gaertner

1. Berry leathery tomentose; leaf margins entire.....**H. alpina**  
1. Berry glabrous; leaf margins serrate or crenate.....**H. pentandra**

**Hydnocarpus alpina** Wight, Ic. t. 942. 1845; FBI 1: 197. 1872; FPL 61. 1990; Balakr., Fl. Ind. 2:418.1993; FTSR 45. 1996.

Medium trees; bark black; branchlets puberulus. Leaves to 15 x 6 cm, ovate, acute at apex, acute or round at base, nerves 7-10 pairs; young sprouts reddish. Flowers 15 mm across in axillary peduncled cymes; pedicel 1.5-2 cm long, deflexed, pubescent; sepals 8 mm long, oblong, pubescent; petals 1 cm long narrow, glabrous; scale linear, as long as petal, sparsely hairy; filaments glabrous; ovary in female flowers globular, tomentose, stigma 5, free, radiating, recurved. Berry 7 cm across, densely tomentose, dark brown.

*Fl. & Fr.* January-May

*Distr.* South India and Sri Lanka. Rare in evergreen forests at high altitudes; *PS 19310* Kothala

**Hydnocarpus pentandra** (Bunch.-Ham.) Oken, Allg. Naturf. 3: 1381. 1841; FPL 61. 1990; Balakr., Fl. Ind. 2:422.1993; FTSR 46. 1996. *Chilmoria pentandra* Bunch.-Ham., Trans. Linn. Soc. London 13. 501. 1822. *Hydnocarpus laurifolia* (Dennst.) Sleum., Bot. Jahrb. 69: 33. 1938. *H. wightiana* Blume, Rumph. 4: 22. 1848; FBI 1: 196. 1872; FPM 52. 1915. *H. alpina* sensu Gamble, FPM 52. 1915.

Medium trees; bark white; branchlets puberulus. Leaves to 17 x 8 cm, elliptic, acuminate at apex, acute or obtuse at base, nerves 8 pairs, prominent. Flowers to 1 cm across, in peduncled axillary cymes; sepals broadly ovate, pubescent; petals broadly ovate, greenish yellow, obtuse, ciliate; scale half as long as petals, densely hairy; filaments hairy; ovary in female flowers globose tomentose; stigma 3-5 sessile; staminodes 5. Berry 5-7 cm across, globose, rind thick, rough with uneven surface.

*Fl. & Fr.* February-October

*Distr.* Endemic to Western Ghats. Common along the riverine areas and semi-evergreen forests; *PS 18805* Thellikkal; *18873* Orukomban

## SCOLOPIA Schreber

**Scolopia crenata** (Wight & Arn.) Clos, Ann. Sci. Nat. Bot. ser 4, 8: 250. 1857; FBI 1: 191. 1872; FPM 52. 1915; FPL 62. 1990; Balakr., Fl. Ind. 2:430.1993; FTSR 46. 1996. *Phoberos crenatus* Wight & Arn., Prodr. 29. 1834.

Small to medium trees; branchlets with transverse lenticels. Leaves 5-9 x 3-5.5 cm, obovate, crenulate, abruptly acuminate, nerves erose, 4-7 pairs. Racemes upper axillary, 5-7 cm long; rachis ferruginous tomentose. Flowers pedicellate; pedicel 6 mm long, puberulus; sepals 6, 3 x 2 mm, obovate; petals 6, smaller, orbicular, white; stamens numerous, free; anthers 1 mm long, oblong, connective produced into a reddish hood. Ovary 1-celled, few ovuled; style 4 mm long, thick; stigma 3-fid. Capsule 10 x 8 mm, globose, with persistent style; seeds few.

*Fl. & Fr.* March-July

*Distr.* Indo-Malesia. Rare in evergreen forests; *PS 30603* Parambikulam

## PITTOSPORACEAE

### PITTOSPORUM Banks ex Solander

**Pittosporum neelgherrense** Wight & Arn., Prodr. 154. 1834; FBI 1: 198. 1872, "nilghirensis"; FPM 55. 1915; Nayar & Giri, Fl. Ind. 2:446.1993; FTSR 47. 1996.

Shrubs to 1.5 m high. Leaves to 12 x 3 cm, elliptic, acuminate at apex, acute at base, nerves indistinct; petiole 2 cm long, hirtus. Racemes 2-5-together, terminal, 2-3 cm long, stout; pedicel 5 mm long, glabrous. Capsule globose, rugulose, brown; seeds 7-10, shining.

*Fl. & Fr.* July-December

*Distr.* South West India and Sri Lanka. Rare along the margins of evergreen forests at high altitudes; *PS 30131* Karimala

## POLYGALACEAE

### POLYGALA Linnaeus

1. Flowers yellow; bracts persistent..... 2
1. Flowers blue or violet; bracts cauducous..... 3
2. Appendage forked; keel distinctly stalked ..... **P. rosmarinifolia**
2. Appendage of the keel fimbriate; keel sessile ..... **P. arvensis**
3. Caruncle with 3 winged membranous appendages..... **P. sibirica**
3. Caruncle with 3 linear appendages ..... **P. telephioides**

**Polygala arvensis** Willd., Sp. Pl. 3: 876. 1802; Banerjee, Fl. Ind. 2:460.1993; FTSR 47. 1996. *Polygala chinensis* Bennet in Hook.f., FBI 1: 204. 1872,p.p, non L. 1758; FPM 58. 1915.

Erect or procumbent herbs. Leaves very variable. 1-5 x 0.5-1.8 cm, glabrous or densely pubescent. Flowers yellow, solitary or in lateral, to 2 cm long racemes. Keel petal crested with shortly forked or notched appendages. Style curved, hooked at apex. Capsule ciliate along the margins; seeds black, elliptic-obovate, pilose.

*Fl. & Fr.* July-December

*Distr.* Indo-Malesia to Australia. Rare in grasslands; *PS 19928, NS 19929* Karimala

**Polygala rosmarinifolia** Wight & Arn., Prodr. 37. 1834; FBI 1: 204. 1872; FPM 58. 1915; FPL 65. 1990; Banerjee, Fl. Ind. 2:480.1993; FTSR 47. 1996.

Erect herbs, glabrous. Leaves to 2.5 x 0.3 cm, linear-oblong, acute, scabrous. Racemes 1.5 cm long, axillary, 3-5-flowered. Flowers yellow; pedicels 2 mm long, outer sepals 1.5 x 1 mm, ovate, obtuse, ciliate, inner sepals 5 x 2 mm, curved, ciliate; wing petals 2.5 x 2 mm, oblong; dorsal petal 2 x 3 mm; erect, stalked, forked. Capsule 4.5 x 3 mm, pubescent; seeds 3 x 1 mm, oblong, pubescent, black.

*Fl. & Fr.* July-December

*Distr.* India and Sri Lanka. Common in wet rocky areas; *PS 19143* Karimala; *19845, 19854, 18967* Vengoli

**Polygala sibirica** L., Sp. Pl. 702. 1753; FBI 1: 205. 1872; FPM 58. 1915; FPL 66. 1990; Banerjee, Fl. Ind. 2:481.1993. *Polygala sibirica* L. var. *heyneana* (Wall. ex Wight & Arn.) Bennet in Hook.f., FBI 1: 205. 1872. *P. heyneana* Wall. ex Wight & Arn., Prodr. 38. 1834.

Diffuse herbs, glabrous. Leaves to 15 x 7 mm, oblong, acute at apex, glabrous. Racemes 5-10 mm long, axillary. Flowers densely packed, blue; outer sepals broadly ovate, unequal; inner sepals 3 x 1.5 mm, elliptic, acuminate, glabrous; wing petals 3 mm long, obovate, dorsal petal 4 mm long; crest fimbriate, branched. Capsule 2 x 2 mm, orbicular, glabrous, seeds 1.5 x 1 mm, hairy, caruncle-lobes equal.

*Fl. & Fr.* July-December

*Distr.* South East Asia and China, extending to Europe. Rare in moist deciduous forests; *PS 30649* Vengoli

**Polygala telephioides** Willd., Sp. Pl. 3: 876. 1802; FBI 1: 205. 1872; Banerjee, Fl. Ind. 2:485.1993. *P. brachystachya* DC., Prodr. 1: 326. 1824, non Blume 1825. *P. chinensis* sensu Adema, Blumea 14: 269. 1966, non L. 1753.

Diffuse herbs. Leaves to 1.25 x 0.5 cm, elliptic or lanceolate, obtusely acuminate, base cuneate, petiole *ca.* 6 mm. Flowers *ca.* 3 mm across in axillary or leaf opposed racemes, blue, outer sepals *ca.* 1.5 mm long, linear-lanceolate, ciliate, inner sepals *ca.* 2 mm long, elliptic, glabrescent, wing petals 1.5 mm, obovate, keel petals *ca.* 3 mm; filaments variously connate middle two free; ovary *ca.* 1 mm, ciliate, style curved at the middle, apex broad, stigma knob like. Capsule *ca.* 2.5 x 2 mm, suborbicular, covered with wing sepals; seeds 2, villous, caruncle 3-lobed.

*Fl. & Fr.* August-December

*Distr.* Indo-Malesia. Rare in grasslands; *PS 18923* Karimalagapuram

## XANTHOPHYLLACEAE

### XANTHOPHYLLUM Roxburgh

**Xanthophyllum arnotianum** Wight, Ill. Indian Bot. 1: 50. t.23. 1840; FTSR 48. 1996. *X. flavescens* sensu Bennet in Hook.f., FBI 1: 209. 1874, non Roxb. 1814; FPM 59. 1915; FPL 66. 1990; Banerjee & Balakr., Fl. Ind. 2:497.1993.

Small trees; bark smooth; branchlets puberulus. Leaves alternate, simple, to 15 x 7 cm, ovate, lanceolate, acuminate at apex, glabrous, drying to yellow; nerves 5-7 pairs; petiole 0.5 cm long. Flowers in terminal or axillary paniced racemes; sepals 5, subequal, to 3 x 2 mm, ovate, acute; petals yellow, unequal, lower one boat-shaped, pubescent; others ovate, to 10 x 4 mm; stamens 8, filaments free, adhered to the base of petals in pairs; ovary 1-celled; ovules 4-16, style curved; disc 5-lobed. Drupe, 2 cm across, globose, rugose, 1-seeded.

*Fl. & Fr.* December-June

*Distr.* Endemic to Western Ghats. Common in evergreen forests; *PS 18824* Parambikulam

## CARYOPHYLLACEAE

1. Prostrate glabrous herbs; leaves orbicular.....**Drymaria**  
1. Erect tomentose herbs; leaves linear.....**Polycarpaea**

### DRYMARIA Willdenow ex J. A. Schultes

**Drymaria cordata** (L.) Willd. ex Roem. & Schult., Syst. Nat. (ed.16) 5: 1819; FBI 1: 244. 1874; FPM 63. 1915; Majundar, Fl. Ind. 2: 533.1993. *Holosteum cordatum* L., Sp. Pl. 88. 1753.

Prostrate glabrous herbs; stem slender. Leaves opposite, 1 cm across, orbicular, cordate at base, obtuse, nerved from the base. Flowers 5 mm across, in cymes axillary or terminal; sepals 5, 3 mm long, lanceolate, spreading; petals 2 mm long, 2-5-fid, chartaceous, white; stamens 5, free, anthers small. Ovary 1-celled, ovules few, basal; style 3-fid. Capsule 4 x 1 mm, 3-valved; seeds orbicular, minutely muricate.

*Fl. & Fr.* Throughout the year.

*Distr.* Paleotropics. Occasional in marshy areas; *PS 19018* Thunakkadavu

### POLYCARPAEA Lamarck

**Polycarpaea corymbosa** (L.) Lam., Tabl. Encycl. 2: 129. 1792; FBI 1: 245. 1874; FPM 65. 1915; Majundar, Fl. Ind. 2:549.1993; FTSR 49. 1996. *Achyranthes corymbosa* L., Sp. Pl. 205. 1753.

Much branched herbs, branchlets villous. Leaves whorled or decussate, 1 x 0.2 cm, linear, acute, stipule scarious, fimbriate. Cymes corymbose, terminal; flowers white; bracts and bracteoles 2 mm, scarious; sepals 2.5 mm, scarious, lanceolate, acute; petals 0.8 mm, suborbicular; stamens 5, filaments 0.5 mm. Capsule 1 mm, oblong.

*Fl. & Fr.* Throughout the year

*Distr.* Asia. Rare in rocky areas; *PS 30467* Vengoli

## PORTULACACEAE

## PORTULACA Linnaeus

1. Leaves obovate or spatulate; node glabrous ..... **P. oleracea** var. **oleracea**
1. Leaves terete; node with setose hairs ..... **P. pilosa** ssp. **pilosa** var. **tuberosa**

**Portulaca oleracea** L., Sp. Pl. 445. 1753, var. **oleracea**; FBI 1: 246. 1874; FPM 66. 1915; FPL 68. 1990; Rao, Fl. Ind. 3:4.1993; FTSR 50. 1996.

Erect or prostrate herbs. Leaves to 2 x 1 cm, obovate, obtuse, puberulus, alternate or pseudo-whorled. Flowers terminal and axillary, solitary or 2-3 together; sepals 5 x 5 mm, ovate, acute, glabrous; petals 6 x 6 mm, obovate, obtuse, white or yellow; stamens 12, filaments hairy at base. Capsule 7 x 7 mm, ovoid, glabrous; seeds many, reniform, tubercled, black.

*Fl. & Fr.* Throughout the year

*Distr.* Pantropical. Rare in rocky areas of moist deciduous forests; *PS 30104* Parambikulam

**Portulaca pilosa** L. ssp. **pilosa** var. **tuberosa** (Roxb.) Sivar., JBNHS 78: 259. 1981; FTSR 50. 1996. *P. tuberosa* Roxb., Fl. Ind. 2: 464. 1832; FBI 1: 247. 1874; FPM 66. 1915; Rao, Fl. Ind. 3:7.1993. *P. suffruticosa* Wall. ex Wight & Arn., Prodr. 356. 1834. *P. pilosa* L. ssp. *pilosa*, Geesink, Blumea 17: 296. 1969.

Spreading prostrate herbs; stem densely long-hairy at nodes. Leaves to 12 x 2 mm, linear, subterete, acute, scabrous, densely arranged. Flowers terminal, 3-5 together; sepals 6 x 4 mm, acute, glabrous, membranous; petals 8 x 8 mm, obovate, red; stamens many, anthers yellow. Capsule 8 x 6 mm, ovoid, glabrous; seeds many, black, shining.

*Fl. & Fr.* January-February

*Distr.* Pantropical. Occasional in rocky areas of moist deciduous forests; *PS 30633* Anappadi

## HYPERICACEAE

### HYPERICUM Linnaeus

1. Stout shrubs; flowers more than 5 cm across ..... **H. mysurense**
1. Slender herbs; flowers less than 1 cm across ..... 2
2. Leaves and sepals gland dotted ..... **H. wightianum**
2. Leaves and sepals otherwise ..... **H. japonicum**

**Hypericum japonicum** Thumb. ex Murr. in L., Syst. Veg. 702. 1784; FBI 1: 256. 1874; FPM 70. 1915; Biswas, Fl. Ind. 3: 69.1993.

Herbs to 20 cm high. Leaves to 10 x 3 mm, lanceolate, auricled at base, 3-ribbed, glabrous. Flowers in terminal cymes or solitary, axillary; pedicels 5 mm long; sepals 3 x 1 mm, oblong, obtuse, many-ribbed; petals yellow, 4 x 1.5 mm, oblong; stamens many, free; ovary 1-celled, ellipsoid, styles 3, 1 mm long. Capsule 3 x 2 mm, 3-valved, smooth; seeds many, 0.5 x 0.3 mm, oblong 7-ribbed.

*Fl. & Fr.* November-January

*Distr.* Indo-Malesia to Australia and New Zealand and East Asia. Rare in grasslands; *PS 18922* Karimalagopuram

**Hypericum mysurense** Heyne ex Wight & Arn., Prodr. 99. 1834; FBI 1: 253. 1874; FPM 70. 1915; FPL 68. 1990; Biswas, Fl. Ind. 3:71.1993; FTSR 51. 1996. *Norisca mysurensis* (Heyne ex Wight & Arn.) Wight, Ic. t. 56. 1838.

Shrubs. Leaves to 2.5 x 0.7 cm, lanceolate, acute at both ends, closely placed, sessile. Flowers 5-6 cm across, in terminal cymes, 2-3 together; sepals 1 cm long, lanceolate; petals 2.5 x 1 cm, obovate, obtuse, glabrous; stamens arranged in 5 bundles; filaments 1 cm long; ovary 5-celled; styles 5, 10 mm long. Capsule 15 mm long, 5-valved, glabrous.

*Fl. & Fr.* October-December

*Distr.* Tropical Asia. Common in grasslands; *NS 19304* Karimala

**Hypericum wightianum** Wall. ex Wight & Arn., Prodr. 99. 1834; FPM 70. 1915; Biswas, Fl. Ind. 3:78.1993. *H. napaulense* sensu Dyer in Hook.f., FBI 1: 256. 1874, non Choisy 1824.

Diffuse herbs. Leaves to 12 x 6 mm, obovate, obtuse, petiolate, membranous. Flowers terminal and axillary; sepals 4 x 2 mm, ovate, acute, margin ciliate with gland-tipped hairs; petals yellow, 6 x 3 mm, obovate, obtuse. Capsule 4 x 3 mm; seeds many, epidermal cells transversally oblong in vertical rows.

*Fl. & Fr.* Throughout the year

*Distr.* South and South East Asia and China. Rare in grasslands; *PS 19923* Karimala

## CLUSIACEAE

1. Flowers in racemes or panicles ..... 2
1. Flowers solitary or inflorescence otherwise ..... 3
2. Lateral nerves inconspicuous, lamina with numerous areoles; styles 2 ..... **Poeciloneuron**
2. Lateral nerves distinct, close and parallel, lamina without areoles; style 1 ..... **Calophyllum**
3. Flowers below 2 cm across; exudate yellow; lateral nerves distinct ..... **Garcinia**
3. Flowers over 5 cm across; exudates otherwise; lateral nerves indistinct ..... **Mesua**

### CALOPHYLLUM Linnaeus

1. Inflorescence brownish tomentose, leaves elliptic-lanceolate ..... **C. polyanthum**
1. Inflorescence glabrous; leaves elliptic oblong ..... **C. calaba**

**Calophyllum calaba** L., Sp. Pl. 514. 1753; FTSR 51. 1996. *C. apetalum* Willd., Ges. Naturf. Fr. Berlin Mag. 5: 79. 1811. *C. decipiens* Wight, Ic. t. 106. 1839; FPM 76. 1915. *C. wightianum* Wall. ex Planch. & Triana, Ann. Sci. Nat. Bot. ser. 4. 15: 256. 1862; FBI 1: 274. 1874; FPM 76. 1915. *C. spurium* Choisy in DC., Mem. Soc. Phys. Hist. Nat. Paris 1: 299. 1823. *C. calaboides* G. Don, Gen. Hist. 1: 622. 1831.

Small trees; bark deeply fissured, reddish brown inside; branchlets quadrangular. Leaves to 9 x 4 cm, obovate, acute, emarginate at tip, attenuate at base. Flowers in axillary panicles, pedicelled; sepals white, 8 x 5 mm, obovate, obtuse; filaments 6 mm long, slender. Drupe 8 x 4 mm, obovoid, obtuse, glabrous.

*Fl. & Fr.* October-January

*Distr.* Endemic to Western Ghats. Common in along riverbanks; *PS 30301* Orukomban

**Calophyllum polyanthum** Wall. ex Choisy, Descr. Guttif. Ind. 43. 1849; Singh, Fl. Ind. 3:94.1993; FTSR 52. 1996. *C. elatum* Bedd., Fl. Sylv. t. 2. 1869; FPM 76. 1915. *C. tomentosum* sensu Hook.f., FBI 1: 274. 1874, non Wight 1839.

Tall trees, to 35 m high; trunk straight, round; bark white, reddish brown inside. Leaves to 10 x 5 cm, elliptic, acute at either ends, petiole 2 cm long. Flowers 1.2 cm across, in axillary racemes; peduncle puberulus; pedicel 1.5 cm long; sepals 3 mm across, orbicular; petals 5 mm across, orbicular, white; stamens polyadelphous. Drupe 10 x 6 mm, ellipsoid, smooth.

*Fl. & Fr.* February-April

*Distr.* Indo-Malesia and China. Common in evergreen forests at high altitudes; *PS 19366* Pezha

### GARCINIA Linnaeus

1. Leaves linear lanceolate; less than 3 cm wide ..... **G. wightii**
1. Leaves otherwise; leave more than 4 cm wide ..... 2
2. Leaves oblong, obtuse; male flowers many ..... **G. spicata**
2. Leave broadly elliptic acute at either ends; male flowers few ..... 3

3. Berry globose, 5-8 grooved; bright yellow..... **G. gummi-gutta**  
 3. Berry ellipsoid, 2-3 cm, smooth; yellow with pink shades ..... **G. morella**

**Garcinia gummi-gutta** (L.) Robs., Brittonia 20: 103. 1968; FPL 70. 1990; Singh, Fl. Ind. 3:110.1993; FTSR 52. 1996. *Cambogia gummi-gutta* L., Gen. Pl. (ed.5) 522. 1754. *Garcinia cambogia* (Gaertn.) Desv. in Lam., Encycl. 3: 701. 1792; FBI 1: 261. 1874; FPM 73. 1915. *Mangostana cambogia* Gaertn., Fruct. 2: 106. 1790. *Garcinia cambogia* var. *conicarpa* (Wight) Anders. in Hook.f., FBI 1: 262. 1874. *G. conicarpa* Wight, Ic. t. 121. 1839.

Trees; bark black, yellow inside; twigs glabrous. Leaves 10-13 x 5-8 cm, elliptic, acute at either ends, nerves 10-12 pairs, oblique. Flowers terminal, umbellate; sepals 7 x 6 mm, obtuse, thick; petals larger, 9 x 7 mm, ovate, obtuse; stamens in male flowers connate into a central column. Female flowers solitary; ovary 6-12-celled, furrowed; staminodes many, in a ring around the ovary. Berry 4-8 cm across, glabrous, grooved, beaked.

*Fl. & Fr.* March-April

*Distr.* South India and Sri Lanka. Rare in evergreen forests; *PS 19605* Kariamchola

**Garcinia morella** (Gaertn.) Desv. in Lam., Encycl. 3: 701. 1792; FBI 1: 204. 1874; FPM 74. 1915; FPL 71. 1990; Singh, Fl. Ind. 3:119.1993; FTSR 52. 1996. *Mangostana morella* Gaertn., Fruct. 2: 106. 1790. *Garcinia pictoria* Roxb., Fl. Ind. 2: 627. 1832. *Garcinia gutta* Wight, Ic. t. 44. 1840, excl. syn.

Medium trees; branchlets quadrangular, glabrous. Leaves to 12 x 10 cm, broadly ovate, acute at both ends, nerves 10-12 pairs. Flowers axillary, solitary or 2-4 together, sessile; sepals 4, 3 x 3 mm, orbicular, thick glabrous; petals 5.5 x 4 mm, orbicular; stamens in male flowers 10-12, combined into a central column; anthers transverse; ovary in female flowers 4-celled; stigma radiating; staminodes 10-12, basely united. Berry 2 x 1.5 cm, smooth, light pink.

*Fl. & Fr.* April-July

*Distr.* Indo-Malesia. Rare in evergreen forests; *PS 18817* Parambikulam; *18860* Kanthalppara

**Garcinia spicata** (Wight & Arn.) Hook. f., J. Linn. Soc. Bot. 14: 486. 1875; FPM 74. 1915; FPL 71. 1990; Singh, Fl. Ind. 3:125.1993; FTSR 53. 1996. *Xanthochymus spicatus* Wight & Arn., Prodr. 102. 1834. *Garcinia ovalifolius* (Roxb.) Hook.f., FBI 1: 269. 1874, incl. vars. except *macrantha*, non Oliver 1868. *G. spicata* (Wight & Arn.) Hook.f. var. *glomerata* Vesque in DC., Monogr. Phan. 8: 311. 1893. *Xanthochymus ovalifolius* Roxb., Fl. Ind. 2: 632. 1832.

Trees; branchlets quadrangular, glabrous. Leaves 10-15 x 4-6 cm, oblong, obtuse at apex, acute at base; intramarginal vein indistinct, very close to margin; petiole 1 cm long. Male flowers in dense axillary spikes; sepals 3 x 4 mm, orbicular; petals 8 x 8 mm, concave; stamens adelphous in 5 phalanges around a pistillode; pistillode clavate, smooth. Female flowers few, larger than male flowers; ovary globose, terete, 4-celled; stigma 3 or 4, globose, sessile. Capsule 4 cm across, smooth.

*Fl. & Fr.* January-March

*Distr.* India and Sri Lanka. Common in evergreen forests; *PS 19123* Kariamchola; *30158* Muthuvarachal

**Garcinia wightii** Anders. in Hook.f., FBI 1: 205. 1874; FPM 74. 1915; Singh, Fl. Ind. 3:129.1993; FTSR 53. 1996.

Large shrubs or small trees; bark black; branchlets 4-angled. Leaves to 12 x 3 cm, lanceolate, acuminate, glabrous; nerves 10-12 pairs. Flowers axillary, solitary or paired, sessile; sepals and petals similar, 3 x 3 mm, orbicular, yellow; staminodes connate into a ring or tube; ovary 4-celled, terete; stigma shortly stalked, peltate. Berry 2 cm across, smooth, light pink, not ribbed; fruiting calyx larger.

*Fl. & Fr.* September-November

*Distr.* Endemic to Southern Western Ghats. Rare along riverbanks; *PS 19342* Thenkudippara; *30170* Orukomban

#### MESUA Linnaeus

1. Leaves oblong, over 15 cm long ..... **M. thwaitesii**  
1. Leaves elliptic, up to 10 cm long ..... **M. ferrea**

**Mesua ferrea** L., Sp. Pl. 515. 1753; FBI 1: 277. 1874; FPM 77. 1915; Singh, Fl. Ind. 3:136.1993; FTSR 53. 1996. *M. roxburghii* Wight, Ill. Ind. Bot. 1: 127. 1840. *M. nagana* Gard., Calcutta J. Nat. Hist. Soc. 8: 4. 1847. *M. nagassarium* Kosterm., Ceylon J. Sci. 12, 1: 71. 1976, non Burm. f.

Tall trees; bark grey. Leaves elliptic, acuminate at apex, attenuate at base; nerves many, closely placed; petiole 1 cm long. Flowers solitary, axillary; pedicels 5 mm long, slender; sepals 6 mm across, orbicular, obtuse, puberulus; petals white, 2 x 1.5 cm, obovate, obtuse; stamens polyadelphous. Capsule 2 cm across, ellipsoid, acute, glabrous, seeds plano-convex.

*Fl. & Fr.* May & October

*Distr.* Indo-Malesia. Common in evergreen forests; *PS 19126* Kariamchola; *NS 19465* Karimalagopuram

**Mesua thwaitesii** Planch. & Triana, Ann. Sci. Nat. Bot. ser. 4, 15: 305. 1861; FBI 1: 278. 1874; Singh, Fl. Ind. 3:143.1993. *M. ferrea* L. var. *thwaitesii* (Planch. & Triana) Vesque in DC., Monogr. Phan. 8: 634. 1893.

Large trees; bark light green. Leaves oblong, acuminate at apex, acute at base, glaucous beneath; petiole 1 cm long. Flowers in terminal cymes, sessile; sepals 1.5 cm across, orbicular, glabrous; petals 3-4 x 2-3 cm, obovate; stamens polyadelphous. Capsule 5 cm across, depressed globose, acute, greenish yellow; seeds 2 or 3, 3 x 2 cm plano-convex or trigonous, brown.

*Fl. & Fr.* March-June

*Distr.* South India and Sri Lanka. Common in evergreen forests; *PS 19446* Pooppara

#### POECILONEURON Beddome

**Poeciloneuron indicum** Bedd., J. Linn. Soc. Bot. 8: 267, t. 17. 1865 & in Fl. Sylv. t. 3. 1869; FBI 1: 278. 1874; FPM 77. 1915; FPL 72. 1990; Singh, Fl. India 3: 144. 1993; FTSR 54. 1996.

Tall trees, branchlets terete. Leaves to 19 x 6.5 cm, oblong, abruptly acuminate, acute at base, nerves many, close, parallel, nervules minutely reticulate into polygonal units; petiole 1.5 cm long. Flowers in terminal panicles, many, bisexual; pedicels 5-7 mm long; sepals 5, 2 mm long, ovate, acute, glabrous; petals 5, 6 mm long, obovate, white, glabrous; stamens 14, free, anthers linear; ovary 2-celled, glabrous; ovule 2 in each cell; style 2. Fruit a 1-seeded capsule.

*Fl. & Fr.* October-January

*Distr.* South India and Sri Lanka. Occasional along the riverine areas in evergreen forests; *NS 5805* Kariamchola

#### THEACEAE

##### CAMELLIA Linnaeus

**Camellia sinensis** (L.) O.Ktze., Unsdié Erde 500. 1881; FPL 73. 1990; Chauhan & Paul, Fl. Ind. 3:159.1993; FTSR 54. 1996. *Thea sinensis* L., Sp. Pl. 515. 1753. *Camellia thea* Link., Enum. Pl. Hort. Berol. 2: 72. 1822; FPM 80. 1915. *C. theifera* Griff., Ic. Pl. Asiat. 4: t. 602. 1854; FBI 1: 292. 1874.

Shrubs. Leaves to 10 x 4 cm, elliptic-oblong, acuminate, serrate; petiole to 5 mm. Flowers axillary, solitary to 3 cm across, white; pedicel to 1.5 cm; bracts 2 or 3, small; sepals 5, 5 mm

across, orbicular; petals 5, 2 x 1.5 cm, obovate, connate with outer whorled of stamen; stamen numerous, biseriate; ovary 3-celled, villous; style 3. Capsule 2 cm across, woody, subglobose.

*Fl. & Fr.* Throughout the year

*Distr.* Cultivated in Subtropical and warm temperate zones of south-east Asia. Rare in evergreen forests near tea plantation; *PS 30275* Pooppara

## DIPTEROCARPACEAE

1. Stipules encircling the stem; smaller wings of the fruit ovate with undulate margin ..... **Dipterocarpus**
1. Stipules not encircling the stem; smaller wings long sometime absent without undulate margin ..... 2
2. Leaves with domatia in the nerve axils..... **Hopea**
2. Leaves without domatia in the nerve axils ..... 3
3. Calyx accrescent and enclosing the fruit; fruit winged..... **Shorea**
3. Calyx not accrescent, not enclosing the fruit; fruit not winged..... **Vateria**

### DIPTEROCARPUS Gaertner f.

**Dipterocarpus indicus** Bedd., Fl. Sylv. t. 94. 1871; FPM 81. 1915; FPL 74. 1990; Janardh., Fl. Ind. 3:214.1993; FTSR 55. 1996. *D. turbinatus* sensu Dyer in Hook.f., FBI 1: 295. 1874 p.p.

Trees; bark smooth, grey inside. Leaves to 15 x 8 cm, ovate, acute; lateral nerves 15 pairs; stipule 2 x 1 cm, ovate, glabrous. Flowers pedicellate; pedicels 3 cm long; larger sepals 0.8 x 0.3 cm, oblong, to 12 x 2.5 cm in fruit, oblong, obtuse, cordate at base, reticulate; petals 2.5-3 cm long, brown; anthers 5 mm long. Nut 1.5-2 cm long, ellipsoid.

*Fl. & Fr.* February-April

*Distr.* Endemic to Western Ghats. Rare in evergreen forests; *PS 19362* Pezha

### HOPEA Roxburgh

**Hopea parviflora** Bedd., Fl. Sylv. t. 7. 1869; FBI 1: 308. 1874; FPM 82. 1915; FPL 74. 1990; Janardh., Fl. Ind. 3:228.1993; FTSR 56. 1996.

Very large trees; bark splitting into tessellated rectangular flakes. Leaves to 8 x 5 cm, ovate, obtuse, rounded to truncate at base; nerves to 8 pairs; petiole 1 cm long. Panicle 15 cm across, terminal and upper axillary; branchlets 1-sided. Flowers pedicelled; sepals 3 mm long, hairy outside; petals 6 mm long, oblong, glabrous, fimbriate at apex; anthers orbicular, appendage 1 mm long. Nut 8x 5 mm, terete, glabrous; wings 6 x 1.8 cm, oblong, 8-10-nerved, glabrous.

*Fl. & Fr.* February-May

*Distr.* Endemic to Southern Western Ghats. Common in evergreen forests; *PS 18897* Muthalakkuzhi

### SHOREA Roxburgh ex Gaertner f.

**Shorea roxburghii** G.Don, Gen. Syst. 1: 813. 1831; Janardh., Fl. Ind. 3:239.1993. *S. talura* Roxb., Fl. Ind. 2: 618. 1832; FBI 1: 304. 1874; FPM 83. 1915. *Vatica laccifera* Wight & Arn., Prodr. 84. 1834. *Shorea laccifera* (Wight & Arn.) Heyne ex Bedd., Fl. Sylv. t. 6. 1869.

Medium trees. Leaves 8-18 x 4-9 cm, elliptic, oblong, apex obtuse or emarginate, base slight cordate or truncate, glossy above, coriaceous, nerves 15-20 pairs, parallel; petiole to 1.5 cm. Panicles axillary and terminal, to 25 cm, glabrous; pedicels to 1 cm, jointed; outer sepals 5 mm, oblong, inner 2, 4 mm, ovate; petals 20 mm, ovate, villous; stamens 15; ovary 2 mm, globose, style 5 mm, stigma 3 fid, Fruit 1 cm, enclosed in accrescent calyx, lobes oblong, 3 longer, 7 x 1 cm; inner 2 smaller, 4 x 1 cm.

*Fl. & Fr.* February-June

*Distr.* Indo-Malesia. Rare in moist deciduous forests; *PS 30449* Anappadi



## VATERIA Linnaeus

**Vateria indica** L., Sp. Pl. 513. 1753; FBI 1: 313. 1874; FPM 85. 1915; FPL 75. 1990; Janardh., Fl. Ind. 3:245.1993; FTSR 56. 1996. *V. malabarica* Blume, Mus. Bot. Lugd.-Bat. 2: 29. 1852.

Tall trees with resinous exudation; bark smooth, grey; branchlets puberulus. Leaves 18-20 x 10-12 cm, oblong, rounded or cordate at base, acuminate at apex, nerves 15-18 pairs, parallel, prominent below, nervules parallel, close; petiole 2.5-3.5 cm long. Panicles terminal, to 30 cm across, densely puberulus. Flowers 3 cm across, pedicellate; sepals 5, free, 1 cm long, lanceolate, covered with stellate hairs; petals white, 1.5 x 0.7 cm, obovate, spreading, shortly united at base; stamens many, free, connective produced into a filiform appendage, filaments hairy; ovary densely hairy, 3-celled, 2-3 ovules in each cell; style filiform. Drupe 3 x 1.5 cm, oblong, obtuse, coarsely puberulus brown.

*Fl. & Fr.* March-July

*Distr.* Endemic to Southern Western Ghats. Common in evergreen forests at lower altitudes; *PS 18811* Parambikulam

## ANCISTROCLADACEAE

### ANCISTROCLADUS Wallich

**Ancistrocladus heyneanus** Wall. ex Graham, Cat. Pl. Bombay 28. 1839; FBI 1: 299. 1874; FPM 86. 1915; FPL 76. 1990; Silpi Das, Fl. Ind. 3:254.1993; FTSR 57. 1996.

Climbing shrubs with hooked branches; twigs glabrous. Leaves crowded at the apex of branchlets, to 20 x 6 cm, oblanceolate, attenuate at base, sessile. Flowers 1 cm across, in terminal lax panicles; sepals 5, unequal, connate into a tube and adnate to the ovary, lobes 3 mm long; petals 5, subequal, to 6 mm long, oblong, obtuse, slightly connate at base, greenish yellow; stamens 10, filaments connate at base, anthers orbicular; ovary 1-celled; ovules solitary; style 3, free. Fruit a nut covered by large wing like sepals; wings unequal, to 5 x 2 cm, obovate, obtuse, reticulate, glabrous

*Fl. & Fr.* March-May

*Distr.* Western Ghats and Sri Lanka. Common in semi-evergreen forests; *PS 18865* Karimthalappara

## MALVACEAE

- |  |                    |
|--|--------------------|
| 1. Calyx spathaceous, split on one side.....       | <b>Abelmoschus</b> |
| 1. Calyx 5 lobed, not split on one side.....       | 2                  |
| 2. Fruit schizocarpic.....                         | 3                  |
| 2. Fruit capsular.....                             | 7                  |
| 3. Fruits covered with glochidiate spines.....     | <b>Urena</b>       |
| 3. Fruits not covered with glochidiate spines..... | 4                  |
| 4. Style twice as many as carpels.....             | <b>Pavonia</b>     |
| 4. Style as many as carpels.....                   | 5                  |
| 5. Cocci one seeded.....                           | <b>Sida</b>        |
| 5. Cocci 2-many seeded.....                        | 6                  |
| 6. Mericarps laterally winged, spineless.....      | <b>Herissantia</b> |
| 6. Mericarps wingless; spined.....                 | <b>Abutilon</b>    |
| 7. Capsule winged.....                             | <b>Fioria</b>      |
| 7. Capsule not winged.....                         | 8                  |
| 8. Style 1,unbranched.....                         | <b>Thespesia</b>   |
| 8. Style 5-many branched.....                      | <b>Hibiscus</b>    |

### ABELMOSCHUS Medikus

**Abelmoschus moschatus** Medik., Malv. 46. 1787; Paul, Fl. Ind. 3:308.1993; MSPI 70. 1996. *Hibiscus abelmoschus* L., Sp. Pl. 696. 1753; FBI 1: 342. 1874; FPM 87. 1915.

Subshrubs, 1.5 m tall; stem densely retrorsely hairy. Leaves 10-23 x 12-25 cm, deeply 3-7-lobed, cordate, lobes acuminate, crenate, hairy; petiole 10-15 cm long; stipule 8 mm long, ovate. Flowers axillary, solitary, pedicel 7 cm long; involucre bracts 15 x 2 mm, free, hispid; calyx 30 mm long, minutely stellate hairy; corolla 9 cm across, yellow with purple centre. Capsule 7-8 cm long, hairy.

*Fl. & Fr.* October-January

*Distr.* South Asia to Pacific Islands. Occasional in moist deciduous forests; *PS 30640* Vengoli

### ABUTILON P. Miller

1. Carpels 5; flower axillary single, forming terminal racemes..... **A. persicum**
1. Carpels 20-25; flowers axillary single not forming racemes..... **A. hirtum**

**Abutilon hirtum** (Lam.) Sweet, Hort. Brit. (ed. 1) 53. 1826; FPM 91. 1915; FPL 77. 1990; Paul, Fl. Ind. 3:308.1993; MSPI 190. 1996; FTSR 58. 1996. *Sida hirta* Lam., Encycl. 1: 7. 1783. *Sida graveolens* Roxb. ex Hornem., Hort. Suppl. 77. 1819. *Abutilon graveolens* (Roxb. ex Hornem.) Wight & Arn. var. *hirtum* (Lam.) Mast. in Hook.f., FBI 1: 327. 1874.

Erect subshrubs, 1-1.5 m tall; densely pubescent, mingled with some erect gland tipped hairs. Leaves 6.7 x 5-6 cm, ovate to orbicular, deeply cordate at base, acuminate, margin coarsely crenate, tomentose below, stipules 0.5 cm, lanceolate. Flowers axillary, solitary; pedicel 2 cm; sepals 1 x 0.5 cm, ovate, acuminate; petals 1.5 x 1.5 cm, ovate, yellow with purplish centre, spreading; staminal column 8 mm; ovary to 5 mm, 20-25 celled. Capsule 1.5 x 2 cm, densely tomentose.

*Fl. & Fr.* February-April

*Distr.* Semiarid tropics of the world; introduced in Tropical America. Common in dry deciduous forests; *PS 30079* Kuchimudi

**Abutilon persicum** (Burm.f.) Merr., Philipp. J. Sci. 19: 364. 1921; FPL 78. 1990; Paul, Fl. Ind. 3:269.1993; MSPI 201. 1996; FTSR 58. 1996. *Sida persica* Burm.f., Fl. Ind. 148. 1768. *Sida polyandra* Roxb., Fl. Ind. 3: 173. 1832. *Abutilon polyandrum* (Roxb.) Wight & Arn. ex Wight, Cat. 12. 1833, non G. Don 1831; FBI 1: 325. 1874; FPM 91. 1915.

Pubescent herbs or subshrubs. Lower leaves ovate-cordate, acute to acuminate, to 15 cm long; upper ovate to lanceolate, crenate-dentate, velutinous below and glabrescent above, basally 5-9 nerved; petioles 2-10 cm long. Flowers 3.5-4.5 cm across. Calyx lobes ovate-lanceolate, tomentose on both sides. Petals yellow, obovate. Upper part of staminal column stellately hairy. Mericarps 5, puberulus.

*Fl. & Fr.* November-April

*Distr.* Indo-Malesia and China. Common in semi-evergreen and moist deciduous forests *PS 19133* Kariamchola; *NS 19220* Vengoli

### FIORIA Mattei

**Fioria vitifolia** (L.) Mattei, Bot. R. Orto. Bot. Palermo 2: 71. 1917; Paul, Fl. Ind. 3:310.1993; MSPI 74. 1996. *Hibiscus vitifolius* L., Sp. Pl. 696. 1753; FBI 1: 338. 1874. *H. obtusifolius* Willd., Sp. Pl. 3: 829. 1801. *H. vitifolius* L. var. *genuina* f. *indica* Hochr., Ann. Cosn. Jard. Bot. Geneve 4: 169. 1900.

Subshrubs, tomentose. Leaves 2.5-9 x 2-9 cm, shallowly 3-5-lobed, basally 7-nerved, lobes triangular, apex acute, stellate pubescent; petiole 2-12 cm, stipules 2 mm, subulate. Flowers axillary, solitary, epicalyx slender, linear, 10 mm; calyx lobes 10 x 5 mm, lanceolate, pubescent; petals 4.5-5 x 4-5 cm, yellow, base purplish inside; staminal column 2 cm, ovary 5-celled, style branches 5. Capsule 5 celled, winged; seeds glabrous.

*Fl. & Fr.* November-February

*Distr.* Paleotropics. Rare in semi-evergreen forests; *PS 30152* Muthuvarachal

#### HERISSANTIA Medikus

**Herissantia crispa** (L.) Briz., J. Arn. Arb. 49. 279. 1968; Paul, Fl. Ind. 3:276.1993; MSPI 209. 1996. *Sida crispa* L., Sp. Pl. 685. 1753. *Abutilon crispum* (L.) Medicus, Malv. 29. 1787; FBI 1: 327. 1874; FPM 91. 1915.

Prostrate herbs, with spreading hairs. Leaves 5 x 3.5 cm, ovate-cordate, acuminate, base deeply cordate, crenate; petiole to 3 cm, stipule 0.5 cm, linear. Flowers axillary, solitary, yellow; pedicels jointed above half. Schizocarp 1.5 x 1.5 cm, globose, drooping, mericarps 10, obtuse, sparsely hairy.

*Fl. & Fr.* October-December

*Distr.* Tropical Asia and Australia. Common in dry deciduous forests; *PS 19542* Thekkady; *30072* Pandaravarai

#### HIBISCUS Linnaeus

- |   |                         |
|---|-------------------------|
| 1. Flowers without epicalyx.....              | <b>H. lobatus</b>       |
| 1. Flowers with epicalyx .....                | 2                       |
| 2. Stem and sepals armed.....                 | 3                       |
| 2. Stem and sepals unarmed.....               | 4                       |
| 3. Stipule ovate-orbicular; subsagittate..... | <b>H. surattensis</b>   |
| 3. Stipule small lanceolate or absent.....    | <b>H. hispidissimus</b> |
| 4. Flowers white .....                        | <b>H. micranthus</b>    |
| 4. Flowers yellow with purple center.....     | <b>H. canescens</b>     |

**Hibiscus canescens** Heyne ex Wight & Arn., Prodr. 49. 1834; FBI 1: 337. 1874; FPM 97. 1915; MSPI 132. 1996. *H. calyphyllus* sensu Rakshit & Kundu, Bull. Bot. Surv. India 12: 172. 1972, non Cav. 1787. *H. purpureus* sensu Paul & Nayar in Nayar *et al.* (eds.) Fasc. Fl. Ind. 19: 144. 1988; Paul, Fl. Ind. 3: 340. 1993.

Shrubs; branchlets tomentose. Leaves 12-17 x 6-12 cm, broadly ovate, broadly crenate, apex minutely apiculate, upper surface sparsely hairy, tomentose below, basally 7-nerved; petiole to 12 cm, hairy, stipules linear, caudaceous, 1.5-2 cm. Flowers axillary, solitary; bracteoles 5, 2.5 cm, lanceolate, pubescent; sepals 1.5 cm; petals 6.5 x 3.5 cm, obovate, yellow, base inside purple; staminal tube shorter than corolla. Capsule 3 x 4 cm, villous.

*Fl. & Fr.* January-March

*Distr.* South Asia and Africa. Rare in dry deciduous forests; *PS 19981* Keerappadi

**Hibiscus hispidissimus** Griff., Not. Pl. Asiat. 4: 521. 1854; MSPI 106. 1996; FTSR 59. 1996. *Hibiscus aculeatus* Roxb., Fl. Ind. 3: 206. 1832; FPL 79. 1990; Paul, Fl. Ind. 3:323.1993. *Hibiscus furcatus* Roxb. ex DC., Prodr. 1: 448. 1824; FBI 1: 335. 1874; FPM 97. 1915.

Scandent shrubs; stem reddish; prickles, retrorse. Leaves 6-10 x 5-8 cm, 3-5 lobed, lobes acuminate, serrate, prickled along the ribs; petiole 5-8 cm long. Flowers axillary; pedicels 5 cm long, prickled; involucre bracts 10-12, bifurcate, hairy; calyx 23 mm long, 10-costate, 5-lobed at apex, lobes acuminate, bristled; corolla 8 cm across, yellow with brown centre. Capsule 4 x 2 cm, ovate, acute, hirsute.

*Fl. & Fr.* October-February

*Distr.* Paleotropics. Common in degraded forest areas; *PS 19048* Thunakkadavu; *30234* Karimala

**Hibiscus lobatus** (Murr.) O. Ktze., Rev. Gen. Pl. 3: 19. 1898; FPL 79. 1990; Paul, Fl. Ind. 3:336.1993; MSPI 125. 1996; FTSR 59. 1996. *Solandra lobata* Murr., Comm. Soc. Reg. Sc. Gott.

6: 20. t.1. 1785. *Hibiscus solandra* L' Herit., Strip. Nov. 1: 103. t.49. 1788; FBI 1: 336. 1874; FPM 98. 1915.

Annual herbs, to 1.5 m high; stem pubescent with simple hairs. Leaves 8-9 x 7-8 cm, upper smaller, entire or 3-lobed, lobes lanceolate, serrate, pubescent; petiole to 7 cm long; upper leaves linear-oblong. Flowers solitary, axillary, become racemose; pedicels 2-4 cm long; involucral bracts smaller; calyx to 1 cm long, lobes deep, glabrous; petals white, 10 x 8 mm, obovate, obtuse, glabrous. Capsule 12 mm long, ovoid, acute, hispid; seeds 2 mm diam., trigonous, hispid. *Fl. & Fr.* August-January

*Distr.* Paleotropics. Common in degraded forest areas; *PS 19856* Vengoli; *NS 19036* Kannimara

**Hibiscus micranthus** L.f., Suppl. Pl. 308. 1781; FBI 1: 335. 1874; FPM 97. 1915; Paul, Fl. Ind. 3:330.1993; MSPI 97. 1996.

Subshrubs; branchlets stellate, pubescent. Leaves 3-6.5 x 3-6 cm, broadly ovate, apex acute, shallowly 3-lobed, 5-nerved, dentate; petiole to 4 cm, pubescent, stipules linear, 8 mm. Flowers axillary, solitary; pedicels to 3 cm, jointed below the flower, curved, bracteoles 6, 2 mm; calyx lobes 3 mm, ovate; petals 1 x 0.5 cm, oblong, white; staminal column 6 mm; anthers yellow, ovary 5 celled, styles branches 5, 2 mm. Capsule 5 mm, subglobose; seeds 3-4 in each cell, clothed with long silky hairs.

*Fl. & Fr.* December-February

*Distr.* South Asia. Rare in dry deciduous forests; *PS 19543* Thekkady

**Hibiscus surattensis** L., SP. Pl. 696. 1753; FBI 1: 334. 1874; FPM 97. 1915; FPL 80. 1990; Paul, Fl. Ind. 3:327.1993; MSPI 119. 1996; FTSR 59. 1996.

Scandent subshrubs; stem greenish, retrorsely prickled. Leaves 5-10 x 8-14 cm, 3-5-lobed, cordate at base, lobes elliptic, acuminate, serrate, pubescent; petiole 5 cm long, slender; stipules 10-15 x 3-5 mm, lanceolate. Flowers axillary; pedicels to 7 cm long, prickled; involucral bracts 20-25 x 2-3 mm, bifurcate, pubescent, lobes unequal, ciliate; calyx to 10 mm long, 10-costate, 5-lobed; corolla 6 cm across, yellow with brown centre.

*Fl. & Fr.* November-February

*Distr.* Pantropical. Common in degraded forest areas; *PS 19965* Karimala

#### PAVONIA Cavanilles

**Pavonia odorata** Willd., Sp. Pl. 3: 837. 1800; FBI 1: 331. 1874; FPM 93. 1915; FPL 81. 1990; Paul, Fl. Ind. 3:373.1993; MSPI 171. 1996. *Hibiscus odoratus* (Willd.) Roxb. ex Wight & Arn., Prodr. 47. 1934.

Sub-shrubs, viscid tomentose. Leaves to 5 x 5 cm, orbicular, 3-5-angled, cordate at base, 3-7-nerved from base, densely hairy beneath; petiole 1-3 cm long. Flowers axillary, solitary, long-pedicelled; involucral bracts 10-12, 7-8 mm long, linear, ciliate; calyx 5-lobed, 2 mm long, ovate; corolla to 25 mm across, yellow; staminal tube short, oblique, anthers with long filaments; ovary 5-celled, ovule 1 in each cell, style 10-fid above; stigma capitate. Mericarps 5, 3 x 2 mm, trigonous, smooth.

*Fl. & Fr.* October-January

*Distr.* Paleotropics. Common in rocky areas; *PS 19550* Thekkady

#### SIDA Linnaeus

1. Prostate or trailing herbs ..... 2
1. Erect herbs or shrubs..... 3
2. Calyx lobes longer than the tube; pedicels jointed near at apex ..... **S. beddomei**
2. Calyx lobes equal to the tube; pedicels jointed at the middle..... **S. cordata**
3. Stipules dissimilar, one linear-lanceolate, others subulate..... **S. acuta**
3. Stipules similar, filiform..... 4

4. Leaves ovate, obovate or orbicular..... **S. mysorensis**  
 4. Leaves elliptic or rhomboid ..... 5  
 5. Mericarps mucronate at apex ..... **S. alnifolia**  
 5. Mericarps awned or beaked at apex ..... **S. rhombifolia**

**Sida acuta** Burm. f., Fl. Ind. 147. 1768, ssp. **acuta**: Borssum, Blumea 14: 186. 1966; FPM 90. 1915; FPL 82. 1990; Paul, Fl. Ind. 3:281.1993; MSPI 238. 1996; FTSR 61. 1996. *S. lanceolata* Retz., Obs. Bot. 4: 119. 1786. *S. carpinifolia* sensu Mast. in Hook.f., FBI 1: 323. 1874 p.p. non L.f. 1781.

Subshrubs. Leaves to 8 x 4 cm, lanceolate, serrate, rounded at base, glabrate; petiole 5 mm long; stipule 1 x 0.5 cm, lanceolate. Flowers solitary or paired, axillary, on short lateral branchlets; pedicels 5 mm long; calyx 5-6 mm across, lobes subulate, ciliate; corolla 10 mm across, petals obovate. Mericarps 3 x 2 mm, trigonous, reticulate.

*Fl. & Fr.* August-January

*Distr.* Pantropical. Common in degraded forest areas; *PS 19042* Thunakkadavu

**Sida alnifolia** L., Sp. Pl. 2,684. 1753. *Sida retusa* L., Sp. Pl. (ed. 2) 961. 1763; MSPI 241. 1996; FTSR 61. 1996. *S. rhombifolia* var. *retusa* (L.) Mast. in Hook.f., FBI 1: 324. 1874; Paul, Fl. Ind. 3:289.1993; *S. rhombifolia* ssp. *alnifolia* Ugborogho, Bol. Soc. Bot. Brot. 54: 70. 1980.

Woody erect herbs; branches bluish, minutely stellate-hairy. Leaves to 4 x 3 cm, obovate, obtuse or acute, emarginate, crenate on the upper half, densely tomentose below; petiole 5 mm long, stipules filiform. Flowers 12 mm across, yellow, axillary or in terminal racemes; pedicels 6 mm long; calyx 8 mm across, lobes acute. Mericarps trigonous, with a pair of short mucro at apex; seeds black.

*Fl. & Fr.* September-December

*Distr.* Indo-Malesia. Common in degraded forest areas; *PS 19898* Thellikkal; *NS 19804* Kariamchola

**Sida beddomei** Jacob, JBNHS 47: 50. 1950; MSPI 266. 1996; FTSR 61. 1996. *S. cordata* sensu Paul & Nayar, Fl. Ind. Fasc. 19: 206. 1988; Paul, Fl. Ind. 3: 285. 1993, non (Burm.f.) Borss., 1966.

Slender prostrate herbs, rooting at nodes, stem, petioles and pedicels sparsely hairy. Leaves ovate, acute or acuminate, base cordate, crenate-serrate along the margin, sparsely tomentose on both sides, to 5 x 4 cm; basally 5-7 nerved; petioles to 4.5 cm long. Flowers solitary, axillary, pedicels to 4 cm long. Calyx lobes longer than the tube. Mericarps awnless.

*Fl. & Fr.* January-March

*Distr.* Endemic to Southern Western Ghats (Kerala). Rare in moist deciduous forests and plantations; *PS 19087* Padippara

**Sida cordata** (Burm. f.) Borss., Blumea 14: 182. 1966; FPL 83. 1990; Paul, Fl. Ind. 3:283.1993; MSPI 266. 1996. *Melochia cordata* Burm. f., Fl. Ind. 143. 1768. *Sida veronicaefolia* Lam., Encycl. 1: 5. 1783; FPM 89. 1915. *S. humilis* Cav. var. *veronicaefolia* (Lam.) Mast. in Hook.f., FBI 1: 322. 1874.

Prostrate herbs; branches slender, pilose. Leaves to 7 x 6 cm, orbicular, abruptly acuminate, cordate at base, serrate, pubescent; petiole 1.5 cm long, slender, stipule 3 mm long, deflexed. Flowers 10 mm across, solitary, axillary; pedicels 3-4 cm long; calyx 5 mm long, widely campanulate, lobes ovate, acute; petals 6 x 4 mm, obovate, ciliate at base. Mericarps 3 x 2 mm, smooth.

*Fl. & Fr.* September-January

*Distr.* Pantropical. Rare in moist deciduous forests and plantations; *PS 30639* Thellikkal

**Sida mysorensis** Wight & Arn., Prodr. 59. 1834; FBI 1: 322. 1874; Paul, Fl. Ind. 3:286.1993; MSPI 271. 1996; FTSR 62. 1996. *S. hirta* Wall., Cat. n. 1855, 1828, non Lam. 1783. *S. glutinosa* Roxb., Fl. Ind. 3: 172. 1832, non Cav. 1785; FPM 89. 1915. *S. urticifolia* Wight & Arn., Prodr. 59. 1834, non St. Hill. 1828. *S. wightiana* D. Dietr., Syn. Pl. 4: 845. 1847.

Erect herbs. Leaves to 7 x 5 cm, ovate, acute, crenate, membranous, tomentose; petiole 4-6 cm long. Flowers 12 mm across, solitary, axillary or in short racemes; pedicels 5-8 mm long, slender; calyx 5 mm long, ribbed, lobes shorter than tube, acute; petals yellow. Mericarps 5, 2.5 x 1 mm, trigonous, smooth.

*Fl. & Fr.* November-January

*Distr.* South and South-East Asia. Occasional in moist deciduous forests and plantations; *PS 19101* Peruvaripallam

**Sida rhombifolia** L., Sp. Pl. 684. 1753; FBI 1: 323. 1874, in part; FPM 90. 1915. *S. rhombifolia* ssp. *rhombifolia*: Borss., Blumea 14: 193. 1966. *S. rhombifolia* ssp. *rhombifolia* var. *rhombifolia*: Paul & Nayar, Fasc. Fl. Ind. 19: 214. 1988. *S. alba* Cav., Diss. I. 22. t. f. 3. 8. 1785, non L. 1763.

Subshrubs or herbs with erect stem. Leaves 2-8 x 1-5 cm, ovate - oblong, rhomboid or lanceolate, minutely stellately hairy; petioles to 1.5 cm long. Flowers 1-1.5 cm across; pedicels longer than the petioles. Mericarps usually muticous or with 2 awns.

*Fl. & Fr.* September-December

*Distr.* Pantropical. Common in moist deciduous forests and plantations; *PS 30797* Thunakkadavu

#### THESPESIA Solander ex Correa

**Thespesia lampas** (Cav.) Dalz. & Gibs., Bombay Fl. 19. 1861; FBI 1: 345. 1874; FPL 84. 1990; Paul, Fl. Ind. 3:350.1993; MSPI 40. 1996; FTSR 63. 1996. *Hibiscus lampas* Cav., Diss. 3: 156. t.56. 1787; FPM 98. 1915.

Shrubs, to 1.5 m tall; stem glabrous. Leaves to 15 x 14 cm; 3-5-lobed or entire, ovate, cordate or truncate at base, lobes acute, densely stellate pubescent beneath; petioles 3-8 cm long. Flowers axillary, solitary or in terminal racemes, pedicels 2-6 cm long jointed above the middle; involucellar bracts 4-7, subulate, deciduous; calyx cupular, 12 mm across, stellate hairy; corolla 6-8 cm across, rose-yellow. Capsule 25 x 20 mm, ellipsoid, glabrous, 5-valved; seeds many, 5 x 3 mm, trigonous, glabrous, brown.

*Fl. & Fr.* November-January

*Distr.* South to South-east Asia, Tropical East Africa. Rare in moist deciduous forests; *PS 30628* Parambikulam

#### URENA Linnaeus

1. Leaves entire or shallowly lobed.....**U. lobata** ssp. **lobata**  
1. Leaves deeply lobed.....**U. lobata** ssp. **sinuata**

**Urena lobata** L. ssp. **sinuata** (L.) Borss., Blumea 14: 142. 1966; FBI 1: 329. 1874; FPL 85. 1990; Paul, Fl. Ind. 3:382.1993; FTSR 63. 1996. *U. sinuata* L., Sp. Pl. 692. 1753; FBI 1: 329. 1874; FPM 92. 1915; MSPI 184. 1996.

Shrubs. Leaves to 8 x 8 cm, palmately 5-lobed; lobes again lobed, narrow, obtuse at apex, serrulate, minutely stellate-hairy; petiole 6 mm long. Flowers shortly pedicelled; involucral bracts 3 mm long, spatulate; calyx 6 mm long, divided below the middle, lobes ovate, acute spreading; corolla 15-20 mm across. Schizocarp 10 mm across.

*Fl. & Fr.* September-January

*Distr.* Pantropical. Common in moist deciduous forests and plantations; *PS 19047* Thunakkadavu

**Urena lobata** L., Sp. Pl. 692. 1753, ssp. **lobata**; FBI 1: 329. 1874; FPM 92. 1915; FPL 85. 1990; Paul, Fl. Ind. 3:380.1993; MSPI 180. 1996; FTSR 63. 1996. *U. lobata* ssp. *lobata* Borss., Blumea 14: 140. 1966.

Shrubs; stem greenish densely stellate pubescent. Leaves 3-8 x 3-9 cm, ovate, 3-5 angular or lobed, densely stellate hairy below; petiole 1-1.5 cm long. Flowers shortly pedicelled; bracts spathulate; calyx glabrous; corolla 25 mm across, petals obovate, stellate-tomentose. Schizocarp 12 mm across, black.

*Fl. & Fr.* September-January

*Distr.* Pantropical; Common in moist deciduous forests and plantations; *PS 19917* Karimala

## BOMBACACEAE

1. Leaves simple; fruits spiny..... **Cullenia**  
1. Leaves digitate; fruits smooth..... **Bombax**

### BOMBAX Linnaeus

1. Leaflets petiolate, to 3 cm long; petals bright red ..... **B. ceiba**  
1. Leaflets sessile, petal creamy yellow or pale red ..... **B. insigne**

**Bombax ceiba** L., Sp. Pl. 511. 1753; FPL 86. 1990; Nayar & Biswas, Fl. Ind. 3:398.1993; FTSR 64. 1996. *B. malabaricum* DC., Prodr. 1: 479. 1824; FBI 1: 349. 1874; FPM 99. 1915. *S. malabarica* (DC.) Schott & Endl., Melet. Bot. 35. 1832.

Large trees. Leaflets 18 x 5 cm, elliptic, caudate-acuminate at apex, attenuate at base; nerves 12-15 pairs; petiolule 2-3 cm long; petiole to 20 cm long. Flowers solitary or 2-5 together; sepals 3 x 3 cm, campanulate, densely villous within, lobes obtuse; petals reddish, 10 x 3.5 cm, oblong, obtuse, stellate-hairy outside; filaments 5.5 cm long, minutely hairy. Capsule 12 x 3 cm, terete, downy tomentose.

*Fl. & Fr.* January-May

*Distr.* Tropical Asia and New Guinea. Common in moist deciduous forests and rocky areas; *PS 30321* Orukomban

**Bombax insigne** Wall., Pl. Asiat. Rar. 1: 71. 1830; FBI 1: 349. 1784; FPM 100. 1915; FPL 87. 1990; Nayar & Biswas, Fl. Ind. 3:398.1993; FTSR 64. 1996. *Salmalia insignis* (Wall.) Schott & Endl., Melet. Bot. 35. 1832.

Medium to large trees, trunk and branches densely prickly; bark greyish-brown, reddish inside. Leaflets oblong or obovate, caudate-acuminate; leaflets subsessile; petioles to 25 cm long. Flowers appear before the leaves. Calyx 2-lobed, densely silky within. Petals oblong, acute, tomentose, creamy yellow to pale red, to 15 x 2.5 cm. Capsule 5-angled, tomentose, to 18 x 4.5 cm.

*Fl. & Fr.* November-March

*Distr.* India and Myanmar. Common in moist deciduous forests; *PS 30751* Parambikulam

### CULLENIA R. Wight

**Cullenia exarillata** Robyns, Bull. Jard. Bot. Nat. Belg. 40: 249. 1970; FPL 87. 1990; Nayar & Biswas, Fl. Ind. 3:402.1993; FTSR 64. 1996. *Cullenia excelsa* Wight, Ic. t. 1701,1762. 1851; FBI 1: 350. 1874; FPM 101. 1915. *C. rosayroana* Kosterm., Comm. For. Res. Inst. Indonesia 51: 4, f.2e & 3. 1956 & in Reinwardtia 4: 72. 1956,p.p.

Large trees; buttress prominent; older branches furnished with large tubercles; young branchlets and underside of leaves densely covered with peltate scales. Leaves alternate, 16 x 6 cm, oblong, acute, nerves not visible, shining above, brownish below. Flowers densely clustered

on tubercles on old branches; pedicels 3 cm long, jointed; bracteoles tubular, 1.5 cm long, 4-5-toothed at apex; petals absent; staminal tube 3 cm long, 5-lobed at apex with many stamens; ovary 5-celled, echinate, ovules 2 in each cell; style woolly, elongate. Capsule globose, 15-20 cm across, dehiscent, densely echinate, globose, 5-valved.

*Fl. & Fr.* December-May

*Distr.* Endemic to Southern Western Ghats. Common in evergreen forests at high altitudes; *PS 19158* Karimala

## STERCULIACEAE

1. Herbs .....	2
1. Shrubs or trees .....	3
2. Leaves glabrous or sub glabrous; ovary 5-celled.....	<b>Melochia</b>
2. Leaves white-woolly; ovary 1-celled.....	<b>Waltheria</b>
3. Follicles spirally twisted .....	<b>Helicteres</b>
3. Follicles not spirally twisted.....	4
4. Fruit indehiscent, 1 seeded .....	<b>Heritiera</b>
4. Fruit dehiscent, 2-many seeded .....	5
5. Peduncle covered with orange-red indumentum; follicles membranous.....	<b>Firmiana</b>
5. Peduncle without orange-red indumentum; follicles coriaceous or woody.....	6
6. Seeds winged .....	7
6. Seeds wingless.....	9
7. Flowers unisexual .....	<b>Pterygota</b>
7. Flowers bisexual.....	8
8. Staminal tube adnate to the gynophore; petals white .....	<b>Pterospermum</b>
8. Staminal tube not adnate to the gynophore; petal yellow .....	<b>Eriolaena</b>
9. Flowers in axillary cymes; flowers bisexual.....	<b>Leptonychia</b>
9. Flowers in panicles or racemes; flowers unisexual .....	<b>Sterculia</b>

### ERIOLAENA A. P. de Candolle

**Eriolaena quinquelocularis** (Wight & Arn.) Wight, Ic. t. 882. 1844-45; FBI 1: 371. 1874; FPM 110. 1915; Malick, Fl. Ind. 3:418.1993. *Microchlaena quinquelocularis* Wight & Arn., Prodr. 71. 1834.

Large shrubs or small trees; branchlets tomentose. Leaves to 9 x 9 cm, broadly ovate, widely cordate at base, acuminate at apex, 5-nerved from base, densely pubescent below. Flowers in terminal or axillary peduncled cymes; bracteoles lacinate; calyx 2.5 cm long, stellate-tomentose outside, simple-tomentose within, lobes deflexed; petals yellow, 25 x 7 mm, oblanceolate, tomentose below; staminal column 15 mm long, stamens numerous, anthers oblong; ovary 5-celled, stellate-hairy; ovules many; style-1, 5-fid at apex. Capsule 20 x 15 mm, ellipsoid; seeds many, winged.

*Fl. & Fr.* July-December.

*Distr.* Endemic to India. Rare in rocky grasslands; *PS 30692* Pandaravarai

### FIRMIANA Marsili

**Firmiana colorata** (Roxb.) R. Br. in Bennet & Brown, Pl. Jav. Rar. 235. 1844; FPM 107. 1915; FPL 88. 1990; Malick, Fl. Ind. 3:420.1993; FTSR 65. 1996. *Sterculia colorata* Roxb., Pl. Corom. t. 25. 1795; FBI 1: 359. 1874. *S. rubicunda* Wall. ex Mast., Hook. f., FBI 1: 360. 1874.

Medium trees. Leaves to 16 x 25 cm, 3-lobed, cordate at base, 7-ribbed, lobes acuminate; petiole to 20 cm long. Flowers unisexual, in terminal paniced racemes; calyx 2 cm long, tubular, reddish, tomentose outside; gynophore 25 mm long; stamens 16, filaments connate into



a cup around the pistillode; carpels 5, free, flattened; style short, curved. Follicle 5-6 cm long, compressed; seeds 2-5, compressed.

*Fl. & Fr.* February-April.

*Distr.* Indo-Malesia and China. Common in semi-evergreen forests; *PS 30191* Kottayali

#### HELICTERES Linnaeus

**Helicteres isora** L., Sp. Pl. 963. 1753; FBI 1: 365. 1874; FPM 167. 1915; FPL 89. 1990; Malick, Fl. Ind. 3:426.1993; FTSR 66. 1996.

Large shrubs. Leaves to 15 cm, orbicular, cordate at base, obtuse at apex, serrate, 3-nerved from base, scabrous. Flowers axillary, fascicled or solitary; calyx 15 mm long, tubular, 5-toothed, yellowish; petals to 3.5 cm long, unequal, reddish; gynophore 4 cm long, curved; stamens 5, filaments short, united at base; ovary 5-celled; ovules many; style 5. Fruit a spirally twisted follicle, 5 cm long; seeds many, tubercled.

*Fl. & Fr.* Almost throughout the year

*Distr.* Indo-Malesia and Australia. Common in moist deciduous forests; *PS 19627* Vengoli

#### HERITIERA W. Aiton

**Heritiera papilio** Bedd., Fl. Sylv. t. 218. 1872; FBI 1: 363. 1874; FPM 104. 1915; Malick, Fl. Ind. 3:430.1993; FTSR 66. 1996. *H. acuminata* Wall. ex Kurz, J. Bot. 12: 65, t.141. f.1. 1-3. 1874.

Medium trees. Leaves alternate, to 9 x 4 cm, ovate, acute at apex, rounded or cordate at base, entire, 3-nerved from base, densely white scaly below. Flowers unisexual, in axillary panicles; peduncle tomentose; calyx 4 mm long, widely campanulate, 5-lobed, lobes acute; stamens 5; anthers 5, sessile on tip of staminal column; carpels 5-6, free, ovules 1-2 in each; styles recurved; stigmas globose. Fruit of 5 distinct winged 1-seeded samaras, 5-6 cm long.

*Fl. & Fr.* December-April

*Distr.* India and Bangladesh. Common in evergreen forests; *PS 30054* Thelliyalimattukkal

#### LEPTONYCHIA Turczaninow

**Leptonychia caudata** (Wall. ex G. Don) Burret, Notizbl. Bot. Gart. Berlin. 9:727. 1926; Malick, Fl. Ind. 3:435.1993; FTSR 66. 1996. *Grewia caudata* Wall. ex G. Don, Gen. Syst. 1:547. 1831. *Leptonychia moacurroides* Bedd., Fl. Sylv. t. 114. 1871; Hook.f., FBI 1: 379. 1874; FPM 112. 1915.

Small slender trees. Leaves oblong or elliptic-oblong, caudate-acuminate, base rounded, subcoriaceous, 7-12 x 3-5 cm; lateral nerves 5-7, archingly jointed along the margin, intercostae reticulate, domatia present in axils of nerves; petioles to 1 cm long. Sepals 3 mm long, tomentose. Petals 5 mm long, white, oblong, linear. Inner staminodes subulate and outer ovate. Ovary depressed globose, 3-4 celled, cells few ovuled. Capsule depressed globose, 3-lobed, tomentose, 2.5 x 2 cm.

*Fl. & Fr.* June-September

*Distr.* Indo-Malesia. Common in evergreen forests; *PS 30197*, *NS 30429* Kothala

#### MELOCHIA Linnaeus

**Melochia corchorifolia** L., Sp. Pl. 675. 1753; FBI 1: 374. 1874; FPM 110. 1915; Malick, Fl. Ind. 3:441.1993; FTSR 67. 1996.

Slender subglabrous herbs. Leaves to 4 x 2 cm, ovate-lanceolate, rounded at base, serrate, scabrid. Flowers 2-6 together, in terminal sessile cymes; sepals 3 mm long, campanulate, lobes subulate, petals pink, 6 mm long, obovate, glabrous; stamens 5, united at base; ovary 5-celled, 2-ovules in each, densely hairy; styles 5, free. Capsule 5-valved, depressed globose, 5 mm across; seeds 1 or 2, angular.

*Fl. & Fr.* Throughout the year

*Distr.* Pantropical. Rare in vayals and wet rocky areas; *PS 30473*, *NS 19617* Vengoli

## PTEROSPERMUM Schreber

1. Leaf base equal, dentate towards the apex..... **P. reticulatum**  
1. Leaf base unequal, entire ..... **P. rubiginosum**

**Pterospermum reticulatum** Wight & Arn., Prodr. 69. 1834; FBI 1: 368. 1874; FPM 108. 1915; Malick, Fl. Ind. 3:451.1993; FTSR 67. 1996.

Medium tree. Leaves to 15 x 10 cm, obovate; 3-7-toothed at apex; cordate at base, white-tomentose below; nerves 6 pairs, prominent. Flowers in terminal or axillary fascicles; bracts lacinate; sepals 4.5 x 0.5 cm, oblong, densely stellate-tomentose; petals 4 x 1.5 cm, obovate, densely stellate-hairy within; stamens 15, staminodes 5. Capsule 7 x 3 cm, oblong, acute, stalked, densely rugose, tomentose; seeds solitary, winged.

*Fl. & Fr.* December-March.

*Distr.* Endemic to Southern Western Ghats. Common in semi-evergreen forests; *PS 19886* Velayudhankai

**Pterospermum rubiginosum** Heyne ex Wight & Arn., Prodr. 68. 1834; FBI 1: 368. 1874; FPM 109. 1915; FPL 90. 1990; Malick, Fl. Ind. 3:451.1993; FTSR 69. 1996.

Large trees. Leaves to 10 x 3 cm, ovate-lanceolate, oblique at base, acuminate at apex, densely tomentose below; nerves 5 pairs. Flowers axillary, 2-3 together; pedicels 1.5 cm long; sepals 4 cm long, linear oblong, densely tomentose; petals 3 cm long, linear-oblong, white; stamens 10, filaments 3 cm long, united at base into a tube; ovary tomentose; style 4-5 cm long. Capsule 4 x 2 cm, angular.

*Fl. & Fr.* January-March.

*Distr.* Endemic to Southern Western Ghats. Fairly common in evergreen and semi-evergreen forests; *PS 30214* Kothala

## PTERYGOTA Schott & Endlicher

**Pterygota alata** (Roxb.) R. Br. in Bennet & Br., Pl. Jav. Rar. 234. 1844; FPM 104. 1915; FPL 91. 1990; Malick, Fl. Ind. 3:455.1993; FTSR 69. 1996. *Sterculia alata* Roxb., Pl. Corom. t. 287. 1820; FBI 1: 360. 1874.

Very large trees; trunk round, straight; bark smooth; branches glabrous. Leaves 15-30 x 13-18 cm, broadly ovate, entire, 7-ribbed, glabrous; rounded or cordate at base. Flowers in axillary panicles; unisexual; calyx 5-partite, lobes 1 cm long, curved out, tomentose outside; stamens 20, 5-adelphous; carpels 5, free, sessile, ovules many in each; staminodes in female flowers 5. Follicle 13 x 8 cm, obovoid, oblique, 2-valved; seeds 6 x 3 cm, oblong, winged.

*Fl. & Fr.* March-December

*Distr.* South Asia and Myanmar. Occasional in evergreen forests; *PS 30637* Kothala

## STERCULIA Linnaeus

1. Leaves entire ..... **S. guttata**  
1. Leaves palmately lobed..... 2  
2. Calyx pubescent within, lobes 3 mm long..... **S. urens**  
2. Calyx glabrous within, lobes more than 5 mm long..... **S. villosa**

**Sterculia guttata** Roxb. ex DC., Prodr. 1: 482. 1824; FBI 1: 355. 1874; FPM 106. 1915; FPL 91. 1990; Malick, Fl. Ind. 3:462.1993; FTSR 70. 1996.

Large trees; branchlets tomentose. Leaves 22 x 13 cm, obovate, abruptly acuminate at apex, rounded at base, stellate-tomentose below, nerves 10 pairs. Panicles to 20 cm across, terminal. Flowers pedicelled; calyx 15 mm across, campanulate, lobes acuminate, densely hairy; stamens 10, column hairy at apex. Capsule 5 x 3 cm, curved-obovoid, tomentose, reddish; seeds few, 8 x 6 mm, ovoid, smooth, shining.

*Fl. & Fr.* January-May

*Distr.* Indo-Malesia. Common in rocky areas in moist deciduous and semi-evergreen forests; *PS 19732* Orukomban; *PS 19821*, *NS 30556* Karimala

***Sterculia urens*** Roxb., Pl. Corom. t. 24. 1795; FBI 1: 355. 1874; FPM 106. 1915; FPL 91. 1990; Malick, Fl. Ind. 3:471.1993; FTSR 70. 1996.

Medium trees; bark yellowish-white, smooth. Leaves 5-30 cm across, orbicular, deeply cordate at base, lobes ovate, acuminate, penninerved, pubescent below; petiole to 18 cm long. Flowers greenish yellow, in terminal and upper axillary panicles; calyx 13 mm diam., lobes oblong, curved outside; staminal column 8 mm long, curved. Follicles 4-5 cm long, oblong, sessile, bristly; seeds few, 6 x 4 mm, black.

*Fl. & Fr.* December-April

*Distr.* Indo-Malesia. Common in rocky areas; *PS 19226* Vengoli

***Sterculia villosa*** Roxb. ex DC., Prodr. 1: 483. 1824; FBI 1: 355. 1874; FPM 106. 1915; Malick, Fl. Ind. 3:472.1993; FTSR 70. 1996.

Medium trees; bark pale brown, fibrous. Leaves to 25 cm across, cordate at base; lobes caudate-acuminate at apex, penninerved, downy pubescent below; petioles 15-20 cm long. Panicles to 20 cm across, terminal, densely hairy. Flowers 2 cm across, greenish brown; pedicels 5 mm long; calyx 8 mm long, lobes oblong, tomentose outside, stamens 10, anthers along the rim of staminal column.; column hairy at apex; staminodes 10 in female flowers. Follicles 2-7, to 5 cm long, oblong, tomentose; seeds black, smooth.

*Fl. & Fr.* February-April

*Distr.* South Asia. Rare in rocky areas; *PS 19364* Pezha

#### WALTHERIA Linnaeus

***Waltheria indica*** L., Sp. Pl. 673. 1753; FBI 1: 374. 1874; FPM 111. 1915; FPL 92. 1990; Malick, Fl. Ind. 3:473.1993. *W. americana* L., Sp. Pl. 673. 1753.

Herbs, to 70 cm high, densely tomentose. Leaves to 5 x 3 cm, ovate, obtuse, crenate; petiole 1.5 cm long. Flowers 3-10-together, in axillary or terminal heads, sessile; calyx 4 mm long, tubular, lobes subulate; petals yellow, 4 mm long, obovate, stamens 5, monadelphous; ovary 1-celled, 2-ovuled, pubescent; style lateral. Capsule 2-valved; 1-seeded, hairy at apex.

*Fl. & Fr.* Throughout the year

*Distr.* Pantropical. Occasional in rocky areas; *PS 19847* Vengoli

#### TILIACEAE

- |   |                   |
|---|-------------------|
| 1. Shrubs or small trees; fruit a drupe ..... | <b>Grewia</b>     |
| 1. Herbs or sub-shrubs; fruit a capsule.....  | 2                 |
| 2. Capsule prickly or bristly .....           | <b>Triumfetta</b> |
| 2. Capsule unarmed.....                       | <b>Corchorus</b>  |

#### CORCHORUS Linnaeus

***Corchorus aestuans*** L., Syst. Nat. (ed. 10) 1079. 1759; FPL 92. 1990; FTSR 71. 1996. *C. acutangulus* Lam., Encycl. 2: 104. 1786; FBI 1: 398. 1874; FPM 121. 1915.

Herbs. Leaves to 3.5 x 2 cm, ovate, acute at apex, base slightly cordate, membranous, minutely and closely crenate, sparsely strigose above and below, 3-4 nerved, basal teeth prolonged into long hairs. Cymes axillary, 1-3 flowered; flowers yellow, 7 mm across, 5-merous; bracts and bracteoles 3 mm, linear; stamens many. Capsule 2.5 cm long, oblong, 3 toothed at apex, glabrous; seeds many, 1.5 mm, disc shaped.

*Fl. & Fr.* October-February

*Distr.* Pantropical. Common in deciduous forests; *PS 30830* Thekkady

## GREWIA Linnaeus

- |  |                        |
|--|------------------------|
| 1. Drupe glabrous, 1-4 lobed.....  | <b>G. glabra</b>       |
| 1. Drupe variously hairy, 2 or 4 lobed .....   | 2                      |
| 2. Leaves glabrous on both sides.....  | 3                      |
| 2. Leaves variously hairy on both sides or below.....                                | 5                      |
| 3. Leaves with hairy domatia in the nerve axils.....                                 | <b>G. obtusa</b>       |
| 3. Leaves without hairy domatia in the nerve axils .....                             | 4                      |
| 4. Peduncle shorter than the petiole; leaves 5 nerved at base.....                   | <b>G. tiliifolia</b>   |
| 4. Peduncle longer than the petiole; leaves 3 nerved at base .....                   | <b>G. orientalis</b>   |
| 5. Leaves 5-nerved at base, rarely 4 nerved.....                                     | 6                      |
| 5. Leaves 3-nerved at base.....  | 7                      |
| 6. Bracts spatulate; peduncle longer than the petiole .....                          | <b>G. orbiculata</b>   |
| 6. Bracts linear or lanceolate; peduncle much shorter than the petiole .....         | <b>G. villosa</b>      |
| 7. Leaves orbicular or rhomboid; stipules shorter than the petiole .....             | <b>G. abutilifolia</b> |
| 7. Leaves oblong, lanceolate or oblanceolate; stipules longer than the petiole ..... | 8                      |
| 8. Style pilose; ovules more than 10.....  | <b>G. flavescens</b>   |
| 8. Style glabrous; ovules less than 8.....   | <b>G. hirsuta</b>      |

**Grewia abutilifolia** Juss., Ann. Mus. Natl. Hist. Nat 4: 92. 1804; FBI 1: 390. 1874; FPL 93. 1990; Daniel & Chandr., Fl. Ind. 3:493.1993; FTSR 71. 1996. *G. aspera* Roxb., Fl. Ind. 2: 591. 1832; FPM 119. 1915. *G. macrophylla* Naray. & Rao, J. Ind. Bot. Soc. 29: 187. 1950, non G. Don 1831.

Shrubs, branches densely stellate-tomentose. Leaves 15 x 10 cm, orbicular, 3-5-toothed at apex, serrate, stellate-tomentose below; petiole 1.5 cm long. Peduncle 3-5 mm long, 3-5 together; sepals 11 x 2 mm, oblong, stellate-pubescent outside; petals white, 3.5 x 1 mm, oblong, gland 1.5 x 1 mm, pubescent; gynandrophore glabrous. Drupe 13 x 10 mm, obscurely 4-lobed.

*Fl. & Fr.* May-September

*Distr.* Indo-Malesia. Rare in dry deciduous forests; *PS 30691* Pandaravarai

**Grewia flavescens** A. Juss., Ann. Mus. Natl. Hist. Nat. 4: 91. 1904; FPM 119. 1915; Daniel & Chandr., Fl. Ind. 3:498.1993. *G. carpinifolia* sensu Mast. in Hook.f., FBI 1: 387. 1874, non Juss. 1804. *G. commutata* DC., Prodr. 1: 511. 1824. *Vincentia flavescens* (Juss.) Burret, Notizbl. Bot. Gard., Berlin-Dahlem 9: 648. 1826.

Shrubs; branchlets pubescent. Leaves 9 x 4 cm, elliptic, stellately pubescent above, tomentose below, margins finely serrate, apex acute, base obtuse, truncate, transverse nerves parallel, somewhat broader above the middle, then abruptly acute; petiole to 0.5 cm; stipules to 1 cm, linear, pubescent. Flowers axillary, peduncles many in the axils, as long as the petiole; bracts ovate, puberulus; sepals 1.3 cm, oblong, acute; petals 1 cm, with a gland at the base; stamens many, to 10 mm; torus to 2 mm; ovary 2 mm, hirsute, style 1.5 cm.

*Fl. & Fr.* November-March

*Distr.* India and Tropical Africa. Rare in dry deciduous forests; *PS 30075* Kuchimudi

**Grewia glabra** Blume, Bijdr. 115. 1825; FPL 94. 1990; FTSR 72. 1996. *G. serrulata* DC., Prodr. 1: 510. 1824; Daniel & Chandr., Fl. Ind. 3:509.1993. *G. disperma* sensu Dunn in Gamble, FPM 118. 1915 non Rottl. ex Spreng. 1825. *G. laevigata* sensu Mast. in Hook.f., FBI 1: 389. 1874, non Vahl 1790.

Erect shrubs, branchlets slender, glabrous. Leaves to 13 x 4 cm, elliptic, sharply acuminate, serrate, petiole 6 mm long. Peduncle 2.5 cm long, slender, glabrous; pedicel 2 cm long, sparsely stellate hairy; sepals 19 x 4 mm, oblong, tomentose outside; petals 3.5 x 3 mm, ovate, white; gynandrophore densely hairy; stigma fimbriate. Drupelets 5 x 5 mm, globose, glabrous.

*Fl. & Fr.* Throughout the year

*Distr.* Indo-Malesia and Tropical Africa. Common in moist deciduous forests; *PS 19460* Pooppara; *30203* Vengoli

**Grewia hirsuta** Vahl, Symb. Bot. 1: 34. 1790; FBI 1: 391. 1874; FPM 119. 1915; FPL 94. 1990; Daniel & Chandr., Fl. Ind. 3:501.1993. *G. roxburghii* G.Don, Gen. Hist. 1: 548. 1831, excl. syn. *G. tomentosa* Naray. & Rao, J. Ind. Bot. Soc. 29: 179. 1950, non Juss. 1804.

Shrubs, branches densely pilose. Leaves 5-7 x 2-3 cm, ovate, acute, rounded at base, serrate, hirsute-pubescent; petiole 3 mm long. Peduncle 10 mm long, hirsute; pedicels 10 mm long, slender; sepals 7 x 3 mm, oblong, 3-ribbed; petals 3 x 1 mm, oblong, obtuse, gland 1 x 1 mm, orbicular, hairy; filaments 1.5 mm long, anthers below the level of ovary; ovary densely hairy; style 2 mm long; stigma globose. Drupe 10 x 10 mm, obscurely 4-lobed, pilose.

*Fl. & Fr.* Throughout the year

*Distr.* India, Bangladesh and Sri Lanka. Common in dry deciduous forests; *PS 30073, NS 30402* Kuchimudi

**Grewia obtusa** Wall. ex Dunn in Gamble, FPM 117. 1915; Daniel & Chandr., Fl. Ind. 3:495.1993. *G. bracteata* auct. non Heyne ex Roth. 1821; FBI 1: 384. 1874p.p.

Shrubs, branchlets dark, lenticellate, young ones brown tomentose. Leaves 13 x 5 cm, ovate-elliptic, apex and base obtuse, secondary nerves arched, glabrous, with hairy domatia in the nerve axils, margins finely serrate; petiole to 1.5 cm; stipules lanceolate, tomentose. Cymes leaf opposed, many flowered; buds oblong, golden tomentose; peduncles to 1 cm; bracts 7 mm, linear; sepals 2 x 0.5 cm, oblong, curved when mature; petals 0.5 cm, white; torus 3 mm; filaments unequal, to 1.5 cm, white; ovary 4 mm, hirsute, style 1.2 cm; stigma capitate, laciniate.

*Fl.* April-July

*Distr.* Peninsular India and Sri Lanka. Common in secondary forests; *PS 18912* Karimala

**Grewia orbiculata** Rotl., Ges. Naturf. Freunde Berlin Neue Schriften 4: 205. 1803; FBI 1: 386. 1874; Daniel & Chandr., Fl. Ind. 3:504.1993. *G. rotundifolia* Juss., Ann. Mus. Natl. Hist. Nat. 4: 92. 1804; FPM 118. 1915.

Shrubs; branchlets tomentose. Leaves 5 cm across, orbicular, base cordate, margins minutely serrate, basally, 5-nerved, glabrous above, thinly pubescent below; petiole to 1 cm, stipules to 1 cm, lanceolate, pubescent. Cymes many in the axils, peduncles to 1.5 cm; pedicels 8 mm; sepals 8 x 2 mm, oblong, pubescent; petals 4 x 2 mm, gland surrounded by hairs; torus elongated to 2 mm; filaments to 1.5 mm; ovary hirsute, style 5 mm, stigma capitate.

*Fl.* February-April

*Distr.* Endemic to India. Rare along the margins of evergreen forests; *PS 30638* Pandaravarai

**Grewia orientalis** L., Sp. Pl. (ed.2) 964. 1762; FPM 117. 1915; Daniel & Chandr., Fl. Ind. 3:506.1993. *G. columnaris* J.E. Smith, Rees, Cyclop. 17: 5. 1811; FBI 1: 383. 1874.

Shrubs, branchlets tomentose. Leaves to 6 x 3.5 cm, ovate or obovate, acuminate, base truncate or subcordate, margins crenulate; tomentose above, glabrous beneath. Cymes axillary or leaf opposed; sepals 5, to 3 mm, lanceolate, pubescent; petals 5, to 7 mm, emarginate; ovary elongate, strigose. Fruit slightly 4-lobed, lobes to 8 mm, subglobose shortly bristly.

*Distr.* Indo-Malesia and Tropical Africa. Rare in moist deciduous forests; *PS 19546* Thekkady

**Grewia tiliifolia** Vahl, Symb. Bot. 1: 35. 1790; FBI 1: 386. 1874, "tiliaefolia"; FPM 118. 1915; FPL 94. 1990; Daniel & Chandr., Fl. Ind. 3:511.1993; FTSR 72. 1996. *Grewia tiliifolia* Vahl var. *argentea* Burret, Notizbl. Bot. Gart. Berlin-Dahlem 9: 659. 1926.

Large trees; bark greyish-brown, rough; branchlets stellate-tomentose. Leaves to 18 x 12 cm, broadly ovate, acute at apex, crenate-serrate, hoary tomentose below; petiole 2 cm long. Peduncle axillary, 7 mm long; sepals 7 mm long, hairy at base inside; petals yellow, 3 x 1 mm, densely tomentose outside; filaments 3 mm long; stigma 2-3-lobed, recurved. Drupelets 1-4, to 5 mm diam., globose, reddish

*Fl. & Fr.* April-June

*Distr.* Tropical Africa, India to Indo-China. Very common in moist deciduous forests; *PS 19368* Orukomban

**Grewia villosa** Willd., Ges. Naturf. Freunde Berlin Neue Schriften 4: 205. 1803; FBI 1: 388. 1874; FPM 119. 1915; FPL 95. 1990; Daniel & Chandr., Fl. Ind. 3:515.1993. *G. orbiculata* G. Don, Gen. Hist. 1: 551. 1831, non Rotl. 1803. *G. corylifolia* A. Rich. in Guillemin *et al.*, Fl. Seneg. Tent. 95. t. 20. 1831.

Large shrubs, branchlets villous. Leaves 8 x 9.5 cm, orbicular, serrate, transverse, nervules concentric, villosus, membranous, base cordate, apex rounded, pubescent; petiole to 2.5 cm. Cymes axillary, 1-3, peduncles to 1 cm, stout, stipules 8 mm, ovate, pubescent, pedicels to 1 cm. Fruit 1.5 cm across, light red, entire or somewhat 4-lobed, rind fibrous.

*Fl. & Fr.* November-December

*Distr.* Paleotropics. Rare in dry deciduous forests; *PS 30068* Kuchimudi

### TRIUMFETTA Linnaeus

- |   |                        |
|---|------------------------|
| 1. All leaves lobed .....                               | <b>T. rhomboidea</b>   |
| 1. Leaves not lobed, lower leaves sometimes lobed ..... | 2                      |
| 2. Leaves scabrid above, orbicular or rhomboid .....    | <b>T. rotundifolia</b> |
| 2. Leaves stellate-tomentose above, lanceolate .....    | <b>T. pilosa</b>       |

**Triumfetta pilosa** Roth, Nov. Pl. Sp. 223. 1821; FBI 1: 394. 1874; FPM 120. 1915; FPL 95. 1990; Daniel & Chandr., Fl. Ind. 3:519.1993; FTSR 73. 1996. *T. oblongata* Link, Enum. Hort. Berol. Alt. 2: 5. 1822. *T. guazumaefolia* Bojer, Rapp. Annuel Trav. Soc. Hist. Nat. Ile Maurice 12: 18. 1842. *T. cana* Blume, Bijdr. 113. 1825; FBI 1: 396. 1874.

Shrubs, to 2 m high; branches stellate-hairy. Leaves to 16 x 10 cm, ovate, rounded at base, acuminate at apex, serrate, densely stellate-hairy below, 5-nerved from base. Flowers 3-10 together; pedicel 3 mm long; sepals 10 x 1 mm, hairy outside; petals yellow, 7 x 2 mm, oblanceolate, hairy at base; stamens 10, filaments 7 mm long. Capsule densely glochidiate-bristled.

*Fl. & Fr.* October-January

*Distr.* Tropical Africa, Central and East Asia. Rare in rocky grasslands; *PS 30544* Pandaravarai

**Triumfetta rhomboidea** Jacq., Enum. Pl. Carib. 22. 1760; FBI 1: 395. 1874; FPM 120. 1915; FPL 95. 1990; Daniel & Chandr., Fl. Ind. 3:520.1993; FTSR 73. 1996. *Bartramia indica* L., Sp. Pl. 378. 1753, non *Triumfetta indica* Lam. 1792. *Triumfetta bartramia* L., Syst. Nat. (ed.10):1044. 1759, *nom. illeg.* *Triumfetta angulata* Lam., Encycl. 3: 421. 1789.

Shrubs or herbs. Leaves to 7 x 7 cm, ovate to rhomboid, 3-lobed, cordate or rounded at base, acuminate at apex, densely stellate-tomentose below, 3-5-ribbed from base; petiole to 3 cm long. Flowers 3-15 together; pedicels 5 mm long; sepals 7 x 1 mm, sparsely stellate-hairy; petals 6 x 2 mm, oblanceolate, with two tufts of hairs at base. Capsule with stiff bristles

*Fl. & Fr.* Throughout the year

*Distr.* Pantropical. Common in moist deciduous forests and degraded forest areas; *PS 19025* Thunakkadavu

**Triumfetta rotundifolia** Lam., Encycl. 3: 421. 1792; FBI 1: 395. 1874; FPM 120. 1915; Daniel & Chandr., Fl. Ind. 3:521.1993.

Shrubs, branchlets stellate tomentose. Leaves to 3 x 2 cm, orbicular-rhomboid, obtuse, base cuneate, serrate; petiole to 2 cm. Racemes interrupted; sepals 5, ca 3 mm, oblong, stellate tomentose; petals 5, 4 mm, obovate, ciliate; ovary spherical, prickled. Capsule 5 mm across, ovoid, woolly.

*Fl. & Fr.* November-February

*Distr.* Endemic to Peninsular India. Rare in dry deciduous forests; *PS 30542* Pandaravarai

**Note:** Present collection is an addition to the flora of Kerala

## ELAEOCARPACEAE

### ELAEOCARPUS Linnaeus

1. Leaves densely brown tomentose on nerves below; leaves more than 15 cm long ..... **E. tuberculatus**
1. Leaves glabrous or glabrescent below; leave to 15 cm long ..... 2
2. Trees without aerial roots; sepals glabrous ..... **E. glandulosus**
2. Trees with reddish aerial roots on buttresses; sepals pubescent ..... 3
3. Fruit oblong-ellipsoid ..... **E. serratus** var. **serratus**
3. Fruit globose-ovoid ..... **E. serratus** var. **weibelii**

**Elaeocarpus glandulosus** Wall. ex Merr., J. Arnold Arbor. 32: 194. 1951; Murti, Fl. Ind. 3:539.1993; FTSR 74. 1996. *E. tectorius* sensu Ramam. in Sald. & Nicols., Fl. Hassan Dist. 131. 1974, non (Lour.) Poiret 1812.

Large trees with broad buttresses. Leaves to 15 x 7 cm, elliptic-oblong, abruptly acuminate with emarginate tip, base rounded, 6-8 nerved, punctuate, domatia glandular. Racemes to 8 cm long; pedicel 3 mm long, glabrous; sepals 7 mm long, minutely pubescent outside, glandular inside; petals white, 7 mm long, fimbriate, glandular; stamens many, anthers 1.5 mm long, puberulus; ovary densely hairy. Drupe 2.5 x 2 cm oblong.

*Fl. & Fr.* August-December

*Distr.* Indo-Malesia. Rare in evergreen forests at lower altitudes; *PS 19353* Kariyilathodu

**Elaeocarpus serratus** L., Sp. Pl. 515. 1753, var. **serratus**; FBI 1: 401. 1874; FPM 124. 1915; FPL 96. 1990; Murti, Fl. Ind. 3:553.1993; FTSR 74. 1996; Zmarzty, Kew Bull. 56: 434. 2001. *E. oblongus* Gaertn., Fruct. 1: 202. t. 43. 1788. *E. cuneatus* Wight, Ill. Indian Bot. t. 83. 1840.

Large trees; twigs glabrous. Leaves to 9 x 4 cm, obovate, acute, narrowed to the base, serrate, 3-4-nerved; domatia glandular; petiole 1.5 cm long, glabrous. Raceme to 8 cm long; glabrous; pedicel 5 mm long, slender. Flowers greenish white; sepals 7 mm long, densely glandulose; petals 7 mm long, glabrous; anthers 2.2 mm long, puberulus, bristles 3 or 4; ovary densely tomentose, 3-celled. Drupe 2.5 cm across, ovoid to oblong; pyrene tubercled.

*Fl. & Fr.* October-February

*Distr.* Indo-Malesia. Common in evergreen forests; *PS 19317* Kothala

**Elaeocarpus serratus** L., Sp. Pl. 515. 1753, var. **weibelii** Zmarzty, Kew Bull. 56: 437. 2001.

Medium trees, branchlets pubescent. Leaves to 14 x 7 cm, elliptic-oblong, acute, base acuminate, margin serrate, nerves with domatia; petiole 1.5-3 cm. Racemes axillary or on leaf scars; pedicel 5-8 cm; sepals *ca* 6 x 2 mm, lanceolate, acuminate, hairy; petals 7-8 x 3 mm, obovate, apically divided; stamens inserted in a ring; ovary *ca* 2 x 1.5 mm, ovate, hairy, style *ca* 4 mm. Fruit to 1.7 x 1.5 cm, ellipsoid, stone to 1.3 x 1.2 cm, ellipsoid, shallowly rugose.

*Fl. & Fr.* November-February

*Distr.* Endemic to Peninsular India. Common in evergreen forests; *PS 18942* Kothala, *NS 19705* Karimala

**Elaeocarpus tuberculatus** Roxb., Fl. Ind. 2: 594. 1832; FBI 1: 404. 1874; FPM 124. 1915; FPL 97. 1990; Murti, Fl. Ind. 3:559.1993; FTSR 74. 1996. *Monocera tuberculata* (Roxb.) Wight & Arn., Prodr. 83. 1834.

Large trees, prominently buttressed; bark white; branchlets stout. Leaves to 22 x 15 cm, obovate, obtuse, entire, 14-16-nerved, glabrous above; petiole 1.5 cm long, stout. Raceme to 12 cm long, ferruginous tomentose; pedicel 2 cm long deflexed. Flowers facing downwards; sepals 15 x 3 mm, lanceolate; petals white, 18 mm long, fimbriate, fulvous tomentose, anthers 5 mm long, thinly tomentose, bristle 3 mm long; ovary densely hairy; style 10 mm long, tomentose. Drupe 3 x 2.5 cm, ferruginous tomentose.

*Fl. & Fr.* September-February

*Distr.* Indo-Malesia. Rare in evergreen forests at lower altitudes; *PS 19777* Shekkalmudi

## ERYTHROXYLACEAE

### ERYTHROXYLUM P. Browne

**Erythroxylum lanceolatum** (Wight) Walp., Rep. 1: 407. 1842; FBI 1: 415. 1874; FPM 127. 1915; Chatterjee & Sharma, Fl. Ind. 3:590.1993. *Sethia lanceolata* Wight, Ill. Indian Bot. 1: 136. 1840. *S. erythroxyloides* Wight, Ill. Indian Bot. 1: 136. 1840.

Small to medium trees, bark reddish brown. Leaves lanceolate, acuminate, base acute or obtuse, glabrous, to 8 x 3 cm, lateral nervous slender, faint. Flowers axillary, solitary or paired. Petals white with an erect ligule at the base. Staminal filaments united at the base to form a tube. Drupe oblong, to 1.5 x 0.4 cm; seed one.

*Fl. & Fr.* November-March

*Distr.* Peninsular India and Sri Lanka. Common in evergreen forests; *PS 19784* Kanthalppara; *NS 30243* Pezha

## MALPIGHIACEAE

### HIPTAGE J. Gaertner

**Hiptage benghalensis** (L.) Kurz, J. Asiat. Soc. Bengal 43: 136. 1874; FPL 97. 1990; FTSR 75. 1996; Sirvas., Fl. Ind. 4:14.1997. *Banisteria benghalensis* L., Sp. Pl. 427. 1753. *Hiptage madablota* Gaertn., Fruct. 2: 169,t.116. 1791; FPM 128. 1915. *Gaertnera racemosa* Roxb., Pl. Corom. t. 18. 1795 & Fl. Ind. 2: 368. 1832.

Woody climbers. Leaves opposite, to 16 x 7 cm, elliptic, acuminate at apex, rounded at base, nerves 7 pairs, intercostae reticulate, green when dried; petiole 1 cm long, hirtus. Racemes 5-10 cm long; pedicels 1.5-2 cm long, hispid; bracts lanceolate. Flowers white, calyx lobes ovate, obtuse, hispid, with a large red gland on one lobe outside; petals 5, 13 x 10 mm, obovate, obtuse, fimbriate; stamens 10, free; ovary densely hairy; style 1, 12 mm long. Wings of fruit 5 x 1.5 cm, elliptic to obovate; seeds 6 mm across, compressed.

*Fl. & Fr.* January-May

*Distr.* Indo-Malesia and China. Rare in moist deciduous forests; *PS 30297* Parambikulam

## ZYGOPHYLLACEAE

### TRIBULUS Linnaeus

**Tribulus terrestris** L., Sp. Pl. 387. 1753; FBI 1: 423. 1874; FPM 130. 1915; Singh & Singh, Fl. Ind. 4:55.1997. *T. lanuginosus* L., Sp. Pl. 387. 1753.

Prostrate silky herbs. Leaves opposite, imparipinnate; leaflets opposite, 4-5 pairs, 1.5 x 0.7 cm, oblong; petiole to 7 mm, petiolule 1 mm, stipules 2-3 in cluster, persistent. Flowers axillary, 1 or 2, golden yellow, 2 cm across; pedicels to 3 cm; sepals 5, 5 mm, linear; petals 5, 7 x 4 mm; stamens 10, filaments dilated at base, disc 10-lobed; ovary 5-lobed, hirsute with bulbous hairs; stigmas 5. Fruit 1 cm across, globose, 5-angled, cocci 5, woody, each with a pair of divaricate spines.

*Fl. & Fr.* October-December

*Distr.* Tropical and warm temperate regions of the world. Rare in dry deciduous forests; *PS 30404* Kuchimudi

## OXALIDACEAE

1. Leaves pinnate, crowded on the top of the stem..... **Biophytum**
1. Leaves digitate, trifoliolate, equidistant ..... **Oxalis**



## BIOPHYTUM A. P. de Candolle

1. Peduncle to 8 cm long; terminal leaflet large; sepals smaller than petals ..... **B. reinwardtii**
1. Peduncle more than 10 cm long; middle leaflet large; sepals as long as petals ..... **B. sensitivum**

**Biophytum reinwardtii** (Zucc.) Klotzsch., Peters Reise Mossamb. Bot. 1: 85. 1861; FBI 1: 437. 1874; FPM 133. 1915; FPL 98. 1990; FTSR 76. 1996; Manna, Fl. Ind. 4:236.1997. *Oxalis reinwardtii* Zucc., Abh. Malth.-Phys. Cl. Koenigl. Bayer. Akad. Wiss. 1: 274. 1829-1830.

Unbranched herbs; stem to 20 cm tall. Leaves 5-12 cm long, collected at apex into a caudex; leaflets 10-15 pairs, oblong, slightly oblique, base truncate, glabrous. Peduncle to 15 cm long, glandular-hispid. Flowers to 8 per umbel; pedicels slender, glandular; sepals 4 x 1 mm, ovate-lanceolate, acute, brown; petals yellow, 7 x 2 mm, oblanceolate, with a red line in the middle.

*Fl. & Fr.* July-December

*Distr.* Indo-Malesia and China. Common in moist deciduous forests and moist areas; *PS 19298* Parambikulam; *19894* Thelikkal

**Biophytum sensitivum** (L.) DC., Prodr. 1: 690. 1824; FBI 1: 436. 1874; FPM 133. 1915; Manna, Fl. Ind. 4:238.1997. *Oxalis sensitiva* L., Sp. Pl. 434. 1753.

Stem simple, to 15 to 40 cm long. Leaves 7-10 cm long, rachis hirsute, leaflets 15-18 pairs, sparsely strigose hairy above, glaucous beneath, basal small, ovate, terminal obovate. Flowers yellow, in 10-18 cm long slender hirsute umbels; peduncles congested; bracts 1.8 x 0.5 mm, ovate, acute, villous; bracteoles 2 x 0.2 mm, linear, villous; sepals to 5 x 1 cm, linear, lanceolate, strigose. Seeds 1 x 0.3 mm, ovoid, tubercled.

*Fl. & Fr.* April-August

*Distr.* Widely distributed in Indo-Malesia. Common in moist deciduous forests and moist areas; *PS 19895* Thelikkal

## OXALIS Linnaeus

**Oxalis corniculata** L., Sp. Pl. 435. 1753; FBI 1: 436. 1874; FPM 132. 1915; FPL 98. 1990; FTSR 76. 1996; Manna, Fl. Ind. 4:242.1997. *Oxalis corniculata* L. var. *hispida* Blatt., JBNHS 34: 898. 1931.

Diffuse perennial herbs, branches slender, procumbent, rooting at lower nodes, pubescent. Leaflets sessile, obcordate, emarginate, base cuneate, pilose, to 1.5 x 1.6 cm; petiole 2-4 cm long, slender. Flowers yellow, 6 mm across, 2-many-together, in peduncled umbels; peduncles 3-7 cm long; pedicels 2 cm long, slender; sepals lanceolate, obtuse at apex; petals 7 mm long, oblong. Capsule oblong, acuminate, to 1.5 cm long; seeds 5-10 per cell, flattened to ovoid, transversely ridged.

*Fl. & Fr.* Throughout the year

*Distr.* Cosmopolitan. Common in moist deciduous forests and degraded forest areas; *PS 19098* Peruvipallam

## BALSAMINACEAE

### IMPATIENS Linnaeus

1. Leaves radical; flowers in scape ..... 2
1. Leaves cauline; flowers in leafy stem ..... 3
2. Scape to 35 cm long; wing 3-lobed ..... **I. scapiflora**
2. Scape to 25 cm long wing 2-lobed ..... **I. acaulis**
3. Epiphytic herbs; lip with saccate spur ..... 4
3. Terrestrial herbs; lip without saccate spur ..... 5
4. Flowers completely green ..... **I. viridiflora**
4. Flower parts variously coloured ..... **I. parasitica**

5.	Leaves opposite.....	6
5.	Leaves alternate.....	12
6	Stem and pedicel viscid glandular .....	<b>I. viscosa</b>
6.	Stem and petiole otherwise .....	7
7.	Flowers in subumbellate inflorescence on upper axils; dorsal auricle of the wings filiform.....	<b>I. goughii</b>
7.	Flowers axillary not forming subumbellate inflorescence; dorsal auricle of wings not filiform .....	8
8.	Spur of the lip to 5 mm long .....	9
8.	Spur of the lip more than 10 mm long.....	11
9.	Leaves narrow; floral parts pubescent .....	<b>I. herbicola</b>
9.	Leaves broad; floral parts glabrous .....	10
10.	Stipule subulate; upper leaves petiolate .....	<b>I. inconspicua</b>
10.	Stipule setaceous or absent; leaves sessile.....	<b>I. oppositifolia</b>
11.	Leaves with two sessile or stalked glands on the petiole .....	<b>I. minor</b>
11.	Leaves eglandular; sessile .....	<b>I. chinensis</b>
12.	Shrubs .....	13
12.	Herbs .....	15
13.	Flower axillary, solitary or in fascicles; flowers white .....	<b>I. hensloviana</b>
13.	Flower in elongate peduncled axillary racemes; flowers pink.....	14
14.	Leaves hairy on both surface; spur longer than petals .....	<b>I. maculata</b>
14.	Leaves glabrous or glabrescent; spur short hooked .....	<b>I. wightiana</b>
15.	Capsule tomentose .....	<b>I. balsamina</b>
15.	Capsule glabrous .....	16
16.	Seeds glabrous; leaves crenate, setose.....	<b>I. pulcherrima</b>
16.	Seeds variously hairy; leaves crenate not setose .....	17
17.	Wings bilobed with equal lobes; standard with a keel on dorsal side.....	<b>I. flaccida</b>
17.	Wings bilobed, lobes sub-equal; standard without a keel on dorsal side.....	<b>I. dasysperma</b>

**Impatiens acaulis** Arn., Comp. Bot. Mag. 1: 325. 1835; FBI 1: 443. 1874; FPM 138. 1915; FPL 99. 1990; Pandura. & Nair, JETB 20: 699. 1996; Vivek. *et al.*, Fl. Ind. 4:111.1997.

Stemless herbs. Leaves to 9 x 9 cm, orbicular, obtuse, cordate at base, glabrous, margins distantly crenate or entire; nerves 4 pairs. Scape 20 cm long, many-flowered. Flowers white, 2-3 cm across, confined to the apex of the scape; bracts 4 mm long, ovate; pedicels 2.5 cm long, solitary; lip 8 mm long, broadly ovate, concave, acute; spur 3.5 cm long, slender, glabrous; lateral sepals 3 x 2 mm, ovate, acute, green; standard pink, 8 x 8 mm, orbicular, emarginate, not cuspidate; wings equally lobed, lobes 25 mm long, oblong, obtuse. Capsule 6-10 mm long, ellipsoid, acute, glabrous.

*Fl. & Fr.* September-November

*Distr.* South India and Sri Lanka. Common in moist deciduous forests; *PS 19590* Karimalagapuram

**Impatiens balsamina** L., Sp. Pl. 938. 1753; FBI 1: 453. 1874; FPM 142. 1915; Vivek. *et al.*, Fl. Ind. 4:123.1997. *I. dahlii* Warb. in K. Schum. & Lauterb, Nachtr. Fl. Deutsch. Sudsee 313. 1905.

Stem 30-40 cm high, glabrous. Leaves to 8 x 0.8 cm, narrowly lanceolate, acute at either ends, serrate; petiole 1.5 cm long. Flowers solitary, axillary; pedicels 8-10 mm long; lip 8 x 4 mm, saccate, cuspidate, densely hairy; spur 10 mm long, curved, densely hairy; sepals minute; standard 6.5 x 8 mm, orbicular, emarginate and cuspidate, hairy, cusp 4-5 mm long; wings 14 x 8 mm, 2-lobed, basal lobe 5 x 4 mm, rounded; terminal lobe notched at apex. Capsule ellipsoid, acute, tomentose; seeds few, rugulose, brown.

*Fl. & Fr.* September-December

*Distr.* Indo-Malesia; introduced into many countries. Common in moist localities of semi-evergreen and moist deciduous forests; *PS 19225* Vengoli

**Impatiens chinensis** L., Sp. Pl. 2: 937. 1753; FBI 1: 444. 1874; FPM 139. 1915; FTSR 77. 1996; Vivek. *et al.*, Fl. Ind. 4:131.1997. *I. fasciculata* Lam., Dict. 1: 359. 1873.

Unbranched herbs, stem to 40 cm high, reddish. Leaves to 10 x 1 cm, linear-oblong, cordate at base, distantly crenate, glabrous. Flowers binate, axillary; lip 8 mm long, acuminate and curved back at apex; spur 15 mm long, slender; standard 4 x 6 mm, orbicular, emarginate; terminal lobe of wing 14 mm long, ovate, obtuse, pink; basal lobe 4 mm long; dorsal auricle 4.5 mm long, slender. Capsule 10 mm long, glabrous.

*Fl. & Fr.* July-December

*Distr.* India and China. Common in degraded forest areas; *PS 18996* Orukomban

**Impatiens dasysperma** Wight, Madras J. Lit. Sci. ser. 1. 5: 7, t. 2. 1837; FBI 457. 1874; FPM 143. 1915; Vivek. *et al.*, Fl. Ind. 4:139.1997.

Erect herbs, 30 cm high. Leaves to 11 x 3.5 cm, elliptic, acuminate at apex, acute at base, crenate, hairy below; petiole 4 cm long. Flowers 20 mm across, solitary or binate, axillary; pedicels 3 cm long; lip 7 x 4 mm, acuminate, glabrous; spur 17 mm long, narrow, minutely hairy; sepals small, ovate, acute, hairy; standard 9 x 6 mm, obovate, emarginate at apex, sharply cuspidate, keeled, keel ciliate; wings 9 x 10 mm, equally 2-lobed, lobes obovate, obcordate. Capsule 12 x 6 mm, glabrous; seeds 1.5 mm ovoid, minutely hirtus.

*Fl. & Fr.* August-November

*Distr.* Endemic to Southern Western Ghats. Rare in moist deciduous forests; *PS 19524* Orukomban

**Impatiens flaccida** Arn., Comp. Bot. Mag. 1: 322. 1836; FBI 1: 457. 1874; FPM 143. 1915; FTSR 78. 1996; Vivek. *et al.*, Fl. Ind. 4:146.1997.

Erect herbs; stem 25-40 cm high, glabrous. Leaves 5-7 x 1.5-3 cm, elliptic, acute at either ends, crenate, eglandular, glabrous; nerves 10 pairs; petiole 2-3 cm long. Flowers solitary or paired, axillary; pedicels to 5 cm long; lip 6 x 3.5 cm, acute; spur 2.8-3 cm long, slender, glabrous; sepal 2 x 1 mm, ovate, acute; standard 8-10 mm long, broadly oblong, emarginate at apex, keeled; lobes of wings equal, 13 mm long, obtuse, pink, dorsal auricle short, obtuse. Capsule 12 x 5 mm, ellipsoid, glabrous; seeds minutely hairy.

*Fl. & Fr.* August-December

*Distr.* South India and Sri Lanka. Rare in moist areas; *PS 19249* Thellikkal

**Impatiens goughii** Wight, Ill. 1: 160. 1840; FBI 1: 452. 1874; FPM 144. 1915; FTSR 78. 1996; Vivek. *et al.*, Fl. Ind. 4:152.1997. *I. anamallayensis* Bedd., Ic. t. 150. 1868-1874. *I. microtheca* Hook.f. in Hook.'s Ic. Pl. 30: t. 2910. 1910.

Herbs, stem 10-30 cm high, reddish, glabrous. Leaves opposite, 2-5 x 2-3 cm, elliptic, acute at either ends, serrate, with stalked glands towards base, glabrous; petiole 1-3 cm long, glabrous. Peduncles 4-6 cm long, glabrous. Flowers in racemes; lip boat-shaped, acute, cuspidate; spur 8-10 mm long, cylindrical, curved, acute; sepals ovate, acute; standard 3-4 x 3 mm, orbicular; wings 10 mm long, 3-lobed, lobes shallow, equal; dorsal auricle slender, produced into the spur. Capsule 6 x 4 mm, ellipsoid, acute, glabrous.

*Fl. & Fr.* June-November

*Distr.* Endemic to Western Ghats. Rare in moist rocky areas; *PS 30509* Thellikkal

**Impatiens hensloviana** Arn., Comp. Bot. Mag. 1: 322. 1836; FBI 1: 458. 1874; FPM 143. 1915; FTSR 78. 1996; Vivek. *et al.*, Fl. Ind. 4:155.1997. *I. albida* Wight, Madras J. 5: 7. 1837 & Ic. t. 743. 1844.

Shrubs, young stem ribbed. Leaves alternate, clustered towards the apex, to 15 x 6 cm, elliptic, acute at either ends, pubescent above and below; petiole to 10 cm long, pubescent. Flowers 4 cm across, solitary or paired, axillary; pedicels to 10 cm long, hairy; lip 12 mm long, funnel-shaped; spur 4.5 cm long; tomentose; sepals 8 x 4 mm, elliptic, acuminate; standard 14

mm long, broadly ovate, keeled; wings 20 mm long, 2-lobed; lobes subequal, obovate, white with red lines, glabrous. Capsule 2.5-3 cm, ellipsoid, acute; seeds many, 3 x 2 mm, ovate, acute, brown, rugose.

*Fl. & Fr.* September-December

*Distr.* South India and Sri Lanka. Rare in moist rocky areas; *PS 19936* Karimala

***Impatiens herbicola*** Hook. f., Kew Bull. 1911: 354. 1911; FPM 141. 1915; Vivek. *et al.*, Fl. Ind. 4:156.1997.

Glabrous herbs. Leaves to 4.5 x 0.5 cm, linear-oblong. Flowers paired, axillary; pedicels 1.5 cm long, pubescent on one side along a line. Lip 5 x 2 mm, boat-shaped, cuspidate, hairy; spur inconspicuous; sepals 4.5 mm long, linear, pubescent; standard 3 x 3.5 mm, obovate; keel ciliate, produced into a short cusp; wings 5 x 2 mm, 2-lobed; basal lobe shorter, dorsal auricle minute. Capsule 7-10 mm long, glabrous; seeds many, glabrous, dark-brown.

*Fl. & Fr.* September-November

*Distr.* Endemic to Southern Western Ghats. Rare in grasslands; *PS 19676* Karimala

***Impatiens inconspicua*** Benth. ex Wight & Arn., Prodr. 139. 1834; FBI 1: 447. 1874; Vivek. *et al.*, Fl. Ind. 4:158.1997. *I. inconspicua* Benth. ex Wight & Arn. var. *filiformis* (Wight & Arn.) Hook.f., FBI 1: 448. 1874. *I. pusilla* var. *nematostachys* Hook.f., Kew Bull. 1910: 294. 1910. *I. pusilla* Heyne ex Hook. f. & Thoms., J. Linn. Soc. Bot. 4: 122. 1859; FPM 140. 1915.

Branched herbs. Leaves 4-5 x 1.5 cm, elliptic to linear-oblong, cordate at base; petiole to 1 cm long; upper leaves narrower with smaller petioles. Pedicel binate, 2 cm long. Lip 4 x 2.5 mm, saccate near the base, spurless; sepals 4 x 0.5 mm, linear; standard 4 x 4 mm, obtusely acute at apex; keel ciliate; wings 6.5 x 3 mm, 2-lobed, lobes unequal, lower lobe smaller, glabrous, yellowish-blue. Capsule 12 x 4 mm, glabrous; seeds few, 2 x 1.5 mm, globose, black, shining.

*Fl. & Fr.* July-October

*Distr.* Endemic to Western Ghats. Rare in moist areas; *PS 30205* Thellikkal

***Impatiens maculata*** Wight, Madras J. ser.1. 5: 12. 1837; FBI 1: 465. 1875; FPM 145. 1915; Vivek. *et al.*, Fl. Ind. 4:177.1997.

Herbs; stem blotched with brown spots, ribbed. Leaves scattered, 10-15 x 3-6 cm, elliptic, acute at either ends, crenate-serrate, pubescent; petiole to 7 cm long;. Racemes to 17 cm long, axillary; pedicels to 3 cm long. Flowers 3 cm across, solitary at nodes; lip 10 mm long, cuspidate; spur 15 mm long, tubular; sepals 6 x 3.5 mm, ovate; standard 5 x 6 mm, orbicular; wings 15-17 mm long; lower lobe very small, rose coloured; upper lobe 15-17 x 10-11 mm, obovate, obtuse. Capsule 8 x 6 mm, bulged to one side, glabrous; seeds many, ovoid, smooth, brown.

*Fl. & Fr.* July-December

*Distr.* Endemic to Southern Western Ghats. Rare in wet areas evergreen forests; *PS 19780, NS 30270* Pooppara

***Impatiens minor*** (DC.) Bennet, Indian J. For. 2: 283. 1979; FTSR 78. 1996; Vivek. *et al.*, Fl. Ind. 4:181.1997. *Balsamina minor* DC., Prodr. 1: 686. 1824. *Impatiens kleinii* Wight & Arn., Prodr. 140. 1834; FBI 1: 445. 1874; FPM 140. 1915.

Slender erect herbs; stem 10-30 cm high, glabrous. Leaves opposite, 3-8 x 1-1.5 cm, elliptic-oblong, sub-entire, acute at either ends; base with stalked glands. Flowers paired, axillary; pedicel 15 mm long, deflexed in fruit; lip 4 x 1.5 mm, acute; spur 10 mm long, straight, slender; sepals 4 mm long, ovate; standard 5 x 4 mm, concave, acute; wings 8 x 3 mm, unlobed, obovate, stalked, white to pink. Capsule 13 x 2 mm, linear, glabrous; seeds few, 1.5 mm long, biconvex, dark-brown.

*Fl. & Fr.* August-November

*Distr.* Endemic to Peninsular India. Rare in grasslands; *PS 30653* Karimala

**Impatiens oppositifolia** L., Sp. Pl. 937. 1753; FBI 1: 448. 1874; FPM 141. 1915; FTSR 78. 1996; Vivek. *et al.*, Fl. Ind. 4:187.1997.

Slender glabrous, erect or decumbent herbs. Leaves subsessile, linear-oblong, acute, base rounded, margin serrulate or subentire, to 6 x 0.7 cm. Flowers pink-purple, 1.2-1.5 cm across; pedicels slender, 1.5 cm long, in fruits to 2.5 cm long. Lateral sepals lanceolate, 2.5 mm long; lower sepal boat-shaped, spur 1-2 mm long. Standard petal cucullate, cuspidate; wings broadly obovate. Capsule fusiform, 1 cm long.

*Fl. & Fr.* July-October

*Distr.* South India and Sri Lanka. Common in degraded forest areas; *PS 30508*Thellikkal

**Impatiens parasitica** Bedd., Madras J. Lit. Sci. ser.2. 20: 66. t.7. f.2. 1859 & Ic. t. 140. 1868-1874; FPM 139. 1915; Vivek. *et al.*, Fl. Ind. 4:191.1997. *I. jerdoniae* Wight var. *parasitica* (Bedd.) Hook.f., FBI 1: 460. 1874.

Epiphytic herbs; stem succulent, unevenly thickened, reddish. Leaves to 5 x 2.5 cm, elliptic, acute at either ends, serrate, collected towards the apex, glabrous; petiole to 1.5 cm long. Cymes 2-4-flowered, axillary; peduncle 2 cm long, glabrous. Flowers 2 cm long; pedicels to 1.5 cm long; lip greenish at mouth, rest scarlet; spur 13 x 7 mm, reddish, striate, broad, obtuse; sepals 3 mm long, linear, green, acute; standard 12 x 14 mm, green with yellow margins, with a strong midrib; wings 7 x 7 mm, 2-lobed, lower lobe larger, flat, enter into the spur of the lip, red.

*Fl. & Fr.* September-December

*Distr.* Endemic to Southern Western Ghats. Rare along the margins of evergreen forests at higher altitudes; *PS 30507*Karimala

**Impatiens pulcherrima** Dalz. in Hook.'s J. Bot. Kew Gard. Misc. 2: 37. 1850; FBI 1: 458. 1874; FPM 143. 1915; Vivek. *et al.*, Fl. Ind. 4:198.1997.

Herbs or subshrubs; 40-70 cm high. Leaves alternate, to 10 x 3 cm, elliptic, acuminate at apex, acute at base, serrate, glabrous; petiole 3 cm long. Flowers axillary, solitary or paired; pedicels 3.5 cm long, slender; lip 10 x 5 mm, boat-shaped, acuminate, keeled; spur 12-14 mm long, slender, curved; sepals minute; standard 8 x 10 mm, notched at apex, cuspidate from back, keeled, glabrous; wings 16 mm long, 2-lobed; lobes subequal, oblong, obtuse, light-pink. Capsule 10 x 3 mm, glabrous; seeds few, 1.5 x 1 mm, obovoid, rugose.

*Fl. & Fr.* October-December

*Distr.* Endemic to Western Ghats. Rare in evergreen forests at lower altitudes; *PS 30632* Kariamchola

**Impatiens scapiflora** Heyne ex Roxb., Fl. Ind. 2: 464. 1824; FBI 1: 443. 1874; FPM 138. 1915; FTSR 79. 1996; Vivek. *et al.*, Fl. Ind. 4:208.1997. *I. rivalis* Wight, Ic. t. 751. 1844.

Stemless herbs. Leaves to 13 x 8 cm, ovate, obtuse, cordate at base, glabrous; petiole 10-20 cm long. Scape to 35 cm long. Flowers 4 cm across, confined towards the apex; bracts 5-8 mm long, ovate, acute; pedicels 4-5 cm long; lip ovate, obtuse, spur 4-5 cm long, glabrous; sepals 4 x 3 mm, ovate, acute; standard concave at base, obtuse at apex; lobes of wings subequal, oblong, obtuse. Capsule 1.2 cm long, ellipsoid, glabrous; seeds glandular-hairy.

*Fl. & Fr.* July-December

*Distr.* Endemic to Western Ghats. Rare in moist rocky areas; *PS 19512*Orukumban

**Impatiens viridiflora** Wight, Madras J. Lit. Sci. Ser. 1, 5: 9. 1837; FBI 1: 460. 1874; FPM 139. 1915; Vivek. *et al.*, Fl. Ind. 4:226.1997.

Stem succulent, cylindrical, reddish or greenish coloured. Leaves 3-5 x 2-3 cm, elliptic, acute at either ends, glabrous, usually collected towards the tip of the stem; petiole 1-2 cm long. Cymes 1-4 flowered, axillary or terminal; pedicels drooping. Flowers scarlet-green; lip 1 cm

broad at mouth, produced into the spur, scarlet or pink, glabrous; sepals 8 x 2 mm, ovate, green and pink; standard broad, reddish; wings 12 mm long, 2-lobed; lobes orbicular, obtuse, red,.

*Fl. & Fr.* October-December

*Distr.* Endemic to Southern Western Ghats. Rare along the margins of evergreen forests at higher altitudes; *NS 5649* Karimala Hills

**Impatiens viscosa** Bedd., Madras J. Lit. Sci. Ser. 1, 10: 66. t.7. f.7. 1859; FBI 1: 453. 1874; FPM 144. 1915; FPL 101. 1990; Vivek. *et al.*, Fl. Ind. 4:228.1997. *I. ballardii* Bedd., Ic. 44, t. 192. 1868-74; FBI 1: 482. 1874.

Erect annuals, 30-40 cm high. Leaves opposite, to 7 x 4 cm, acute at either ends, crenate, glabrous; petioles 0.8-2 cm long, eglandular. Peduncles 8-10 cm long, axillary. Flowers restricted to the terminal portion; pedicels 2 cm long, slender; lip 7 x 4 mm, ovate, acuminate; spur 15 mm long, ensiform, acute; sepals ovate, acute; standard 4 x 4 mm, rounded at apex; wings 15 x 8 mm, 2-lobed; lower lobe very small; dorsal auricle filiform, 10 mm long, produced into the spur. Capsule 10 x 4mm, glabrous; seeds many, 1 x 0.5 mm, densely hairy, dark-brown.

*Fl. & Fr.* September-November

*Distr.* Endemic to Southern Western Ghats. Common in grasslands; *PS 19279* Karimala

**Impatiens wightiana** Bedd., Madras J. Lit. Sci. Ser. 2. 20: 67. 1859 & Ic. t. 146. 1868-1874; FBI 1: 467. 1875; FPM 145. 1915; Vivek. *et al.*, Fl. Ind. 4:229.1997.

Erect glabrous herbs. Leaves to 15 x 5 cm, elliptic-lanceolate, acuminate, base rounded or obtuse, margins serrate or crenate; petiole to 7 cm long with a few stipitate glands below the lamina. Racemes 10-15 cm long; flowers 2 cm long, white with pink shade. Sepals small. Standard orbicular, apiculate. Lip funnel shaped, spur short, incurved.

*Fl. & Fr.* June-September

*Distr.* Endemic to Southern Western Ghats. Rare in moist shades of evergreen forests; *PS 19779* Pooppara

## RUTACEAE

1. Rachis and petiole winged.....	<b>Naringi</b>
1. Rachis and petiole wingless.....	2
2. Leaves simple.....	3
2. Leaves compound.....	5
3. Climbing shrubs with recurved axillary thorns.....	<b>Paramignya</b>
3. Erect shrubs or trees, with or without strait axillary thorns.....	4
4. Petiole to 2.5 cm long; flowers in long peduncled corymbs.....	<b>Acronychia</b>
4. Petiole to 1 cm long; flowers in short racemes, panicles or fascicles.....	<b>Atalantia</b>
5. Climbers, armed with axially or extra-axillary prickles.....	6
5. Erect shrubs or trees, unarmed rarely truncate with long prickles.....	7
6. Leaflets entire; stamen more than 8.....	<b>Luvunga</b>
6. Leaflets serrate; stamen to 6.....	<b>Toddalia</b>
7. Leaves opposite.....	<b>Melicope</b>
7. Leaves alternate.....	8
8. Stamens equal to the number of sepals.....	<b>Zanthoxylum</b>
8. Stamens twice to the number of sepals.....	9
9. Leaflets digitate; flowers unisexual.....	<b>Vepris</b>
9. Leaflets pinnate; flowers bisexual.....	10
10. Anthers glandular; style persistent.....	<b>Glycosmis</b>
10. Anthers eglandular; style deciduous.....	11
11. Leaflets glabrous; alternating stamens longer.....	<b>Murraya</b>
11. Leaflets pubescent below; stamens all equal.....	<b>Clausena</b>

ACRONYCHIA J. R. Forster & J. G. A. Forster

**Acronychia pedunculata** (L.) Miq., Fl. Ind. Bot. Suppl. 532. 1861; FPL 102. 1990; FTSR 80. 1996; Nair & Nayar, Fl. Ind. 4:392.1997. *Jambolifera pedunculata* L., Sp. Pl. 349. 1753. *Acronychia laurifolia* Blume, Cat. Gew. Buitenz. 63. 1823; FBI 1: 498. 1875; FPM 152. 1915. *A. barberi* Gamble, Kew Bull. 1915: 345. 1915 & FPM 152. 1915.

Small trees. Leaves 9-15 x 3-6 cm, obovate to oblong, obtusely acute at apex, acute at base. Panicle 5-8 cm across, axillary; peduncle to 6 cm long. Flowers bisexual, many, pedicelled; sepals 4, 1.5 mm long, ovate, obtuse; petals 4, 6 x 2 mm, oblong, densely hairy within; stamens 8, 2-seriate; filaments unequal, densely reflexed-hairy; anthers oblong; ovary 4-celled, tomentose; style 1, 3 mm long. Drupe 10 mm across, globose, obtusely 3-angled.

*Fl. & Fr.* July-August

*Distr.* Indo-Malesia. Common in evergreen and semi-evergreen forests; *PS 19134, 19552* Kariamchola; *NS 18988* Orukomban

ATALANTIA Correa

1. Inflorescence corymbose; calyx cupular.....**A. monophylla**
1. Inflorescence racemose or fascicled; calyx not cupular ..... 2
2. Fruit ellipsoid; filaments free.....**A. wightii**
2. Fruit globose; filaments united at least in lower half ..... **A. racemosa** var. **bourdillonii**

**Atalantia monophylla** (L.) DC., Prodr. 1: 535. 1824; FBI 1: 511. 1875; FPM 159. 1915; Nair & Nayar, Fl. Ind. 4:266.1997. *Limonia monophylla* L., Mant. Pl. 2: 237. 1771. *Malnaregam malabarica* Raf., Sylv. Tellur. 143. 1838. *Atalantia floribunda* Wight, Ic. t. 1611. 1850.

Small trees, spines straight, axillary, 1.5 cm. Leaves to 6 x 3 cm long, elliptic, lanceolate, apex emarginate. Corymbs axillary, to 1.5 cm, pedicels 1 cm long, pubescent; flowers white; calyx 4-lobed; petals 4, 9 x 4 mm; ovary 4-celled. Berry 3 cm across, globose.

*Fl. & Fr.* December-February

*Distr.* Indo-Malesia. Common in evergreen forests; *PS 19316* Kothala

**Atalantia racemosa** Wight var. **bourdillonii** Nairayanan Nair & Nayar, Indian J. For. 13: 69. 1990; FTSR 80. 1996; Nair & Nayar, Fl. Ind. 4:271.1997.

Small evergreen trees. Leaves elliptic-oblong or ovate-oblong, obtusely acuminate, shortly emarginate, base broadly cuneate, glabrous, 8-12 x 3-5 cm; lateral nerves 12-20 pairs; petiole 0.5 to 1 cm long. Flowers shortly pedicelled, in axillary racemes. Calyx 4-lobed, ciliate along the margins. Petals 4, oblong. Stamens 8, staminal tube glabrous. Ovary glandular punctate; style short. Berry subglobose, 2 cm across.

*Fl. & Fr.* April-June

*Distr.* Endemic to Southern Western Ghats. Common in evergreen forests; *PS 30159* Muthuvarachal; *19346* Puliyala; *NS 30190* Kottayali

**Atalantia wightii** Tanaka, Bull. Soc. Bot. France 75: 714. 1928; FPL 103. 1990; FTSR 80. 1996; Nair & Nayar, Fl. Ind. 4:274.1997. *A. ceylanica* (Arn.) Oliver, J. Linn. Soc. Bot. 5. Suppl. 2: 25. 1861, p.p. excl. basionym, quoad tantum specim. Nilgiri; Hook.f., FBI 1: 512. 1875; FPM 160. 1915.

Shrubs to 2 m high; branchlets minutely hispid. Leaves 8-11 x 3-5 cm, ovate, acute, tip rounded or emarginate, acute at base; nerves 10-12 pairs, prominent below, glabrous. Raceme to 1 cm long, pedicels 5 mm long, hispid. Flowers 12 mm across; sepals 2 mm long, ovate, acute, ciliate, petals white, 9 x 2 mm, oblong, obtuse; stamens 8, filaments 4 mm long, inner ones smaller; style 5 mm long.

*Fl.* January-March

*Distr.* Endemic to Western Ghats. Common in evergreen forests; *PS 19425* Pooppara; *NS 18834* Kottayali

## CLAUSENA N. L. Burman

1. Flowers in axillary compound racemes, tetramerous ..... **C. anisata**
1. Flowers in terminal corymbs or panicles, pentamerous ..... 2
2. Young shoots puberulus; flowers in corymbs..... **C. indica**
2. Young shoots glabrous; flowers in thyrsoid panicles.....**C. austroindica**

**Clausena anisata** (Willd.) Hook.f. ex Benth. in Hook., Niger Fl. 256. 1849; Nair & Nayar, Fl. Ind. 4:321.1997. *Amyris anisata* Willd., Sp. Pl. 2: 337. 1799. *C. willdenowii* Wight & Arn., Prodr. 96. 1834; FBI 1: 506. 1875; FPM 155. 1915. *C. willdenowii* Wight & Arn. var. *pubescens* (Wight & Arn.) Hook. f., FBI 1: 506. 1875. *C. dentata* (Willd.) Roem. var. *dulcis* (Bedd.) Swingle, J. Wash. Acad. Sci. 28: 532. 1938. *C. dentata* (Willd.) Roem. var. *pubescens* (Wt.& Arn.) Tanaka, J. Bot. 68:277.1930; FTSR 81. 1996.

Shrubs to small trees; bark brown; twigs puberulus. Leaves to 25 cm long; leaflets 7-9 pairs, sub-opposite, to 6 x 3 cm; ovate, acute, nerves 9 pairs, pubescent below. Panicles to 10 cm long, axillary. Flowers pedicelled; 8-10 mm across; sepals 4, 1 mm long, oblong, obtuse; petals 5 mm long, obovate, concave; stamens 8, filaments unequal, glabrous. Berry 8 mm across, globose, glandular; seeds few, seated in yellow pulp.

*Fl. & Fr.* March-June

*Distr.* India, Nepal, Sri Lanka and Africa. Common in moist deciduous forests; *PS 19534* Thekkady

**Clausena austroindica** Stone & Nair, Nordic J. Bot. 14:491. 1994; Nair & Nayar, Fl. Ind. 4:322.1997. *Clausena heptaphylla* (Roxb.) Wight & Arn., Prodr. 95. 1834; FBI 1: 504. 1875; FPM 155. 1915; FPL 103. 1990; FTSR 81. 1996.

Shrubs. Leaf 20-40 cm long, 7 or 8 foliolate; leaflets to 15 x 6 cm, elliptic, acute at apex, attenuate at base; petiolule 5 mm long. Panicle 20 x 5 cm, terminal. Flowers shortly pedicelled, 4 mm across; sepals 4 or 5, very small, ovate, acute; petals yellow, 3 x 2 mm, concave, glabrous; filaments shorter than anthers, thickened at base; ovary depressed, globose; style constricted at base. Berry to 10 x 7 mm, ovoid; seeds 1, ovoid, rugulose.

*Fl. & Fr.* August-January

*Distr.* Southern Western Ghats. Rare in evergreen forests; *PS 30827* Pooppara

**Clausena indica** (Dalz.) Oliver, J. Linn. Soc. Bot. 5: 36. 1861; FBI 1: 505. 1875; FPM 155. 1915; FPL 103. 1990; FTSR 81. 1996; Nair & Nayar, Fl. Ind. 4:328.1997. *Piptostylis indica* Dalz. in Hook.'s J. Bot. Kew Gard. Misc. 3: 33. t.2. 1851.

Small trees. Leaves to 23 x 10 cm, 12-16-foliolate; leaflets alternate, 7 x 4 cm, ovate, oblique at base, acute or obtuse at apex; lateral nerves 5 pairs; petiolule 3 mm long. Panicle to 10 cm across, terminal or subterminal, branches puberulus. Flowers sessile, 3 mm across; sepals ovate, acute, ciliate; petals greenish white, 2.5 x 1.5 mm, ovate, glabrous; stamens 10, filaments glabrous, Berry 8 mm across, globose, dark blue; seeds 1-4, biconvex, glabrous.

*Fl. & Fr.* July-August

*Distr.* Peninsular India and Sri Lanka. Common in moist deciduous and semi-evergreen forests; *PS 19219, 19562, 19564* Kariamchola; *30398* Kuchimudi; *30252* Pezha

## GLYCOSMIS Correa

1. Flowers in short axillary cymes; ovary seated on minutes fleshy disk..... **G. cyanocarpa** var. **cymosa**
1. Flowers in axillary and terminal panicles; ovary seated on a distinct gynophore ..... 2
2. Sepals glabrous; berry more than 1.5 cm across ..... **G. macrocarpa**
2. Sepals ciliate; berry to 1 cm across ..... 3
3. Ovary puberulus; peduncles and branches ferruginously pubescent ..... **G. pentaphylla**
3. Ovary glabrous; peduncles and branches rusty pubescent..... **G. mauritiana**



**Glycosmis cyanocarpa** (Blume) Spreng. var. **cymosa** Kurz, J. Bot. 14:34. 1876; Nair & Nayar, Fl. Ind. 4: 336.1997. *Cookia cyanocarpa* Blume, Bijdr. 3: 136. 1825. *Glycosmis cymosa* (Kurz) Narayana Swamy, Rec. Bot. Surv. India 14: 26. 1941.

Small slender trees, branchlets glabrous. Leaves mostly 3-5 foliolate; leaflets lanceolate or elliptic-lanceolate, acuminate, base acute, entire, glabrous, to 12 x 3 cm; lateral nerves ca. 10 pairs, slender; petiolule ca. 3 mm long. Flowers creamy white, buds globose. Calyx lobes short, ciliolate along margins. Petals 5, glandular. Stamens 10. Ovary ovoid or oblong, glabrous, 4-5 celled. Berry pink-red, ca. 1 cm long.

*Fl. & Fr.* March-April

*Distr.* India and Myanmar. Common in evergreen forests; *PS 19606* Orukomban; *NS 30435* Karimala

**Glycosmis macrocarpa** Wight, Ill. Indian Bot. 1: 109. 1840; FTSR 82. 1996; Nair & Nayar, Fl. Ind. 4:338.1997. *G. pentaphylla* Hook. f. var. *macrocarpa* (Wight) Hook.f., FBI 1: 500. 1875.

Shrubs, to 2 m high; leaflets 3-7, to 22 x 7 cm, elliptic, obtusely acuminate at apex, acute at base, pale beneath, nerves 8 pairs; petiolule 5 mm long. Panicle 4 x 3 cm, terminal, congested; peduncle to 3 cm long. Flowers 4 mm across, densely packed; sepals triangular, acute, spreading; petals 2 x 1 mm, ovate, obtuse; stamens 10, filaments equal to anthers in length; ovary 3-celled. Berry globose, greenish-red.

*Fl. & Fr.* August-February

*Distr.* South India and Sri Lanka. Occasional in evergreen forests; *PS 18813* Parambikulam; *19759* Pooppara

**Glycosmis mauritiana** (Lam.) Tanaka, Bot. Not. 1928: 159. 1928; FPL 104. 1990; Nair & Nayar, Fl. Ind. 4:343.1997. *Limonia mauritiana* Lam., Encycl. 3: 517. 1792. *L. pentaphylla* Roxb., Pl. Corom. t. 84. 1798, non Retz. 1788. *Glycosmis pentaphylla* sensu Narayana., Rec. Bot. Surv. India 14:12. 1941, excel syn.

Shrubs to 1.5 m high; stem reddish, glabrous or puberulus. Leaves 5-foliate, leaflets to 18 x 7 cm, obovate, obtuse at apex, acute at base, nerves 10-12 pairs, reticulate beneath. Panicle to 10 x 5 cm, ferruginous tomentose. Flowers 4 mm across, sessile; sepals triangular, ciliate, petals white, 3 x 2 mm, obovate, obtuse, glandular; stamens 10; filaments shorter than anthers. Berry pale pink, glabrous.

*Fl. & Fr.* August-February

*Distr.* Indo-Malesia. Common in evergreen forests; *PS 19127*, *NS 19553* Kariamchola

**Glycosmis pentaphylla** (Retz.) DC., Prodr. 1: 538. 1824, quoad basionym; FBI 1: 499. 1875, p.p; FTSR 82. 1996; Nair & Nayar, Fl. Ind. 4:343.1997. *Limonia pentaphylla* Retz., Obs. Bot. 5: 24. 1788. *L. arborea* Roxb., Pl. Corom. t. 85. 1798. *Glycosmis arborea* (Roxb.) DC., Prodr. 1: 538. 1824. *G. cochinchinensis* Gamble, FPM 153. 1915p.p, non (Lour.) Pierre ex Engl. 1896.

Shrubs to small trees. Leaves pinnate; leaflets 3-7, elliptic or oblong, acute, acuminate or obtuse, finely serrate or entire, glabrous, 7-15 x 2.5-6 cm; lateral nerves 5-7, faint. Flowers creamy white. Peduncle brown tomentose. Calyx lobes minute, ciliolate along the margins. Stamens 10, filaments tapering towards apex. Berry globose, white, turning to dull pink.

*Fl. & Fr.* September-April

*Distr.* Indo-Malesia. Common in moist deciduous forests and plantations; *PS 19030* Kannimara

#### LUVUNGA Buchanan-Hamilton ex Wight & Arnott

**Luvunga eleutherandra** Dalz. in Hook.'s J. Bot. Kew Gard. Misc. 2: 258. 1850; FBI 1: 509. 1875; FPM 157. 1915; FTSR 83. 1996; Nair & Nayar, Fl. Ind. 4:296.1997. *L. sarmentosa* (Blume) Kurz, J. Asiat. Soc. Bengal 39: 6. 1870. *Triphasia sarmentosa* Blume, Bijdr. 1: 132. 1825.

Large woody climbing shrubs, thorns axillary, 2 cm long, recurved. Leaves 3-foliolate; leaflet to 12 x 4 cm, oblong, acute or obtuse at apex, acute at base, shining above; nerves obscure; petiole 6 cm long; petiolule 8 mm long, thick. Cymes axillary, 3 cm across, sessile or shortly pedunculate. Flowers 1 cm across, shortly pedicelled; calyx cupular, shallowly 4-lobes; petals 4, 8 x 3 mm, oblong; stamens 8, filaments 4 mm long; anthers cleft at base, oblong; ovary 4-celled; ovules paired in each cell; style stout; stigma terminal, capitate. Fruit a berry, 2.5 x 2 cm, globose-oblong, smooth; seeds 1-4-oblong, covered with mucilaginous pulp.

*Fl. & Fr.* March-August

*Distr.* Endemic to Western Ghats. Rare in evergreen forests; *PS 30245* Pezha

#### MELICOPE J. R. Forster & J. G. A. Forster

**Melicope lunu-ankenda** (Gaertn.) Hartley, Sandakania 4: 61. 1994; Nair & Nayar, Fl. Ind. 4:369.1997. *Fagara lunu-ankenda* Gaertn., Fruct. Sem. Pl. 334, t. 68. f. 9. 1778. *Euodia lunu-ankenda* (Gaertn.) Merr., Philipp. J. Sci. 7: 378. 1912; FPM 148. 1915; FPL 104. 1990; FTSR 82. 1996. *E. roxburghiana* (Cham.) Benth., Fl. Hongk. 59. 1861; FBI 1: 487. 1875. *E. lunu-ankenda* (Gaertn.) Merr. var. *tirunelvelica* Henry & Chandrab., Bull. Bot. Surv. India 15: 144. 1973.

Medium size trees; bark brown, smooth; branchlets minutely pubescent. Leaves opposite, 3-foliolate; leaflets to 18 x 8 cm, elliptic, abruptly acuminate at apex, acute at base; nerves 16-22 pairs, parallel; petiole 10 cm long. Panicle 15 x 5 cm, axillary, densely pubescent. Flowers unisexual, polygamous, 3 mm across; sepals 4, 1 mm long, ovate, acute, tomentose; petals 4, 2 mm long, ovate; stamens 4, free; ovary deeply 4-lobed, 4-celled; ovules 2 in each cell; stigma 4-lobed. Fruits 4, 1-seeded cocci, 3 mm diam.; seeds globose, rugose.

*Fl. & Fr.* August-December

*Distr.* Indo-Malesia. Common in evergreen forests; *PS 30276* Pooppara

#### MURRAYA J.G.Koenig ex Linnaeus

**Murraya paniculata** (L.) Jack., Malay. Misc. 1: 31. 1820; FPL 105. 1990; FTSR 83. 1996; Nair & Nayar, Fl. Ind. 4:352.1997. *Chalcas paniculata* L., Mant. Pl. 1: 68. 1767. *Murraya exotica* L., Mant. Pl. 2: 563. 1771; FBI 1: 502. 1875; FPM 155. 1915.

Shrubs; branchlets white, glabrous. Leaves pinnately 3-5 foliolate, leaflets 3-8 x 2-4 cm, ovate, obtusely acuminate, crenulate, terminal the largest. Flowers 3-7 together in axillary cymes; sepals 5, 1 mm long, ovate, acute; petals white, 17 x 6 mm, oblanceolate, clawed, imbricate; stamens 10, 2-seriate, filaments 8 mm long, inner smaller; anthers ovate; ovary 2-celled; oblong, glabrous; style slender; stigma capitate. Berry 15 x 7 mm, oblong, reddish; seeds planoconvex, densely white-woolly.

*Fl. & Fr.* May-October

*Distr.* Indo-Malesia and Australia. Common in evergreen forests; *PS 19319* Kothala; *30171* Kottayali

#### NARINGI Adanson

**Naringi crenulata** (Roxb.) Nicols. in Sald. & Nicols., Fl. Hassan Dist. 387. 1976; FPL 106. 1990; FTSR 84. 1996; Nair & Nayar, Fl. Ind. 4:302.1997. *Limonia crenulata* Roxb., Pl. Corom. t. 86. 1798; FPM 157. 1915. *Hesperethusa crenulata* (Roxb.) Roem., Syn. Monogr. 1: 38. 1846. *Limonia acidissima* sensu Hook. f., FBI 1: 507. 1875, non L. 1762.

Large shrubs or small trees, armed with axillary erect spines; branchlets angled, white. Leaves 3-7-foliolate; leaflets opposite, to 5 x 2 cm, elliptic-obovate, obtuse or obtusely acute, crenate; rachis winged. Flowers 6-8 mm across, 3-6 together in axillary cymes; pedicel 10 mm long; sepals 4, free or united at base; petals 4, 4 x 2 mm, oblong, white; stamens 8, filaments equal; anthers sagittate at base; ovary globose, 4-celled; style stout; stigma capitate. Berry 8 mm across, globose; seeds 1-3, ovoid, dull yellow, smooth.

*Fl. & Fr.* February-May

*Distr.* Indo-Malesia. Very common in moist deciduous forests; *PS 19636* Vengoli

### PARAMIGNYA Wight

**Paramignya monophylla** Wight, Ill. Indian Bot. 1: 108, t.42. 1840; FBI 1: 510. 1875; FPM 158. 1915; FTSR 84. 1996; Nair & Nayar, Fl. Ind. 4:312.1997.

Climbing shrubs, branches with recurved axillary thorns. Leaflet ovate-oblong or elliptic, obtuse or acute, mucronate, base rounded, coriaceous, glabrous, 5-10 x 25-5 cm; lateral nerves and reticulation not prominent. Flowers 1-3, axillary; calyx cupular, 5-lobed, pubescent; petals white, narrowly oblong, imbricate; stamens 10; ovary densely pubescent; style puberulent.

*Fl.* March

*Distr.* South Asia. Common in evergreen forests; *PS 30502* Orukomban

### TODDALIA A. L. Jussieu

**Toddalia asiatica** (L.) Lam., Tabl. Encycl. 2: 116. 1797; FPM 150. 1915; Nair & Nayar, Fl. Ind. 4:403.1997. *Paullinia asiatica* L., Sp. Pl. 365. 1753. *Toddalia aculeata* (Smith) Pers., Syn. Pl. 1: 249. 1805; FBI 1: 497. 1875. *Toddalia asiatica* (L.) Lam. var. *floribunda* (Wall.) Kurz, J. Asiat. Soc. Bengal pt.2, Nat. Hist. 44: 130. 1875; FPM 107. 1915; FPL 106. 1990; FTSR 85. 1996. *Toddalia asiatica* (L.) Lam. var. *obtusifolia* Gamble, FPM 151. 1915. *Toddalia asiatica* (L.) Lam. var. *gracilis* Gamble, FPM 151. 1915.

Erect or climbing shrubs, usually armed with prickles. Leaves 3-foliolate; leaflets to 9 x 4 cm, elliptic-obovate, obtuse or obtusely acute, entire or crenulate, nerves many, closely packed. Panicles axillary or terminal. Flowers pedicelled, unisexual; sepals 4 or 5, united below; petals 4 or 5, oblong, yellow; stamens in male flowers 5, filaments equal, spreading; anthers oblong, obtuse; ovary 4 or 5-celled, ovoid, glabrous, ovule 2 in each cell; style absent, stigma capitate, sessile. Berry 7 x 10 mm, depressed-globose; seeds 1-4, ovoid, in fleshy pulp.

*Fl. & Fr.* December-August

*Distr.* Indo-Malesia and Africa. Common along the margins of evergreen forests; *PS 19235* Vengoli; *19430* Pooppara; *NS 18915* Karimala

### VEPRIS Commerson ex A. Jussieu

**Vepris bilocularis** (Wight & Arn.) Engl. in Engl. & Prantl, Pflanzenf. 3:178. 1896 & (ed.2) 19a:306. 1931; FPM 151. 1915; FTSR 85. 1996; Nair & Nayar, Fl. Ind. 4:405.1997. *Toddalia bilocularis* Wight & Arn., Prodr. 149. 1834; FBI 1: 497. 1875. *Dipetalum bioculare* (Wight & Arn.) Dalz. in Hook.'s J. Bot. Kew Gard. Misc. 2: 138. 1850.

Medium trees, bark white corky; branchlets glabrous. Leaves 3-foliolate; leaflets to 19 x 7 cm, obovate-oblong, abruptly acuminate, entire; nerves many, closely parallel, joining into an intramarginal vein; petiole to 7 cm long. Panicles 6 x 5 cm, terminal. Flowers 4 mm across, polygamous; pedicels 3 mm long; sepals 3, ovate, free; petals 3, orbicular; stamens 3, equal, filaments broad at base; anthers ovate, sagittate at base; ovary 2-celled and conical in male flowers, 4-celled and globose in female flowers. Fruit a berry, 15 x 12 mm, 2-4 celled; seeds planoconvex.

*Fl. & Fr.* March-July

*Distr.* Endemic to Southern Western Ghats. Common in evergreen forests; *PS 30187* Kottayali

### ZANTHOXYLUM Linnaeus

1. Leaves digitate; branchlets unarmed or with small retrorse prickles..... **Z. ovalifolium**
1. Leaves pinnate; trunk with woody prickles ..... **Z. rhetsa**

**Zanthoxylum ovalifolium** Wight, Ill. Indian Bot. 1: 169. 1839; FBI 1: 492. 1875; FPM 150. 1915; FPL 106. 1990; Nair & Nayar, Fl. Ind. 4:384.1997.

Erect shrubs; stem brownish, smooth; leaflets digitate, to 12 x 4.5 cm, elliptic-obovate, abruptly acuminate, glabrous, nerves 15-18 pairs with an irregular intramarginal vein; petioles

5-10 cm long. Panicle 3 x 2 cm, axillary, puberulus. Flowers few; male flowers 2-3 mm long; sepals 4, triangular; petals 2-3 mm long, white; stamens 4; female flowers 3-4 mm long; staminodes 4, filiform; pedicels 5 mm long. Capsule 6 mm across, globose, dark brown, seed 1, globose, shining.

*Fl. & Fr.* December-January

*Distr.* Indo-Malesia. Rare along the margins of evergreen forests; *PS 30223* Karimala

**Zanthoxylum rhetsa** (Roxb.) DC., Prodr. 1: 728. 1824; FBI 1: 495. 1875; FPM 150. 1925; FTSR 85. 1996; Nair & Nayar, Fl. Ind. 4:387.1997. *Fagara rhetsa* Roxb., Fl. Ind. 1: 438. 1820. *Zanthoxylum limonella* (Dennst.) Alston in Trimen, Handb. Fl. Ceyl. 6: 37. 1931. *Fagara budrunga* Roxb., Fl. Ind. 1: 437. 1820. *Zanthoxylum budrunga* (Roxb.) DC., Prodr. 1: 728. 1824; FBI 495. 1875; FPM 150. 1915.

Medium deciduous trees, armed with stout prickles. Leaves imparipinnate, clustered at the apex of branchlets, 25-35 cm long; leaflets 13-21, opposite, elliptic-oblong or ovate-oblong, caudate acuminate, base oblique, entire, glabrous, to 12 x 5 cm; lateral nerves 10-12 pairs, slender. Flowers pedicelled, 2-3 mm across, greenish-yellow, in terminal cymose panicles. Fruit tubercled; seeds globose, smooth, 3 mm across.

*Fl. & Fr.* December-August

*Distr.* Indo-Malesia. Common in moist deciduous forests; *PS 30269* Pooppara

## SIMAROUBACEAE

### AILANTHUS Desfontaines

**Ailanthus excelsa** Roxb., Pl. Corom. 1: 24, t. 23. 1795; FBI 1: 518. 1875; Basak, Fl. Ind. 4:410.1997. *Pongelion wightii* Tieghem, Ann. Sci. Nat. Bot. 1: 277. 1906.

Medium trees. Leaves pari or imparipinnate, to 1 m long; leaflets alternate to subopposite, 8-14 pairs, 15 x 8 cm, ovate, lanceolate, acute, base unequal, truncate, widely dentate along the lower half, densely tomentose on the lower side, thinly on the upper side; petiole to 3 cm. Panicles subterminal; flowers polygamous, pedicels 0.8 cm; sepals 5, 1 mm, ovate, pubescent; petals 5; stamens 10, inserted at the base of 10-lobed disc, filaments 1 mm; anthers oblong, 2 mm.

*Fl.* December-April

*Distr.* Indo-Malesia. Rare in dry deciduous forests; *PS 30768* Keerappadi

## BURSERACEAE

1. Branchlets velvety tomentose; stamens connate into a tube ..... **Canarium**
1. Branchlets glabrous; stamen free ..... 2
2. Leaflets ovate or oblong, apex caudate; flowers 4-merous ..... **Commiphora**
2. Leaflets oblong-lanceolate, apex acuminate; flowers 5-merous ..... **Garuga**

### CANARIUM Linnaeus

**Canarium strictum** Roxb., Fl. Ind. 3: 138. 1832; FBI 1: 534. 1875; FPM 172. 1915; FPL 107. 1990; FTSR 86. 1996; Chithra & Henry, Fl. Ind. 4:440.1997. *C. sikkimense* King, J. Asiat. Soc. Bengal 62: 187, t.11,12. 1894. *C. resiniferum* Brace ex King, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 62: 188. 1894.

Large trees, bark white, peeling, exuding a resin; branchlets dark-fulvous-tomentose. Leaves alternate, imparipinnate, 30-60 cm long; leaflets 9-11 pairs, 16 x 7 cm, ovate, acuminate, serrulate, nerves parallel. Flowers in large terminal panicles, 3-6 together; calyx cupular, 5-

lobed, densely tomentose; petals 3, white, 1 cm long, oblong, stamens 6, filaments connate at base; ovary 2 or 3-celled; ovules 2 in each cell; styles 1, stout; stigma capitate. Fruit a drupe, 3.5 x 1.5 cm, ellipsoid, dark blue, 1-3-celled; seeds 1-3.

*Fl. & Fr.* March-August

*Distr.* India and Myanmar. Common in evergreen forests; *PS 30164* Pezha

#### COMMIPHORA N. J. Jacquin

**Commiphora caudata** (Wight & Arn.) Engl. in DC., Monogr. Phan. 4: 27. 1883; FPM 171. 1915; Chithra & Henry, Fl. Ind. 4:443.1997. *Protium caudatum* Wight & Arn., Prodr. 176. 1834; FBI 1: 530. 1875. *P. caudatum* Wight & Arn. var. *roxburghiana* (Wight & Arn.) Bennet in Hook. f., FBI 1: 530. 1875. *P. roxburghiana* Wight & Arn., Prodr. 176. 1834.

Armed trees, bark green, peeling off in thin scales. Leaves 3-7-foliolate, rachis 6-15 cm; leaflets opposite, 6 x 4.5 cm, ovate, oblong or elliptic; petiole to 6 cm. Flowers polygamous, bisexual flowers-sepals 4, ovate; petals 4, 4 mm, cream, reflexed; stamens 8, 1 and 2 mm; ovary ovoid, stigma 2-lobed. Drupe 1.5 x 1 cm, globose.

*Fl. & Fr.* February-June

*Distr.* India and Sri Lanka. Common in dry deciduous forests; *PS 30403* Kuchimudi

#### GARUGA Roxburgh

**Garuga floribunda** Decne., Nouv. Ann. Mus. Hist. Nat. 3: 477. 1834, var. **gamblei** (W. Smith) Kalkam, Blumea 7: 466. 1953; Chithra & Henry, Fl. Ind. 4:448.1997. *G. gamblei* King ex W. Smith, Rec. Bot. Surv. Ind. 4: 262. 1911; FPM 169. 1915.

Medium trees, bark white with dark spots. Leaves apically clustered, to 30 cm; leaflets subopposite, 7 x 2-2.5 cm, oblong-lanceolate, base cuneate, oblique, serrate. Panicle axillary, to 25 cm; flowers polygamous, bisexual flowers-calyx campanulate, lobes 5, 1.5 mm, ovate, tomentose; petals 4 x 2 mm, oblong, acute, yellow turns to white, disc 10-lobed, crenate; stamens 10, filaments 1.5 and 2 mm; anthers versatile; ovary pubescent, 5-celled, ovules 2 per cell, style, 2.5 mm, pubescent, stigma 5-lobed. Drupe 1.5 x 1 cm, globose, 4-lobed.

*Fl. & Fr.* February-June

*Distr.* India, Bangladesh and West China. Common in dry deciduous forests; *PS 30731* Keerappadi

#### MELIACEAE

- |  |                           |
|--|---------------------------|
| 1. Petiole winged.....   | <b>Naregamia</b>          |
| 1. Petiole not winged.....   | 2                         |
| 2. Seeds winged; cells many ovuled.....  | 3                         |
| 2. Seeds not winged; cells one or two ovuled.....                                | 4                         |
| 3. Young shoots glabrous; filaments free.....                                    | <b>Toona</b>              |
| 3. Young shoots tomentose; filaments united.....                                 | <b>Chukrasia</b>          |
| 4. Perennial herbs or subshrubs.....   | <b>Munronia</b>           |
| 4. Trees or woody shrubs.....  | 5                         |
| 5. Leaflets entire.....  | 6                         |
| 5. Leaflets toothed.....   | 11                        |
| 6. Leaves with domatia in the nerve axils.....                                   | <b>Reinwardtiodendron</b> |
| 6. Leaves without domatia in the nerve axils.....                                | 7                         |
| 7. Peduncle to 25 cm long; staminal tube with bilobed appendages.....            | <b>Trichilia</b>          |
| 7. Peduncle to 10 cm long; staminal tube without bilobed appendages.....         | 8                         |
| 8. Young parts covered with stellate hairs or fimbriate scale; disc obscure..... | <b>Aglaia</b>             |
| 8. Young parts otherwise; disc prominent.....                                    | 9                         |
| 9. Panicles longer than the leaves, drooping; petals 3.....                      | <b>Aphanamixis</b>        |
| 9. Panicles shorter than the leaves, erect; petals 5.....                        | 10                        |

10. Leaves trifoliolate.....	<b>Walsura</b>
10. Leaves 5-many, foliolate.....	<b>Dysoxylum</b>
11. Leaves simple.....	<b>Turraea</b>
11. Leaves trifoliolate or pinnate.....	12
12. Leaves bipinnate.....	<b>Melia</b>
12. Leaves simple pinnate.....	13
13. Branchlets tomentose; ovary 5-celled.....	<b>Cipadessa</b>
13. Branchlets glabrous; ovary 3-celled.....	<b>Azadirachta</b>

#### AGLAIA Loureiro

1. Leaves simple.....	<b>A. simplicifolia</b>
1. Leaves 3-many foliolate.....	2
2. Leaf rachis and nerves below densely brown tomentose.....	<b>A. tomentosa</b>
2. Leaf rachis and nerves glabrous or scaly.....	3
3. Panicle to 40 cm long.....	<b>A. perviridis</b>
3. Panicle to 15 cm long.....	4
4. Base of the leaflets unequal and oblique.....	<b>A. lawii</b>
4. Base of the leaflets equal and not oblique.....	5
5. Young shoot reddish brown tomentose; seeds with white mucilaginous aril.....	<b>A. barberi</b>
5. Young shoot not brownish tomentose; seeds exarillate.....	<b>A. elaeagnoidea</b>

**Aglaia barberi** Gamble, Kew Bull. 1915: 346. 1915 & FPM 180. 1915; FTSR 88. 1996; Jain & Bennet, Fl. Ind. 4:457.1997.

Small to medium trees; bark reddish brown, smooth. Leaves to 20 cm long, 7-foliolate; leaflets to 10 x 3 cm, elliptic-oblong, acuminate, glabrous, nerves to 15 pairs; petiolule 3 mm long. Panicles to 15 x 6 cm, axillary, densely scaly. Flowers 1.5 mm across, globose; calyx rim ciliate; petals 4, 1 x 1 mm, orbicular; staminal tube 1 mm long; anthers 5, ovate. Berry 2.5 cm across, globose, brownish puberulus.

*Fl. & Fr.* January-July

*Distr.* Endemic to Western Ghats. Common in evergreen forests; *PS 19116* Kariamchola; *30162* Pezha

**Aglaia elaeagnoidea** (Juss.) Benth., Fl. Austral. 1: 383. 1863; Pannell, Kew Bull. (Add. ser. XVI) 143.1992; Jain & Bennet, Fl. Ind. 4:461.1997. *Nemadra elaeagnoidea* Juss., Mem. Mus. Natl. Hist. Nat. 19: 259, t. 14. 1830. *Aglaia roxburghiana* (Wight & Arn.) Miq., Ann. Mus. Ludg.-Bat. 4: 41. 1868; FPM 180. 1915. *A. wallichii* Hiern in Hook.f., FBI 1: 555. 1875. *A. roxburghiana* (Wight & Arn.) Miq. var. *beddomei* Gamble, FPM 180. 1915. *A. roxburghiana* (Wight & Arn.) Miq. var. *courtallensis* Gamble, FPM 180. 1915. *A. elaeagnoides* (Juss.) Benth. var. *beddomei* (Gamble) Nair, JBNHS 78: 426. 1981; FPL 109. 1990; Jain & Bennet, Fl. Ind. 4:462.1997.

Medium trees, bark red; branchlets covered with brownish scales. Leaves imparipinnate, 18-20 cm; leaflets 5 pairs, opposite, 8-12 x 3-3.5 cm, elliptic-obovate, apex acuminate, base crenate, scaly on both surface, densely so below. Panicles axillary, to 11 cm; flowers polygamo-dioecious, yellow; calyx campanulate, scaly; petals 5, 2 x 1 mm; staminal tube 1.5 mm, entire at apex; anthers included.

*Fl.* February-May

*Distr.* Indo-Malesia to Pacific Islands. Common in evergreen forests; *PS 19907* Kariamchola

**Aglaia lawii** (Wight) Sald. in Sald. & Nicols., Fl. Hassan Dist. 392. 1976; FPL 109. 1990; Pannell, Kew Bull. (Add. ser. XVI) 97.1992; FTSR 88. 1996; Jain & Bennet, Fl. Ind. 4:471.1997. *Nimmonia lawii* Wight, Calcutta J. Nat. Hist. 7: 13. 1847. *Nemadra nimmonii* Dalz. & Gibs., Bombay Fl. 37. 1861. *Amoora lawii* (Wight) Bedd., Fl. Sylv. t. 133. 1871; FBI 1: 561. 1875; FPM

181. 1915. *Amoora canarana* (Turcz.) Hiern in Hook. f., FBI 1: 560. 1875. *Aglaia jainii* Viswan. & Ramach., Bull. Bot. Surv. India 24: 212. 1982 (1983).

Trees; branchlets and younger parts covered with light brown fimbriate scales. Leaves 6-8 foliolate; leaflets to 15 x 7 cm, elliptic-oblong, abruptly acuminate at apex, oblique at base, densely scaly; nerves 7-9 pairs, nervules indistinct; petiole 1 cm long. Panicle to 10 x 8 cm, axillary. Flowers 5 mm across; calyx 3 mm across, cupular, lobes obscure; petals 4 x 4 mm, orbicular, concave, glabrous, not spreading; staminal tube 3 mm long, globose; anthers 10. Berry 2 x 1.5 cm, obovoid, obtuse, smooth, brown.

*Fl. & Fr.* February-July

*Distr.* Indo-Malesia to Pacific Islands. Rare in evergreen forests; *PS 19137* Kariamchola; *19371* Orukomban

***Aglaia perviridis*** Hiern in Hook.f., FBI 1: 556. 1875; Pannell, Kew Bull. (Add. ser. XVI) 198.1992; FTSR 91. 1996; Jain & Bennet, Fl. Ind. 4: 473. 1997. *A. maiae* Bourd., JBNHS 12: 350. t.11. 1899; FPM 180. 1915; Jain & Bennet, Fl. Ind. 4:473. 1997.. *A. canarensis* Gamble, FPM 180. 1915.

Trees, branchlets covered with reddish scales. Leaves to 45 cm long, 9-11-foliolate; leaflets to 17 x 6 cm, ovate-oblong, acute at apex, scales on midrib only; nerves to 17 pairs, irregular; petiolule 8 mm long. Panicles 40 x 20 cm, axillary, sparsely scaly. Flowers 2.5 mm across, 5-merous; calyx lobes obtuse, ciliate; petals 2 mm long, obovate; staminal tube 1.5 mm long; anthers 5. Berry 2 x 1.5 cm, ovoid, brownish-red.

*Fl. & Fr.* March-August

*Distr.* Indo-Malesia and China. Rare in evergreen forests; *PS 30242* Pezha

***Aglaia simplicifolia*** (Bedd.) Harms, Pflanzenf. (ed. 2) 196. 1: 146. 1940; Pannell, Kew Bull. (Add. ser. XVI) 306.1992; Jain & Bennet, Fl. Ind. 4:474.1997. *Beddomea simplicifolia* Bedd., Fl. Sylv. t. 135. 1871; FBI 1: 566. 1875; FPM 184. 1915. *B. simplicifolia* var. *parviflora* Bedd., Fl. Sylv. t. 135. 1871. *B. simplicifolia* var. *racemosa* Bedd., Fl. Sylv. t.135. 1871.

Small trees or large shrubs; branchlets stellate hairy. Leaves to 13 x 5 cm, elliptic, shortly acuminate, nerves 10-12 pairs, nervules parallel; petiole 2 cm long, jointed above the middle. Panicle 5 cm across, very hairy. Flowers 6 mm across, 5-6-merous; calyx-lobes obtuse, densely hairy; petals 3 x 3 mm orbicular, dull white, glabrous; anthers 5; ovary stellate hairy. Drupe 3 x 2 cm; obovoid, acute at apex, dark brown, stellate hairy many ridged.

*Fl. & Fr.* February-August

*Distr.* Indo-Malaysia. Fairly common in evergreen forests at higher altitudes; *PS 30226, NS 30562* Karimala

***Aglaia tomentosa*** Teijsm. & Binn., Nat. Tijdsch. Ned. Ind. 27: 43. 1864; Pannell, Kew Bull. (Add. ser. XVI) 331.1992; FTSR 91. 1996. *A. minutiflora* Bedd., Ic. t. 192. 1868-1874; FPM 181. 1915; FPL 109. 1990. *A. minutiflora* Bedd. var. *travancorica* Hiern in Hook.f., FBI 1: 557. 1875. *A. cordata* Hiern in Hook.f., FBI 1: 557. 1875. *Aglaia exstipulata* sensu Balak. in JBNHS 67:57.1970, non (Griff.) Theobald 1883; FTM 61; Jain & Bennet, Fl. Ind. 4:465.1997.

Small to medium trees, bark brown; young shoots densely brown-tomentose. Leaves to 50 cm long; leaflets 11-13 pairs, to 20 x 6 cm, oblong-lanceolate, acuminate, base rounded, densely brown-tomentose below; lateral nerves to 20 pairs, parallel; petiolule 5 mm long; rachis angled. Panicle 40 x 20 cm, densely stellate-hairy; pedicels 2 mm long. Flowers 1.5 mm diam.; sepals ovate, obtuse; petals 4, orbicular, glabrous; staminal tube 1 mm long.

*Fl. & Fr.* November-February

*Distr.* Indo-Malesia to Australia. Rare in evergreen forests at higher altitudes; *PS 19764* Pooppara

APHANAMIXIS Blume

**Aphanamixis polystachya** (Wall.) Parker, Indian For. 57: 486. 1931; FPL 110. 1990; FTSR 94. 1996; Jain & Bennet, Fl. Ind. 4:477.1997. *Aglaia polystachya* Wall. in Roxb., Fl. Ind. 2: 429. 1824. *Amoora rohituka* (Roxb.) Wight & Arn. in Wight, Cat 24. 1833 & Prodr. 119. 1834; FBI 1: 559. 1875; FPM 181. 1915. *Amoora beddomei* Kosterm., Acta Bot. Neerl. 31: 133. 1982.

Shrubs or small trees. Leaves 20-65 cm long, 7-17-foliolate; leaflets 10-23 x 3-7 cm, opposite, ovate-oblong, acute, glabrous; nerves to 13 pairs; petiolule 5 mm long. Panicle to 70 cm long, drooping, many-flowered; pedicels 6 mm long. Flowers 8 mm across; sepals 5, orbicular, thick; petals 3, orbicular; staminal tube 4 mm long, globose; anthers 8, oblong, sessile; ovary 3-celled, conical; ovules 2 in each cell; style absent, stigma capitate, 3-ridged. Capsule 2.5-3 cm across, 3-lobed, shortly stalked, glabrous.

*Fl. & Fr.* July-February

*Distr.* India, Pakistan, Nepal, Bhutan, Bangladesh, Myanmar and Sri Lanka. Fairly common in evergreen forests; *PS 19789* Kanthalppara; *30375* Pandaravarai

#### AZADIRACHTA A. Jussieu

**Azadirachta indica** A. Juss., Mem. Mus. Par. 19: 221. 1830; FPM 177. 1915; FPL 113. 1990; FTSR 100. 1996; Jain & Bennet, Fl. Ind. 4:478.1997. *Melia azadirachta* L., Sp. Pl. 385. 1753; FBI 1: 544. 1875. *Melia indica* Brandis, Forest Fl. N. W. India 67. 1874.

Medium trees. Leaves imparipinnate, 15-25 cm; leaflets 7 pairs, subopposite or opposite, 5-8 x 2-2.5 cm, acuminate, base oblique, serrate, glabrous; petiolule to 2 cm. Panicle axillary, to 17 cm, pedicels 0.5 cm; flowers bisexual; calyx lobes 5, ovate, ciliate; petals 5 x 1.5 mm, oblong, narrowed at base, pubescent; staminal tube 10-lobed, to 4 mm, glabrous; anthers slightly exerted; ovary 3-celled, ovules 2 per cell, stigma 3-lobed. Drupe 1.5 x 0.5 cm, oblong.

*Fl. & Fr.* March-June

*Distr.* Indo-Malesia. Grown as an avenue plant; *PS 30767* Parambikulam

#### CHUKRASIA A. Jussieu

**Chukrasia tabularis** A. Juss., Mem. Mus. Natl. Hist. Nat. 19: 251. t.22. 1830; FBI 1: 568. 1875; FPM 186. 1915; FPL 110. 1990; FTSR 94. 1996; Jain & Bennet, Fl. Ind. 4:481.1997. *C. velutina* Roem., Fam. Nat. Syn. Monogr. 1: 135. 1846.

Tall trees; branchlets glabrous or velvety hairy. Leaves to 30 cm long, imparipinnate; leaflets alternate, to 13 x 6 cm, ovate, acute, sharply unequal at base, glabrous or hairy; petiolule 1 cm long. Panicle to 20 cm across, terminal; bracts lanceolate. Flowers bisexual, yellowish-white, calyx campanulate, 6 mm across, 3 mm long, hairy or glabrous; petals 5-6, 10 mm long, oblong; staminal tube cylindrical, anthers 10; ovary densely hairy, 3-5-celled; ovules many in each cell, style stout, stigma clavate. Fruit a capsule, 5 x 4 cm, 4-5-valved, glabrous; seeds many, winged.

*Fl. & Fr.* February-December

*Distr.* Indo-China. Common in evergreen forests; *PS 19409*, 30354 Kariamchola

#### CIPADESSA Blume

**Cipadessa baccifera** (Roth) Miq., Ann. Mus. Bot. Lugd.-Bat. 4: 6. 1868; FPM 176. 1915; FPL 110. 1990; FTSR 95. 1996; Jain & Bennet, Fl. Ind. 4:482.1997. *Melia baccifera* Roth, Nov. Pl. Sp. 215. 1821. *Ekebergia indica* Roxb. ex Hoffsgg. Verz. Pfl.-Kult. (Suppl. 2) 9, 34. 1828 & Fl. Ind. 2: 392. 1832. *Cipadessa fruticosa* Blume, Bijdr. 162. 1825; FBI 1: 545. 1875.

Shrubs. Leaves to 30 cm long, 7-9-foliolate; leaflets to 10 x 5 cm, elliptic, acute, serrate, hispid along the nerves below. Flowers 5 mm across, in long peduncled axillary cymes; calyx cupular, 5-lobed; petals 3.5 x 1 mm, oblong, pale yellow; stamens 10, filaments adnate below; anthers oblong; ovary truncate, 5-celled, glabrous, 5-celled; ovules 2 in each cell style one short; stigma clavate. Drupe 5 mm across, reddish, glabrous; seeds 1 or 2, angled.

*Fl. & Fr.* Almost throughout the year

*Distr.* Indo-Malesia. Common in moist deciduous forests; *PS 18970* Vengoli

#### DYSOXYLUM Blume



1. Leaflets alternate; ovary 2 celled..... **D. beddomei**  
 1. Leaflets opposite or sub-opposite; ovary 3-5 celled..... **D. malabaricum**

**Dysoxylum beddomei** Hiern in Hook.f., FBI 1: 548. 1875; FPM 178. 1915; FTSR 95. 1996; Jain & Bennet, Fl. Ind. 4:485.1997.

Small trees; branchlets minutely hispid. Leaves to 25 cm long; leaflets 5-9, alternate, to 13 x 5 cm, elliptic-oblong, acute at both ends, nerves to 20 pairs, parallel; petiolule 1 cm long. Panicle 1-1.5 cm across, axillary. Flowers few; calyx 4 mm across, cupular, sub-entire, hispid; petals 4, 5 x 2.5 mm, oblong, hispid outside; staminal tube hispid along 4 vertical lines outside; disc toothed. Capsule 8 x 6 cm, obovoid, stalked, acute at apex, vertically ridged, coarsely rugose.

*Fl. & Fr.* September-February

*Distr.* Endemic to Southern Western Ghats (Kerala). Rare in evergreen forests; *PS 18998* Orukomban

**Dysoxylum malabaricum** Bedd. ex Hiern in Hook.f., FBI 1: 548. 1875; FPM 178. 1915; FTSR 95. 1996; Jain & Bennet, Fl. Ind. 4:489.1997. *D. glandulosum* Talb., Syst. List. Trees Bombay 39. 1894.

Tall trees; bark corky-lenticellate; branchlets densely hispid. Leaves to 40 x 20 cm; 10-foliolate; leaflets to 19 x 7 cm, ovate-oblong, acute, rounded at base, nerves 17-19 pairs, prominent below; petiolule 8 mm long. Raceme 15-20 cm long, axillary. Flowers shortly pedicellate; calyx 1.5 mm long, deeply lobed; petals 9 x 3 mm, oblong, acute; staminal tube 7 mm long; disk hispid at rim; style 5 mm long.

*Fl. & Fr.* March-July

*Distr.* Endemic to Southern Western Ghats. Common in evergreen forests; *PS 30650* Pezha

#### MELIA Linnaeus

**Melia dubia** Cav., Diss. 7: 364. 1789; FBI 1: 545. 1875; FPL 111. 1990; FTSR 97. 1996; Jain & Bennet, Fl. Ind. 4:495.1997. *M. composita* Willd., Sp. Pl. 2: 509. 1799; FPM 176. 1915. *M. superba* Roxb., Fl. Ind. 2: 396. 1832. *M. robusta* Roxb., Fl. Ind. 2: 397. 1832.

Large trees; branchlets lenticellate. Leaves 3 pinnate, to 40 cm long, secondary rachis 3 pairs; leaflets 2-5 pairs, opposite, 5-8 x 2-3 cm, ovate, lanceolate, apex acuminate, base cordate, serrate; petiole to 10 cm, petiolule to 1 cm. Panicles axillary, to 18 cm; flowers white; calyx lobes 1.5-2 mm, ovate, pubescent; petals 7 x 1 mm, obovate; staminal tube 6 mm; anther exerted; ovary 5-celled, 1 mm, stigma capitate. Drupe 2 x 1 cm, globose.

*Fl. & Fr.* March-January

*Distr.* Indo-Malesia to Australia. Common in moist deciduous forests; *PS 18806* Anakkalvayal

#### MUNRONIA Wight

**Munronia pinnata** (Wall.) Harms, Ber. Deutsch. Bot. Ges. 35: 78. 1917; FPL 111. 1990; FTSR 97. 1996; Jain & Bennet, Fl. Ind. 4:497.1997. *Turraea pinnata* Wall., Pl. Asiat. Rar. 2: 21. t.119. 1829. *Munronia wallichii* Wight, Ill. Indian Bot. 1: t.54. 1840; FBI 1: 543. 1875; FPM 175. 1915.

Shrubs, younger parts villous. Leaves to 30 cm long, imparipinnate; leaflets 10-14, opposite, to 13 x 5.5 cm, ovate-lanceolate, rounded or cordate at base, hispid, below. Flowers few, in axillary short cymes; pedicel 1 cm long; calyx tubular, lobes 8 x 3 mm, oblanceolate, leafy; petals 5, white, 3 cm long, spatulate, partly cohering below; staminal tube 2 cm long, 10-toothed; anthers 10, apiculate; ovary 5-celled; ovules 2 in each cell; style slender, longer than staminal tube. Capsule 1.5 cm across, depressed globose, hispid; seeds 5, 7 x 5 mm, oblong, smooth.

*Fl. & Fr.* November-December

*Distr.* Endemic to India. Rare in semi-evergreen forests; *PS 19392* Karimala

#### NAREGAMIA Wight & Arnott

**Naregamia alata** Wight & Arn., Prodr. 117. 1834; FBI 1: 542. 1875; FPM 175. 1915; FPL 111. 1990; FTSR 98. 1996; Jain & Bennet, Fl. Ind. 4:498.1997.

Glabrous herbs. Leaves 3-foliolate, petiole winged; leaflets 5 x 3 cm, elliptic, crenate, obtuse, sessile. Flowers 1-3-together, in axillary fascicles, pedicellate; calyx 3 mm long campanulate, lobed half way down, tomentose; petals 5, white, 3 cm long, oblanceolate; staminal tube 2.5 cm long, slender; anthers 10; ovary 3-celled, glabrous; ovules paired; style filiform, 2 cm long; stigma capitate. Capsule 6 x 6 mm, depressed globose; seeds solitary, ellipsoid, transversally rugose.

*Fl. & Fr.* January-August

*Distr.* Endemic to Peninsular India. Common in moist deciduous forests; *PS 30347*Vengoli

#### REINWARDTIODENDRON Koorders

**Reinwardtiodendron anamalaiense** (Bedd.) Mabb., Malayan For. 45: 452. 1982; Jain & Bennet, Fl. Ind. 4:498.1997. *Lansium anamallayanum* Bedd., Madras J. Lit. Sci. ser.3, 1: 40. 1864. *L. anamallayanum* (Bedd.) Bedd., Fl. Sylv. t. 131. 1871 & Ic. t. 104. 1868-1874; FBI 1: 558. 1875; FPM 82. 1915. *Aglaiia anamallayana* (Bedd.) Kosterm., Reinwardtia 7: 257,t.10. 1966. *Reinwardtiodendron anamallayanum* (Bedd.) Sald. in Sald. & Nicols., Fl. Hassan Dist. 392. 1976; FTSR 98. 1996.

Small evergreen trees; bark greyish-brown, mottled with grey, lenticellate, 3-4 mm thick; young shoots minutely grey tomentose. Leaves pinnate, to 25 cm long; leaflets 5-7, elliptic-acuminate, base cuneate, glabrous, to 12 x 5 cm; lateral nerves 5-8 pairs, domatia present in the axils of nerves, reticulations prominent on both surfaces. Flowers creamy yellow, in axillary spikes. Sepals ovate-orbicular. Anthers within the staminal tube. Berry oblong ca. 1.8 cm long; seeds covered with white mucilaginous aril.

*Fl. & Fr.* March-November

*Distr.* Endemic to Southern Western Ghats. Common in evergreen forests; *PS 30244* Pezha; *NS 30365* Kariamchola

#### TOONA (Endlicher) M. Roemer

**Toona ciliata** Roem., Syn. Hesper. 139. 1846; FPL 112. 1990; FTSR 98. 1996; Jain & Bennet, Fl. Ind. 4:504.1997. *Cedrela toona* Roxb., ex Rottl. & Willd., Ges. Naturf. Freunde Berlin Neue Schriften 2: 198. 1803; FBI 1: 568. 1875; FPM 186. 1915.

Tall trees. Leaves to 60 cm long, imparipinnate, 12-16-foliolate; leaflets alternate, 15 x 6 cm, ovate, acuminate, glabrous; petiolules 8 mm long. Panicle to 30 x 15 cm, terminal. Flowers 7 mm across, sessile; calyx cupular, 5-toothed, tomentose; petals dull yellow, 5 x 3 mm, oblong, spreading; stamens 5, free; disk pubescent; ovary 5-celled, densely hairy, style 3 mm long, stigma discoid. Capsule 2.5 x 1.5 cm; seeds many, winged at both ends.

*Fl. & Fr.* January-February

*Distr.* Indo-Myanmar; cultivated in Sri Lanka, Afghanistan, Africa and the Hawaiian Islands. Rare in rocky areas in moist deciduous forests; *PS 19968* Parambikulam

#### TRICHILIA P. Browne

**Trichilia connaroides** (Wight & Arn.) Bentvelzen, Acta Bot. Neerl. 11: 13. 1962; FPL 112. 1990; FTSR 99. 1996; Jain & Bennet, Fl. Ind. 4:515.1997. *Zanthoxylum connaroides* Wight & Arn., Prodr. 148. 1834, "Zanthoxylon". *Walsura trijuga* (Sims) Kurz, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 44: 148. 1875. *Heynea trijuga* Roxb. ex Sims, Bot. Mag. 41 t. 1738. 1815; FBI 1: 565. 1872; FPM 183. 1915. *H. affinis* A.Juss., Mem. Mus. Hist. Nat. Paris 19: 235. 275. 1830.

Small trees. Leaves alternate, to 35 cm long, imparipinnate; leaflets 7-9, opposite, to 15 x 7 cm, ovate, abruptly acuminate, unequal at base; petiolules 15 mm long. Panicle axillary; peduncle to 25 cm long, erect. Flowers 5 mm across, many; calyx gamosepalous, 5-toothed; petals 3 x 1 mm, oblong, greenish white; staminal tube 3 mm long, divided to the middle,

pubescent; anthers 10; ovary 3-celled, ovule 2 in each cell, style thickened above, stigma 2-toothed. Capsule 1 cm across, globose, glabrous, pinkish; seeds 1-3, arillate.

*Fl. & Fr.* February-October

*Distr.* Indo-Malesia. Common in evergreen and semi-evergreen forests; *PS 19352* Kariyilathodu; *30444* Karimala; *NS 18893* Muthalakkuzhi

#### TURRAEA Linnaeus

**Turraea villosa** Bennet, Fl. Jav. Rar. 1: 182. 1840; FBI 1: 542. 1875; FPM 174. 1915; FPL 112. 1990; FTSR 99. 1996; Jain & Bennet, Fl. Ind. 4:515.1997. *T. virens* Hiern in Hook. f., FBI 1: 541. 1875, non L. 1771.

Shrubs, densely villous. Leaves simple, alternate, to 13 x 8 cm, broadly ovate, abruptly acuminate, rounded at base, entire. Flowers 2-3-together in axillary fascicles; pedicel 3 cm long; sepals 5, ovate, connate at base; petals 50 x 3 mm, linear-oblong, spatulate at apex; white, partially connate; staminal tube 4 cm long, slender, toothed; anthers 10, projected above, disk tubular, 4 mm long; ovary 5-celled, ovules solitary in each cell; style 4 cm long, slender, bulged below the stigma. Capsule 10 mm across, depressed globose, seeds 5, reddish.

*Fl. & Fr.* February-April

*Distr.* Indo-Malesia. Common in evergreen forests; *PS 18947* Kothala; *30179* Kottayali

#### WALSURA Roxburgh

**Walsura trifolia** (A. Juss.) Harms in Engl. & Prantl, Pflanzenf. (ed.2) 196: 119,177. 1940; FTSR 99. 1996; Jain & Bennet, Fl. Ind. 4:522.1997. *Heynea trifolia* A. Juss., Mem. Mus. Hist. Nat. 19: 235. 1830. *Walsura piscidia* Roxb., Fl. Ind. 2: 387. 1832; FBI 1: 564. 1875; FPM 183. 1915.

Small trees. Leaflets 10 x 4 cm, elliptic, entire, acute, glaucous below; petiolules 1 cm long. Panicle axillary, 5-10 cm across; peduncle 6 cm long. Flowers sessile, 4 mm across; calyx gamosepalous, tomentose; petals 5, white, 2.5 x 1 mm, oblong, hairy; stamens 10, filaments connate at base, pubescent; anthers ovate-cuspidate; ovary densely hairy, 3-celled; ovule 2 in each cell; style short; stigma obconical. Fruit 1.5 x 1 cm, obovoid, obtuse, brown-tomentose.

*Fl. & Fr.* October-January

*Distr.* India and Sri Lanka. Common in semi-evergreen forests; *PS 19378* Pooppara

### DICHAPETALACEAE

#### DICHAPETALUM D. Thouars

**Dichapetalum gelonioides** (Roxb.) Engl. in Engl. & Prantl, Pflanzenf. 3: 348. 1891; FPM 188. 1915; FTSR 100. 1996; Nair, Fl. Ind. 4:528.1997. *Moacurra gelonioides* Roxb., Fl. Ind. 2: 69. 1832. *Chailletia gelonioides* (Roxb.) Bedd., For. Man. Bot. 59. Anal. Gen. t.9. f.1. 1871; FBI 1: 570. 1875.

Shrubs, branchlets slender. Leaves alternate, to 10 x 3 cm, elliptic, caudate-acuminate, entire. Flowers unisexual, in axillary short peduncled cymes, densely villous; bracts lanceolate; sepals 5, 1.5 mm long, ovate; petals 1.5 mm long, obovate, bilobed at apex, glabrous; stamens 5, filaments short; anthers ovoid, disc 4 lobed, scale like; ovary 3-celled; ovule 2 in each cell; style 1, trifid above. Fruit a 2-lobed, drupe, 10 mm across, compressed, rugose; seeds arillate.

*Fl. & Fr.* July-November

*Distr.* Indo-Malesia. Common in evergreen forests; *PS 30322* Orukomban; *30552* Karimala; *30496* Muthuvarachal

### OLACACEAE

1. Trees; flowers in axillary fascicles ..... **Strombosia**  
1. Scandent shrubs; flowers in axillary racemes ..... **Olax**

#### OLAX Linnaeus

**Olax imbricata** Roxb., Fl. Ind. 1:69. 1820; Hook.f., FBI 1: 575. 1875; FTSR 101. 1996; Uniyal, Fl. Ind. 5: 7. 2000. *O. wightiana* Wall. ex Wight & Arn., Prodr. 89.1834; FPM 190.1915.

Scandent shrubs. Leaves elliptic-oblong, acute or obtuse, base rounded or truncate, glabrous and chartaceous, to 12 x 6 cm; lateral nerves 7-9, intercostae obscure; petiole 1 cm long. Petals creamy white, 1 cm long. Drupe yellow, oblong, 1.5-2 cm long.

*Fl. & Fr.* January-April

*Distr.* Indo-Malesia. Common in semi-evergreen forests; *PS 18818* Parambikulam; *NS 30566* Kariamchola

#### STROMBOSIA Blume

**Strombosia ceylanica** Gard., Calcutta J. Nat. Hist. 6: 350. 1846; FBI 1: 579. 1875; FPM 191. 1915; FTSR 101. 1996; Uniyal, Fl. Ind. 5: 14. 2000.

Large trees, bark uneven, light pink inside; branchlets glabrous. Leaves to alternate, 18 x 6 cm, lanceolate, rounded at base, acute at apex; nerves 6 pairs, glabrous. Flowers many, fascicled in axillary or lateral tubercles; pedicels 1.5 mm long; calyx 1 mm long, 2 mm across, campanulate, lobes 5, acute, petals 2.5 x 1 mm, lanceolate, tomentose inside; stamens 5, antipetalous, erect; ovary 1-celled. Berry 10 x 8 mm, obovoid, smooth, truncate at apex; seed 1.

*Fr. & Fr.* March-May

*Distr.* Western Ghats and Sri Lanka. Occasional in evergreen forests; *PS 30693* Parambikulam

#### OPILIACEAE

1. Inflorescence a raceme; petals 5, free ..... **Opilia**
1. Inflorescence a spike; petals 4, connate..... **Cansjera**

#### CANSJERA A. Jussieu

**Cansjera rheedii** Gmel., Syst. 1: 280. 1791; FBI 1: 582. 1875; FPM 193. 1915; Mathur, Fl. Ind. 5: 40. 2000. *C. scandens* Roxb., Pl. Corom. t. 103. 1799 & Fl. Ind. 1: 441. 1832.

Climbing shrubs. Leaves alternate, to 11 x 7 cm, ovate, acute at apex, rounded at base, rugose, shortly petiolate. Flowers bisexual, in axillary spikes; calyx minute, 4-toothed; petals 4, united into an urceolate tube, 4 mm long, lobes valvate, reflexed, stamens 4, free; disc 4-lobed, lobes erect, tridentate; ovary oblong, 1-celled, ovule 1, style cylindrical; stigma capitate, 4-lobed. Fruit a drupe; seed 1.

*Fl. & Fr.* September-December

*Distr.* India through Malaya to Hong Kong and North Australia. Rare in dry deciduous forests. *PS 19999* Kuchimudi

#### OPILIA Roxburgh

**Opilia amentacea** Roxb., Corom. Pl. 3: t.158. 1802; FBI 1: 583. 1875; FPM 192. 1915; Mathur, Fl. Ind. 5: 44. 2000. *Ximenia olacioides* Wight & Arn., Prodr. 89. 1834.

Climbing shrubs, branchlets lenticellate, brown tomentose. Leaves 9 x 3 cm, ovate, acute, base obtuse or acute, coriaceous; petiole to 8 mm. Racemes axillary, 1-5 together, to 3 cm; flowers in groups of 2 or 3, pedicels 2 mm; sepals 5, minute; petals 2 mm, oblong, recurved; stamens opposite to petals, filaments 2 mm; anthers 0.5 mm, glands 5, fleshy, club shaped, alternating with the stamens; ovary 1-celled, 1.5 mm, oblong, style minute, ovule pendulous.

*Fl.* February-April

*Distr.* Peninsular India through Sri Lanka to Tropical Australia and Africa. Rare in dry deciduous forests; *PS 30295* Thellikkal; *30573* Keerappadi

## ICACINACEAE

- |  |                     |
|--|---------------------|
| 1. Trees or shrubs.....                                    | 2                   |
| 1. Climbers.....   | 3                   |
| 2. Leaves to 20 x 10 cm; flowers in terminal panicles..... | <b>Nothapodytes</b> |
| 2. Leaves to 15 x 5 cm; flowers in axillary cymes.....     | <b>Gomphandra</b>   |
| 3. Leaves dentate; flowers in long peduncled heads.....    | <b>Miquelia</b>     |
| 3. Leaves entire; flowers in elongate spikes.....          | <b>Sarcostigma</b>  |

### GOMPHANDRA Wallich ex Lindley

- |  |                     |
|--|---------------------|
| 1. Branchlets green; cymes glabrous.....       | <b>G. coriacea</b>  |
| 1. Branchlets pale green; cymes puberulus..... | <b>G. tetrandra</b> |

**Gomphandra coriacea** Wight, Ill. Indian Bot. 1: 103. 1840; FPM 195. 1915; FPL 114. 1990; FTSR 102. 1996; Mathur, Fl. Ind. 5: 22. 2000. *G. polymorpha* Wight, Ill. Indian Bot. 1: 103. 1840 p.p. & Ic. tt. 953,954. 1843; FBI 1: 586. 1875.

Small trees; branchlets brown. Leaves to 12 x 5 cm, elliptic, abruptly acuminate; nerves obscure, 6 pairs; petiole 1.5 cm long. Cymes peduncled, extra-axillary. Flowers 5-9 together; calyx cup truncate; corolla 4 mm long; lobes acute; pistillode in male flowers pubescent. Drupe 15 x 8 mm, oblong, terete.

*Fl. & Fr.* August-November

*Distr.* Endemic to Western Ghats. Common in evergreen forests; *PS 19176* Karimala; *30315* Pooppara; *19794* Orukomban

**Gomphandra tetrandra** (Wall.) Sleumer, Notizbl. Bot. Gart. Berlin-Dahlem 15: 238. 1940 & Blumea 17: 204. 1969; FPL 114. 1990; FTSR 102. 1996; Mathur, Fl. Ind. 5: 25. 2000. *Lasianthera tetrandra* Wall. in Roxb., Fl. Ind. 2: 238. 1824. *Gomphandra axillaris* Wall. ex Bedd., Fl. Sylv. t. 61. 1870; FBI 1: 586. 1875. *G. polymorpha* Wight, Ill. Indian Bot. 1: 103. 1840 p.p.; FPM 195. 1915.

Shrubs, to 2 m high; branchlets green. Leaves to 16 x 4.5 cm, oblong, acute at base, acuminate at apex, nerves to 9 pairs. Cymes peduncled; peduncle 10 mm long. Flowers 3-10 together; calyx 1 mm long, cupular; corolla 6 mm long, lobes cuspidate; filaments 8 mm long, connate. Drupe 13 x 6 mm, obovate, acute.

*Fl. & Fr.* August-December

*Distr.* South West India and Sri Lanka. Common in evergreen forests; *PS 19526* Orukomban

### MIQUELIA Meissner

**Miquelia dentata** Bedd., Madras J. Lit. Sci. ser. 3, 1: 38. 1864; FBI 1: 593. 1875; FPM 197. 1915; FPL 114. 1990; FTSR 102. 1996; Mathur, Fl. Ind. 5: 29. 2000 [Figure 4].

Glabrous slender climbers. Leaves to 16 x 7 cm, ovate, rounded or truncate at base, acute, dentate, more sharply near the base; petiole 3-4 cm long. Flowers unisexual, in peduncled globose spike; peduncle to 6 cm long; calyx cupular, 4-toothed; petals 4, 3 mm long, oblong; stamens 4 or 5, in male flowers; ovary 1-celled, 4-angled; style absent; stigma 4-angled; ovules 2, pendulous. Drupe 2 x 1 cm, 3-8 together, ovoid, sessile, yellow; seeds 1.5 x 1 cm, stalked, pitted.

*Fl. & Fr.* April-January

*Distr.* Endemic to Southern Western Ghats. Rare in evergreen and semi-evergreen forests; *PS 19447* Pooppara

### NOTHAPODYTES Blume

**Nothapodytes nimmoniana** (Graham) Mabb. in Manilal, Bot. Hist. Hort. Malab. 88. 1980; FPL 115. 1990; FTSR 104. 1996; Mathur, Fl. Ind. 5: 31. 2000. *Premna nimmoniana* Graham,

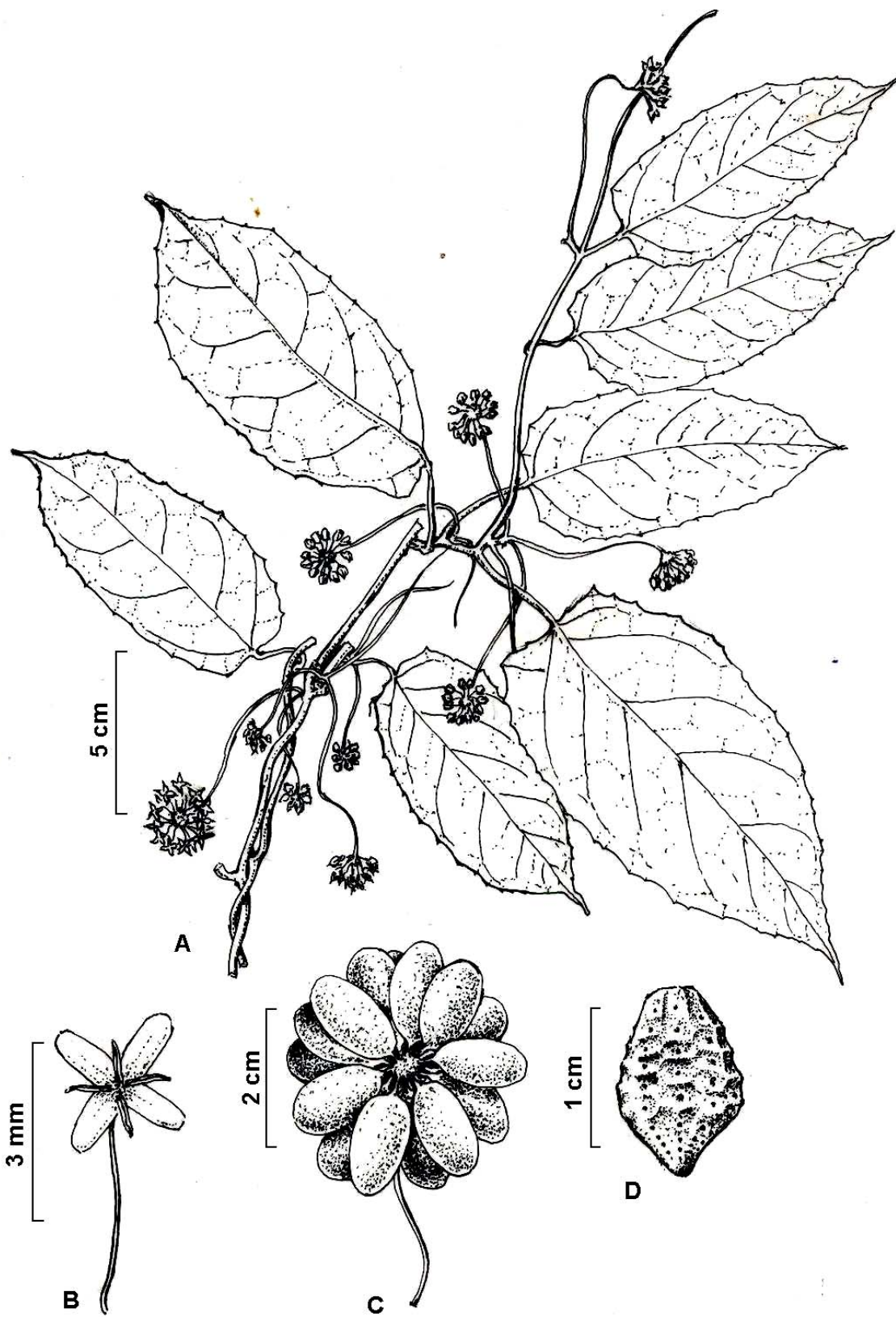


Figure 4. *Miquelia dentata* Bedd. **A.** - flowering branch; **B.** - male flower, **C.** - fruit, **D.** - seed

Cat. Pl. Bombay 155. 1839. *Stemonurus foetidus* Wight, Ic. t. 955. 1845. *Mappia foetida* (Wight) Miers, Ann. Mag. Nat. Hist. (ser. 2) 9: 395. 1852; 1: 589. 1875; FPM 196. 1915. *Nothapodytes foetida* (Wight) Sleumer, Notizbl. Bot. Gart. Berlin-Dahlem 15: 247. 1940 & Blumea 17: 232. 1969. *Mappia wightiana* Miers, Ann. Mag. Nat. Hist. ser. 2, 9: 397. 1852; FPM 197. 1915. *M. tomentosa* Miers, Ann. Mag. Nat. Hist. ser. 2, 9: 397. 1852; FBI 1: 589. 1875; FPM 196. 1915. *M. ovata* Miers, Ann. Mag. Nat. Hist. ser. 2. 9: 396. 1852; FBI 1: 589. 1852; FPM 197. 195.

Small trees; branchlets prominently lenticellate. Leaves to 17 x 9 cm, broadly ovate or elliptic, acute or acuminate, base unequal, tomentose along the veins beneath and glabrous above, lateral nerves 8-10 pairs, domatia present in the axils of nerves; petiole to 6 cm long. Flowers creamy yellow, in terminal panicles, foul smelling; calyx cupular, 1 mm long, 5-lobed; petals connate, tomentose outside, villous within, apex inflexed; stamens 5, filaments as long as the petals; staminodes 5, hairy; ovary 1-celled, densely hairy. Drupe 8 x 4 mm, oblong, reddish-brown, glabrous.

*Fl. & Fr.* August-January

*Distr.* Indo-Malesia and China. Rare in evergreen forests; *PS 19523* Orukomban

#### SARCOSTIGMA Wight & Arnott

**Sarcostigma kleinii** Wight & Arn., Edinb. New Phil. J. 14: 299. 1833; FBI 1: 594. 1875; FPM 199. 1915; FPL 115. 1990; FTSR 104. 1996; Mathur, Fl. Ind. 5: 35. 2000.

Large climbers, branchlets glabrous. Leaves to 22 x 12 cm, ovate, acute at base and apex; lateral nerves 8 pairs, reticulate; petiole 5-15 cm long. Spikes to 35 cm long, slender, from old branches. Flowers 3-6 together; calyx cupular, 2 mm across, 5-toothed; petals 3-5 mm long, oblong, recurved; stamens 5, anthers versatile, staminodes 5, in female flowers, hairy; ovary 1-celled, densely hairy; stigma sessile, discoid; pistillode in male flowers conical. Drupe 3 x 1.5 cm, ovoid, orange, glabrous.

*Fl. & Fr.* November-March

*Distr.* Indo-Malesia. Rare in evergreen forests; *PS 30097* Kottayali

### ERYTHROPALACEAE

#### ERYTHROPALUM Blume

**Erythralum scandens** Blume, Bijdr. 922. 1826; FBI 1: 578. 1875; FTSR 100. 1996; Uniyal, Fl. Ind. 5: 5. 2000. *Mackaya populifolia* Arn., Jard. Mag. Zool. Bot. 2: 531. 1838. *Erythralum populifolium* (Arn.) Mast. in Hook.f., FBI 1: 578. 1875; FPL 113. 1990.

Weak tendrillate climbers. Leaves alternate, to 15 x 10 cm, ovate to deltoid, acuminate, truncate at base, 3-ribbed, glaucous below, membranous. Flowers in axillary peduncled cymes, drooping, pedicellate; sepals cupular, 5-toothed; petals 5, 6 x 2 mm, oblong, obtuse, yellow; stamens 5, filaments very short, staminodes hairy; disc surrounds the ovary; ovary 1-celled, 1-3-ovuled; style short, stigma 3-fid. Fruit ovoid, 8 x 6 mm, orange-red, glabrous; seed 1, black, aril red.

*Fl. & Fr.* July-January

*Distr.* Endemic to Western Ghats. Common along the margins of evergreen forests; *PS 19132* Kariamchola

### CELASTRACEAE

- |   |                    |
|---|--------------------|
| 1. Climbing shrubs; leaves alternate .....                | <b>Celastrus</b>   |
| 1. Trees; leaves opposite .....                           | 2                  |
| 2. Flowers fascicled in axillary tubercles.....           | <b>Microtropis</b> |
| 2. Flowers in axillary or terminal cymes or panicles..... | 3                  |
| 3. Fruit a drupe .....                                    | <b>Cassine</b>     |
| 3. Fruit a capsule.....                                   | 4                  |

4. Capsule obcordate, to 3 cm long; leaves with deciduous stipule ..... **Euonymus**  
 4. Capsule compressed 3 valved, to 20 cm long; leaves exstipulate ..... **Lophopetalum**

**CASSINE** Linnaeus

1. Cymes stout, lax; flowers large, greenish-yellow ..... **C. paniculata**  
 1. Cymes slender, dense; flowers small, whitish ..... **C. albens**

**Cassine albens** (Retz.) Kosterm., Gard. Bull. Sing. 39: 178. 1986; Ramamurthy, Fl. Ind. 5: 80. 2000. *Schrebera albens* Retz., Observ. Bot. 6: 25. t. 3. 1791. *Cassine glauca* (Rottb.) O. Ktze., Rev. Gen. Pl. 1: 114. 1891. *Mangifera glauca* Rottb., Nye Saml. Kongel. Danske Vidensk. Selsk. Skr. 2: 534. t. 4. f. 1. 1783. *Elaeodendron glaucum* (Vahl) Pers. Syn. 1: 241. 1806; FBI 1: 623. 1875 p.p.; FPM 211. 1918. *Celastrus glaucus* Vahl, Symb. Bot. 2: 42. 1791. *Elaeodendron roxburghii* Wight & Arn., Prodr. 157. 1834.

Trees, bark exudes watery sap when cut, blaze reddish. Leaves to 8 x 5.5 cm, broadly ovate-elliptic, apex and base acute, crenate, subcoriaceous; petiole to 1.5 cm. Cymes dichasial, axillary, to 5 cm; flowers greenish; bracts to 1 cm, ovate; pedicel 3 mm; calyx lobes 1 mm, ovate; petals 5, 3 mm, oblong; stamens 5, inserted on the disc; filaments 5 mm; anthers subglobose; ovary embedded in disc; style 1 mm, stout. Drupe 1 cm long, oblong.

*Fl. & Fr.* February-May

*Distr.* India and Sri Lanka. Common in moist deciduous forests; *PS 30447* Anappadi; *19649* Vengoli; *30525* Pandaravarai

**Cassine paniculata** (Wight & Arn.) Loobr.-Callen, Adansonia ser. 2. 15: 220. 1976; Ramamurthy, Fl. Ind. 5: 83. 2000. *Elaeodendron paniculatum* Wight & Arn., Prodr. 157. 1834; FPM 212. 1918. *E. glaucum* sensu Lawson in Hook.f., FBI 1: 623. 1875.

Large trees, branchlets terete, slender. Leaves opposite, to 8 x 4 cm, elliptic-oblong, crenate, membranous, reddish-black; petiole 12 mm long. Inflorescence a dichasial cyme, dichotomously branched, 3-6 cm across; peduncle 5.5 cm long, slender; pedicels 7 mm long. Flowers 11 mm across; sepals 9, unequal, orbicular; petals 5 x 3 mm, oblong, greenish yellow; disk 4 x 4 mm, thick, spreading, glabrous; stamens 5, filaments short along the margin of the disk; anthers 0.5 mm across, orbicular; ovary 2-5-celled, surrounded by disk; ovules 2 in each cell; style very short, as a small conical projection above the disk.

*Fl. & Fr.* May-July

*Distr.* Indo-Malesia. Common in evergreen forests; *PS 19405* Kariamchola

**CELASTRUS** Linnaeus

**Celastrus paniculatus** Willd., Sp. Pl. 1: 1125. 1797; FBI 1: 617. 1875; FPM 208. 1918; FPL 117. 1990; FTSR 105. 1996; Ramamurthy, Fl. Ind. 5: 87. 2000.

Large climbers; stem lenticellate. Leaves alternate, to 12 x 7 cm, broadly ovate, abruptly acuminate, membranous, crenulate; petiole 6 mm long. Panicle to 15 x 8 cm, terminal, axillary, oblong; pedicel 6 mm long. Flowers many, 6 mm across; sepals 5, small, imbricate, ciliate; petals white, 2.5 x 2 mm, ovate, obtuse; stamens 5, erect, anthers sagittate at base; ovary 3-celled, ovules 2 in each cell; stigmas 3, recurved. Capsule 1 x 1 cm, loculicidal, 3-celled, yellow; seeds 3, aril reddish.

*Fl. & Fr.* July-August

*Distr.* South Asia and Australia. Rare along the margins of semi-evergreen forests; *PS 19835*, *NS 18957* Vengoli

**EUONYMUS** Linnaeus

1. Cymes to 3 flowered; capsule wall deeply obcordate ..... **E. indicus**  
 1. Cyme more than 5 flowered; capsule wall slightly obcordate ..... 2



2. Leaves oblong-lanceolate, margin entire or obscurely crenate..... **E. dichotomus**  
 2. Leaves elliptic, margin crenate serrate..... **E. paniculatus**

**Euonymus dichotomus** Heyne ex Roxb., Fl. Ind. 2: 40. 1824; FBI 1: 609. 1875; FPM 203. 1918; FPL 117. 1990; Ramamurthy, Fl. Ind. 5: 97. 2000.

Small trees, branchlets terete, slender. Leaves to 7 x 3 cm, elliptic, ovate, apex obtuse, base cuneate, obscurely serrate towards upper half, pale greenish beneath when dry; petiole to 8 mm. Cymes dichasial, axillary, to 5 cm; flowers red, peduncle and pedicels slender; bracts minute, ovate; sepals connate at base, 2 mm, orbicular; petals 3 mm, orbicular; stamens inserted on disc; ovary 3-5-celled, 2-ovuled each, style to 0.5 mm.

*Fl. & Fr.* March-May

*Distr.* Endemic to Western Ghats. Rare in evergreen forests at higher altitudes; *PS 30229* Karimala

**Euonymus indicus** Heyne ex Roxb., Fl. Ind. 2: 409. 1824; FBI 1: 608. 1875; FPM 202. 1918; FTSR 106. 1996; Ramamurthy, Fl. Ind. 5: 102. 2000. *E. goughii* Wight, Ic. t. 215. 1839.

Small trees, branchlets 0.5-1 mm thick, yellow. Leaves 5-12 x 2-4 cm, elliptic-lanceolate, acuminate, tip rounded, entire, grey when dry; nerves obscure; petiole 7 mm long. Peduncle 6-8 mm long, stout; pedicel 8 mm long, stout. Flowers 10 mm across; sepals 3 x 3 mm, orbicular, dark pink; petals 5 x 4 mm, ciliate, dark purple. Capsule 1 x 1.5 cm, obcordate, dark purple; seeds 7 x 6 mm, oblong, reddish, with yellow aril.

*Fl. & Fr.* March-April

*Distr.* Endemic to Western Ghats. Common in evergreen forests; *PS 30558* Karimala

**Euonymus paniculatus** Wight ex Lawson in Hook.f., FBI 1: 609. 1875; FPM 203. 1918; Ramamurthy, Fl. Ind. 5: 105. 2000. *E. crenulatus* Wall. ex Wight & Arn. var. *laxiflora* Wight, Ic. t. 214. 1839.

Large shrubs; branchlets grey. Leaves to 8 x 2.5 cm, lanceolate, acuminate, serrulate along upper half, attenuate to the base; petiole 7 mm long, grey. Cymes broad, on short axillary peduncle; secondary peduncle, 2 cm long, slender, trichotomously branched, spreading, 6-12 flowered. Flowers 6 mm across; sepals entire, orbicular, green; petals entire, orbicular, deep purple, glabrous.

*Fl.* April

*Distr.* Endemic to Southern Western Ghats. Common in evergreen forests at higher altitudes; *PS 30246* Pezha

#### LOPHOPETALUM Wight ex Arnott

**Lophopetalum wightianum** Arn., Ann. Nat. Hist. 3: 151. 1839; FBI 1: 615. 1875; FPM 205. 1918; FPL 119. 1990; FTSR 106. 1996; Ramamurthy, Fl. Ind. 5: 116. 2000.

Large trees, branches terete, brown. Leaves opposite, 9-20 x 3-5 cm, oblong, acute, many-nerved, entire; petiole 1 cm long. Flowers 15 mm across, in lax axillary cymes; peduncle 2-5 cm long, dichotomously branched, glabrous; sepals 5, orbicular; petals 5, 7 mm diam., orbicular, uneven, clawed, pale pink, disk prominent, spreading, 5-lobed, deep pink; stamens 5, inserted on the disk, filaments short erect; ovary 2-celled; cells many-ovuled, immersed in the disk. Capsule 15-20 cm long, flat, coriaceous, loculicidal; seeds thin, arillate.

*Fl. & Fr.* March-May

*Distr.* Endemic to Western Ghats. Common along the riverine areas of evergreen forests; *PS 18875* Orukomban

#### MICROTROPIS Wallich ex Meissner

1. Branchlets quadrangular; leaf base attenuate..... **M. wallichiana**  
 1. Branchlets terete; leaf base cuneate..... **M. stocksii**

**Microtropis stocksii** Gamble, Kew Bull. 1916: 132. 1916 & FPM 206. 1918; FPL 119. 1990; FTSR 107. 1996; Ramamurthy, Fl. Ind. 5: 131. 2000.

Large shrubs; branchlets reddish-brown. Leaves 10 x 5 cm, elliptic, obtusely acuminate, attenuate at the base, margins folding, green or yellow when dried; petiole 0.8 cm long, yellow. Flowers 2 mm across, few in axillary clusters; sepals ovate, obtuse; petals 2 x 1 mm, ovate, obtuse, white, glabrous. Capsule 13 x 8 mm, brown, aril red.

*Fl. & Fr.* December-February

*Distr.* Endemic to Western Ghats. Common in evergreen forests; *PS 19450* Pooppara; *30119* Karimala

**Microtropis wallichiana** Wight ex Thw., Enum. Pl. Zeyl. 71. 1858; FBI 1: 613. 1875; FPM 206. 1918; FTSR 107. 1996; Ramamurthy, Fl. Ind. 5: 131. 2000.

Small trees. Leaves to 11 x 5 cm, elliptic, abruptly obtusely acuminate, nerves *ca.* 10 pairs, slender; petiole to 1 cm long, black. Cluster of flowers 8 mm across, sessile, axillary. Flowers 3 mm across, many together; sepals obovate, obtuse; petals 2.5 x 1 mm, obovate, obtuse, white with brown lines.

*Fl. & Fr.* March-April

*Distr.* South West India and Sri Lanka. Common in evergreen forests; *PS 19359* Pezha; *19792* Orukomban

#### HIPPOCRATEACEAE

1. Fruit a berry; seeds not winged.....**Salacia**
1. Fruit a follicle; seeds winged ..... **Loeseneriella**

#### LOESENERIELLA A. C. Smith

1. Petals clawed, orbicular..... **L. arnottiana**
1. Petals not clawed, triangular ..... 2
2. Branchlets quadrangular; petals puberulus within..... **L. bourdillonii**
2. Branchlets terete; petals glabrous within..... **L. obtusifolia**

**Loeseneriella arnottiana** (Wight) A.C. Smith, J. Arnold Arbor. 16: 174. 1945; FPL 118. 1990; FTSR 108. 1996; Ramamurthy & Naithani, Fl. Ind. 5: 140. 2000. *Hippocratea arnottiana* Wight, Ill. Indian Bot. 1: 133, t. 46. f. 47. 1840; FBI 1: 624. 1875; FPM 213. 1918.

Stragglers. Leaves 8-12 x 4-6 cm, coarsely coriaceous, elliptic, ovate, acuminate, stipules small. Panicles of cymes axillary or terminal; sepals 1 x 1.5 mm, ovate; petals 3-4 x 3-4 mm, obovate, clawed; stamens inserted on disc; ovary enclosed in the disc, 3-celled, ovule 2-10 in each cell. Fruit 7 x 2 cm, oblong, 3 winged.

*Fl. & Fr.* February-May

*Distr.* Endemic to South West India. Rare in semi-evergreen forests; *PS 18898* Muthalakkuzhi

**Loeseneriella bourdillonii** (Gamble) Ramam. in Sald. & Nicols., Fl. Hassan Dist. 315. 1976; FPL 118. 1990; FTSR 108. 1996; Ramamurthy & Naithani, Fl. Ind. 5: 140. 2000. *Hippocratea bourdillonii* Gamble, Kew Bull. 1916: 132. 1916 & FPM 213. 1918.

Climbing shrubs, branchlets 4-angled, glabrous. Leaves to 13 x 6 cm, oblong, abruptly acuminate, nerves 7-9 pairs, obscure, margins recurved. Flowers in pedunculate cymes, peduncle to 5 cm long, quadrangular; sepals 1.5 mm long, ovate, acute, pubescent; petals 6 x 2 mm, lanceolate, acute, pubescent outside; disk densely hairy along the rim; filaments 1.5 mm long; ovary projected above the disk.

*Fl. & Fr.* March-May

*Distr.* Endemic to Southern Western Ghats. Rare in evergreen forests; *PS 30146* Kariamchola

**Loeseneriella obtusifolia** (Roxb.) A. C. Smith, Amer. J. Bot. 28: 440. 1941; FPL 118. 1990; Ramamurthy & Naithani, Fl. Ind. 5: 141. 2000. *Hippocratea obtusifolia* Roxb., Fl. Ind. 1: 166. 1820; FBI 1: 623. 1875; FPM 213. 1918.

Climbing shrubs, branchlets stout looped. Leaves to 14 x 5 cm, ovate, acute at apex and base, greenish when dry; nerves 5 pairs, irregular. Panicles 8 x 6 cm, puberulus. Flowers many, 10 mm across; pedicel 3 mm long, slender, puberulus; sepals ovate, hairy outside; petals 3.5 x 2 mm, ovate, acute, hairy outside.

*Fl.* January-April

*Distr.* Paleotropics. Rare along the margins of evergreen forests; *PS 19987* Pandaravarai; *30172* Kottayali

#### SALACIA Linnaeus

**Salacia fruticosa** Heyne ex Lawson in Hook.f., FBI 1: 628. 1875; FPM 215. 1918; FTSR 108. 1996; Ramamurthy & Naithani, Fl. Ind. 5: 153. 2000.

Climbing shrubs; branchlets looped with circular lenticels. Leaves to 13 x 4 cm, oblong, acuminate at apex, rounded at base; nerves 9 pairs, regular; petiole 4 mm long. Cymes 3-9 flowered; peduncle 5-7 mm long, slender. Flowers 3 mm across, sepals 0.5 x 1 mm, orbicular, with white margins; petals orbicular; filaments 0.5 mm long; ovary not exerted above the disk. Berry to 5 x 4 cm, reddish; seeds 2.5 x 1.5 cm, ovoid, tuberculate.

*Fl. & Fr.* January-March

*Distr.* Endemic to Western Ghats. Rare in evergreen and semi-evergreen forests; *PS 30268* Pooppara

#### RHAMNACEAE

- |   |                  |
|---|------------------|
| 1. Fruit winged .....                       | <b>Ventilago</b> |
| 1. Fruit wingless .....                     | 2                |
| 2. Leaves penninerved; unarmed .....        | <b>Maesopsis</b> |
| 2. Leaves 3-5 nerved from base; Armed ..... | <b>Zizyphus</b>  |

#### MAESOPSIS Engler

**Maesopsis eminii** Engl., Pflanzenw. Ost-Afrikas, C. 255. 1895.

Medium trees; branchlets pubescent. Leaves sub-opposite, to 12 x 4 cm, lanceolate, acuminate, base oblique, obtuse, margin serrate; petiole to 2 cm, stipule subulate, cauducous. Flowers in dichasial axillary cymes, peduncle to 1.5 cm. Flowers 8 mm across, calyx 5-lobed, ovate, petals 5, to 2 mm, orbicular; stamens 5, inserted on disc; ovary ovoid, 1-celled; style small, stigma 5-furrowed. Drupe to 4 x 1.5 cm, oblong or obovoid.

*Fl. & Fr.* January-April

*Distr.* Native of Africa. Planted occasionally in premises of forest office; *PS 30753* Thunakkadavu

#### VENTILAGO J.Gaertner

**Ventilago bombaiensis** Dalz. in Hook.'s J. Bot. Kew Gard. Misc. 3: 36. 1851; FBI 1: 631. 1875; FPM 217. 1918; FPL 120. 1990; FTSR 110. 1996. *Smythea bombaiensis* (Dalz.) Banerjee & Mukherjee, Indian For. 96:214. 1970; Bhandari & Bhansali, Fl. Ind. 5: 210. 2000.

Large unarmed climbers; stem ribbed; branchlets looping. Leaves to 9 x 4 cm, elliptic-oblong, acute at either ends, crenulate; nerves 6 pairs, nerve-axils hairy, nervules parallel. Flowers 4 mm across, 20-30 together, in axillary clusters; pedicels to 5 mm long; sepals 5, triangular; petals 5, obovate, emarginate to 2-lobed, glabrous; stamens 5, disk cup-shaped; ovary 2-celled, densely hairy. Fruit subglobose with a long flattened style, 6.5 cm long.

*Fl. & Fr.* January-March

*Distr.* Endemic to Western Ghats. Common in evergreen forests; *PS 30590* Kothala; *30258* Pezha

## ZIZYPHUS P. Miller

1. Flowers in axillary and terminal, elongate, paniculate cymes ..... **Z. rugosa**
1. Flowers in axillary condensed cymes ..... 2
2. Drupes more than 2 cm diameter ..... **Z. xylopyrus**
2. Drupes to 1 cm diameter ..... 3
3. Leaves rusty below, orbicular, apex rounded ..... **Z. mauritiana**
3. Leaves not rusty below, ovate-lanceolate or oblong elliptic, apex acute or obtuse ..... 4
4. Branchlets and leaves brown silky hairy ..... **Z. oenoplia**
4. Branchlets tomentose, leaves without brown silky hairs ..... **Z. glabrata**

**Zizyphus glabrata** Heyne ex Roth, Nov. Pl. Sp. 159. 1821; FBI 1: 633. 1875; Bhandari & Bhansali, Fl. Ind. 5: 229. 2000. *Z. trinervia* Roxb., Fl. Ind. 1: 606. 1832; FPM 220. 1918.

Small unarmed trees, branchlets tomentose. Leaves 4-7 x 2-3 cm, oblong-elliptic, base obtuse, 3-nerved, margin crenate, petiole *ca* 5 mm, stipule small cauducous. Cymes axillary to 1 cm; flowers to 20, *ca* 8 mm across; calyx tube *ca* 2 mm, 5-lobed, lobes ovate, pubescent, petals greenish, obovate; stamens 5, filaments *ca* 2 mm. Disc 10-lobed, ovary, ovate, 2-celled.

*Fl. & Fr.* February-April

*Distr.* India and Bhutan. Common in dry deciduous forests; *PS 30406* Keerappadi

**Zizyphus mauritiana** Lam., Encycl. 3: 319. 1789; Bhandari & Bhansali, Fl. Ind. 5: 234. 2000. *Z. jujuba* Lam., Encycl. 3: 318. 1789; FBI 1: 632. 1875; FPM 219. 1918, non Mill. 1768. *Rhamnus jujuba* L., Sp. Pl. 194. 1753.

Armed small trees; young branches, leaves and flowers white tomentose. Leaves 2.5-5 x 1.5-3 cm, ovate, elliptic, apex rounded, base slightly oblique, coarsely crenate, basally 3-nerved, tomentose beneath. Flowers in fascicles, sessile; calyx lobes 1 mm, ovate; petals 1 mm, concave, margin strongly curved, disc of 10 grooved lobes.

*Fl.* February-April

*Distr.* India and Sri Lanka. Common in moist deciduous forests; *PS 30671* Thekkady

**Zizyphus oenoplia** (L.) Mill., Gard. Dict. (ed. 8). 3. 1768; FBI 1: 634. 1875; FPM 220. 1918; FPL 121. 1990; FTSR 110. 1996; Bhandari & Bhansali, Fl. Ind. 5: 238. 2000. *Rhamnus oenoplia* L., Sp. Pl. 194. 1753.

Large rambling climbers, thorns many, stout, recurved; branchlets densely silky hairy. Leaves 4-6.5 x 2-3 cm, ovate, acuminate, oblique at base 3-4-ribbed from the base, densely fulvous hairy, sessile or shortly petioled. Flowers 3 mm across, shortly pedicelled, 6-25 in dense axillary clusters; sepals triangular, hispid outside; petals clawed, concave, greenish yellow; disk flat, glabrous. Drupe globose, 6 x 6 mm, black.

*Fl. & Fr.* May-June

*Distr.* Tropical Asia and Australia. Very common in moist deciduous forests and degraded forest areas; *PS 19616* Vengoli

**Zizyphus rugosa** Lam., Encycl. 3: 319. 1789; FBI 1: 636. 1875; FPM 221. 1918; FPL 121. 1990; FTSR 110. 1996; Bhandari & Bhansali, Fl. Ind. 5: 241. 2000.

Scandent shrubs, thorns to 6 mm long, recurved. Leaves to 12 x 7 cm, ovate-orbicular, acute, unequally cordate at base, fulvous-tomentose beneath, coriaceous, crenulate; petiole 1 cm long. Flowers 6-20 together; subsessile, 5 mm across; sepals densely tomentose outside; disk flat, glabrous; ovary densely tomentose, 2-celled; styles 2, curved out. Drupe 8-10 mm across, white, glabrous.

*Fl. & Fr.* January-March

*Distr.* India, Sri Lanka and Myanmar. Common in moist deciduous forests; *PS 19231* Vengoli

**Zizyphus xylopyrus** (Retz.) Willd., Sp. Pl. 1: 1104. 1798; FBI 1: 636. 1875; FPM 221. 1918; FPL 121. 1990; FTSR 111. 1996; Bhandari & Bhansali, Fl. Ind. 5: 243. 2000. *Rhamnus xylopyrus* Retz., Obs. Bot. 2: 11. 1781.

Small unarmed trees; young branches pubescent. Leaves 6-8 x 3-4 cm, ovate, oblong, apex truncate, apiculate, crenate, glabrous above, tomentose below. Cymes axillary, pubescent; calyx 5-lobed, 1.5 mm, radiating; petals 2 mm, spatulate; disc 5-lobed. Drupe woody.

*Fl. & Fr.* February-May

*Distr.* India and Sri Lanka. Common in moist and dry deciduous forests; *PS 19493* Thellikkal; *30401* Kuchimudi

## VITACEAE

- |   |                     |
|---|---------------------|
| 1. Tendrils on peduncles .....              | <b>Ampelocissus</b> |
| 1. Tendrils leaf opposed .....              | 2                   |
| 2. Leaves simple .....                      | <b>Cissus</b>       |
| 2. Leaves 3 or more foliolate.....          | 3                   |
| 3. Stipule prominent; flowers bisexual..... | <b>Cayratia</b>     |
| 3. Stipule obscure; flowers unisexual ..... | <b>Tetrastigma</b>  |

### AMPELOCISSUS Planchon

**Ampelocissus tomentosa** (Heyne. ex Roth.) Planch., Vigne Amer. Eur. 8: 375. 1884; FPM 230. 1918; FPL 122. 1990. *Vitis tomentosa* Heyne ex Roth, Nov. Pl. Sp. 157. 1821; FBI 1: 650. 1875.

Scandent shrubs; branchlets and leaves densely woolly. Leaves 15 x 15 cm, broadly ovate, 3-5-lobed, lobes acute, base cordate, serrate, densely floccose beneath, basally 5-nerved, tendrils branched; petiole to 6 cm, floccose. Cymes many branched, peduncles to 7 cm; flowers 5-merous, reddish; calyx lobes 1 mm, triangular, woolly; petals 2 mm, ovate, glabrous, disc prominent; stamens 5; ovary conical, stigma sessile.

*Fl.* October-January

*Distr.* Peninsular India and Sri Lanka. Rare in moist deciduous forests; *PS 30651* Vengoli

### CAYRATIA A. L. Jussieu

- |   |                                     |
|---|-------------------------------------|
| 1. Leaves 3-foliolate, softly villous .....         | <b>C. mollissima</b>                |
| 1. Leaves 5-9 foliolate, glabrous or pubescent..... | 2                                   |
| 2. Leaves 5-foliolate.....                          | <b>C. tenuifolia</b>                |
| 2. Leaves 7-9 foliolate.....                        | 3                                   |
| 3. Stem and leaves hispid tomentose.....            | <b>C. pedata</b> var. <b>pedata</b> |
| 3. Stem and leaves glabrous.....                    | <b>C. pedata</b> var. <b>glabra</b> |

**Cayratia mollissima** (Wall.) Gagnep. in Lecomte, Notul. Syst. (Paris) 1: 345. 1911; FPM 237. 1918; FTSR 112. 1996. *Vitis mollissima* Wall. in Roxb., Fl. Ind. 2: 482. 1824; FBI 1: 656. 1875.

Weak climbers; stem scabrous. Leaflets 3, 8-12 x 4-7 cm, ovate, acuminate at apex, acute at base, distantly spineous-serrate; nerves 4 or 5 pairs, glabrous; petiole 4 cm long. Peduncle 1.5 cm long, extra-axillary, trichotomous cymes 2 x 3 cm. Flowers greenish-yellow; calyx a membranous cup, 2 mm across, entire; petals 2 x 1 mm, oblong. Berry 6 mm across, obovoid, glabrous; seeds pitted on sides

*Fl. & Fr.* January-February

*Distr.* Indo-Malesia. Common in moist deciduous forests; *PS 30303* Vengoli; *30329* Pezha

**Cayratia pedata** (Lam.) Juss. ex Gagnep. in Lecomte, Notul. Syst. (Paris) 1: 346. 1911 var. **pedata**; FPM 236. 1915; FPL 123. 1990. *Cissus pedata* Lam., Encycl. 1: 31. 1783. *Vitis pedata* (Lam.) Wall. ex Wight & Arn., Prodr. 128. 1834; FBI 1: 661. 1875. *V. canarensis* Dalz. in Hook.'s J. Bot. Kew Gard. Misc. 3: 123. 1851.

Weak climbers; stem minutely hispid. Leaflets 7-15 x 3-6 cm, ovate, acuminate, serrate,

hispid, nerves 8-10 pairs, regular, prominent; rachis 9 cm long; petiolule 1 cm long, of terminal leaflet 3.5 cm long. Cymes 7 x 8 cm, hispid; peduncle 3 cm long. Flowers 6 mm across, greenish; petals 3 x 2 mm, ovate, acute; disk a fleshy rim. Berry 1 x 1 cm, 2-4 lobed, rusty tomentose; seed 6 x 6 mm, faces rugose.

*Fl. & Fr.* April-August

*Distr.* Indo-Malesia. Occasional in secondary forests; *PS* 30400, 30388 Kuchimudi; 30440 Karimala

***Cayratia pedata*** (Lam.) Juss. ex Gagnep. var. ***glabra*** Gamble, FPM 236. 1918.

Climbers, stem glabrous. Leaflets to 11 x 5 cm, elliptic, crenate, abruptly acuminate at apex, acute to round at base, nerves 7 pairs; rachis 9 cm long; petiolule of terminal leaflets 15 mm long, of lateral ones smaller. Peduncle 5 cm long, slender; cymes 3 x 3 mm, puberulus. Flowers 1.5 mm across, greenish; calyx 4-lobed, lobes acute; ovary tomentose; style 1 mm long; stigma lobed.

*Fl.* April

*Distr.* Endemic to Southern Western Ghats. Common in moist deciduous forests; *PS* 19615 Vengoli

***Cayratia tenuifolia*** (Wight & Arn.) Gagnep. in Lecomte, Notul. Syst. (Paris) 1: 343. 1911; FPM 237. 1918; FPL 124. 1990; FTSR 112. 1996; Shetty & Paramjit, Fl. Ind. 5: 273. 2000. *Vitis tenuifolia* Wight & Arn., Prodr. 129. 1834p.p.; FBI 1: 660. 1875.

Slender climbers. Leaves pedately 5-foliolate; leaflets elliptic or obovate, acute or obtuse, crenate, glabrous, the terminal leaflets to 4-5 x 2 cm; petiole 2.5-3 cm long. Flowers in axillary, dichotomous cymes; pedicels very slender. Calyx truncate. Petals white, ovate-oblong, hooded at apex, 2.5 mm long. Disc lobed. Berry obovoid, 1 cm across; seeds 1-4.

*Fl. & Fr.* July-August

*Distr.* Indo-Malesia, China and Japan. Fairly common in moist deciduous forests; *PS* 19875 Vengoli; 19510 Orukomban

#### CISSUS Linnaeus

- |   |                       |
|---|-----------------------|
| 1. Stem 4-winged.....   | <b>C. glyptocarpa</b> |
| 1. Stem terete or angular.....                                  | 2                     |
| 2. Branchlets 4-6 angular.....                                  | 3                     |
| 2. Branchlets terete.....                                       | 4                     |
| 3. Leaf margins bristly serrate; branchlets 5 or 6 angled.....  | <b>C. discolor</b>    |
| 3. Leaf margins distantly crenate; branchlets quadrangular..... | <b>C. heyneana</b>    |
| 4. Erect shrubs; berry pyriform; petals hooded.....             | <b>C. arnottiana</b>  |
| 4. Scandent shrubs; berry globose; petals not hooded.....       | <b>C. repens</b>      |

***Cissus arnottiana*** Shetty & Singh, Kew Bull. 44: 473. 1989; Shetty & Paramjit, Fl. Ind. 5: 281. 2000. *Vitis pallida* sensu Lawson in Hook. f., FBI 1:647.1875,p.p., non Wight & Arn. *Cissus pallida* sensu Planch. in DC., Monogr. Phan. 5: 477. 1887,p.p., non Salisb. 1796.

Shrubs; tendrils simple. Leaves 9 x 10 cm, broadly ovate, apex acute, base cordate, margins glandular, dentate, basally 5-nerved, membranous; petiole to 6 cm, stipules 5 mm, ovate. Cymes axillary, leaf opposed, 3 x 6 cm; peduncles to 3 cm, puberulus; bracts 5 mm, ovate, pedicels to 5 mm; calyx truncate, 4-lobed, 1.5 mm; petals 4 mm, hooded, brown outside, white inside; stamens 4, filaments 2 mm, disc prominent, 4-lobed; ovary embedded, style 1 mm, stout.

*Fl.* April-June

*Distr.* West Himalaya and India. Common in rocky areas of moist deciduous forests; *PS* 30395 Kuchimudi

**Cissus discolor** Blume, Car. Gew. Buitenz. 39. 1823; FPM 235. 1918; FPL 124. 1990; FTSR 112. 1996; Shetty & Paramjit, Fl. Ind. 5: 282. 2000. *Vitis discolor* (Blume) Dalz. in Hook.'s J. Bot. Kew Gard. Misc. 2: 39. 1850; FBI 1: 648. 1875. *Cissus javana* DC., Prodr. 1: 628. 1824.

Creeping or climbing shrubs; stem reddish, quadrangular. Leaves 6-13 x 3-7 cm, acuminate, cordate at base, spinous serrate, usually pink beneath; petiole 1-3 cm long. Cymes 2 cm across, reddish; peduncle 1 cm long. Flowers pedicelled; calyx 2 mm across, rim white; petals reddish, 1.5 mm long; disk pubescent. Berry 4 x 3 mm, oblique-obovoid, smooth; seeds pitted.

*Fl. & Fr.* Throughout the year

*Distr.* Peninsular India and Sri Lanka. Occasional in moist deciduous forests; *PS* 19874 Vengoli; 19567 Kariamchola; 19093 Amakkundu

**Cissus glyptocarpa** (Thw.) Planch. in DC., Monogr. Phan. 5: 477. 1887; FPM 235. 1918; FPL 125. 1990; Shetty & Paramjit, Fl. Ind. 5: 285. 2000. *Vitis glyptocarpa* Thw., Enum. Pl. Zeyl. 62. 1858; FBI 1: 645. 1875.

Creepers or climbers; branches with corky wings, glabrous. Leaves to 10 x 7 cm, ovate, acuminate at apex, cordate at base, serrate, puberulus, nerves 4-7 pairs; petiole to 3 cm long. Cymes 3 x 3 cm, extra-axillary, peduncled. Flowers many, 1.5 mm long, greenish; pedicels 10 mm long; petals 2 mm long, oblong, green.

*Fl.* March

*Distr.* Peninsular India and Sri Lanka. Occasional in moist deciduous forests and plantations; *PS* 19105 Peruvripallam

**Cissus heyneana** (Wall. ex Lawson) Planch in DC., Monogr. Phan. 5: 476. 1887; FPM 234. 1918; FTSR 113. 1996; Shetty & Paramjit, Fl. Ind. 5: 285. 2000. *Vitis heyneana* Wall. ex Lawson in Hook.f., FBI 1: 647. 1875.

Weak climbers; stem terete, glaucous. Leaves to 9 x 7 cm, ovate, acuminate, cordate at base, 6-nerved, glabrous; petiole 1-2 cm long. Cymes 10 cm long, axillary, thinly hairy; peduncle 3-6 cm long, dichotomous; pedicels 3 mm long. Flowers 3 mm across, greenish; calyx tube 1 mm long, entire; petals ovate, bulged at base. Berry 8 x 6 mm, obovoid, white, smooth.

*Fl. & Fr.* February-April

*Distr.* Peninsular India and Sri Lanka. Common in moist deciduous forests; *PS* 30350 Vengoli

**Cissus repens** Lam., Encycl. 1: 31. 1783; FPM 233. 1918; Shetty & Paramjit, Fl. Ind. 5: 290. 2000. *Vitis repens* (Lam) Wight & Arn. in Wight, Cat. 58. 1833 & Prodr. 125. 1834; FBI 1: 646. 1872.

Creepers; stem glaucous, terete. Leaves 10-16 x 6-11 cm, ovate, acuminate, deeply cordate at base, 5 nerved from base, midrib with 3 pairs of lateral nerves; petiole 4-7 cm long. Cymes 5-7 cm across, glabrous; peduncle 6 cm long; junctions with orbicular bracts; pedicels 5-8 together, 1 cm long. Flowers many; calyx obtusely lobed, ciliate; petals 1.5 mm long, reddish, disk glabrous. Drupe 4 x 3 mm, oblique-obovoid, smooth

*Fl. & Fr.* September-January.

*Distr.* Indo-Malesia. Common in moist deciduous forests; *PS* 19630 Vengoli; 30624 Thekkady

#### TETRASTIGMA (Miquel) Planchon

**Tetrastigma sulcatum** (Lawson) Gamble, FPM 229. 1918; FTSR 113. 1996; Shetty & Paramjit, Fl. Ind. 5: 319. 2000. *Vitis sulcatum* Lawson in Hook.f., FBI 1: 661. 1875.

Small climbers or creepers; stem thick, tuberculate. Leaves 3-5-foliolate; leaflets ovate-elliptic, acuminate, crenate-serrate, nerves 13-15 pairs; rachis 4 cm long. Peduncle 1-2 cm long, dichotomous, glabrous. Flowers 5 mm across; sepals ovate, acute; petals 3 mm long, oblong, obtuse. Berry 2-2.5 cm across, white, glabrous; seeds 4, 10 x 5 mm, brownish.

*Fl. & Fr.* February-April

*Distr.* Endemic to Peninsular India. Rare along the margins of semi-evergreen forests; *PS* 30652 Kottayali

## LEEACEAE

LEEAE D. van Royen ex Linnaeus

- |  |                      |
|--|----------------------|
| 1. Flowers crimson-red.....              | <b>L. guineensis</b> |
| 1. Flowers greenish-yellow or white..... | <b>L. indica</b>     |

**Leea guineensis** G. Don, Gen. Syst. 712. 1831; FTSR 114. 1996; Naithani, Fl. Ind. 5: 336. 2000. *Leea wightii* Clarke, J. Bot. 19: 105. 1881; FPM 239. 1918. *L. staphylea* Wight, Ill. Indian Bot. 1. t. 58. 1845 & Ic. 1: t. 78. 1854, non Roxb., 1832.

Glabrous shrubs. Leaves bipinnate; leaflets 17 x 6 cm, ovate-lanceolate, caudate-acuminate, base truncate or acute, serrate; lateral nerves 7-10 pairs, intercostae sub-scalariform; petiolule 5-7 mm long; rachis to 23 cm long; stipules obovate, ca. 4 cm long. Cymes 2-6 cm across. Flowers crimson red, densely packed, 3-5 mm across; calyx and corolla glabrous; staminal tube shortly notched at apex. Berry 6-lobed, 6-7 mm across.

*Fl. & Fr.* April-December

*Distr.* Indo-Malesia and Africa. Common in semi-evergreen and occasional in moist deciduous forests; *PS 18946* Kothala

**Leea indica** (Burm. f.) Merr., Philipp. J. Sci. 14. 245. 1919; Ridsd., Blumea 22: 95. 1974; FPL 127. 1990; FTSR 114. 1996; Naithani, Fl. Ind. 5: 337. 2000. *Staphylea indica* Burm. f., Fl. Ind. 75, t. 23, f. 2. 1768. *Leea sambucina* Willd., Sp. Pl. 1: 1177. 1798; Wight, Ic. t. 78. 1838; Lawson in Hook. f., FBI 1: 666. 1875; FPM 240. 1918.

Shrubs to small trees. Leaves 2 or 3-pinnate; leaflets to 14 x 5 cm, oblong or elliptic-lanceolate, caudate-acuminate, serrate-dentate; lateral nerves 12-15 pairs, intercostae parallel, curved; stipules obovate-obtuse, 5 x 4 cm. Young leaves bright-red. Cymes 6 x 8 cm; peduncles 3-4 cm long, paired, axillary. Flowers greenish-white. Staminal tube shortly lobed at apex, anthers combined. Berry purple, ca. 6 mm across; seeds densely red-glandular.

*Fl. & Fr.* February-August

*Distr.* Indo-Malesia, Australia and China. Occasional in moist deciduous forests; *PS 19284* Karimala

## SAPINDACEAE

- |  |                      |
|--|----------------------|
| 1. Herbaceous climbers; leaves biternate.....                                | <b>Cardiospermum</b> |
| 1. Shrubs or trees; leaves simple pinnate.....                               | 2                    |
| 2. Leaves digitate, margins serrate.....                                     | <b>Allophylus</b>    |
| 2. Leaves pinnate, margins entire.....                                       | 3                    |
| 3. The lowest pair of the leaflets reniform, stipule like.....               | <b>Otonephelium</b>  |
| 3. All leaflets similar.....   | 4                    |
| 4. Leaf rachis broadly winged.....   | <b>Filicium</b>      |
| 4. Leaf rachis not winged.....   | 5                    |
| 5. Fruit an inflated 2 lobed capsule; bright red on maturity.....            | <b>Harpullia</b>     |
| 5. Fruit otherwise.....  | 6                    |
| 6. Fruit sparsely muriccate; petals absent.....                              | <b>Schleichera</b>   |
| 6. Fruit smooth or tubercled; petals present.....                            | 7                    |
| 7. Fruit tubercled.....  | <b>Dimocarpus</b>    |
| 7. Fruit smooth.....   | 8                    |
| 8. Drupe united at sides; petals not clawed without scales.....              | <b>Sapindus</b>      |
| 8. Drupe united at base but diverging, petals clawed with 1 or 2 scales..... | <b>Lepisanthes</b>   |

## ALLOPHYLUS Linnaeus

- |  |                      |
|--|----------------------|
| 1. Thyrsus branched; leaves glabrous.....    | <b>A. concanicus</b> |
| 1. Thyrsus unbranched; leaves pubescent..... | <b>A. cobbe</b>      |



**Allophylus cobbe** (L.) Raeusch., Nomencl. Bot. (ed. 3) 108. 1797; FBI 1: 673. 1875p.p; FPL 129. 1990; FTSR 116. 1996; Pant, Fl. Ind. 5: 346. 2000. *Rhus cobbe* L., Sp. Pl. 267. 1753. *Schmidelia rheedii* Wight, Ic. t. 964. 1845. *Allophylus rheedii* (Wight) Radlk. in Engl. & Prantl, Pflanzenf. 3:313. 1895; FPM 246. 1918.

Erect shrubs. Leaflets to 11 x 5.5 cm, obovate, abruptly acuminate, deep brown when dried, sharply serrulate, pale white-tomentose beneath; nerves 9 pairs; petiole to 7.5 cm long. Raceme to 26 cm long, slender, hispid, 1-3-branched. Flowers 2 mm across, 1-3 together, shortly pedicelled or sessile; sepals orbicular, glabrous; ovary densely hairy. Drupe 3 x 2 mm, densely hairy

*Fl. & Fr.* July-December

*Distr.* South India, Sri Lanka and South East Asia. Common in moist deciduous forests; *PS 19442* Pooppara

**Allophylus concanicus** Radlk., Sitzungsber. Math.-Phys. Cl. Koenigl. Bayer. Akad. Wiss. Muenchen 20. 230. 1890; FPM 246. 1918; FPL 129. 1990; Pant, Fl. Ind. 5: 348. 2000. *Sapindus concanicus* Radlk. var. *lanceolatus* Gamble, FPM 246. 1918.

Stragglers, branchlets brownish, lenticellate. Leaflets to 13 x 6 cm, ovate, acuminate, cuspidate; 6-nerved, serrate towards the apex, black above when dried; midrib pubescent; domatia hairy. Raceme branched, hispid. Flowers solitary or paired, 2 mm across; pedicel 1 mm long; sepals orbicular, ciliate; petals 5 mm across, densely white hairy within; filaments hairy, reddish, connective broad; disk lobes 4, globular.

*Fl. & Fr.* October-December

*Distr.* Endemic to Western Ghats. Rare in moist deciduous and semi-evergreen forests; *PS 19783* Kanthalppara

#### CARDIOSPERMUM Linnaeus

1. Leaves densely tomentose below; fruit obscurely 3-lobed..... **C. canescens**

1. Leaves sub-glabrous; fruit distinctly 3-lobed..... **C. halicacabum**

**Cardiospermum canescens** Wall., Pl. Asiat. Rar. 1: 14. t. 14. 1829; FBI 1: 670. 1875; FPM 245. 1918; FPL 130. 1990; Pant, Fl. Ind. 5: 355. 2000.

Climbing herbs; branchlets pubescent. Leaves 2-ternate; leaflets lobed, terminal 5 x 2.5 cm, acuminate, mucronate, sparsely hairy above and pubescent below; petiole 4 cm, petiolule 1.5-2 cm. Racemes axillary; flowers white; sepals 2 + 2, outer 1 mm, inner 2.5 mm, obovate; petals 2 + 2, 3 mm, upper ones oblong-obovate, basal scale to 2 mm, lower ones 2.5 mm, basal scale 1 mm; stamens 8, filaments subequal, pilose. Capsule 3.5 x 3 cm, not winged, tomentose; seeds 3, to 5 mm across, globose.

*Fl. & Fr.* June-August

*Distr.* Pantropical. Common in dry deciduous forests; *PS 19982* Keerappadi

**Cardiospermum halicacabum** L., Sp. Pl. 366. 1753; FBI 1: 670. 1875; FPM 244. 1918; FPL 130. 1990; FTSR 116. 1996; Pant, Fl. Ind. 5: 356. 2000.

Tendrillate climbers. Leaves bipinnate, 10 x 10 cm, 3-7-foliolate; leaflets to 4 x 2.5 cm, pinnatifid. Tendril trichotomous, middle one forms the cymes. Flowers 3 mm across, 3-7 together, polygamodioecious; sepals 4, ovate, acute, free; petals 4, white, oblanceolate, obtuse, hooded; stamens 8, one-sided; disk one-sided, lobed; ovary obovoid, 3-celled one ovule in each cell; style 3-fid. Capsule membranous, saccate, 1.5 x 2 cm, obcordate; seeds 3, 3 x 3 mm, globose, shining.

*Fl. & Fr.* Throughout the year

*Distr.* Tropics. Common in moist deciduous forests and degraded forest areas; *PS 19002* Thunakkadavu

## DIMOCARPUS Loureiro

**Dimocarpus longan** Lour., Fl. Cochinch. 233. 1790; FPL 131. 1990; FTSR 117. 1996; Pant, Fl. Ind. 5: 358. 2000. *Euphorbia longan* (Lour.) Steud. Nom. Bot. 1: 328. 1821. *E. longana* Lam., Encycl. 3: 574. 1792, *nom illeg.* *Nephelium longana* (Lam.) Camp., Mem. Mus. Hist. Nat. 18: 30. 1829; FBI 1: 688. 1875; FPM 252. 1918.

Medium trees. Leaves paripinnate, leaflets 4-10 pairs, 10-18 x 2.5 cm, elliptic-oblong, glaucous beneath, nerves ca. 20 pairs, petiolulate. Panicle to 30 cm long, terminal. Flowers pedicelled, polygamous, 6 mm across; sepals 3 x 2 mm, hairy outside; petals 3 x 1 mm, oblanceolate, densely hairy, deflexed; stamens 8, filaments hairy; ovary 2-lobed; ovule one in each cell, style long; stigma bifid. Fruit of 1-2 nutlets, each 1.3 x 1 cm, oblong, densely rugose, tubercled, brown.

*Fl. & Fr.* January-March

*Distr.* Indo-Malesia. Common in evergreen forests; *PS 30262* Karimala

## FILICIUM Thwaites ex J. D. Hooker

**Filicium decipiens** (Wight & Arn.) Thw., Enum. Pl. Zeyl. 408. 1864; FBI 1: 539. 1875; Pant, Fl. Ind. 5: 363. 2000. *Rhus decipiens* Wight & Arn., Prodr. 172. 1834.

Large trees, branchlets angular. Leaves imparipinnate; leaflets 6-8 pairs, 9 x 2 cm, elliptic-oblong, many-nerved; rachis winged. Panicle axillary and terminal, to 18 x 5 cm; branches glandular. Flowers polygamous, 4 mm across; sepals 2 x 1 mm, ovate, pubescent inside, ciliate; petals orbicular; disk densely white-hairy; stamens 5, filaments erect, glabrous; ovary 2-celled, glabrous; ovule one in each cell; style short. Drupe 8 x 5 mm, obovoid, glabrous; seeds 1 or 2.

*Fl. & Fr.* November-January

*Distr.* India and Sri Lanka. Rare in evergreen forests; *PS 19209* Kariamchola

## HARPULLIA Roxburgh

**Harpullia arborea** (Blanco) Radlk., Sitzungsber. Math.-Phys. Cl. Koenigl. Bayer. Akad. Wiss. Muenchen 16: 404. 1890; FPL 131. 1990; FTSR 117. 1996; Pant, Fl. Ind. 5: 365. 2000. *Ptelea arborea* Blanco, Fl. Filip. 1: 63. 1837. *Harpullia imbricata* (Blume) Thw., Enum. Pl. Zeyl. 56. 1858; FPM 253. 1918. *H. cupanoides* sensu Hiern in Hook.f., FBI 1: 692. 1875p.p., non Roxb. 1832.

Small to medium trees; branchlets fulvous tomentose. Leaves paripinnate, leaflets 5 pairs, 16 x 6 cm, elliptic-oblong, abruptly acuminate, membranous, oblique at base. Flowers in loose axillary panicle; pedicels to 4 cm long, slender; sepals 5 x 2.5 mm, obovate, hairy; petals yellow, 8 x 3 mm, oblong, clawed; stamens 5; filaments free; ovary 2-celled; one ovule in each cell; style elongate. Capsule 5 x 7 cm, 2-lobed, inflated, saccate, red; seeds black, shining.

*Fl. & Fr.* March-January

*Distr.* Indo-Malesia. Common in semi-evergreen forests; *PS 19233* Vengoli; *19292* Karimala

## LEPISANTHES Blume

1. Capsule triangular; flowers irregular..... **L. tetraphylla**  
1. Capsule tri-lobed; flowers regular..... **L. erecta**

**Lepisanthes erecta** (Thw.) Leenh., Blumea 17: 69. 1969; FPL 131. 1990; FTSR 118. 1996; Pant, Fl. Ind. 5: 368. 2000. *Nephelium erectum* Thw., Enum. Pl. Zeyl. 57. 1858. *Sapindus erecta* (Thw.) Hiern in Hook.f., FBI 1: 683. 1875, "erectus". *Thraulococcus erectus* (Thw.) Radlk., Sitzungsber. Math.-Phys. Cl. Koenigl. Bayer. Akad. Wiss. Muenchen 8: 300. 1878; FPM 251. 1918.

Shrubs. Leaves 35-50 cm long; leaflets 4 pairs, 20-25 x 5-9 cm, oblong, acute at either ends, nerves 10-13 pairs; petiole 5 mm long, smooth. Panicle 20 x 5 cm, terminal, erect. Flowers

clustered, subsessile; sepals 5 x 3 mm, ovate, obtuse, pubescent outside; petals 6 x 4 mm, obovate, broadly clawed; scale oblong, not lobed, hairy; filaments hairy above. Capsule 1.5 x 1 cm, oblong, obtuse, minutely fulvous-tomentose.

*Fl. & Fr.* January-March

*Distr.* South India and Sri Lanka. Rare in evergreen forests; *PS 19388* Karimala

**Lepisanthes tetraphylla** (Vahl) Radlk. Sitzungsber. Math.-Phys. Cl. Koenigl. Bayer. Akad. Wiss. Muenchen 8: 276. 1878; FPM 247. 1918; FPL 132. 1990; FTSR 118. 1996; Pant, Fl. Ind. 5: 372. 2000. *Sapindus tetraphylla* Vahl, Symb. Bot. 3: 1794. *Hemigyrosa canescens* (Roxb.) Blume, Rumphia 3: 166. 1849; FBI 1: 671. 1875. *Molinaea canescens* Roxb., Pl. Corom. t. 60. 1796. *Lepisanthes deficiens* (Wight & Arn.) Radlk., Sitzungsber. Math.-Phys. Cl. Koenigl. Bayer. Akad. Wiss. Muenchen 8: 276. 1878; FPM 247. 1918. *Hemigyrosa deficiens* (Wight & Arn.) Bedd., Fl. t. 231. 1872. *Sapindus deficiens* Wight & Arn., Prodr. 111. 1834.

Trees, 5-9 m high. Leaves to 30 cm long; leaflets 2-4 pairs, sub-opposite, to 15 x 5 cm, oblong-lanceolate; nerves 11 pairs, prominent; petiolule 5 mm long, transversally rugose. Panicle terminal or subterminal, erect or spreading, 35 x 20 cm, branches fulvous-tomentose. Flowers crowded; sepals 4 x 4 mm, orbicular, hairy outside; petals dull white, 7 x 4 mm, oblanceolate, clawed; scale 2-lobed, hairy. Capsule 2 x 1.5 cm, obovoid, obtusely trigonous, densely fulvous tomentose, apiculate.

*Fl. & Fr.* December-May

*Distr.* Indo-Malesia. Rare along the riverine areas; *PS 19763* Pooppara

#### OTONEPHELIUM Radlkofer

**Otonepnelium stipulaceum** (Bedd.) Radlk., Sapindac. Holl. Ind. 71. 1879; FTSR 118. 1996; Pant, Fl. Ind. 5: 378. 2000. *Nephelium stipulaceum* Bedd., Trans. Linn. Soc. London 25: 212. 1865 & Ic. t. 103. 1868-1874; FBI 1: 690. 1875; FPM 252. 1918.

Trees to 20 m high; branchlets glabrous. Leaves paripinnate, 6-8 foliolate, leaflets to 20 x 7 cm, elliptic, acuminate at either ends, glaucous below; lowest pair small, reniform; nerves 11 pairs. Panicle 15 x 8 cm, terminal or axillary. Flowers 3 mm across, crowded; sepals 6, ovate, acute, free, densely tomentose; petals absent; stamens 6, filaments free, shorter than anthers; pistillode globose, densely hairy; ovary 2-4-lobed, ovule 1 in each cell; style terminal. Fruit of 1-3 drupelets, 2 x 1.4 cm, oblong, densely soft-prickled.

*Fl. & Fr.* March-May

*Distr.* Endemic to Southern Western Ghats. Very common in evergreen forests; *PS 18815* Parambikulam; *NS 19355* Kariyilathodu

#### SAPINDUS Linnaeus

1. Leaves glabrous below ..... **S. trifoliata**  
1. Leaves densely hairy below ..... **S. emarginatus**

**Sapindus emarginatus** Vahl, Symb. Bot. 3: 54. 1794; FPM 250. 1918; Pant, Fl. Ind. 5: 381. 2000. *Sapindus trifoliata* sensu Hiern in Hook.f., FBI 1: 682. 1875, p.p., non L. 1753.

Trees, to 5 m high. Leaves 4-foliolate; leaflets 9 x 4 cm, obovate-oblanceolate, nerves 10 pairs; petiolule 6 mm long. Panicles 15 x 10 cm, spreading, tomentose. Flowers 6 mm across, pedicellate; sepals 3 x 2 mm, obovate, tomentose; petals greenish white, 3 x 1.5 mm, oblong, scales hairy; filaments tomentose.

*Fl.* December-May

*Distr.* India, Sri Lanka and Myanmar. Rare in dry deciduous forests; *PS 19980* Keerappadi

**Sapindus trifoliata** L., Sp. Pl. 367. 1753; FBI 1: 682. 1875; FTSR 119. 1996; Pant, Fl. Ind. 5: 382. 2000. *Sapindus laurifolius* Vahl, Symb. Bot. 3: 54. 1794; FPM 250. 1918; FPL 132. 1990.

Small to medium trees; bark smooth, grey. Leaflets 3-4 pairs, elliptic-lanceolate or elliptic, acuminate, glabrous, to 15 x 7 cm; lateral nerves 8-10 pairs prominent and raised below, intercostae reticulate. Panicles terminal, tomentose. Sepals tomentose. Petals linear-lanceolate, villous, 5 mm long. Ovary not lobed, tomentose.

*Fl. & Fr.* December-April

*Distr.* India and Sri Lanka. Common in semi-evergreen forests and rare in moist deciduous forests; *PS 19838* Vengoli; *NS 19034* Kannimara

#### SCHLEICHERA Willdenow

**Schleichera oleosa** (Lour.) Oken, Allg. Naturgesch. 3:1341. 1841; FPL 133. 1990; FTSR 119. 1996; Pant, Fl. Ind. 5: 384. 2000. *Pistacia oleosa* Lour., Fl. Cochinch. 615. 1790. *Schleichera trijuga* Willd., Sp. Pl. 4: 1096. 1805; FBI 1: 681. 1875; FPM 248. 1915.

Large trees; branchlets puberulus. Leaves paripinnate; leaflets 3-5 pairs, to 19 x 8 cm, sessile, oblong, acute, tomentose along the nerves below; nerves 20 pairs. Flowers polygamodioecious, 3 mm across, in terminal or axillary panicles; sepals 5, ovate, acute; petals absent; stamens 8, free, filaments 6 mm long, glabrous; ovary ovoid, 3-celled, with solitary ovule in each. Fruit 2 x 2 cm, ovoid, globose, spiny, glabrous; seeds 3, 1.5 x 1 cm, hemispheric, smooth.

*Fl. & Fr.* January-March

*Distr.* Indo-Malesia. Common in wet localities in moist deciduous forests; *PS 18889* Muthalakkuzhi

#### STAPHYLEACEAE

#### TURPINIA Ventenat

**Turpinia malabarica** Gamble, Kew Bull. 1917: 135. 1916. & FPM 241. 1918; FPL 128. 1990; FTSR 115. 1996; Pant, Fl. Ind. 5: 415. 2000.

Trees to 20 m tall; branchlets brown. Leaves to 40 cm long; leaflets broadly elliptic, crenate, acuminate at apex; petiolule 0.7-2 cm long. Panicles 20 x 15 cm, glabrous, axillary; peduncle to 10 cm long. Flowers greenish yellow, pedicelled; sepals 3 mm long, ovate, slightly connate at base, obtuse, ciliate; filaments villous; style 3-fid at apex. Berry globose, brown, scurfy.

*Fr. & Fr.* July-December

*Distr.* Endemic to Southern Western Ghats. Common in evergreen forests; *PS 30306* Pezha; *30026* Puliya; *18879* Parambikulam

#### SABIACEAE

1. Climbing shrubs; staminodes absent ..... **Sabia**  
1. Trees; staminodes present ..... **Meliosma**

#### MELIOSMA Blume

1. Leaves simple ..... **M. simplicifolia**  
1. Leaves imparipinnate ..... **M. pinnata** var. **barbulata**

**Meliosma pinnata** (Roxb.) Maxim. ssp. **barbulata** (Cufod.) Beus. in Dassan. & Fosb., Rev. Handb. Fl. Ceylon 3: 384. 1981; FPL 133. 1990; Majumder, Fl. Ind. 5: 423. 2000. *M. rhoifolia* Maxim., ssp. *barbulata* Cufod., Oest. Bot. Z. 88. 254. 1939. *Millingtonia arnottiana* Wight, Ill. Indian Bot. 1: t.53. 1840. *Meliosma arnottiana* (Wight) Walp., Rep. 1: 423. 1842; FBI 2: 6. 1876, p.p.; FPM 256. 1918. *M. pinnata* (Roxb.) Maxim. ssp. *arnottiana* (Wight) Beus., Blumea 19: 499. 1971. *Millingtonia pinnata* Roxb., Fl. Ind. 1: 103. 1820.

Medium trees, branchlets thickly tomentose. Leaves 10-16-foliolate; leaflets opposite, to 13 x 3.5 cm, elliptic, acuminate, densely hairy, petiolulate; rachis bulged at base. Panicles terminal, 30 cm across, densely tomentose. Flowers 4 mm across, sessile; sepals ovate, hairy; petals orbicular, pale yellow; ovary densely hairy. Drupe 7 mm across, globose

*Fl. & Fr.* May-August

*Distr.* Indo-Malesia. Common in semi-evergreen forests; *PS 19461* Pooppara

**Meliosma simplicifolia** (Roxb.) Walp. Rep. 1: 103. 1842; FBI 2: 5. 1876; FPM 256. 1918; FPL 134. 1990; FTSR 120. 1996; Majumder, Fl. Ind. 5: 427. 2000. *Millingtonia simplicifolia* Roxb., Pl. Corom. 3: 50. t.254. 1820, p.p.

Small trees; branchlets glabrous. Leaves to 30 x 10 cm, oblanceolate, acute at apex, glabrous; nerves 16 pairs, regular, scabrid, young leaves crimson-red; petiole to 5 cm long. Flowers 2 mm across, in large axillary panicles; sepals 5, free, ovate, ciliate, petals 3, white, imbricate, glabrous. Drupe 5 mm across, ampulliform, glabrous.

*Fl. & Fr.* March-October

*Distr.* Indo-Malesia and China. Rare in moist deciduous, evergreen and semi-evergreen forests; *PS 19293* Karimala; *19757* Pooppara

#### SABIA Colebrooke

**Sabia limoniacea** Wall. ex Hook.f. & Thoms., Fl. Ind. 1: 210. 1855; FTSR 120. 1996; Majumder, Fl. Ind. 5: 432. 2000. *S. malabarica* Bedd., lc. 39, t. 177. 1868-1874; FBI 2: 2. 1876; FPM 254. 1918.

Branchlets glabrous. Leaves oblong-lanceolate, base rounded, glabrous, coriaceous, to 12 x 4 cm; lateral nerves ca. 5 pairs, intercostae reticulate, prominent; petiole 1.5 cm long. Cymes solitary and axillary to new leaves or in paniced cymes in the axils of old leaves. Sepals ciliate along margins. Petals suborbicular, white, 1 mm across. Ovary globose, glabrous.

*Fl. & Fr.* April-May

*Distr.* Indo-Malesia and China. Rare along the margins of evergreen forests; *PS 19457* Pooppara

#### ANACARDIACEAE

1. Leaves simple .....	4
1. Leaves compound .....	2
2. Drupe more than 3 x 2 cm; ovary 5-celled.....	<b>Spondias</b>
2. Drupe less than 1.5 cm across; ovary 1-celled .....	3
3. Leaflets crenulate; petals valvate .....	<b>Solenocarpus</b>
3. Leaflets entire; petals imbricate .....	<b>Lannea</b>
4. Leaves with petiolar appendages.....	<b>Holigarna</b>
4. Leaves without petiolar appendages .....	5
5. Drupe on fleshy hypocarp .....	6
5. Drupe not on fleshy hypocarp .....	7
6. Leaves to 15 cm long; all stamens not fertile.....	<b>Anacardium</b>
6. Leaves more than 25 cm long; all stamens fertile .....	<b>Semecarpus</b>
7. Flowers in axillary or terminal racemes or small compound racemes .....	<b>Nothopegia</b>
7. Flowers in axillary or terminal large panicles.....	8
8. Leaves and branchlets pubescent .....	<b>Buchanania</b>
8. Leaves and branchlets glabrous.....	<b>Mangifera</b>

#### ANACARDIUM Linnaeus

**Anacardium occidentale** L., Sp. Pl. 583. 1753; FBI 2: 20. 1876; FPM 260. 1918; Dali & Mukherjee, Fl. Ind. 5: 437. 2000.

Small trees. Leaves to 15 x 7 cm, obovate, obtuse, base cuneate-rotund. Panicles terminal; flowers unisexual and bisexual, to 1 cm; calyx 5, lanceolate; petals 5, oblong-elliptic; stamens to 10, 1-fertile, base of the filaments connate; ovary 1-celled; style to 1 cm. Drupe reniform, 3 x 1 cm, hypocarp pyriform, to 6 x 3 cm.

*Fl. & Fr.* February-May

*Distr.* Native of South America; now widely cultivated in Asia and Africa. Cultivated in settlements

#### BUCHANANIA Sprengel

**Buchanania lanzan** Spreng., J. Bot. (Schr.) 2: 234. 1800; FBI 2: 23. 1876; FPM 258. 1918; FPL 136. 1990; Dali & Mukherjee, Fl. Ind. 5: 443. 2000. *B. latifolia* Roxb., Fl. Ind. 2: 385. 1832.

Small trees; branchlets stout, rusty tomentose. Leaves simple, to 20 x 12 cm, oblong, obtuse at apex, round at base, coriaceous, densely hairy below, nerves 19 pairs, prominent; petiole 1 cm long, stout. Panicle to 15 x 25 cm, terminal, branches stout, densely rusty-tomentose. Flowers many, clustered, bisexual, 6 mm across, sessile; sepals 5, free, ovate; petals 5, 2 x 1 mm, ovate-oblong, glabrous; fertile stamen 1, sterile ones 4; disk densely hairy; fertile carpel 1, sterile carpels 4; style short. Drupe 1 x 0.8 cm, oblong, dark, glabrous.

*Fl. & Fr.* January-March

*Distr.* South India and Myanmar. Common in rocky areas of moist deciduous forests; *PS 19230* Vengoli

#### HOLIGARNA Hamilton ex Roxburgh

- |   |                      |
|---|----------------------|
| 1. Leaves tomentose below; bristles on petiole 2 or 3 pairs .....               | <b>H. grahamii</b>   |
| 1. Leaves glabrous; bristles on petiole one pair .....                          | 2                    |
| 2. Leaves obtusely acute at apex; drupe with a tuft of brown hairs at apex..... | <b>H. arnottiana</b> |
| 2. Leaves emarginate at apex; drupe without a tuft of hairs at apex.....        | 3                    |
| 3. Leaves oblanceolate; petals obtuse .....                                     | <b>H. ferruginea</b> |
| 3. Leaves spatulate; petals acute.....  | <b>H. nigra</b>      |

**Holigarna arnottiana** Hook. f., FBI 2: 36. 1876; FPM 268. 1918; FPL 136. 1990; FTSR 121. 1996. *H. longifolia* auct. non Roxb., 1820: Wight & Arn., Prodr. 169. 1834.

Trees; branches stout, glabrous. Leaves to 20 x 6 cm, oblanceolate, obtusely acute at apex, attenuate at base, nerves 12 pairs, brown beneath; petiole 1 cm long, pubescent; bristle one on either side. Panicle 10 x 10 cm. Flowers yellowish white, many; branches and pedicels puberulus; petals 5, ovate, acute, hirsute outside. Drupe 1.5 x 1 cm, obovoid-oblong, apex with a crown of golden brown hairs.

*Fl. & Fr.* January-April

*Distr.* Endemic to Western Ghats. Occasional in evergreen forests; *PS 30839* Orukomban

**Holigarna ferruginea** Marchand, Rev. Anacard. 171. 1868; FBI 2: 37. 1876; FPM 268. 1918; FTSR 121. 1996; Dali & Mukherjee, Fl. Ind. 5: 459. 2000.

Trees, to 25 m or more high; bark white, smooth. Leaves to 15 x 5 cm, oblanceolate, obtuse, to emarginate, olive brown below when dried; nerves 7-10 pairs; petiole 2.5 cm long, Bristles 1 or 2, short. Panicles 10 x 10 cm, terminal; branches thick, dark purple-tomentose. Flowers 3 mm across, densely dark purple-tomentose; petals rose, ovate, obtuse. Drupe 2.5 x 1 cm, obovoid, obtuse, narrowed to the base, glabrous.

*Fl. & Fr.* March-May

*Distr.* Endemic to Western Ghats. Rare along the margins of evergreen forests; *PS 30129* Karimala; *PS 19641* Orukomban

**Holigarna grahamii** (Wight) Kurz, J. Asiat. Soc. Bengal 42: 305. 1872; FBI 2: 37. 1876; FPM 268. 1918; FPL 136. 1990; FTSR 121. 1996; Dali & Mukherjee, Fl. Ind. 5: 460. 2000. *Semecarpus grahamii* Wight, Ic. t. 235. 1839. *Holigarna wightii* Balakr., JBNHS 63: 327. 1966.

Trees, to 30 m high; sap very acrid; branchlets stout; densely fulvous-tomentose. Leaves to 40 x 20 cm, oblanceolate, suddenly widening above the middle, glabrous above, densely golden brown tomentose below, nerves more than 30 pairs, prominent, regular, parallel. Panicle 20 x 35 cm, terminal, densely fulvous-hairy. Flowers many, sessile; sepals cupular, 4 or 5-toothed; petals dull white, 2.5 x 1.5 mm, densely hairy; filaments 3 mm long, glabrous.

*Fl. & Fr.* October-March

*Distr.* Endemic to Western Ghats. Common in evergreen forests at lower altitudes; *PS 19608* Kariamchola; *30163* Pezha

**Holigarna nigra** Bourd., Indian For. 30: 95. 1904; FPM 268. 1918; FPL 137. 1990; Dali & Mukherjee, Fl. Ind. 5: 462. 2000.

Medium trees. Leaves to 15 x 5 cm, spatulate rounded, cuneate. Racemes to 12 cm, sparsely branched, densely brown fulvous tomentose; flowers sessile, 8 mm across, hairy. Drupe 4 x 1.5 cm, obovoid, glabrous.

*Fl. & Fr.* March-May

*Distr.* Endemic to Southern Western Ghats. Rare in evergreen forests at higher altitudes; *PS 30769* Karimala

#### LANNEA A. Richard

**Lannea coromandelica** (Houtt.) Merr., J. Arnold Arbor. 19: 353. 1938; FPL 137. 1990; FTSR 122. 1996; Dali & Mukherjee, Fl. Ind. 5: 463. 2000. *Dialium coromandelicum* Houtt., Nat. Hist. ser. 2. 2: 39. t. 5. f. 2. 1774. *Odina wodier* Roxb., Fl. Ind. 2: 293. 1832; FBI 2: 29. 1876; FPM 263. 1918.

Small deciduous trees, to 10 m high; bark reddish inside; branches glabrous. Leaves pinnate; leaflets opposite, 4-5 pairs, 8-10 x 4-5 cm, ovate, lanceolate, glabrous. Panicle to 15 x 15 cm, terminal, stellate-hairy. Flowers clustered, unisexual, monoecious, 4 mm across; sepals 4, ovate, acute, spreading; petals 2 x 1 mm, obovate, obtuse; stamens 8-10 in male flowers, free, all fertile; filaments glabrous; ovary 1-celled, ovule solitary. Fruit a drupe, 10 x 6 mm, ovoid, glabrous.

*Fl. & Fr.* January-April

*Distr.* Indo-Malesia and China. Common in rocky areas of moist deciduous forests; *PS 19229* Vengoli; *PS 30109* Karimala

#### MANGIFERA Linnaeus

**Mangifera indica** L., Sp. Pl. 200. 1753; FBI 2: 13. 1876; FPM 259. 1918; FPL 138. 1990; FTSR 122. 1996; Dali & Mukherjee, Fl. Ind. 5: 466. 2000.

Trees, to 20 m high; bark rough with vertical fissures. Leaves alternate, usually clustered towards the apex, to 22 x 5 cm, oblong, acute at either ends, coriaceous; nerves 30, parallel; petiole to 2 cm long. Panicles usually terminal, to 20 x 10 cm or larger, densely hispid. Flowers many, unisexual, 8 mm across; sepals 2 x 1.5 mm, triangular; petals dull yellow, 4 x 1.5 mm, oblong, curved; fertile stamens 1; ovary 1-celled, ovule solitary; style lateral. Drupe 5 x 3 cm, oblong, mesocarp fleshy; endocarp fibrous; seed sub-reniform.

*Fl. & Fr.* April-May

*Distr.* India, Myanmar, Thailand. Common in evergreen forests; *PS 30300* Vengoli

#### NOTHOPEGIA Blume

1. Branchlets and petiole glabrous; raceme to 5 cm long ..... **N. colebrookeana**
1. Branchlets and petiole variously pubescent; racemes to 1 cm long ..... 2
2. Intercostae parallel; leaf apex abruptly long acuminate ..... **N. travancorica**
2. Intercostae reticulate; leaf apex obtusely acute ..... **N. heyneana**

**Nothopegia colebrookeana** (Wight) Blume, Mus. Bot. Lugd.-Bat 1: 203. 1850; FBI 2: 40. 1876; FPM 265. 1918; FTSR 124. 1996; Dali & Mukherjee, Fl. Ind. 5: 474. 2000. *Pegia colebrookeana* Wight, Ic. t. 230. 1839.

Trees to 5 m high; branchlets dark, lenticellate. Leaves to 12 x 4 cm, obovate, attenuate at base, shining above, pale white beneath; nerves 19-21 pairs, regular; petiole 1 cm long. Panicle 5 x 2 cm, congested, rusty tomentose. Flowers 2 mm across, densely rusty-tomentose; sepals 4, ovate, acute; petals oblong, puberulus inside, densely tomentose outside; stamens 4, filaments glabrous. Drupe 9 x 6 mm, ovoid, acute, black.

*Fl. & Fr.* December-January

*Distr.* India and Sri Lanka. Common in evergreen forests; *PS 30353* Orukomban; *30222* Karimala

**Nothopegia heyneana** (Hook. f.) Gamble, FPM 265. 1918; Dali & Mukherjee, Fl. Ind. 5: 476. 2000. *N. colebrookeana* (Wight) Blume var. *heyneana* Hook.f., FBI 2: 40. 1876.

Shrubs, branchlets slender. Leaves to 9 x 2 cm, oblong, acute at apex and base, brown when dried; nerves ca. 20 pairs; intercostae irregular; petiole 5 mm long. Raceme 1 cm long, axillary. Flowers 5-6 mm across; sepals 4, triangular, glabrous; petals 4 x 1.5 mm, oblong, acute, glabrous; stamens 4, filaments 1 mm long, erect; ovary conical; stigma capitate.

*Fl. & Fr.* May-June

*Distr.* Endemic to Peninsular India. Rare in evergreen forests at higher altitudes; *PS 30221* Karimala

**Nothopegia travancorica** Bedd. ex Hook.f., FBI 2: 40. 1876; FPM 265. 1918; FTSR 124. 1996; Dali & Mukherjee, Fl. Ind. 5: 477. 2000.

Shrubs; branchlets lenticellate, ferruginous tomentose. Leaves to 14 x 4 cm, elliptic-oblong, obtusely acuminate at apex, nerves 15 pairs, prominent; yellow; intercostae regular, closely parallel; petiole 1 cm long, curved. Flowers in axillary fascicles, 2-3 together; calyx ferruginous tomentose; petals 1.5 mm long, ovate, acute, hairy inside, ciliate.

*Fl. & Fr.* December-May

*Distr.* Endemic to Southern Western Ghats. Rare in evergreen forests; *PS 30696* Orukomban

#### SEMECARPUS Linnaeus f.

1. Leaves below and inflorescence tomentose ..... **S. anacardium**

1. Leaves and inflorescence glabrous..... **S. travancorica**

**Semecarpus anacardium** L. f., Suppl. Pl. 182. 1781; FBI 2: 30. 1876; FPM 266. 1918; FPL 139. 1990; FTSR 124. 1996; Dali & Mukherjee, Fl. Ind. 5: 500. 2000.

Small to medium deciduous trees; bark greyish-brown, red inside; young shoots sericeous. Leaves oblong-elliptic or obovate, emarginate or retuse, base subcordate or acute, to 30 x 15 cm, lateral nerves 10-15 pairs, intercostae reticulate; petiole to 4 cm long. Flowers yellowish white; panicles to 20 cm long. Calyx lobes ovate, margins ciliate. Disc villous. Filaments glabrous.

*Fl. & Fr.* February-April

*Distr.* Indo-Malesia to Australia. Rare in dry areas of moist deciduous forests; *PS 30448* Anappadi

**Semecarpus travancorica** Bedd., Fl. Sylv. t. 232. 1872; FBI 2: 31. 1876; FPM 267. 1918; FTSR 124. 1996; Dali & Mukherjee, Fl. Ind. 5: 504. 2000.

Large trees; bark dull brown. Leaves 20-40 x 12-20 cm, obovate, obtuse or acute at apex and base, coriaceous; nerves to 16 pairs, prominent, regular; petioles 5 cm long. Panicle 30 x 5 cm, axillary, glabrous. Flowers many, 1.5 mm across; sepals ovate, ciliate; petals white, oblong, acute, glabrous. Drupe 2.5 x 1.5 cm, compressed; pseudocarp 1.5 x 1 cm, globose, brown, striate.



*Fl. & Fr.* February-August

*Distr.* Endemic to Southern Western Ghats. Fairly common in evergreen forests; *PS 30279* Pooppara

#### SOLENOCARPUS Wight & Arnott

**Solenocarpus indicus** Wight & Arn., Prodr. 172. 1834; FTSR 125. 1996; Dali & Mukherjee, Fl. Ind. 5: 505. 2000. *Spondias indica* (Wight & Arn.) Airy Shaw & Forman, Kew Bull. 21: 16. 1967-1968; FBI 2: 27. 1876; FPM 262. 1918; FPL 139. 1990.

Small trees, sometimes epiphytic; bark brown, rough; branchlets slender. Leaves pinnately compound; leaflets 6 pairs, opposite or subopposite, 6-7 x 2-3 cm, ovate-lanceolate, acuminate, sessile, many-nerved, base obliquely cordate. Panicle to 20 x 20 cm, axillary or terminal, spreading. Flowers many, bisexual, 3 mm across; calyx 5-lobed, lobes small, imbricate; petals 5, ovate, white; stamens 10, inserted outside the disk; ovary sessile, uni-locular; ovule solitary, pendulous. Drupe 8 x 5 mm, obovoid, smooth.

*Fl. & Fr.* November-March

*Distr.* Endemic to Peninsular India. Common in rocky areas of moist deciduous forests; *PS 30396* Kuchimudi; *NS 30501* Muthuvarachal; *PS 19650* Vengoli

#### SPONDIAS Linnaeus

**Spondias pinnata** (L. f.) Kurz, Prelim. Rep. For. & Veg. Pegu Append. A. 44. & B. 42. 1875; FPL 139. 1990; FTSR 125. 1996; Dali & Mukherjee, Fl. Ind. 5: 507. 2000. *Mangifera pinnata* L. f., Suppl. Pl. 156. 1781. *Spondias mangifera* Willd., Sp. Pl. 2: 751. 1799; FBI 2: 42. 1876; FPM 261. 1918.

Large trees; bark yields a gum; branchlets stout, white. Leaves pinnate; leaflets 10 x 4 cm, opposite, oblong-acuminate; many-nerved, nerves parallel, forming an intramarginal vein. Panicle to 25 x 20 cm, terminal, glabrous. Flowers 6 mm across, sessile; sepals 5, triangular; petals 5, 3 x 1 mm, oblong, glabrous; fertile stamen 1, staminodes 9; ovary 4-5-celled; ovule 1 in each cell; styles 4 or 5. Drupe 4 x 2.5 cm, ovoid-oblong, smooth.

*Fl. & Fr.* November-March

*Distr.* Indo-Malesia. Common in semi-evergreen and rare in moist deciduous forests; *PS 19369* Orukomban

### CONNARACEAE

#### CONNARUS Linnaeus

1. Leaflets glabrous; valves of the follicles velvety within ..... **C. sclerocarpus**
1. Leaflets tomentose along the nerves below; valves of follicles glabrous within ..... **C. monocarpus**

**Connarus monocarpus** L., Sp. Pl. 675. 1753; FBI 2: 50. 1876; FPM 272. 1918; FPL 141. 1990; FTSR 126. 1996; Mondal, Fl. Ind. 5: 526. 2000.

Large climbing shrubs; branchlets glabrous. Leaflets 9 x 4 cm, ovate, obtusely acuminate; nerves 5-7 pairs, reddish brown beneath; petiole 8 mm long. Panicles to 15 x 10 cm, terminal, branches fulvous-tomentose. Flowers many; pedicels hispid; sepals 4 x 1.5 mm, oblong, obtuse, hispid outside; petals 8 x 2 mm, acute, hispid outside; filaments glandular-hairy; ovary densely hairy. Capsule 5 x 2.5 cm, biconvex, stipitate, reddish, glabrous inside; seeds polished.

*Fl. & Fr.* May-December

*Distr.* Peninsular India and Sri Lanka. Rare along the margins of evergreen forests; *PS 30241* Pezha; *NS 18866* Karimthalappara

**Connarus sclerocarpus** (Wight & Arn.) Schellenb., Candollea 2: 98. 1925; FPM 273. 1918; FPL 141. 1990; Mondal, Fl. Ind. 5: 531. 2000. *Rourea ? sclerocarpa* Wight & Arn., Prodr. 262. 1839.

Large climbers. Leaflets 6-8 x 2-3.5 cm, elliptic, acute at base and apex; nerves 3 or 4 pairs, basal pair opposite, rib like; petiole 5 mm long. Panicles 10 x 10 cm, terminal, densely brown tomentose. Flowers light pink; pedicels very short; sepals yellow, 3 x 1.5 mm, densely tomentose outside; petals 7 x 2 mm, oblanceolate, obtuse, densely hairy; style 5 mm long, densely tomentose.

*Fl. & Fr.* March-June

*Distr.* Endemic to Southern Western Ghats. Rare in secondary forests; *PS 30424* Pezha

## FABACEAE

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2. Pods orbicular, 1 seeded.....	<b>Pterocarpus</b>
2. Pods oblong or linear many seeded.....	3
3. Leaves trifoliolate.....	4
3. Leaves many foliolate .....	7
4. Lianas.....	5
4. Trees.....	6
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5. Stamens diadelphous.....	<b>Spatholobus</b>
6. Keel petals much shorter than the standard.....	<b>Erythrina</b>
6. Keel petals longer than or equal to the standard.....	<b>Butea</b>
7. Pods winged.....	<b>Derris</b>
7. Pods not winged.....	8
8. Flowers in axillary racemes or an old wood.....	<b>Castanospermum</b>
8. Flowers in axillary or terminal panicles or cymes.....	9
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9. Leaflets opposite; pods woody .....	10
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11. Herbaceous climbers .....	12
11. Erect herbs or shrubs.....	21
12. Leaflets 8-15 pairs.....	<b>Abrus</b>
12. Leaflets 3.....	13
13. Stamen monadelphous .....	14
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14. Inflorescence rachis not swollen at nodes .....	15
15. Flowers white; pods without hooked horn .....	<b>Neonotonia</b>
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16. Pods 1 or 2 seeded .....	<b>Rhynchosia</b>
16. Pods more than 4 seeded .....	17
17. Calyx lobes obscure .....	<b>Dumasia</b>
17. Calyx lobes distinct .....	18
18. Keel petal twisted; stigma oblique.....	<b>Vigna</b>
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19. Pods densely tomentose or bristly.....	20
20. Anthers uniform .....	<b>Shuteria</b>
20. Anthers dimorphic.....	<b>Mucuna</b>

21. Anthers dimorphic.....	22
21. Anthers uniform .....	25
22. Leaves bifoliolate .....	<b>Zornia</b>
22. Leaves 1 or 3 foliolate.....	23
23. Flowers axillary solitary .....	<b>Goniogyna</b>
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25. Leaves 1-foliolate or odd-pinnate .....	26
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28. Calyx herbaceous; Joint of pods not turgid .....	<b>Desmodium</b>
29. Pods 1 or 2 seeded .....	<b>Flemingia</b>
29. Pods 3 or more seeded.....	30
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32. Leaves 3-foliolate.....	33
33. Flowers axillary solitary or in 3 flowered fascicles.....	<b>Rothia</b>
33. Flowers in axillary or terminal racemes or panicles .....	<b>Cajanus</b>

#### ABRUS Adanson

- |  |                       |
|--|-----------------------|
| 1. Pods to 5 cm long; leaflets mucronate .....     | <b>A. precatorius</b> |
| 1. Pods to 10 cm long; leaflets not mucronate..... | <b>A. pulchellus</b>  |

**Abrus precatorius** L., Syst. Nat. (ed. 12) 2: 472. 1767; FBI 2: 175. 1876; FPM 349. 1918; FPL 145. 1990; FTSR 129. 1996. *Glycine abrus* L., Sp. Pl. 753. 1753.

Twining herbs, glabrous. Leaves paripinnate, leaflets opposite, to 11 pairs, to 3 x 1 cm, oblong, obtuse, chartaceous, terminal leaflets larger; stipule lanceolate, deflexed. Flowers crowded in short tubercles, on long axillary raceme; calyx cupular, truncate; petals to 1 cm long, mauve, standard obovate; wings falcate, clawed; keel oblong; stamens monadelphous; ovary densely hairy. Pods 7 x 1 cm, oblong, slightly curved, compressed, glabrous; seeds many, 6 x 4 mm, dark red.

*Fl. & Fr.* November-February

*Distr.* Pantropical. Common in moist deciduous forests; *PS 30744* Thellikkal

**Abrus pulchellus** Wall. ex Thw., Enum. Pl. Zeyl. 91. 1859; FBI 2: 175. 1876; FPM 350. 1918; FTSR 129. 1996. *A. fruticosus* sensu Bret., Blumea 10: 612. 1960, p.p.

Twining herbs, stem slender, hispid. Leaves to 12 cm long; leaflets 8-10 pairs, oblong, obtuse, base subcordate, glabrous, to 4 x 1.5 cm. Flowers pink, in short few-flowered axillary racemes. Calyx hispid. Pods to 10 x 1 cm; seeds ca. 10, orbicular, 4-5 mm across.

*Fl. & Fr.* November-February

*Distr.* Indo-Malesia and China. Rare along the margins of evergreen forests; *PS 19900* Kariamchola

## ALYSICARPUS Necker ex Desvaux

1. Leaves ovate to orbicular ..... **A. vaginalis**
1. Leaves oblong to lanceolate ..... 2
2. Racemes interrupted ..... **A. bupleurifolius**
2. Racemes not interrupted ..... **A. heterophyllus**

**Alysicarpus bupleurifolius** (L.) DC., Prodr. 2: 352. 1825; FBI 2: 158. 1876; FPM 338. 1918; FPL 146. 1990; FTSR 130. 1996. *Hedysarum bupleurifolium* L., Sp. Pl. 745. 1753.

Erect herbs. Leaves to 4 x 0.9 cm, oblong, acute, cordate or rounded at base, ciliate; petiole 3 mm long; stipule 1 cm long. Racemes 10-15 cm long, interrupted; bracts 7 x 5 mm, chaffy. Flowers grouped; calyx 10 mm long, lobes ciliate at apex; petals bluish violet. Pods 2 cm long; joints reticulate, smooth.

*Fl. & Fr.* November-January

*Distr.* Indo-Malesia to Polynesia. Common in degraded forest areas; *PS 19749* Pezha; *NS 19619* Vengoli

**Alysicarpus heterophyllus** (Benth. ex Baker.) Jafri & Ali, Biologia (Lahore) 12: 33. 1966. *A. vaginalis* (L.) DC. var. *heterophyllus* Benth. ex Baker in Hook.f., FBI 2: 158. 1876.

Procumbent herbs; stem strigose along one line. Leaves to 6 x 0.5 cm, linear-oblong, acute, minutely hairy below, base rounded; petiole 5 mm long; stipule 2 x 0.3 cm, lanceolate, acuminate, straw-coloured. Raceme to 5 cm long, terminal; bracts 7 x 4 mm, ovate, acute; calyx 10 mm long, lobes strongly ciliate at apex; standard pink, 8 mm long.

*Fl. & Fr.* October-December

*Distr.* India, Sri Lanka and Afghanistan. Common in moist deciduous forests; *PS 19881* Velayudhankai

**Alysicarpus vaginalis** (L.) DC., Prodr. 2: 353. 1825; FBI 2: 158. 1876; FPM 338. 1918; FPL 146. 1990; FTSR 130. 1996. *Hedysarum vaginalis* L., Sp. Pl. 746. 1753. *Alysicarpus cylindricus* (Lam.) Desv., Ann. Linn. Soc. Paris 4: 301. 1826.

Procumbent herbs, stem glabrous. Leaves to 3 x 1.5 cm, ovate, obtuse, cordate at base, thinly villous below; petiole 1 cm long; stipule 10 x 2 mm, lanceolate. Racemes 3-6 cm long, terminal; bract 4 mm long, glabrous. Flowers paired; pedicels 2 mm long, slender; standard 5 mm long, pink. Pods 2 x 0.2 cm, jointed, joints 7, rectangular, minutely hooked-hairy.

*Fl. & Fr.* August-December

*Distr.* Old World tropics; introduced in America. Common in degraded forest areas; *PS 30211* Vengoli; *PS 19040*, *NS 18981* Thunakkadavu

## BUTEA Roxburgh ex Willdenow

**Butea monosperma** (Lam.) Taub. in Engl. & Prantl, Pflanzenf. 3: 366. 1894; FPL 147. 1990. *Erythrina monosperma* Lam., Encycl. 1: 391. 1785. *Butea frondosa* Koen. ex Roxb., Asiat. Res. 3: 369. 1792 & Pl. Corom. t. 21. 1795; FBI 2: 194. 1876; FPM 357. 1918.

Deciduous trees; branchlets densely tomentose. Terminal leaflets 14 x 15 cm, rhomboid-obovate, emarginate at apex, pubescent on both sides when young, lateral leaflets 15 x 14 cm, oblique, obovate-oblong; petiole to 12 cm, petiolule 0.5 cm, jointed. Panicles axillary or terminal, cauliflorous; flowers bright red; calyx tube 1 cm, campanulate, tomentose, upper two connate, teeth 3 mm; standard petal 5 x 2.5 cm, lanceolate, clawed, 8 mm; wings falcate, 4.5 x 1.5 cm; keel united 4.5 x 3 cm, curved, tomentose outside; staminal tube 6 cm, hairy at the base; ovary 2.5 cm, style 4.5 cm, pubescent. Pods 16 x 5 cm, flat, tomentose.

*Fl. & Fr.* February-July

*Distr.* Tropical Asia. Occasional in moist deciduous forests; *PS 19141* Kariamchola

## CAJANUS A. P. de Candolle

1. Erect shrubs..... **C. lineatus**  
1. Climbing or creeping herbs ..... **C. heynei**

**Cajanus heynei** (Wight & Arn.) van der Maesen, Agri. Univ. Wagen. 85-4: 129. 1985; FTSR 131. 1996. *Dunbaria heynei* Wight & Arn., Prodr. 258. 1834; FBI 2: 217. 1876; FPM 370. 1918. *D. oblonga* Arn., Nov. Acta Phys. Med. Acad. Caes. Leop. Carol. Nat. Cur. 18: 333. 1836.

Twining herbs, stem patently hairy. Leaflets obovate, caudate-acuminate, lateral leaflets oblique, tomentose, to 7 x 4.5 cm, lateral nerves ca. 5 pairs, impressed above; petiole to 6 cm long. Flowers 2 cm long, confined to the tip of axillary racemes. Calyx red, pubescent. Petals yellow. Ovary pilose, style tomentose. Pods villous, 3 cm long; 4-5 seeded.

*Fl. & Fr.* October-February

*Distr.* South West India, Sri Lanka and Indo-China. Common in secondary forests; *PS 30198* Kothala; *18841* Kuriarkutty

**Cajanus lineatus** (Wight & Arn.) van der Maesen, Agri. Univ. Wagen. 85-4: 143. 1985; FTSR 131. 1996. *Atylosia lineata* Wight & Arn., Prodr. 258. 1834; FBI 2: 213. 1876; FPM 368. 1918; FPL 147. 1990. *A. lawii* Wight, Ic. t. 93. 1835.

Erect shrubs, branchlets silky tomentose. Leaflets subsessile, obovate or rhomboid, mucronate, base acute, grey tomentose beneath, to 4 x 1.5 cm, 3-ribbed from the base; petiole to 1.5 cm long. Flowers yellow, 1.3 cm long, in axillary pairs. Calyx tomentose, lobes deltoid, acuminate. Ovary densely villous. Pods densely hairy, 2 x 0.8 cm; seeds 3.

*Fl. & Fr.* June-January

*Distr.* Endemic to Western Ghats. Common in grasslands; *PS 19280* Karimala; *19952* Karimala

## CANAVALIA A. P. de Candolle

**Canavalia cathartica** Thouars in Desv., J. Bot. 1: 81. 1813; FTSR 132. 1996. *C. virosa* (Roxb.) Wight & Arn., Prodr. 253. 1834 p.p.; FPM 359. 1918. *Dolichos virosus* Roxb., Fl. Ind. 3:301. 1832. *Canavalia ensiformis* DC. var. *virosa* (Roxb.) Baker in Hook.f., FBI 2:196. 1876.

Climbing shrubs. Leaflets broadly ovate, acute or acuminate at apex, base rounded or truncate, subcoriaceous, to 13 x 8 cm; lateral nerves ca. 7 pairs; petiole to 6 cm long. Flowers 2.5 cm long, in axillary, 10-15 cm long racemes. Calyx hispid. Petals lilac. Ovary pubescent. Pods oblong, compressed apiculate, pubescent, to 12 x 2 cm.

*Fl. & Fr.* September-December

*Distr.* India and Sri Lanka. Fairly common in deciduous forests; *PS 30831* Padippara

## CASTANOSPERMUM A. Cunningham ex W. J. Hooker

**Castanospermum australe** A. Cunn. & Fraser ex Hook., Bot. Misc. 1: 241, t. 51. 1830.

Medium trees. Leaves alternate, odd-pinnate, leaflets 5-7 pairs, to 10 x 5 cm, elliptic, acute, base rounded; petiole to 5 mm. Racemes to 10 cm, axillary or on old wood, calyx to 2 cm, 5-lobed, corolla to 2.5 cm, orange-red, standard obovate, orbicular, wing and keels, oblong; stamens 5, free. Pods to 15 x 5 cm, oblong, turgid, apiculate one large; seeds subglobose.

*Fl.* flowering is not observed

*Distr.* Native of Australia. Planted in Rage Office campus

## CENTROSEMA (A. P. de Candolle) Benth

**Centrosema pubescens** Benth., Comm. Legum. Gen. 55. 1837; FPL 178. 1990; FTSR 133. 1996. *C. virginianum* (L.) Benth., Ann. Wien. Mus. 2: 120. 1838. *Clitoria virginiana* L., Sp. Pl. 753. 1753.

Twining herbs; stem covered with hooked hairs. Leaves 3-foliolate; leaflets to 7.5 x 3.5 cm, ovate-oblong, acuminate at apex, rounded at base, pubescent, stipellate; petiole 3-10 cm long; stipules ovate. Flowers 3-9-together, in umbellate racemes on long peduncles; bracts large, ovate; calyx 6 mm long, campanulate, toothed; standard 3 cm across, violet-pink, hairy on back; wings obovate, clawed; keel curved, acute; stamens monadelphous. Pods to 14 x 0.6 cm, sessile, glabrous, compressed with thick margins, cuspidate; seeds many, grey, mottled with green.

*Fl. & Fr.* Throughout the year

*Distr.* Native of America; introduced in India. Very common in moist deciduous forests and plantations; *PS 19031* Kannimara

#### CROTALARIA Linnaeus

1. Leaves trifoliolate.....	<b>C. laevigata</b>
1. Leaves simple .....	2
2. Shrubs or sub shrubs .....	3
2. Erect or prostrate herbs .....	5
3. Pods glabrous.....	<b>C. retusa</b>
3. Pods variously hairy.....	4
4. Corolla yellow; leaf margins ciliate.....	<b>C. juncea</b>
4. Corolla bluish-white; leaves glabrous.....	<b>C. heyneana</b>
5. Pods glabrous.....	6
5. Pods hairy .....	10
6. Flowers in heads or umbels.....	7
6. Flowers in racemes.....	8
7. Upper calyx lobes connate .....	<b>C. nana</b>
7. Upper calyx lobes deeply divided .....	<b>C. dubia</b>
8. Pods to 1 cm, as long as the calyx .....	<b>C. humifusa</b>
8. Pods more than 2 cm, longer than the calyx.....	9
9. Stipules lanceolate, margin ciliate; pods oblong .....	<b>C. ferruginea</b>
9. Stipules linear, margin not ciliate; pods obovoid.....	<b>C. mysorensis</b>
10. Stem quadrangular; leaf base equal.....	<b>C. clarkei</b>
10. Stem terete; leaf base unequal.....	<b>C. evolvuloides</b>

**Crotalaria clarkei** Gamble, Kew Bull. 1917: 27. 1917 & FPM 296. 1918.

Suberect herbs; stem quadrangular, pilose. Leaves to 4 x 1.3 cm, oblong, obtuse, subcordate at base, hairy below; petiole 1 mm long; stipule 5 x 3 mm, ovate, oblique. Raceme 6-10 cm long, terminal or axillary; bracts 4 x 3 mm, ovate, cordate. Flowers few; calyx 1 cm long, lobes acuminate, densely fulvous; standard 10 x 3 cm, hairy without; wings 9 x 3 mm, obtuse; keel 10 mm long, ciliate. Pods 25 x 9 mm, oblong.

*Fl. & Fr.* November-January

*Distr.* Endemic to Peninsular India. Common in grasslands; *PS 19922* Karimala

**Crotalaria dubia** Graham ex Benth. in Hook.'s London J. Bot. 2: 568. 1834; FBI 2: 73. 1876; FPM 296. 1918.

Shrubs, branchlets silky pubescent. Leaves to 5 x 2 cm, obovate, obtuse, mucronate, subsessile. Flowers in short terminal heads; bracts and bracteoles 4 mm, ovate, acuminate; calyx lobed, lobes to 4 mm; corolla yellow, standard to 1 x 0.3 cm oblong; wings 11 x 2 mm, linear, keels curved, *ca* 1 x 0.5 cm. Pods to 6 x 3 mm, 4-6 seeded; seeds 2 mm across, reniform.

*Fl. & Fr.* November-February

*Distr.* South West India, Bangladesh and Myanmar. Common in moist deciduous forests; *PS 19029* Thunakkadavu

**Crotalaria evolulooides** Wight ex Wight & Arn., Prodr. 188. 1834; FBI 2: 68. 1876; FPM 292. 1918; FPL 150. 1990; FTSR 134. 1996.

Prostrate herbs; stem pubescent. Leaves to 4 x 2 cm, ovate, obtuse, mucronate, unequal at base, pubescent below; stipule 3 mm long, deflexed. Racemes erect, 3-4 cm long; bracts 3 x 2 mm, cordate at base. Flowers 3-7 in a raceme; calyx 10 mm long, lobes lanceolate; standard 8 x 7 mm, orbicular; wings 6 x 3 mm, clawed; keel glabrous. Pods 15 x 7 mm, hairy.

*Fl. & Fr.* August-December-

*Distr.* Peninsular India and Sri Lanka. Occasional in moist deciduous forests and plantations; *PS 19106* Peruvuripallam; *19816* Kanimara

**Crotalaria ferruginea** Graham ex Benth. in Hook.f., FBI 2: 68. 1876.

Erect branched herbs, silky pubescent. Leaves to 5.5 x 1.5 cm, oblong, obovate, apex obtuse, apiculate, base cuneate, pubescent; petiole 1 mm, stipule 0.5 cm, lanceolate, ciliate. Racemes lax, 6-8 flowered; flowers yellow, pedicels 0.5 cm; sepals connate at the base, 1.5 cm, lanceolate, tomentose; keel sepal linear; standard petal 17 x 8 mm, orbicular; wings 10 x 5 mm, oblong, obtuse; keel united, 1.5 cm long, enclosing the stamens and pistil; anthers dimorphic, larger 3 mm, smaller 0.3 mm; ovary 4 mm, oblong, style constricted at the bent, 1.3 cm long, puberulus, stigma oblique. Pods 3 x 1 cm, oblong, glabrous, shining; seeds many.

*Fl. & Fr.* December-February

*Distr.* Indo-Malesia. Common in moist deciduous and rare in dry deciduous forests; *PS 19984* Keerappadi

**Crotalaria heyneana** Graham ex Wight & Arn., Prodr. 187. 1834; FBI 2: 78. 1876; FPM 297. 1918; FPL 150. 1990; FTSR 134. 1996.

Erect shrubs; stem 3-angled, villous. Leaves to 9 x 7 cm, ovate, obtuse, cuneate at base, minutely hairy below; stipule 7 mm broad, semi-lunar. Raceme to 20 cm long, terminal; bracts deflexed. Flowers numerous; pedicels 6-7 mm long, bracteolate at middle; calyx 8 mm long, lobes ovate, acuminate, thinly hairy; petals white or bluish white; standard 12 x 8 mm, glabrous; wings 10 x 6 mm; keel glabrous. Pods 35 x 13 mm, minutely hispid, clawed.

*Fl. & Fr.* October-January

*Distr.* Endemic to Southern Western Ghats. Occasional in moist deciduous forests and plantations; *PS 19052* Thunakkadavu

**Crotalaria humifusa** Graham ex Benth. in Hook.'s London J. Bot. 2: 476. 1843; FBI 2: 67. 1876; FPM 292. 1918; FPL 150. 1990; FTSR 134. 1996.

Prostrate herb; stem villous. Leaves to 5 x 3.5 cm, ovate, obtuse, pubescent, petiolate; stipule filiform. Raceme axillary, 6-12 cm long, peduncled. Flowers 5-10; pedicels 5 mm long; bracts and bracteoles filiform; calyx 6 mm long, lobes equal, densely fulvous hairy; standard 5 x 3 mm, obovate; wings 4 x 2 mm, oblanceolate; keel glabrous. Pods to 7 x 3 mm, oblong, glabrous.

*Fl. & Fr.* October-December

*Distr.* Indo-Malaya. Occasional in grassland areas; *PS 19962* Karimala

**Crotalaria juncea** L., Sp. Pl. 714. 1753; FBI 2: 79. 1876; FPL 150. 1990.

Silky pubescent subshrubs; branchlets striate. Leaves to 10 x 0.6 cm, oblong, apex obtuse, mucronate, base cuneate, pubescent on both sides, sessile; stipule adpressed, lanceolate, deciduous. Racemes terminal; flowers yellow; bracts 4 mm, linear; bracteoles cauducous; calyx lobes 2 and 1.5 cm long, lanceolate, densely tomentose, standard petal 3 x 2.5 cm; wings 2 x 0.9 cm, keel 2.5 x 1 cm; staminal sheath 4 mm, filaments 8 and 16 mm; anthers dimorphic, 7 and 1 mm; ovary 1 cm, villous, style 2 cm. Pods 3 x 1 cm, oblong, densely brownish tomentose.

*Fl. & Fr.* January-March

*Distr.* Native of India; now spread to moist tropical countries. Rare in degraded forest areas; *PS 19096* Peruvuripallam

**Crotalaria laevigata** Lam., *Encycl.* 2: 198. 1786; *FBI* 2: 83. 1876; *FPM* 300. 1918; *FPL* 151. 1990; *FTSR* 134. 1996.

Shrubs, 2-3 m tall. Leaflets obovate or oblong-obovate, obtuse or retuse, membranous, glabrous, glaucous below, terminal much larger than the laterals, to 3 x 1.5 cm; lateral nerves and reticulations faint; petiole to 3 cm long; stipule subulate, to 4 mm long. Flowers 1.5 cm across, in axillary, 2-5 flowered racemes; bracts minute, setaceous. Calyx lobes puberulus, deltoid-lanceolate, 4 mm long. Petals bright yellow, standard ovate; keels beaked. Pods glabrous, 1.5 x 0.5 cm; seeds ca. 10.

*Fl. & Fr.* October-January

*Distr.* Peninsular India and Madagascar. Common in rocky grassland areas; *PS 30517* Pezha

**Crotalaria mysorensis** Roth, *Nov. Pl. Sp.* 338. 1821; *FBI* 2: 70. 1876; *FPM* 295. 1918; *FPL* 151. 1990; *FTSR* 134. 1996.

Shrubs to 1 m high; stem terete, densely long-hairy. Leaves to 5.5 x 0.7 cm, linear-oblong, obtuse, densely fulvous hairy, stipule 1 cm long, oblong, erect. Raceme to 20 cm long, velutinous hairy. Flowers distant; pedicels 1 cm long; bracts 1.5 cm long, lanceolate; calyx 18 mm long, densely hairy; standard 17 x 12 cm, obovate, fulvous hairy on back; wings 12 x 4 mm, rugose; keel 15 mm long, densely pubescent on margins. Pods 2.2 x 1 cm, obovoid, glabrous.

*Fl. & Fr.* November-January

*Distr.* Indo-Malesia. Common in rocky grassland areas; *PS 30479* Vengoli

**Crotalaria nana** Burm.f., *Fl. Ind.* 156, t. 48. f. 2. 1768; *FBI* 2: 71. 1876; *FPL* 151. 1990; *FTSR* 135. 1996. *C. umbellata* Wight ex Wight & Arn., *Prodr.* 191. 1834; *FPM* 294. 1918. *C. nana* Burm. f. var. *umbellata* (Wight & Arn.) Prain, *J. Asiat. Soc. Bengal* 66: 351. 1897.

Erect herbs, to 30 cm high; stem fulvous. Leaves to 3 x 0.8 cm, oblong, acute or obtuse, densely hairy. Flowers 16-30-together, in terminal sessile congested umbel; bracts 5 mm long, filiform; calyx lobes lanceolate, densely hairy; standard 5 x 3 mm, obovate, yellow; wings 4 x 2 mm, verrucose; keel ciliate along the margins. Pods 5 x 4 mm, globose, glabrous, 6-10-seeded.

*Fl. & Fr.* November-January

*Distr.* Indo-Malesia. Occasional in grasslands; *NS 5734, PS 19963* Karimala

**Crotalaria retusa** L., *Sp. Pl.* 715. 1753; *FBI* 2: 75. 1876; *FPM* 293. 1918; *FPL* 152. 1990.

Erect shrubs; stem glabrous, terete. Leaves to 12 x 3 cm, oblanceolate, obtuse to retuse; petiole to 1 cm long; stipule minute, filiform. Raceme terminal, many-flowered; bracts and bracteoles filiform. Flowers yellow; pedicels 1 cm long, deflexed; calyx 12 mm long, lobes ovate, acute, thinly hairy; standard 2.5 x 3 cm, orbicular, retuse, glabrous; wings 2 cm long, verrucose; keel tomentose along the margins. Pods 5 x 1.3 cm, oblong, tomentose.

*Fl. & Fr.* October-January

*Distr.* Pantropical. Occasional in rocky grasslands; *PS 19703* Karimala

#### DALBERGIA Linnaeus f.

- |  |   |
|--|---|
| 1. Lianas.....                                     | <b>D. volubilis</b>                           |
| 1. Trees.....                                      | 2   |
| 2. Leaflets more than 10; stamens 10.....          | 5   |
| 2. Leaflets less than 10; stamens 9.....           | 3   |
| 3. Flowers in axillary corymbose panicles.....     | <b>D. latifolia</b>                           |
| 3. Flowers in terminal panicles on new shoots..... | 4   |
| 4. Leaflets 4 or 5, sub-orbicular.....             | <b>D. sissoo</b>                              |
| 4. Leaflets 10, obovate.....                       | <b>D. sissooides</b>                          |
| 5. Branchlets glabrous.....                        | <b>D. lanceolaria</b> ssp. <b>lanceolaria</b> |
| 5. Branchlets densely pubescent.....               | <b>D. lanceolaria</b> ssp. <b>paniculata</b>  |



**Dalbergia lanceolaria** L. f., Suppl. Pl. 316. 1781, ssp. **lanceolaria**; FBI 2: 235. 1876; FPM 383. 1918; FPL 154. 1990; FTSR 137. 1996. *D. frondosa* Roxb., Fl. Ind. 3: 226. 1832.

Trees, to 25 m tall; bark greenish-white. Leaflets 12-20 pairs, 2-5 x 1-2 cm, oblong, obtuse, glabrous, nerves many, close. Panicles 15 x 8 cm, yellowish-hirsute. Flowers greenish white; calyx 3 mm long, lobes ovate, acute, hirsute; petals white; standard 10 x 7 mm, orbicular, glabrous; wings 8 mm long, curved; keel glabrous. Pods to 9 x 2.5 cm, elliptic-oblong, glabrous, acute at apex, narrowed to the base, 1-3 seeded; stalk very long.

*Fl. & Fr.* May-September

*Distr.* India, Myanmar, Nepal and Sri Lanka. Common in moist deciduous forests; *PS 30233, 19377* Karimala

**Dalbergia lanceolaria** L.f. ssp. **paniculata** (Roxb.) Thoth., Bull. Bot. Surv. India 25: 171. 1985. *D. paniculata* Roxb., Corom. t. 114. 1799; FBI 2: 236. 1876; FPM 383. 1918. *Amerimnon paniculatum* (Roxb.) O. Ktze, Rev. Gen. Pl. 1: 159. 1891.

Small trees, branchlets pubescent. Leaves odd-pinnate; leaflets alternate, 5 or 6 pairs, to 4 x 2.5 mm, oblong, obovate, obtuse, base cuneate; petioles *ca* 4 mm. Panicles terminal or axillary on tender shoot, pubescent; flowers *ca* 1 cm across; calyx tube *ca* 4 mm, rusty tomentose; corolla white, standard 1 x 0.5 mm, ovate, oblong, wings and keels to 8 x 3 mm; stamens 10, diadelphous; ovary *ca* 3 mm. Pods to 7 x 11.5 cm, lanceolate, acute; seeds 1 or 2.

*Fl. & Fr.* February-June

*Distr.* India and Myanmar. Rare in moist deciduous forests; *PS 30392* Kuchimudi

**Dalbergia latifolia** Roxb., Corom. Pl. 2: 7,t.1798; FBI 2: 231. 1876; FPM 383. 1918; FPL 154. 1990; FTSR 137. 1996. *D. emarginata* Roxb., Fl. Ind. 3: 224. 1832.

Tall trees, to 30 m tall; branchlets slender, white. Leaves 7-11-foliolate, leaflets 3-6 cm across, obovate-orbicular, rounded to emarginate at apex, rounded at base, glaucous beneath; petiolule 6 mm long. Panicles to 10 x 4 cm, axillary, glabrous. Flowers 10 mm long, creamy white; calyx 5 mm long, glabrous; standard 8 mm across, clawed; wings curved; keel glabrous. Pods to 10 x 2 cm, oblong, obtuse, glabrous, 1-6-seeded; stalk short.

*Fl. & Fr.* June-September

*Distr.* India, Nepal and Malesia. Common in moist deciduous forests and plantations; *PS 30483* Kuchimudi; *19612* Vengoli

**Dalbergia sissooides** Graham ex Wight & Arn., Prodr. 1: 265. 1834; FBI 2: 231. 1870; FPM 383. 1918; FPL 154. 1990; FTSR 137. 1996. *D. latifolia* var. *sissooides* (Graham ex Wight & Arn.) Baker in Hook. f., FBI 2: 231. 1876. *D. latifolia* sensu Wight, Ic. t. 1153. 1846, non Roxb. 1796.

Tall trees, to 25 m tall. Leaves 6-9-foliolate; leaflets to 7 x 4 cm, obovate, acute at the apex and base; petiolule 6 mm long. Panicle 5-15 cm across, terminal or upper axillary, glabrous. Flowers 8 mm long, greenish yellow; pedicels 6 mm long, slender; calyx 4 mm long, lobes obtuse, glabrous; standard 7 x 5 mm, greenish yellow; keel glabrous. Pods to 8 x 1.5 cm, elliptic-oblong, acute at apex, attenuate into a long stalk at base.

*Fl. & Fr.* March-June

*Distr.* Peninsular India and Indonesia. Rare in secondary forests; *PS 30231* Karimala

**Dalbergia sissoo** Roxb., Fl. Ind. 3: 223. 1832; FBI 2: 237. 1876; FPM 384. 1918.

Medium trees, branchlets pilose. Leaflets alternate, 2 pairs, to 7 x 6 cm, obovate, obtuse, base cuneate; subsessile. Panicle lax terminal and axillary on new shoots; pedicel *ca* 2 mm, calyx tube *ca* 3 mm, corolla cream, standard *ca* 8 x 5 mm, obovate, wings and keels 6 mm; stamens 9, monadelphous; sheath *ca* 4 mm. Pods to 7.5 x 1 cm, oblong acute, apiculate; seeds 2.

*Fl. & Fr.* February-March

*Distr.* Native of Tropical Himalaya to North East India, cultivated in Tropical to Subtropical Africa, Asia. Planted in nearby areas of Keerappadi check post; *NS 3213, 3212* Parambikulam

**Dalbergia volubilis** Roxb., Corom. Pl. 2: 48. t.191. 1805; FBI 2: 235. 1876; FPM 384. 1918; FPL 155. 1990; FTSR 137. 1996.

Climbers. Leaves 8-10-foliolate; leaflets to 3 x 1.5 cm, obovate-oblong, obtuse at apex, glabrous. Panicle 25 x 10 cm, terminal. Flowers 10 mm across, blue; calyx 5 mm long, lobes ovate, acute, hairy; standard 8 mm across, reflexed; keel 5 x 3 mm, glabrous; stamens isodiadelphous. Pods to 3.5 x 1.5 cm, elliptic, obtuse at apex, shortly cuspidate, stalked, glabrous; seed solitary.

*Fl. & Fr.* March-June.

*Distr.* India, Sri Lanka and Myanmar. Common in moist deciduous forests; *PS* 30284 Parambikulam

#### DERRIS Loureiro

1. Leaflets 9-13, to 5 x 2 cm ..... **D. scandans**
1. Leaflets 7-9, to 9 x 4 cm ..... 2
2. Branchlets softly pubescent; pods turgid over seeds..... **D. benthamii**
2. Branchlets glabrous; pods compressed and flat..... **D. brevipes**

**Derris benthamii** (Thw.) Thw., Enum. Pl. Zeyl. 413. 1864; FPM 387. 1918. *Brachypterum benthamii* Thw., Enum. Pl. Zeyl. 93. 1859. *Derris paniculata* Benth., J. Linn. Soc. 4 (Suppl.): 105, 1860; FBI 2: 242. 1878.

Stout climbers; branchlets densely lenticellate, minutely dark brown hispid. Leaves 7-9-foliolate; leaflets to 4 x 2 cm, ovate, abruptly acuminate, acumen twisted, retuse, pubescent along the nerves below; petiolule hispid. Panicle to 30 x 30 cm, brown-hispid. Calyx 4 mm long, oblique at mouth, densely hispid outside, lobes short; standard 10 x 6 mm, clawed, concave, white; keel 10 x 3 mm, oblong, clawed. Pods 3.5 x 2 cm, 1.5 cm thick, densely brown hispid, acute and hooked at apex, acute at base; seeds 1 or 2.

*Fl. & Fr.* December-May

*Distr.* Peninsular India and Sri Lanka. Common in evergreen forests and riverine areas; *PS* 30445 Karimala

**Derris brevipes** (Benth.) Baker in Hook.f., FBI 2: 244. 1878; FPM 388. 1918; FTSR 138. 1996. *D. heyneana* Benth. var. *brevipes* Benth., J. Linn. Soc. 4 (Suppl.): 110. 1860.

Stout climber; branchlets slender, glabrous. Leaves 3-9-foliolate; leaflets to 12 x 5 cm, obovate-oblong, abruptly acuminate at apex, retuse, acute at base. Panicles 10 x 10 cm, axillary, rusty tomentose. Calyx cupular, 4 mm long, hispid, black, lobes obtuse; standard 11 x 7 mm, obovate, emarginate, white, clawed; wing 9 x 3 mm, oblong; keel glabrate; stamens monadelphous; ovary densely hairy. Pods 5 x 2.5 cm, ovate, obtuse at either ends, dark brown-hispid; seeds 2.

*Fl. & Fr.* March-August

*Distr.* Endemic to Western Ghats. Common in semi-evergreen forests;; *PS* 19331 Thenkudippara

**Derris scandens** (Roxb.) Benth., J. Linn. Soc. Bot. 4 (Suppl.) 103. 1860; FBI 2: 240. 1878; FPM 387. 1918; FPL 155. 1990; FTSR 138. 1996. *Dalbergia scandens* Roxb., Pl. Corom. t. 192. 1805. *D. timorensis* DC., Prodr. 2: 417. 1825. *Brachypterum scandens* (Roxb.) Benth., Ann. Wien Mus. 2: 101. 1838. *B. timorensis* (DC.) Benth. in Miq., Pl. Jungh. 1: 253. 1852. *Derris timorensis* (DC.) Pittier, Contr. U.S. Nat. Herb. 20: 41. 1917.

Woody climbers, stem terete, lenticellate. Leaves to 12 cm; leaflets 9-13, to 4.5 x 2 cm, oblong-obovate, puberulus beneath; petiolule 5 mm, stipels minute. Racemes axillary and rarely terminal, to 25 cm long, nodes tumid; flowers pinkish-white; pedicels to 8 mm, pubescent; bracteoles 2 above the middle of the pedicel; calyx 3 mm, truncate, campanulate; standard petal 9 x 7 mm, ovate-orbicular; wings 9 x 2 mm, appendaged; keel 9 mm; staminal tube 7 mm,

filaments 2 and 3 mm; ovary 7 mm, tomentose, style 5 mm, bent upwards, stigma globose. Pods winged on the upper suture, tapering at both ends, pubescent; seeds 1-4.

*Fl. & Fr.* June-September

*Distr.* Indo-Malesia. Rare in dry deciduous forests; *PS 30490* Kuchimudi

#### DESMODIUM Desvaux

1. Leaves 1-foliolate.....	2
1. Leaves 3-foliolate.....	5
2. Petiole winged; stem 3-angled.....	<b>D. triquetrum</b>
2. Petiole not winged; stem not 3-angled.....	3
3. Articles long, rhomboidal.....	<b>D. zonatum</b>
3. Articles short, linear.....	4
4. Leaves glabrous above; stipules lanceolate.....	<b>D. gangeticum</b>
4. Leaves velutinus above; stipules ovate.....	<b>D. velutinum</b>
5. Flowers in axillary umbels.....	<b>D. triangulare</b>
5. Flowers in axillary or terminal racemes or panicles.....	6
6. Flowers included in the large foliaceous orbicular bracts.....	<b>D. pulchellum</b>
6. Flowers exposed without foliaceous or orbicular bracts.....	7
7. Trailing herbs.....	8
7. Erect shrubs or herbs.....	9
8. Stem glabrescent; leaflets emarginate at apex.....	<b>D. triflorum</b>
8. Stem hairy; leaflets rounded at apex.....	<b>D. heterophyllum</b>
9. Joints of pods lunar or crescentic; stamens monadelphous.....	<b>D. repandum</b>
9. Joints of pods square; stamens diadelphous.....	10
10. Calyx 5 lobed, upper calyx lobes not connate.....	<b>D. alysicarpoides</b>
10. Calyx 4 lobed, upper calyx lobes connate.....	11
11. Inflorescence dense; secondary bracts absent.....	<b>D. heterocarpon</b>
11. Inflorescence lax; secondary bracts present.....	<b>D. laxiflorum</b>

**Desmodium alysicarpoides** van Meeuwen, Reinwardtia 6: 246. 1961. *Alysicarpus parviflorus* Dalz. in Hook.'s J. Bot. Kew Gard. Misc. 3: 211. 1851; FPM 339. 1918. *Desmodium parviflorum* (Dalz.) Baker in Hook.f., FBI 2: 172. 1876, non Mart. & Galeotti 1843.

Erect or suberect herbs, to 30 cm high; stem villous. Leaflets 4.5 x 2 cm, elliptic acute at apex, rounded at base, tomentose below; laterals much smaller. Racemes to 30 cm long, terminal; pedicels 2 or 3-together. Flowers blue; calyx 4.5 mm long, lobes linear-lanceolate, densely hairy, standard 3 x 2.5 mm, glabrous. Pods curved, 6-jointed, joint 2 x 1.5 mm, straight along one suture, glabrous.

*Fl. & Fr.* September-January

*Distr.* Indo-Malesia. Rare in dry deciduous forests and degraded forest areas; *PS 30063* Kuchimudi

**Desmodium gangeticum** (L.) DC., Prodr. 2: 327. 1825; FBI 2: 168. 1876; FPL 157. 1990; FTSR 139. 1996. *Hedysarum gangeticum* L., Sp. Pl. 746. 1753. *H. maculatum* L., Sp. Pl. 1051. 1753. *Desmodium collinum* Wight, Ic. t. 272. 1840.

Erect subshrubs, stem hispid, 3-angled. Leaves to 12 x 8 cm, ovate, acute at apex, rounded or truncate at base, glabrous above, densely tomentose below; nerves prominent beneath. Racemes to 30 cm long, axillary, villous; pedicels 2-5 together, 3 mm long. Flowers pale blue; calyx 2 mm long, lobes acute; standard 3.5 x 3 mm, acute at base, retuse at apex. Pods straight, 8-jointed; joints 2.5 x 2.5 mm, moniliform, glabrous, black.

*Fl. & Fr.* November-March

*Distr.* Tropical Asia, Africa and Australia. Common in deciduous forests and plantation; *PS 30832* Padippara

**Desmodium heterocarpon** (L.) DC., Prodr. 2: 337. 1825; FPL 157. 1990; FTSR 139. 1996. *Hedysarum heterocarpon* L., Sp. Pl. 474. 1753. *H. polycarpum* Poir. in Lam., Encycl. 6: 431. 1805. *Desmodium polycarpum* (Poir.) DC., Prodr. 2: 334. 1825; FBI 2: 171. 1876; FPM 346. 1918. *D. patens* Wight, Ic. t. 407. 1840.

Erect herbs; stem strigose. Leaflets to 7 x 3.5 cm, elliptic, obtuse at apex, rounded at base, pubescent below, glaucous, nervules parallel; stipules 18 mm long, lanceolate, subulate above. Raceme to 20 cm long, axillary, densely adpressed-strigose. Flowers densely arranged; bracts 4-8 x 3-5 mm, ovate, acuminate; calyx 2 mm long, lobes ovate, acute, standard 4 x 2.5 mm, obovate, pink. Pods 2 x 0.3 mm, 6-8 jointed; joints squarish, pubescent.

*Fl. & Fr.* October-December

*Distr.* Indo-Malesia, China and Japan. Common in moist deciduous forests and vayals; *PS* 19796 Orukomban

**Desmodium heterophyllum** (Willd.) DC., Prodr. 2: 334. 1825; FPM 347. 1918; FPL 157. 1990; FTSR 140. 1996. *Hedysarum heterophyllum* Willd., Sp. Pl. 3: 1201. 1802. *Desmodium triflorum* (L.) DC. var. *majus* Wight & Arn., Prodr. 229. 1834.

Trailing herbs; stem densely villous, reddish. Terminal leaflets 2.5 x 1.2 cm, elliptic, obtuse, glabrous above; petiole 1.5 cm long; lateral leaflets smaller, stipule 6 x 3 mm, lanceolate, ciliate. Racemes axillary, 1-3-flowered; pedicel 1.3 cm long, slender, villous. Flowers blue; calyx 3 mm long, lobes long-ciliate; standard 5 mm across; stamens diadelphous. Pods 2 x 0.4 cm, joints strongly reticulate, thinly pubescent.

*Fl. & Fr.* July-December

*Distr.* Indo-Malesia and China. Common in degraded forest areas and plantations; *PS* 19718 Parambikulam; 30478 Vengoli

**Desmodium laxiflorum** DC., Ann. Sci. Nat. (Paris) 4: 100. 1825 & Prodr. 2: 335. 1825; FBI 2: 164. 1876; FPM 344. 1918; FPL 158. 1990; FTSR 140. 1996. *D. diffusum* DC., Ann. Sci. Nat. (Paris) 4: 100. 1825. *D. recurvatum* (Roxb.) Graham ex Wight & Arn., Prodr. 226. 1834. *Hedysarum recurvatum* Roxb., Fl. Ind. 3: 358. 1832.

Erect herbs, to 35 cm high; stem angled, adpressed-hairy. Terminal leaflet to 13 x 10 cm, ovate, acute at apex, rounded at base, densely hairy below, glabrate above; petiole 4 cm long; stipules 8 mm long, lanceolate; stipels filiform. Racemes to 35 cm long, axillary or terminal; rachis hairy. Flowers solitary or paired, pink; calyx 2 mm long, hairy; standard 6 x 3 mm, emarginate. Pods 6-9 jointed; joints 4 x 1.25 mm, oblong, longitudinally striate.

*Fl. & Fr.* November-January

*Distr.* India to Formosa, Malesia. Common in moist deciduous forests and plantations; *PS* 30497 Muthuvarachal

**Desmodium pulchellum** (L.) Benth., Fl. Hongk. 83. 1861; FBI 2: 162. 1876; FPM 344. 1918; FPL 158. 1990; FTSR 140. 1996. *Hedysarum pulchellum* L., Sp. Pl. 747. 1753. *Phyllodium pulchellum* (L.) Desv., J. Bot. ser. 2, 1:124.1813. *Dicerma pulchellum* (L.) DC., Prodr. 2:339.1825.

Erect shrubs, to 1.5 m tall; stem and branches arching. Leaflets 10 x 6 cm, obovate, obtuse at apex, acute at base, thinly hairy above, densely below. Racemes paniced, terminal or subterminal, to 30 cm long; floral leaves bifarious, to 12 mm across, orbicular, hispid, with one filiform appendage at base. Flowers 1-3 together; bracts and bracteoles minute; standard 4-5 mm long, pale blue, glabrous. Pods 2-jointed, 7 mm long, joints orbicular, glabrous.

*Fl. & Fr.* October-January

*Distr.* Tropical Asia and Australia. Common in moist deciduous forests and plantations; *PS* 19049 Thunakkadavu

**Desmodium repandum** (Vahl) DC., Prodr. 2: 334. 1825. *Hedysarum repandum* Vahl, Symb. Bot. 2: 82. 1791. *Desmodium scalpe* DC., Prodr. 2: 334. 1825; FBI 2: 165. 1876; FPM 345. 1918. *D. strangulatum* Wight & Arn., Prodr. 228. 1834.

Undershrubs; branches slender. Leaves few; leaflets to 20 x 6 cm, ovate, acuminate, rounded at base, glabrous above, adpressed pubescent below; nerves finely reticulated below; stipules ovate, acuminate. Flowers in paniced racemes, terminal or axillary; rachis tomentose, to 25 cm long; calyx 4-lobed, campanulate; standard to 10 mm across, reddish, orbicular, retuse at apex. Joints of pods 2 or 3, to 1.5 x 0.6 cm, falcate, densely covered with hooked hairs.

*Fl. & Fr.* November-February

*Distr.* Paleotropics. Common in degraded forest areas; *PS 19453* Valiyathode

**Desmodium triangulare** (Retz.) Merr., J. Arnold Arbor. 23: 170. 1942; FTSR 141. 1996. *Hedysarum triangulare* Retz., Obs. Bot. 3: 40. 1783.

Shrubs; branchlets triangulare, adpressed hairy. Leaflets subequal, to 9 x 4 cm, elliptic, acuminate, hairy when young; nerves 8-10 pairs, regular; petiole 3 mm long; stipules 1 cm long, ovate, acuminate. Flowers many-together, in axillary clusters; upper calyx lobes united and longer than the others; petals white; standard to 8 mm across, orbicular, glabrous; wings 6 mm long, obovate; keels glabrous. Pods to 2.5 cm long, curved, crenate; joints 4-6, adpressed tomentose.

*Fl. & Fr.* August-December

*Distr.* Indo-Malesia and China. Common in moist deciduous forests and rocky areas; *PS 30465* Vengoli

**Desmodium triflorum** (L.) DC., Prodr. 2: 334. 1825; FBI 2: 173. 1876; FPL 159. 1990; FTSR 141. 1996. *Hedysarum triflorum* L., Sp. Pl. 249. 1753. *Desmodium triflorum* (L.) DC. var. *minus* Wight & Arn., Prodr. 229. 1834. *Hedysarum stipulaceum* Burm.f., Fl. Ind. t. 54. f. 2. 1768.

Prostrate herbs; branches trailing, slender, pilose. Leaflets 4-6 x 4-5 mm, orbicular, obtuse to retuse, pubescent below; stipule 4 mm long, ovate. Flowers 3 mm across, 3-5 in short axillary raceme; calyx 2 mm long, 5-lobed; standard 3 mm across, orbicular, pink; wings obovate. Pods to 1 cm long, straight; joints 4-6, squarish, hooked-pubescent.

*Fl. & Fr.* December-February

*Distr.* Indo-Malesia and Australia. Common in degraded forest areas; *PS 19880* Velayudhankai; *19211* Kariamchola

**Desmodium triquetrum** (L.) DC., Prodr. 2: 326. 1825; FBI 2: 163. 1876, p.p.; FPM 345. 1918; FPL 159. 1990; FTSR 141. 1996. *Hedysarum triquetrum* L., Sp. Pl. 746. 1753. *Tadehagi triquetrum* (L.) Ohashi, Ginkgoana 1: 290. 1973.

Erect subshrubs, to 1.5 m tall, sparsely branched; stem scabrous, triquetrous. Leaves to 11 x 3 cm, oblong, acuminate, cordate at base, pubescent; petiole 1.5 cm long, wing 8 mm broad; stipule 2 cm long, lanceolate. Raceme to 40 cm long, terminal, rarely branched at base; bracts 1 cm long, lanceolate. Flowers subsessile; calyx 5 mm long, lobes very unequal; petals pink, standard 7 mm across, clawed; keel spurred, pink. Pods 2 x 0.6 cm, oblong, scabrous, straight.

*Fl. & Fr.* September-February

*Distr.* Indo-Malesia and China. Common in moist deciduous forests; *PS 30832* Padippara

**Desmodium velutinum** (Willd.) DC., Prodr. 2: 328. 1825; FPL 159. 1990; FTSR 142. 1996. *Hedysarum velutinum* Willd., Sp. Pl. 3: 1174. 1802. *Desmodium latifolium* (Roxb. ex Ker.) DC., Prodr. 2: 328. 1825; FBI 2: 168. 1876; FPM 346. 1918. *Hedysarum latifolium* Roxb. ex Ker., Bot. Reg. 5: t. 355. 1819.

Shrubs, to 1.5 m high; stem ferruginous-tomentose. Leaves to 13 x 10 cm, broadly ovate, acute or obtuse at apex, rounded at base, densely velutinus below; nerves 6-8 pairs, regular, prominent below; stipules 3 mm long, cordate at base, white; stipel minute, filiform. Raceme terminal, paniced, to 30 cm long. Flowers 4 mm across, pink; calyx 1.5 mm long, lobes ovate,

acute, hairy; standard 3 x 3 mm. Pods 2 cm long, crenate along ventral suture; joints 8-10, each 3 x 3 mm, roundish, hirsute

*Fl. & Fr.* October-January

*Distr.* South and South East Asia and Africa. Common in moist deciduous forests and plantations; *PS 19871* Vengoli

**Desmodium zonatum** Miq., *Fl. Ind. Bat.* 1, 1: 250. 1855. *D. ormocarpoides* Baker in Hook. f., *FBI* 2: 164. 1876, non DC. 1828; *FPM* 345. 1918.

Erect herbs, to 30 cm tall. Leaves to 10 x 4 cm, ovate, acute to acuminate, rounded at base, glabrous above, densely hairy below; nerves to 8 pairs; petiole to 2 cm long; stipule 10 mm long, lanceolate, ciliate. Raceme to 20 cm long, terminal; pedicels 1 cm long, slender. Flowers white, 5 mm long; calyx 1.5 mm long, lobes ovate, acute; standard 5 mm across, orbicular, white. Pods fragile, 6-8-jointed; joints 15 x 3 mm, elliptic-oblong, densely covered with viscid hooked-hairs.

*Fl. & Fr.* July-December

*Distr.* Indo-Malaya and China. Occasional in degraded forest areas; *PS 19555* Kariamchola

#### DUMASIA A. P. de Candolle

**Dumasia villosa** DC., *Ann. Sci. Nat. (Pairs)* 4: 96. 1825 & *Prodr.* 2: 241. 1825; *FBI* 2: 183. 1876; *FPM* 351. 1918; *FPL* 160. 1990; *FTSR* 142. 1996. *D. congesta* Graham ex Wight & Arn., *Prodr.* 206. 1834.

Slender twining herbs, branches tomentose. Leaflets ovate, obtuse, tomentose on both sides to 6.5 x 4 cm; lateral nerves 4-6 pairs, slender; petiole to 5 cm long; stipules lanceolate, tomentose, 0.5 cm long. Flowers ca. 2 cm long, in axillary 6-10 cm long racemes. Calyx glabrescent, mouth oblique. Petals golden yellow. Pods velvety tomentose, 3 cm long.

*Fl. & Fr.* August-December

*Distr.* Indo-Malesia, China and Africa. Rare in grasslands; *PS 5750* Karimala Hills

#### ERYTHRINA Linnaeus

1. Unarmed trees; keel petals free ..... **E. variegata**  
1. Armed trees; keel petals connate ..... **E. stricta**

**Erythrina stricta** Roxb., *Fl. Ind.* 3:251.1832; *FBI* 2:189.1876; *FPM* 354.1918; *FTSR* 142.1996.

Tall trees; bark corky; branchlets densely prickled. Leaves 3-foliolate; leaflets to 15 x 12 cm, broadly obovate-deltoid, 3-7-nerved from the base, glabrous; petiole to 20 cm long. Flowers 6 cm long, in stout axillary racemes; calyx 1 cm long, spathiform, split on one side; petals red, standard 5 x 2.5 cm, elliptic, acute; wings 8 x 4 mm, obovate; keel 2 x 2 cm; stamens 10, monadelphous, vexillary stamens free above; anthers uniform; ovary stalked, many-ovuled; style curved. Pods 15 x 1 cm, oblong, cylindrical, acuminate at apex; seeds 3-6.

*Fl. & Fr.* March-May

*Distr.* India, South East Asia and China. Occasional in rocky areas of moist deciduous forests; *PS 19381* Karimala

**Erythrina variegata** L., *Herb. Amb.* 10. 1754; *FTSR* 143. 1996. *E. variegata* L., *Stickm. Herb. Amboin* 10. 1754 & *Amoen. Acad.* 4: 122. 1759. *E. corollodendron* L. var. *orientalis* L., *Sp. Pl.* 706. 1753. *E. variegata* L. var. *orientalis* (L.) Merr., *Interpr. Herb. Amb.* 276. 1917. *E. indica* Lam., *Encycl.* 2: 391. 1786; *FBI* 2: 188. 1876; *FPM* 353. 1918.

Small trees, branchlets stellately pubescent. Leaves trifoliolate; leaflets to 15 cm across, rhomboid-ovate, acuminate; petiole to 25 cm. Racemes to 15 cm; bracts triangular; bracteoles subulate, 2 mm; flowers to 7.5 cm long; pedicels to 1 cm; calyx to 2 x 8 cm, spathaceous, apically 5-toothed; corolla bright-red, standard to 6.5 x 2.5 cm, oblong-elliptic, obtuse, wings to 1.5 x 1

cm, obovate; keels to 1 x 0.7 cm, oblong falcate, staminal sheath 3.5 cm; ovary *ca* 2 cm, pubescent.

*Fl. & Fr.* March-April

*Distr.* Indo-Malesia, China and Africa. Planted; *PS 18900* Muthalakkuzhi

#### FLEMINGIA Roxburgh ex W. Aiton et E. T. Aiton

- |   |                        |
|---|------------------------|
| 1. Leaves simple .....                                      | <b>F. strobilifera</b> |
| 1. Leaves 3-foliolate.....                                  | 2                      |
| 2. Petioles prominently winged.....                         | <b>F. semialata</b>    |
| 2. Petioles not winged .....                                | 3                      |
| 3. Leaflets black glandular beneath; leaflets elliptic..... | <b>F. macrophylla</b>  |
| 3. Leaflets red glandular beneath; leaflets ovate.....      | <b>F. grahamiana</b>   |

**Flemingia grahamiana** Wight & Arn., Prodr. 242. 1834; FBI 2: 228. 1876; FPM 378. 1918.

Shrubs, stem scabrous. Leaflets 10 x 5 cm, obovate, obtusely acute, grey-tomentose beneath; nerves to 8 pairs, very prominent beneath, impressed above, reticulate; petiole 5-6 cm long, triquetrous. Racemes 3-5 cm long, 1-3 together, densely yellowish brown hairy; bracts 3 x 2 mm, ovate. Flowers densely arranged; calyx 8 mm long, densely red-glandular, lobes lanceolate; standard 9 x 6 mm, obovate, acute; wings 8 x 1.5 mm, linear-oblong; ovary densely hairy. Pods 10 x 6 mm, oblong; seeds 4 x 2 mm.

*Fl. & Fr.* December-February

*Distr.* India and Tropical Africa. Common in moist deciduous forests and plantations; *PS 19095* Peruvuripallam; *30534* Pandaravarai

**Flemingia macrophylla** (Willd.) Prain ex Merr., Philipp. J. Sci. 5: 130. 1910. *Crotalaria macrophylla* Willd., Sp. Pl. 3: 982. 1802. *Flemingia congesta* Roxb. ex Ait. Hort. Kew (ed.2) 4. 349. 1812; FBI 2: 228. 1876; FPM 378. 1918. *Moghania macrophylla* (Willd.) O. Ktze., Rev. Gen. Pl. 199. 1891. *Flemingia semialata* Roxb., Fl. Ind. 3: 340. 1832; FPM 378. 1919. *F. congesta* var. *semialata* (Roxb.) Baker in Hook. f., FBI 2: 229. 1876, p.p.

Shrubs, to 3 m tall; branches obtusely triquetrous, adpressed hairy. Leaflets ovate, lanceolate, acute, pubescent along nerves, black glandular beneath; nerves 10 pairs, lowest pair from the base, rib-like; petiole 8-11 cm long. Racemes to 4 cm long, axillary, densely hairy; bracts 4 mm long, ovate. Calyx 9 mm long, hairy, black-glandular, standard 9 x 5 mm, ovate; wings 7 x 2 mm, clawed; keel 9 x 3 mm, obovate. Pods 12 x 8 mm, oblong, hispid.

*Fl. & Fr.* December-January

*Distr.* India to Malesia, Australia and Africa. Rare in moist deciduous forests; *PS 19349* Puliyala

**Flemingia semialata** Roxb., Fl. Ind. 3: 340. 1832; FPM 378. 1918; FPL 161. 1990; FTSR 143. 1996. *F. congesta* Roxb. var. *semialata* (Roxb.) Baker in Hook.f., FBI 2: 229. 1876 p.p.

Shrubs to 1.5 m tall, stem minutely villous. Leaflets to 15 x 7 cm, elliptic, acuminate at apex, scabrous along the nerves; nerves, to 7 pairs, similar to midrib; petiole to 8 cm long, winged. Racemes 15-20 cm long, terminal, paniced, densely velutinus; bracts 5 x 1 mm, acuminate. Flowers many, closely packed, calyx 10 mm long, lobes lanceolate, densely hairy; petals light pink; standard 9 x 4.5 mm, emarginate; wing to 7 x 1.5 mm, curved, verrucose; keel 9 x 3 mm, long-clawed. Pods 14 x 8 mm, obovoid.

*Fl. & Fr.* November-January

*Distr.* South Asia. Common in degraded forest areas; *PS 30004* Anappadi

**Flemingia strobilifera** (L.) R. Br. ex Ait., Hort. Kew (ed. 2) 4: 350. 1812; FBI 2: 227. 1876; FPM 377. 1918; FTSR 143. 1996. *Hedysarum strobiliferum* L., Sp. Pl. 746. 1753. *H. bracteatum*

Roxb., Fl. Ind. 3: 351. 1832. *Flemingia bracteata* (Roxb.) Wight, Ic. t. 268. 1840; FPM 378. 1918. *F. strobilifera* var. *bracteata* (Roxb.) Baker in Hook. f., FBI 2: 227. 1876.

Shrubs, to 2.5 m high. Leaves 1-foliolate, 15 x 6 cm, ovate-lanceolate, acuminate, glabrate; nerves 8 pairs, lowest pair rib-like; nervules parallel; petiole 1 cm long. Racemes to 20 cm long, axillary, axis zig-zag, tomentose; floral leaves 25 x 4 mm, orbicular, cuspidate, ciliolate. Flowers included, 3-6-together in short cymes, pedicelled; calyx 6 mm long, hairy, one lobe larger; standard 5 x 6 mm, orbicular, pinkish; wings 4.5 x 1 mm, white; keel 6.5 x 2 mm, clawed.

*Fl. & Fr.* December-January.

*Distr.* Indian subcontinent and Malesia. Common in moist deciduous forests and plantations; *PS 19050* Thunakkadavu

#### GONIOGYNA A. P. de Candolle

**Goniogyna hirta** (Willd.) Ali., Taxon 16: 463. 1967; FPL 163. 1990. *Hallia hirta* Willd., Sp. Pl. 3: 1169. 1802. *Heylandia latebrosa* sensu Baker in Hook.f., FBI 2: 65. 1876, non (L.) DC. 1825; FPM 280. 1918.

Diffuse herbs, densely hispid. Leaves simple, to 1.5 cm across, ovate to orbicular, cordate at base. Flowers small, axillary, solitary, almost concealed by leaves; calyx tube 2 mm long, lobes 5, lanceolate, upper 2 lobes united; petals pale yellow, standard 5 x 3 mm, obovate; wings 4 x 1 mm, oblong, keel 4 mm long; stamens 10, monadelphous, alternately smaller and larger; anthers dimorphous; ovary densely hairy. Pods 6 x 3 mm, oblong, turgid, hairy, 1-seeded.

*Fl. & Fr.* July-December

*Distr.* South Asia. Rare in moist rocky areas; *PS 19848* Vengoli

#### INDIGOFERA Linnaeus

1. Leaves 3-foliolate..... **I. trifoliata**
1. Leaves 5 or more foliolate..... 2
2. Flowers solitary..... **I. uniflora**
2. Flowers in racemes or spikes ..... 3
3. Racemes shorter than leaves; stipule setaceous..... **I. colutea**
3. Racemes longer than leaves; stipules otherwise ..... 4
4. Stipular base appendaged; seeds smooth..... **I. spicata**
4. Stipular base not appendaged; seeds pitted..... **I. astragalina**

**Indigofera astragalina** DC., Prodr. 2: 228. 1825; Sanjappa, Fasc. Fl. Ind. 21:20. 1995. *I. hirsuta* sensu Baker in Hook. f., FBI 2: 98. 1876, p.p. non L. 1753; FPM 312. 1918.

Densely hairy herbs; stem woody. Leaflets 7-9 pairs, to 3 x 1 cm, elliptic, acute, stipules lanceolate; stipules filiform. Racemes to 4 cm long, axillary. Flowers densely arranged, 8 mm long, shortly pedicelled; calyx 8 mm long, lobes linear; petals pink, glabrous. Pods 1.5 x 0.3 cm, 4-angular, densely hairy; seeds cubical, black, pitted.

*Fl. & Fr.* October-January

*Distr.* Pantropical. Occasional in moist rocky areas; *PS 19611* Vengoli

**Indigofera colutea** (Burm. f.) Merr., Philipp. J. Sci. 19: 355. 1921; Sanjappa, Fasc. Fl. Ind. 21:39. 1995; FTSR 144. 1996. *Galega colutea* Burm. f., Fl. Ind. 172. 1768. *Indigofera viscosa* Lam., Encycl. 3: 247. 1789; FBI 2: 95. 1876; FPM 311. 1919.

Erect perennial herbs. Leaves 6 cm long; leaflets 7 pairs, 12 x 7 mm, obovate, obtuse, cuspidate, hairy; stipules lanceolate. Racemes 5 cm long, axillary, slender. Flowers 5 mm long; calyx-lobes linear; petals exerted, glabrous, pink. Pods 21 x 2 mm, terete, densely glandular hairy; seeds 1.5 x 1.5 mm, cubical, smooth.

*Fl. & Fr.* August-January

*Distr.* Paleotropics. Rare in dry deciduous forests and degraded forest areas; *PS 30600* Kuchimudi



**Indigofera spicata** Forssk., Fl. Aeg.-Arab. 138. 1775; FPL 164. 1990; Sanjappa, Fasc. Fl. Ind. 21:123. 1995. *I. endecaphylla* Jacq. Ic. Pl. Rar. 3: t.570. 1789, "*hendecaphylla*"; FBI 2: 98. 1876; FPM 311. 1918. *I. kleinii* Wight & Arn., Prodr. 204. 1834.

Undershrubs. Leaves 4 cm long; leaflets 8-10 pairs, 20 x 6 mm, oblanceolate, obtuse, shortly mucronate, sessile; stipules 1 cm long, subulate. Racemes 12 cm long, slender. Flowers 6 mm long; calyx lobes subulate; standard pink, hispid outside. Pods 20 x 2 mm, compressed, marginate, rugose, seeds 5-10.

*Fl. & Fr.* August-December

*Distr.* Sri Lanka, India, Africa and Madagascar. Common in degraded forest areas; *PS 19892* Thellikkal; *30606* Parambikulam

**Indigofera trifoliata** L. in Torner, Cent. Pl. 2: 29. 1756; FBI 2: 96. 1876,p.p.; FPM 310. 1918; Sanjappa, Fasc. Fl. Ind. 21:138. 1995; FTSR 145. 1996. *I. trifoliata* L. var. *multicaulis* (DC.) Miq., Fl. Ind. Bat. I, 1: 313. 1855; FPM 310. 1918.

Prostrate herbs with radiating branches; stem slender, reddish, glabrous; leaflets 15 x 6 mm, obovate, obtuse; petiole 15 mm long. Flowers 3 mm long, in axillary fascicles, 2-4 together; calyx lobes ovate, acuminate, hairy; standard hispid outside, pink. Pods 11 x 1 mm, linear-oblong, deflexed, compressed; seeds 6-8, 1.3 x 0.5 mm, oblong, deep brown, smooth.

*Fl. & Fr.* October-December

*Distr.* Indo-Malesia, China and Australia. Common in degraded forest areas; *PS 30471* Vengoli

**Indigofera uniflora** Buch.-Ham. ex Roxb., Fl. Ind. 3: 374. 1832; FBI 2: 94. 1876; FPM 309. 1918; FPL 165. 1990; Sanjappa, Fasc. Fl. Ind. 21:151. 1995; FTSR 146. 1996.

Prostrate herbs with slender elongated much branched glabrous stem. Leaflets 3-7, usually digitate, linear-oblong, minutely adpressed hairy, to 0.7 x 0.3 cm, stipules minute, cauducous. Flowers small, solitary on long filiform pedicels which are longer than the leaves. Calyx lobes lanceolate, sparsely hairy. Petals red. Pods linear, glabrous, 1-1.3 cm long; 4-6 seeded.

*Fl. & Fr.* September-December

*Distr.* Endemic to South West India. Occasional in degraded forest areas; *PS 30601* Anappadi

#### MILLETTIA R. Wight & Arnott

**Millettia rubiginosa** Wight & Arn., Prodr. 263. 1834; FBI 2: 104. 1876; FPM 322. 1918; FPL 166. 1990; FTSR 145. 1996.

Large woody climbers; stem yellow pubescent. Leaves pinnately 3-5-foliolate; leaflets to 20 x 8 cm, ovate-oblong, acuminate at apex; minutely golden brown hairy, petiole to 10 cm long; stipule ovate; stipel filiform. Flowers in axillary simple or branched racemes; bracts ovate; calyx campanulate, 3 mm long, minutely lobed, standard 13 x 10 mm, obovate, emarginate, densely fulvous hairy on back; wings 10 mm long, oblong, with two patches of golden hairs; keel similar to wings; stamens 9 + 1; anthers uniform; ovary sessile, few-ovuled. Pods *ca.* 8 x 4.5 cm, obovate, compressed, woody, densely hairy; seeds 1-3, compressed, ovoid.

*Fl. & Fr.* December-February

*Distr.* Endemic to Southern Western Ghats. Common in evergreen forests; *PS 19799* Kariamchola; *18940* Kothala

#### MUCUNA Adanson

**Mucuna pruriens** (L.) DC., Prodr. 2: 405. 1825; FBI 2: 187. 1876; FPL 167. 1990; FTSR 147. 1996. *Dolichos pruriens* L. in Stickman, Herb. Amb. 23. 1754 & Syst. Nat. (ed. 10) 1162. 1759. *Stizolobium pruriens* (L.) Medikus, Vorels. Churpfalz. Phys.-Ocon. Ges. 2: 339. 1787. *Mucuna purita* Hook.'s Bot. Misc. 2: 348. 1831; FPM 356. 1918. *M. utilis* Wight, Ic. t. 280. 1840.

Twining shrubs, stem pubescent. Leaflets ovate or rhomboid, lateral ones oblique, adpressed pubescent, to 8 x 6 cm; petiole to 12 cm long. Flowers *ca.* 3.5 cm long, in axillary tomentose,

pendulous racemes. Petals dark purple. Pods slightly curved at both ends, tawny bristly, 7 x 1.2 cm; 4-6 seeded.

*Fl. & Fr.* October-February

*Distr.* India, Myanmar and Sri Lanka. Occasional in secondary forests; *PS 19142* Karimala

#### NEONOTONIA Lackey

**Neonotonia wightii** (Graham ex Wight & Arn.) Lackey var. **coimbatorensis** (Ajitha Sen) Karthik., Indian J. For. 4: 65. 1981; FTSR 147. 1996. *Notonia wightii* Wight & Arn., Prodr. 208. 1834. *Glycine wightii* Verdc. var. *coimbatorensis* Ajitha Sen, JBNHS 74: 330. 1978. *G. javanica* L., Sp. Pl. 754. 1753; Baker in Hook. f., FBI 2: 183. 1876, p.p; FPM 351. 1918.

Stout climbers. Leaves 3-foliolate; leaflets equal, 8 x 6 cm, ovate, acute, pubescent. Racemes erect, to 25 cm long, axillary. Flowers 8 mm long, densely clustered; bracts and bracteoles striate; calyx 5 mm long, lobes lanceolate; petals white, standard obovate; wings oblong, appendaged at base, keel obovate; stamens 10, monadelphous; anthers uniform; ovary densely hairy, 4-6 ovuled; style stout, stigma fimbriate. Pods 4 x 0.6 cm, oblong, deflexed, densely hairy, depressed between seeds; seeds 5 x 4 mm, oblong.

*Fl. & Fr.* October-January

*Distr.* Endemic to Southern Western Ghats. Common in moist deciduous forests; *PS 19884* Velayudhankai; *NS 19802* Kariamchola

#### PONGAMIA Ventenat

**Pongamia pinnata** (L.) Pierre, Fl. Forest. Cochinch. sub. t. 385. 1899; FPL 167. 1990; FTSR 148. 1996. *Cytisus pinnatus* L., Sp. Pl. 741. 1753. *Pongamia glabra* Vent., Jard. Malm. 28. t.28. 1803; FBI 2: 240. 1876; FPM 385. 1918. *Derris indica* (Lam.) Bennet, JBNHS 68. 303. 1971. *Galedupa indica* Lam., Encycl. 2: 594. 1788.

Trees, branchlets lenticellate. Leaves paripinnate; leaflets 3-6 pairs, to 9 x 4.5 cm, elliptic, acuminate, nerves ca. 8 pairs; petiole to 1 cm, thick, stipules 2 mm, oblong. Racemes panicle, axillary and terminal, to 15 cm; flowers pinkish-white; calyx tube 4 x 5 mm, campanulate, truncate; standard petal 1.2 x 1 cm, obovate; wings 1.2 x 0.4 cm, oblong; keel 1 x 0.3 cm, obtuse; staminal tube 8 mm, filaments 3 mm; ovary 5 mm, subsessile, pubescent, style 7 mm, incurved, stigma capitate. Pods 4 x 3 cm, obliquely oblong, woody, indehiscent.

*Fl. & Fr.* February-June

*Distr.* Indo-Malesia. Common along the riverine areas; *PS 30105* Parambikulam

#### PSEUDARTHRIA R. Wight & Arnott

**Pseudarthria viscida** (L.) Wight & Arn., Prodr. 209. 1834; FBI 2: 154. 1876; FPM 334. 1918; FPL 168. 1990; FTSR 149. 1996. *Hedysarum viscidum* L., Sp. Pl. 747. 1753.

Erect shrubs, viscid pubescent. Leaves 3-foliolate, leaflets 10 x 7 cm, broadly ovate, acute, rounded at base, stipellate; petiole 7 cm long; stipule lanceolate. Flowers in terminal or axillary raceme; calyx 2-lipped, 2 mm long, lobes lanceolate; petals red; standard 6 mm diam., orbicular, retuse; wings 3 mm long, oblong; keel glabrous; stamens 9 + 1; ovary sessile, many-ovuled; style inflexed. Pods 2-3 cm long, oblong, compressed, viscid hairy; seeds 3-5, reniform.

*Fl. & Fr.* November-January

*Distr.* Peninsular India and Sri Lanka. Very common in moist deciduous forests and plantations; *PS 19795* Orukomban

#### PTEROCARPUS N. J. Jacquin

**Pterocarpus marsupium** Roxb., Pl. Corom. t. 116. 1799; FBI 2: 239. 1876; FPM 385. 1918; FPL 168. 1990; FTSR 149. 1996.

Large trees; bark rough, black, reddish inside, exudate red. Leaves pinnate, leaflets 3-13, alternate, to 10 x 7 cm, ovate-oblong, obtuse to retuse at apex, nerves many, close. Panicles to 20 cm across, terminal, rusty tomentose; bracts ovate. Flowers many, 15 mm long; calyx 5 mm long, campanulate, shortly lobed, brown; petals yellow; standard obovate, crisped along the margins; wings obovate, auricled; keel similar to wings; stamens 5 + 5; ovary stalked, ovules 2, style incurved. Pods 5 cm across, compressed, orbicular, stalked, winged.

*Fl. & Fr.* June-September

*Distr.* India and Sri Lanka. Common in rocky areas of moist deciduous forests; *PS 19656*  
Vengoli

#### PUERARIA A. P. de Candolle

***Pueraria tuberosa*** (Roxb. ex Willd.) DC., Ann. Sci. Nat. (Paris) 4: 97. 1825; FBI 2: 197. 1876; FPM 360. 1918; FPL 168. 1990; FTSR 150. 1996. *Hedysarum tuberosum* Roxb. ex Willd., Sp. Pl. 3: 1197. 1803.

Large deciduous climbing shrubs with tuberous roots. Leaflets subequal, ovate acuminate, base obtuse or acute, laterals oblique at base, glabrous above and glabrescent below, to 18 x 14 cm; lateral nerves 7 or 8 pairs, reticulations prominent; petiole to 18 cm long; stipules ovate, 5 mm long. Flowers 1.3 cm long in much branched panicles, pedicels short. Calyx brown tomentose, bluish-purple. Petals pale blue. Ovary densely brown-hirsute. Pods 1.5-3 cm long, brown-hirsute.

*Fl. & Fr.* December-April

*Distr.* India, also in Tropical Himalayas. Common in moist deciduous forests; *PS 19370*  
Anappadi

#### RHYNCHOSIA Loureiro

- |   |                      |
|---|----------------------|
| 1. Erect sub shrubs.....  | <b>R. rufescens</b>  |
| 1. Twining herbs.....   | 2                    |
| 2. Racemes dense capitate; leaf margins ciliate .....                   | <b>R. densiflora</b> |
| 2. Racemes not capitate; leaf margins not ciliate .....                 | 3                    |
| 3. Pods as long as the calyx; calyx lobes oblong .....                  | <b>R. hirta</b>      |
| 3. Pods much longer than the calyx; calyx lobes linear-lanceolate ..... | <b>R. acutissima</b> |

***Rhynchosia acutissima*** Thw., Enum. Pl. Zeyl. 413. 1859; FBI 2: 226. 1876; FPM 375. 1918; FTSR 151. 1996.

Herbaceous twiners, branches pubescent. Leaflets ovate-rhomboid, caudate-acuminate, base truncate, puberulent above and sericeous below, to 15 x 11 cm; basally 3-nerved, intercostae reticulate; petiole to 8 cm long; stipule lanceolate, striate, cauducous 0.5 cm long. Flowers, 1.2 cm long, paired, in axillary many flowered racemes; pedicels 0.5 cm long, tomentose. Calyx lobes lanceolate, ciliate along the margins. Petals pale yellow with red veins. Ovary villous; style glabrous. Pods villous, greenish-yellow, 2 cm long; seeds bluish-black.

*Fl. & Fr.* November-April

*Distr.* Peninsular India and Sri Lanka. Common in moist deciduous forests; *PS 19910*  
Kariamchola

***Rhynchosia densiflora*** (Roth) DC., Prodr. 2: 386. 1825; FBI 2: 226. 1876; FPM 376. 1918. *Glycine densiflora* Roth, Nov. Pl. Sp. 348. 1821.

Twiners branchlets hirsute. Terminal leaflets to 9 x 6 cm, laterals 6.5 x 5 cm, obovate-rhomboid, acute, basally, 3-nerved, inequilateral, membranous, puberulus; petiole to 7 cm, stipule 4 mm, ovate, pubescent. Racemes axillary, to 6 cm long, many flowered; flowers yellow; bracts 8 x 3 mm, lanceolate, ciliate; calyx tube 2 mm, lobes 5 and 7 mm, lanceolate, acuminate, glandular pubescent; standard petal 1 x 0.7 cm, obovate; wings 1 x 0.3 cm; staminal tube 7 mm,

filaments subequal; ovary 2 mm, pubescent, style 5 mm, stigma terminal. Pods 1.5 x 0.5 cm, oblong, flat, smooth, long pilose, gland dotted; seeds bluish-black.

*Fl. & Fr.* January-April

*Distr.* India, Sri Lanka and Myanmar. Common in moist deciduous forests and occasional in plantations; *PS 19026*Thunakkadavu

**Rhynchosia hirta** (Andr.) Meikle & Verdc., *Taxon* 16: 462. 1967; FPL 170. 1990. *Dolichos hirtus* Andr., *Bot. Rep.* t. 446. 1807. *Cylista tomentosa* Roxb., *Pl. Corom.* t. 221. 1811. *Rhynchosia cyanosperma* Benth. in Oliver, *Fl. Trop. Africa* 2: 218. 1871; FBI 2: 222. 1876; FPM 375. 1918. *Cyanospermum tomentosum* Wight & Arn., *Prodr.* 260. 1834.

Climbers, densely fulvous hairy. Leaflets to 13 x 9 cm, broadly ovate, shortly acuminate, rounded at base; petiole to 6 cm long; stipules ovate; stipels filiform. Racemes to 15 cm long, axillary, hispid; bracts 25 x 15 mm, ovate, acuminate. Flowers 2 cm long, densely arranged; pedicels 8 mm long; calyx 2 cm long, lobes oblong, densely hispid; petals included, yellow; standard 15 x 10 mm, emarginate; wings 12 x 5 mm, oblong, spurred; keel glabrous. Pods 18 x 8 mm, oblong, acute at apex, impressed between seeds; seeds 5 mm across, smooth, shining.

*Fl. & Fr.* December-February

*Distr.* India, Africa and Sri Lanka. Rare along the margins of evergreen forests; *PS 19218* Kariamchola

**Rhynchosia rufescens** (Willd.) DC., *Prodr.* 2: 387. 1825; FBI 2: 220. 1876; FPM 373. 1918; FPL 170. 1990; FTSR 151. 1996. *Glycine rufescens* Willd., *Ges. Naturf. Freunde Berlin Neue Schriften* 4: 222. 1803.

Subshrubs with trailing branches, glandular-hairy. Leaflets 6.5 x 2.5 cm, ovate, acute, rounded at base; petiole 4-5 cm long; stipules ovate. Flowers in short racemes; calyx 8 mm long, lobes oblong, obtuse; petals included, yellow; standard 7 mm diam., orbicular, glabrous; wings 5 mm long, oblong. Pods 7 x 5 mm, ovoid, turgid, minutely hispid; seed-1, black.

*Fl. & Fr.* October-January

*Distr.* Indo-Malesia. Rare in rocky areas of moist deciduous forests; *PS 19238*Vengoli

#### ROTHIA Persoon

**Rothia indica** (L.) Druce, *Bot. Exch. Club Soc. Brit. Isles* 3: 423. 1914; FPL 170. 1990. *Trigonella indica* L., *Sp. Pl.* 778. 1753. *Rothia trifoliata* (Roth) Pers., *Syn.* 2: 302. 1807; FBI 2: 63. 1876; FPM 279. 1918. *Dillwynia trifoliata* Roth, *Cat. Bot.* 3: 71. 1806.

Erect woody herbs, densely hispid. Leaves 3-foliolate; leaflets subsessile, 1.5 x 0.5 cm, obovate, obtuse, densely hairy; petiole to 7 mm long; stipules 3 mm long, obovate. Flowers 8 mm long, in small axillary racemes; calyx 5-lobed, hispid, lobes lanceolate; standard obovate, pink; wings oblanceolate, without auricles at base; keel similar to wings; stamens 10, monadelphous; ovary densely hairy, many-ovuled; style straight. Pods 5 x 0.3 cm, linear-oblong, compressed, densely hairy; seeds many, cubical.

*Fl. & Fr.* August-December

*Distr.* Indo-Malesia and Australia. Fairly common in degraded forest areas; *PS 30707*Vengoli

#### SHUTERIA R. Wight & Arnott

**Shuteria involucrata** (Wall.) Wight & Arn., *Prodr.* 207. 1834. *Glycine involucrata* Wall., *Pl. Asiat. Rar.* 3: 22. t. 241. 1832. *Shuteria vestita* Wight & Arn., *Prodr.* 207. 1834; FBI 2: 181. 1876; FPM 350. 1918; FPL 171. 1990.

Slender twiners, stem villous. Leaves 3-foliolate, leaflets unequal, to 4.5 x 2.5 cm, ovate, obtuse, rounded at base, chartaceous, villous; petiole to 6 cm long, stipules lanceolate, striate with a tuft of hairs at base. Racemes to 20 cm long, axillary; bracts and bracteoles similar. Flowers many, white, deflexed; calyx 4 mm long, lobes acuminate; petals white; standard 7 x 5

mm, orbicular, wings 8 mm long, spurred at base; keel 8 x 3 mm, oblong; stamens 9 + 1; ovary many-ovuled, densely hairy. Pods 4 x 0.5 cm, oblong, flat, densely hispid; seeds many, cubical.

*Fl. & Fr.* November-March

*Distr.* Indo-Malesia. Common in degraded forest areas; *PS 19977* Keerappadi; *NS 30138* Karimala

#### SMITHIA W. Aiton

1. Flowers axillary, one or two ..... **S. conferta**
1. Flowers in axillary racemes ..... 2
2. Leaflets two pairs ..... **S. bigemina**
2. Leaflets more than three pairs ..... 3
3. Leaflets glabrous; stem hirsute ..... **S. venkobarrowii**
3. Leaflets pilose; stem glabrescent or softly hairy ..... **S. racemosa**

**Smithia bigemina** Dalz. in Hook.'s J. Bot. Kew Gard. Misc. 3: 208. 1851; FBI 2: 149. 1876; FPM 329. 1918; FPL 172. 1990.

Diffuse herbs, leaflets to 4 pairs, to 0.9 x 0.3 cm, oblong. Racemes lax; flowers yellow; pedicels to 0.5 cm; calyx 2-lipped, lower 3-lobed. Lomentum reticulate, papillose.

*Fl. & Fr.* September-February

*Distr.* India and Pakistan. Rare in marshy grasslands; *PS 19964* Karimala

**Smithia conferta** Sm. in Rees, Cyclop. 33: 2. 1819; FPM 329. 1918; FPL 172. 1990. *S. geminiflora* Roth, Nov. Pl. Sp. 352. 1821; FBI 2: 149. 1876, incl. var. *conferta* (Sm.) Baker; FPM 329. 1918.

Erect or scandent herbs; stem glabrous. Leaflets 5 or 6 pairs, 7-13 x 2-4 mm, oblong, acute, strongly bristled along margins and midribs below; rachis terminate into a bristle; stipule 13 mm long, ovate above, 2-lobed below. Flowers solitary or paired, pedicelled; bracts 7 mm long, ovate, cuspidate. Calyx 8 x 5 mm, lobes undivided; petals yellow with red lineole.

*Fl. & Fr.* June-January

*Distr.* Indo-Malesia to Australia. Occasional in marshy areas; *PS 19028* Thunakkadavu

**Smithia racemosa** Heyne ex Wight & Arn., Prodr. 221. 1834; FPM 330. 1918; FTSR 153. 1996. *S. blanda* Wall. ex Wight & Arn. var. *racemosa* (Heyne ex Wight & Arn.) Baker in Hook. f., FBI 2: 151. 1876. p.p. *S. bigemina* Matthew, Ill. Fl. Tamil. Car. t. 222. 1982, non Dalz 1851.

Straggling herbs. Leaflets 8-14 x 4-6 mm, obovate, obtuse, glabrous above, sparsely bristly below, ciliate, stipule 10 x 1.5 mm, acuminate at either ends, densely bristly. Racemes paired, 4-8-flowered; peduncles 2-3 cm long, villous; pedicel 4 mm long. Flowers yellow; calyx 4 mm long, smooth; standard 8 x 7 mm, emarginate, clawed; wings 8 x 3 mm, obovate; keel deeply auricled at base.

*Fl. & Fr.* June-December

*Distr.* South West India and Sri Lanka. Common in grasslands; *PS 19692* Karimala

**Smithia venkobarrowii** Gamble, FPM 330.1918 & Kew Bull. 1919:223.1919; FTSR 153.1996.

Erect subshrubs, to 70 cm high; stem white, yellowish villous. Leaflets 2-4 pairs 2-2.5 x 0.5 cm, oblong, obtuse, mucronate, glaucous beneath, glabrous, rachis hairy; stipules 12 mm long, 2-lobed at base; glabrous. Racemes 2 cm across; congested; bracts deciduous; bracteoles 3 x 1.5 mm, obovate, bristled. Flowers few; calyx 7 mm long, lips similar, obtuse, sparsely ciliate; standard 1 cm across, yellow. Joints of pods 3 x 2.5 mm, orbicular, strongly reticulate, smooth, 5-7 together.

*Fl. & Fr.* November-January

*Distr.* Endemic to Southern Western Ghats. Rare in moist areas of grasslands; *PS 30499* Koorankuzhi

### SPATHOLOBUS Hasskarl

**Spatholobus parviflorus** (Roxb. ex DC.) O. Ktze., Rev. Gen. Pl. 1: 205. 1891; FPL 172. 1990; FTSR 154. 1996. *Butea parviflora* Roxb. ex DC., Prodr. 2: 415. 1825. *Spatholobus roxburghii* Benth. in Miq., Pl. Jungh. 238. 1852; FBI 2: 193. 1876; FPM 358. 1918.

Large climbers; branches puberulus. Leaflets ovate, obtusely acute at apex, rounded at base, densely hairy below, lateral nerves 8 pairs; nervules parallel; petiole 3-6 cm long. Panicles 20 x 15 cm, axillary, densely hispid. Flowers 9 mm long, 8 mm across; calyx 4 mm long, densely villous inside; standard 8 x 6 mm, glabrous, pale-pink; wings 6 mm long, long-clawed; keel 9 mm long, obovoid. Pods 14 x 4.5 cm, stalked; stalk 3 cm long.

*Fl. & Fr.* October-January

*Distr.* India and Sri Lanka to Malesia. Common in moist deciduous forests and plantations; *PS 30595* Padippara

### STYLOSANTHES O. Swartz

**Stylosanthes fruticosa** (Retz.) Alston in Trimen, Handb. Fl. Ceylon, 6. (Suppl.): 77. 1931. *Arachis fruticosa* Retz., Obs. Bot. 5: 26. 1789. *Stylosanthes mucronata* Willd., Sp. Pl. 3: 1166. 1802; FBI 2: 148. 1876; FPM 326. 1918.

Coarse subshrubs. Leaves 3-foliolate; leaflets 2-3 x 0.6 cm, lanceolate, coriaceous, mucronate, glabrous or pubescent, strongly nerved; stipules 2 cm long, lanceolate, long-mucronate. Flowers in terminal or axillary cymes, covered with trilobed bracts and bracteoles; calyx 5 mm long, tubular; lobes obtuse, ciliate; petals pink; standard 6mm diam., orbicular; wings curved-oblong; keel petals incurved; stamens 10, monadelphous, anthers dimorphous; ovary sessile, ovules 3. Pods 3 mm long, oblong, glabrous; seeds compressed.

*Fl. & Fr.* Throughout the year

*Distr.* Sri Lanka, India, Africa and Madagascar. Rare in moist deciduous and dry deciduous forests; *PS 30487* Kuchimudi

### TEPHROSIA Persoon

- |   |                       |
|---|-----------------------|
| 1. Pods glabrous.....                         | <b>T. purpurea</b>    |
| 1. Pods covered with white cottony hairs..... | 2                     |
| 2. Stipules broadly ovate.....                | <b>T. pulcherrima</b> |
| 2. Stipules linear-lanceolate.....            | <b>T. canarensis</b>  |

**Tephrosia canarensis** Drum. in Gamble, FPM 319. 1918; FPL 174. 1990. *Tephrosia tinctoria* Pers. var. *intermedia* Baker in Hook. f., FBI 2: 112. 1876 p.p.

Erect sub-shrubs, stem channelled, hairy. Leaflets 7 or 9, to 5.5 x 1.3 cm, oblong-elliptic, obtuse, mucronate, base acute, glabrous above, glaucous below; petiolule *ca* 3 mm, stipule *ca* 4 x 3 mm, ovate. Racemes axillary, peduncle to 10 cm; bracts and bracteoles subulate; flowers red, calyx to 7 mm, lobes lanceolate, velvety, standard to 1.5 x 8 cm, wings obovate, to 12 x 4 mm, keels to 13 x 5 mm; staminal sheath *ca* 7 mm; ovary *ca* 6 mm, velvety; style *ca* 4 mm, pubescent. Pods to 7.5 x 0.6 cm, slightly curved, sparsely hairy; seeds many.

*Fl. & Fr.* October-February

*Distr.* India and Sri Lanka. Common in rocky areas; *PS 19756* Vengoli

**Tephrosia pulcherrima** (Wight ex Baker) Gamble, FPM 319. 1918; FPL 174. 1990; FTSR 155. 1996. *T. tinctoria* Pers. var. *pulcherrima* Wight ex Baker in Hook.f., FBI 2: 112. 1876.

Shrubs; stem densely erect-hairy. Leaflets 5, to 6 x 2 cm, elliptic-oblong, obtuse, mucronate, glabrous above; stipule 10 x 4 mm, ovate. Racemes axillary; peduncle 8 cm long, stout. Flowers red; calyx 4 mm long, lobes hairy; standard 10 x 8 mm, densely hairy on back, clawed; wings 10 x 5 mm, dark pink at apex, verrucose; keel 10 mm long, yellowish-pink. Pods to 7 x 0.5 cm, oblong, densely hairy.

*Fl. & Fr.* November-February

*Distr.* Peninsular India and Sri Lanka. Common in grasslands; *PS 19690* Karimala

**Tephrosia purpurea** (L.) Pers., Syn. 2: 329. 1807; FBI 2: 112. 1876,p.p.; FPM 320. 1918; FPL 174. 1990; FTSR 155. 1996. *Cracca purpurea* L., Sp. Pl. 752. 1753. *Tephrosia hamiltonii* Drumm. ex Gamble, FPM 320. 1918.

Shrubs, stem minutely scabrous. Leaflets 15-17, to 2.5 x 0.7 cm, oblanceolate, obtuse, mucronate, glabrous above, stipule 6 mm long, subulate, deflexed. Raceme to 12 cm long, axillary. Flowers lax; pedicels 6 mm long, slender; calyx 7 mm long, one lobe much smaller than others; standard red, 10 x 10 mm, clawed, glabrous; wings 10 x 4 mm, curved; keel 7 mm long, clawed. Pods 4 x 0.4 cm, minutely velutinus; seeds 7 or 8, 4 x 3 mm, rectangular, dark-brown.

*Fl. & Fr.* Throughout the year

*Distr.* Indo-Malesia. Common in rocky areas; *PS 19979* Keerappadi

#### TERAMNUS P. Brown

**Teramnus labialis** (L.f.) Spreng., Syst. Veg. 3: 235. 1826; FBI 2: 184. 1876; FPM 352. 1918; FPL 175. 1990; FTSR 156. 1996. *Glycine labialis* L.f., Suppl. Pl. 325. 1782.

Slender climbers, branchlets glabrescent. Leaflets ovate or elliptic, acute, membranous, puberulent below, to 6 x 2.5 cm; petiole to 5 cm. Flowers 4 mm long, on few-flowered slender racemes; calyx villous; petals red. Pods linear, beaked, compressed, 4 x 0.3 cm.

*Fl. & Fr.* October-December

*Distr.* Indo-Malesia and Africa. Common in degraded forest areas; *PS 19849* Vengoli

#### URARIA Desvaux

1. Racemes lax, to 30 cm long..... **U. rufescens**

1. Racemes dense, 4-8 cm long ..... **U. lagopodioides**

**Uraria lagopodioides** (L.) Desv. in DC., Prodr. 2: 324. 1825; "*lagopoides*"; FBI 2: 156. 1876; FPM 336. 1918. *Hedysarum lagopodioides* L., Sp. Pl. 1198. 1753.

Trailing subshrubs; stem hispid. leaflets to 5 x 2.5 cm, ovate-oblong, obtuse, mucronate, hispid below, subcordate at base; petiole 1.5 cm long; stipule 12 mm long, filiform. Racemes 2 cm broad; bracts 8 x 5 mm, ciliate. Flowers many, pedicelled; calyx lobes 10 mm long, bristled, upper lobes smaller; standard 7 x 5 mm, acute to the base; wings 5 x 2 mm, clawed; keel 6 mm long, auricled. Joints of pods 3.5 x 2.5 mm, reticulate, shining.

*Fl. & Fr.* August-December

*Distr.* Indo-Malesia to Australia and Pacific Islands. Common in moist deciduous forests; *PS 19102* Peruvaripallam

**Uraria rufescens** (DC.) Schind., Feddes Repert. 21: 14. 1925; FPL 175. 1990; FTSR 156. 1996. *Desmodium rufescens* DC., Ann. Sci. Nat. (Paris) 4: 101. 1825. *Doodia hamosa* Roxb., Fl. Ind. 3: 367. 1882. *Uraria hamosa* (Roxb.) Wall. ex Wight & Arn., Prodr. 222. 1834; FBI 2: 150. 1876; FPM 336. 1918.

Subshrubs. Leaflets to 8.5 x 4.5 cm, elliptic, acute or obtuse at apex and base, hispid below; stipules 12 mm long, acuminate. Flowers distant; bracts 7 mm long, hispid; calyx 3 mm long, glabrous; standard 6 x 8 mm, orbicular, cuneate at base, pinkish; wings 5 x 3 mm, oblique, auricled at base; keel 6 x 3 mm. Joints of pods 6-8, each 2 x 2 mm, hispid, black.

*Fl. & Fr.* November-February

*Distr.* India-Malesia. Common in moist deciduous forests and plantations; *PS 30594* Karimala

#### VIGNA Savi

1. Pods glabrous..... **V. umbellata**

1. Pods variously hairy..... 2

2. Leaflets entire; flowers pink..... **V. vexillata**  
 2. Leaflets lobed; flowers yellow..... 3  
 3. Stipules obovate; leaf margins ciliate..... **V. trilobata**  
 3. Stipules deltoid; leaf margin not ciliate..... **V. radiata** var. **sublobata**

**Vigna radiata** (L.) Wilczek var. **sublobata** (Roxb.) Verdc., Kew Bull. 24: 559. 1970; FPL 176. 1990. *Phaseolus sublobatus* Roxb., Fl. Ind. 3: 288. 1832; FPM 363. 1918. *P. trinervius* Heyne ex Wight & Arn., Prodr. 245. 1834; FBI 2: 203. 1876. *Vigna sublobata* (Roxb.) Bairiy *et al.*, JETB 7: 274. 1985.

Slender climbers. Leaflets to 45. x 3 cm, laterals smaller, ovate, acute or obtuse at apex, sparsely hispid; petiole 4 cm long. Flowers densely packed, sessile; calyx lobes obtuse, ciliate. Pods 3-5 x 0.5 cm, densely brown-strigose; seeds 3 x 2.5 mm, rectangular, longitudinally rugose. *Fl. & Fr.* November-January  
*Distr.* Indo-Malesia, widely cultivated. Common in degraded forest areas; *PS 19166* Karimala; *19191* Rockpoint

**Vigna trilobata** (L.) Verdc., Taxon 17: 172. 1968 & Kew Bull. 24: 560. 1970; FPL 176. 1990; FTSR 157. 1996. *Dolichos trilobatus* L., Mant. Pl. 1: 101. 1767. *Phaseolus trilobus* Baker in Hook. f., FBI 2: 201. 1876; FPM 362. 1918.

Twiners, pilose. Leaflets to 3.5 x 2.5 cm, apex obtuse, acute, pilose, basally tri-nerved; petiole 7 cm long, stipule 8 mm, oblong, acute, stipels 3 mm, linear. Racemes axillary, to 15 cm; flowers yellow; bracts 7 mm, lanceolate; calyx tube 1.5 mm, campanulate, lobes 5, 0.5 mm, ovate; corolla 4 mm long; keel 6 x 2 mm, curved, produced to a beak; staminal tube to 4 mm; ovary to 5 mm, pubescent, style curved, bearded at the apex, stigma oblique. Pods 4 x 0.2 cm, terete, puberulus. *Fl. & Fr.* December-April  
*Distr.* Indo-Malesia. Common in secondary forests; *PS 19966* Karimala

**Vigna umbellata** (Thumb.) Ohwi & Ohashi, Jap. J. Bot. 44: 31. 1969; FPL 177. 1990; FTSR 158. 1996. *Dolichos umbellatus* Thunb., Trans. Linn. Soc. London 2: 339. 1794. *Phaseolus calcaratus* Roxb., Fl. Ind. 3: 289. 1832; FBI 2: 203. 1876; FPM 363. 19183.

Slender twiners; stem reflexed hairy. Leaflets 10 x 5 cm, ovate, acuminate, hispid; petiole 10 cm long, slender, stipule 8 mm long, ovate, decurrent at base. Flowers in short axillary racemes, 2-3-together; calyx 3 mm long, lobes ovate; petals yellow; standard 10 x 15 mm, strongly auricled at base; wings 8 x 6 mm, orbicular; keel 7 x 6 mm, incurved to one turn, spurred to one side. Pods 7 x 0.5 cm, compressed, many-seeded.  
*Fl. & Fr.* November-December  
*Distr.* Indo-Malesia. Common in moist deciduous forests and plantations; *PS 19815* Thellikkal

**Vigna vexillata** (L.) A. Rich. in Sagra, Hist. Fist. Polit. Nat. Cuba 11: 191. 1845; FBI 2: 206. 1876; FPM 364. 1918; FPL 177. 1990.

Slender climbers. Leaflets to 4.5 x 2 cm, ovate, acute at apex, rounded at base, strigose hairy; petiole 4 cm long; stipule cordate at base. Flowers solitary or 2-3 together; calyx 9 mm long, strigose hairy; lobes lanceolate; petals yellow; standard 3 x 3 cm, orbicular, wings 25 x 12 mm, auricled at base; keel 25-30 mm long, strongly spurred on lateral side. Pods 5.5 x 0.5 cm, densely brown-hispid.  
*Fl. & Fr.* November-February  
*Distr.* Cosmopolitan in tropics. Common in degraded forest areas; *PS 19748* Pezha

#### ZORNIA J. F. Gmelin

**Zornia gibbosa** Span., Linnaea 15: 192. 1841; FPL 177. 1990; FTSR 158. 1996. *Z. angustifolia* Sm. in Rees, Cyclop. 39: 200. 1819. *Z. graminea* Span., Linnaea 15: 192. 1841.



Diffuse herbs. Leaves bifoliolate, leaflets 4 x 6 m, lanceolate, acute, sessile; stipule peltate, acuminate. Flowers sessile in terminal racemes; bracts paired, 15 x 5 mm, peltate, acuminate; calyx lobes unequal, 2 upper connate, lateral ones smaller; corolla yellow, 4 mm long; standard orbicular, auriculated at base, clawed; wings oblong, clawed; keel obovate; staminal tube 1.5 x 2 mm, cleft above. Pods 2-5-jointed; joints moniliform, covered with retrorsely hispid bristles.

*Fl. & Fr.* Throughout the year

*Distr.* Indo-Malesia to Australia and China. Common in wet rocky areas and vayas; *PS 30210* Vengoli

### Caesalpinioideae

- |   |                     |
|---|---------------------|
| 1. Leaves simple, bilobed .....   | <b>Bauhinia</b>     |
| 1. Leaves compound, pinnate .....   | 2                   |
| 2. Leaves bipinnate .....   | 3                   |
| 2. Leaves simple pinnate .....  | 5                   |
| 3. Trees; rachis unarmed .....  | <b>Acrocarpus</b>   |
| 3. Shrubs or climbers; rachis armed .....   | 4                   |
| 4. Flowers yellow; pods not apically winged .....   | <b>Caesalpinia</b>  |
| 4. Flowers white; pods apically winged .....  | <b>Pterolobium</b>  |
| 5. Stipule large foliaceous, appendaged .....   | <b>Humboldtia</b>   |
| 5. Stipule not foliaceous, un-appendaged .....  | 6                   |
| 6. Petals 4 or 5; stamens free .....  | 7                   |
| 6. Petals 3; stamens monadelphous .....   | <b>Tamarindus</b>   |
| 7. Stamens 10, lower 3 long and curved; fruit terete, woody, indehiscent; trees .....                           | <b>Cassia</b>       |
| 7. Stamens 10 or less, subequal; fruit compressed or terete, not woody, dehiscent or not; herbs or shrubs ..... | 8                   |
| 8. Pods indehiscent or if dehiscent valves not elastic; seed coat with closed areole; bracteoles absent .....   | <b>Senna</b>        |
| 8. Pods elastically dehiscent; seed coat without areoles; bracteoles 2 .....                                    | <b>Chamaecrista</b> |

### ACROCARPUS R. Wight ex Arnott

**Acrocarpus fraxinifolius** Wight & Arn., *Mag. Zool. Bot.* 2: 547. 1838; *FBI* 2: 292. 1878; *FPM* 397. 1919.

Very large trees; bark thick, rough, peeling. Leaves bipinnate, pinnae 3-5 pairs, 4-6-foliolate; leaflets 7-12 x 3-6 cm, lanceolate, acuminate, petiolulate. Racemes dense, axillary, to 25 cm long. Flowers 2.5 cm long, deflexed, densely packed; calyx 10 mm long, tubular below, lobes ovate, obtuse, densely hairy; petals 5, each 7 x 2 mm, oblong, obtuse, erect, yellowish pink; stamens 5, free; filaments erect, 15 mm long, pink; ovary stipitate, many-ovuled, style short, recurved. Pods 15 x 2 cm, compressed, oblong, winged, 10-seeded, glabrous.

*Fl. & Fr.* January-April

*Distr.* Indo-Malesia and Africa. Rare in semi-evergreen forests; *PS 30561* Karimala

### BAUHINIA Linnaeus

- |   |                      |
|---|----------------------|
| 1. Trees; flowers creamy yellow .....     | <b>B. malabarica</b> |
| 1. Climbing shrubs; flowers crimson ..... | <b>B. phoenicea</b>  |

**Bauhinia phoenicea** Wight & Arn., *Prodr.* 296. 1834; *FBI* 2: 283. 1878; *FPM* 408. 1919; *FPL* 179. 1990; *FTSR* 159. 1996. *Phanera phoenicea* (Wight & Arn.) Benth. in *Miq.*, *Pl. Jungh.* 262. 1852. *Bauhinia benthamii* Bedd., *l.c.* t. 107. 1868-1874.

Large climbing shrubs. Leaves to 10 cm across, orbicular, deeply bifid above, lobes acute, cordate at base, 9-ribbed from base, nervules parallel. Flowers in extra-axillary racemes, axis 10-20-flowered; pedicel 3 cm long; calyx tube short, lobes 2 cm long, oblong, puberulus outside;

petals 5, 4 x 0.8 cm, long-clawed, spreading; stamens 4 or 5, exserted, anthers linear, 6 mm long; style slender; stigma peltate. Pods to 16 x 2.5 cm, oblong, broadened above, densely rusty, pubescent, many-seeded.

*Fl. & Fr.* October-February

*Distr.* Endemic to Western Ghats. Rare in moist deciduous forests; *PS 19888* Velayudhankai

**Bauhinia malabarica** Roxb., *Fl. Ind.* 2: 321. 1832; *FBI* 2: 227. 1878; *FPM* 407. 1919; *FPL* 179. 1990; *FTSR* 159. 1996. *Piliostigma malabaricum* (Roxb.) Benth. in *Miq. Pl. Jungh.* 261. 1852.

Trees, to 10 m high, bark black, red inside. Leaves to 10 x 13 cm, orbicular, bilobed above; lobes obtuse, cordate at base, 9-ribbed, nervules reticulate; petiole 4 cm long; panicles axillary, 5 cm across. Flowers 2 cm long, few; calyx oblong, connate, rusty pubescent; petals 5, oblong, greenish yellow, glabrous, shortly stalked; stamens 10, inner 5, smaller, anthers oblong; ovary oblong, many-ovuled. Pods 25 x 2 cm, compressed, longitudinally striate; seeds many, oblong.

*Fl. & Fr.* September-February

*Distr.* India and Myanmar. Common in moist deciduous forests; *PS 19607* Kothala; 18943 Kothala

#### CAESALPINIA Linnaeus

- 1. Pods winged; leaflets 3-5 pairs ..... **C. cucullata**
- 1. Pods not winged; leaflets more than 7 pairs ..... 2
- 2. Branchlets with reddish glandular hairs; leaflets to 1 x 0.5 cm ..... **C. mimosoides**
- 2. Branchlets glabrous; leaflets to 5 x 2.5 cm ..... **C. bonduc**

**Caesalpinia bonduc** (L.) Roxb., *Fl. Ind.* 2: 362. 1832; *FTSR* 161. 1996. *Guilandina bonduc* L., *Sp. Pl.* 381. 1753. *Caesalpinia bonducella* (L.) Flem., *Asiat. Res.* 11: 159. 1810; *FBI* 2: 254. 1878. *Caesalpinia crista* sensu Gamble, *FPM* 393. 1919, non L. 1753.

Climbing shrubs, rusty, tomentose. Leaves to 70 x 40 cm, pinnules 8 pairs, leaflets 8 pairs, 5 x 3 cm, ovate, abruptly acuminate, rachis armed with recurved spines. Racemes to 30 cm long, axillary, tomentose. Flowers yellow, 1.8 cm across; sepals oblong, obtuse, tomentose; petals 10 mm long, obovate with wavy margins. Pods 12 x 5 cm, obovate-oblong, densely spiny, 2-3-seeded.

*Fl. & Fr.* January-March

*Distr.* Paleotropics. Rare in evergreen forests; *PS 30096* Kottayali

**Caesalpinia cucullata** Roxb., *Fl. Ind.* 2: 358. 1832; *FTSR* 161. 1996. *Mezoneuron cucullatum* (Roxb.) Wight & Arn., *Prodr.* 283. 1834; *FBI* 2: 258. 1878; *FPM* 395. 1919; *FPL* 182. 1990.

Stout climbers; old stem covered with strong thorns with clavate thick base. Leaves to 45 cm long; pinnules 5 or 6 pairs; leaflets 3 pairs, to 10 x 4 cm, ovate, acuminate, glabrous; rachis with strong curved thorns. Racemes to 25 cm long, clustered. Flowers 2 cm across, irregular, cucullate; sepals unequal, lobes obtuse, glabrous; petals unequal, orbicular; filaments glabrate. Pods 10 x 2.5 cm, flattened, oblong, obtuse, glabrous.

*Fl. & Fr.* December-January

*Distr.* Indo-Malesia. Fairly common in moist deciduous and along the margins of evergreen forests; *PS 18871* Orukomban

**Caesalpinia mimosoides** Lam., *Encycl.* 1: 452. 1785; *FBI* 2: 256. 1878; *FPM* 394. 1919; *FTSR* 161. 1996.

Rambling shrubs, densely prickly, pungent smelling when cut; stem tomentose. Leaves 30-40 x 25 cm; pinnules 10-14 pairs; leaflets 10 x 4 mm, oblong inequilateral, obtuse.

Raceme to 40 cm long, axillary or terminal, densely prickly, pedicels solitary, 2 cm long. Flowers 3 cm across; sepals 8 x 4 mm, oblong, obtuse; petals yellow, to 1.5 cm long, orbicular, wavy along the margins. Pods 5 x 2.5 cm, compressed, brown, 1 or 2 seeded.

*Fl. & Fr.* December-January

*Distr.* Peninsular India and Sri Lanka. Common in disturbed forest areas; *PS 30834* Thekkady

#### CASSIA Linnaeus

**Cassia fistula** L., Sp. Pl. 377.1753; FBI 2:201.1878; FPM 400.1919; FPL 181. 1990; FTSR 163. 1996. *C. rhombifolia* Roxb., Fl. Ind. 3:334.1832.

Small to medium trees. Leaves to 30 cm long; leaflets 4-8 pairs, 10 x 4 cm, ovate, acute, eglandular. Racemes to 40 cm long, axillary, drooping; pedicels to 4 cm long. Flowers 4 cm across; bracts minute; sepals ovate, obtuse, green; petals to 2 x 2 cm, orbicular, concave; filaments unequal, to 3.5 cm long, anthers dimorphic. Pods to 40 cm long, septate, glabrous; seeds transverse, orbicular.

*Fl. & Fr.* March-June

*Distr.* South-East Asia. Common in moist deciduous forests and sparsely in plantations; *PS 30801* Thunakkadavu

#### CHAMAECRISTA (Breyne) Moench

1. Leaflets 2, eglandular ..... **C. absus**
1. Leaflets more than 6 pairs, with gland on the petiole ..... 2
2. Leaflets 8-10 pairs, gland on the petiole stalked ..... **C. kleinii**
2. Leaflets 25-40 pairs, gland on the petiole sessile ..... **C. mimosoides**

**Chamaecrista absus** (L.) Irwin & Barneby, Mem. New York Bot. Gard. 35: 664. 1982. *Cassia absus* L., Sp. Pl. 376.1753; FBI 2:255.1878; FPM 403.1919; FTSR 163. 1996.

Scabrid herbs. Leaves to 6 cm long; leaflets 3.5 x 1.6 cm, ovate, acute, hispid; stipule lanceolate, deflexed. Flowers in terminal racemes, 6 mm across, shortly pedicelled; sepals oblong, obtuse; petals yellow, obovate, obtuse; stamens unequal; anthers dimorphic. Pods 4.5 x 0.7 cm, oblong, flat, hispid, oblique at base; seeds 6, biconvex.

*Fl. & Fr.* September-January

*Distr.* Paleotropics. Fairly common in moist deciduous forests, in open rocky areas; *PS 30828* Kannimara

**Chamaecrista kleinii** (Wight & Arn.) Mathew, Kew Bull. 48: 760. 1993. *Cassia kleinii* Wight & Arn., Prodr. 293. 1834; FBI 2: 266. 1878; FPM 403. 1919. *Chamaecrista kleinii* (Wight & Arn.) Mathew, Kew Bull. 48: 760. 1993.

Prostrate herbs. Leaves 3-6 cm; leaflets 8-13 pairs, 13 x 4 mm, falcate, mucronate, midrib near to upper margin, gland on the petiole stipitate, near to the lowest pair of leaflets. Flowers axillary, 1-3, yellow; bracts and bracteoles 2-3 mm; sepals 6-7 mm long, pubescent; petals 8-10 mm; stamens 10, subequal. Pods 4.5 x 0.5 cm, flat, hairy, thickened on the sutures.

*Fl. & Fr.* July-October

*Distr.* Peninsular India and Sri Lanka. Fairly common in plantations; *PS 19820* Kannimara

**Chamaecrista mimosoides** (L.) Green, Prittonia 4:27.1899. *Cassia mimosoides* L., Sp. Pl. 379.1753; FBI 2:266.1878; FPM 403.1919; FPL 181. 1990; FTSR 163. *Chamaecrista mimosoides* (L.) Green, Prittonia 4: 27. 1899.

Erect subshrubs, hirsute. Leaves to 8 cm long, leaflets 4 x 1 mm, oblong, inequilateral, hirsute; stipule to 1 cm long, lanceolate, subulate at apex. Flowers axillary, solitary or paired, 1

cm across; sepals lanceolate, acuminate, hairy; petals obovate, yellow; all stamens with fertile anthers, filaments equal. Pods 6 x 0.6 cm, oblong, sparsely hairy; seeds many.

*Fl. & Fr.* September-January

*Distr.* Pantropical. Fairly common in moist deciduous forests; *PS 19745* Pezha

#### HUMBOLDTIA Vahl

**Humboldtia vahliana** Wight, Ic. tt. 1607,1608. 1850; FBI 2: 274. 1878; FPM 411. 1919; FTSR 165. 1996.

Small trees. Leaflets 3 pairs, 21 x 6 cm, oblong, acute; nerves 8 pairs, reticulate. Racemes erect, axillary, to 18 cm long; bracts ovate, obtuse, densely tomentose; bracteoles similar, paired. Flowers pedicelled; sepals 7 x 3 mm, oblong, obtuse; petals 9 x 5 mm, obovate, clawed; stamens 5. Pods 13-20 x 3-5 cm, compressed, oblong, acute at base and apex, rusty tomentose.

*Fl. & Fr.* January-April

*Distr.* Endemic to Southern Western Ghats. Common along the riverine areas; *PS 19351* Orukomban

#### PTEROLOBIUM R. Brown ex Wight & Arnott

**Pterolobium hexapetalum** (Roth) Sant. & Wagh, Bull. Bot. Surv. India 5: 108. 1964; FPL 183. 1990. *Reichardia hexapetala* Roth, Nov. Pl. Sp. 210. 1821. *Caesalpinia lacerans* Roxb., Fl. Ind. 2: 367. 1832. *Pterolobium indicum* Rich., Fl. Abyss. 1: 247. 1847; FBI 2: 259. 1878; FPM 395. 1919. *Pterolobium lacerans* Wall. ex Wight & Arn., Prodr. 283. 1834.

Stragglers. Leaves to 15 cm, pinnae 4-7 pairs; leaflets 6-10 pairs, 1.2 x 0.7 cm, oblong, obovate, apex rounded, base oblique, pubescent; petiole to 3 cm. Racemes axillary or terminal, to 15 cm; peduncles to 5 cm; flowers white; pedicel 1-1.5 cm; bracts subulate; sepals 4 and 6 mm, hooded; petals 6 x 2 mm, obovate, clawed, subequal; stamens 10. Pods 4.5 x 1.5 cm, samaroid, flat, apically winged, reddish when young; seed 1, 10 x 5 mm.

*Fl. & Fr.* March-August

*Distr.* Endemic to Peninsular India. Common in dry deciduous forests; *PS 30088* Keerappadi; *19549* Thekkady

#### SENNA P. Miller

1. Branchlets and pods hirsute ..... **S. hirsuta**
1. Branchlets and pods glabrous or glabrescent ..... 2
2. Leaflets obovate; pods less than 3 mm broad ..... **S. tora**
2. Leaflets oblong-lanceolate; pods more than 5 mm broad..... **S. occidentalis**

**Senna hirsuta** (L.) Irwin & Barneby, Phytologia 44:499.1979. *Cassia hirsuta* L., Sp. Pl. 378.1753; FBI 2:263.1878; FPM 401.1919; FPL 181. 1990; FTSR 163. 1996. *Senna hirsuta* (L.) Irwin & Barneby, Phytologia 44:499.1979. *Cassia tomentosa* Wight & Prodr. 286.1834, non L.

Shrubs. Leaves 25 cm long; leaflets 4 pairs, to 7 x 3 cm, ovate-lanceolate, acute. Flowers 3-7 together, on axillary umbel, 3 cm across; sepals 6 x 4 mm, obovate, hispid; petals 12 x 8 mm, obovate, entire, glabrous. Pods 15 x 0.5 cm, terete, falcate, densely hispid.

*Fl. & Fr.* September-December

*Distr.* Paleotropics. Common in degraded forest areas; *PS 30791* Sungam

**Senna occidentalis** (L.) Link, Handb. 2: 140. 1829. *Cassia occidentalis* L., Sp. Pl. 377. 1753; FBI 2: 262. 1878; FPM 401. 1919; FPL 182. 1990; FTSR 163. 1996. *Senna occidentalis* (L.) Link, Handb. 2: 140. 1829.

Glabrous shrubs. Leaves to 22 cm long, glandular at the base of petiole; leaflets 6 pairs, to 7 x 2 cm, lanceolate, ciliate, shortly petiolulate. Flowers 3 cm across, pedicelled, in axillary two flowered umbel turning to terminal racemes; pedicels to 1.5 cm long; sepals orbicular, green;

petals yellow, obovate, clawed; 3 stamens with larger anthers, 4 stamens with short anthers, 3 staminodes. Pods 11 x 8 cm, oblong, curved, compressed, marginate, long-cuspidate.

*Fl. & Fr.* July-December

*Distr.* Native of South America; naturalised in Asia. Common in degraded forest areas; *PS 19003* Thunakkadavu

**Senna tora** (Lam.) Roxb., *Fl. Ind.* 2: 340. 1832. *Cassia tora* L., *Sp. Pl.* 376.1753; *FBI* 2: 263. 1878; *FPM* 401.1919; *FPL* 182. 1990; *F TSR* 164. 1996.

Glabrous shrubs. Leaves to 12 cm long; rachis glandular between leaflets; leaflets 2-4 pairs, to 5 x 3 cm, obovate, obtuse. Flowers 3 cm across, in axillary fascicles, pedicellate; calyx ovate, acute, hispid; petals obovate, not clawed; 7 stamens antheriferous, 3 staminodes, anthers subequal. Pods to 17 x 0.3 cm; terete, glabrous.

*Fl. & Fr.* August-December

*Distr.* Pantropical. Fairly common in degraded forest areas; *NS 30803* Thunakkadavu

### TAMARINDUS Linnaeus

**Tamarindus indica** L., *Sp. Pl.* 34. 1753; *Hook.f. FBI* 2: 273. 1878; *FPM* 409. 1919; *FPL* 184. 1990; *F TSR* 166. 1996.

Trees; branchlets warty. Leaves paripinnate; leaflets 14-17 pairs, 2 x 0.7 cm, oblong, apex obtuse; petiole 1 cm. Racemes terminal on short branches, 6 cm long; bracts and bracteoles ovate; pedicel 7 mm; calyx tube 6 mm, turbinate, lobes 4, to 1 cm, subequal; petals 3, 1.5 x 1 cm, oblanceolate, lateral clawed, subequal, yellow, outer one dotted with pink; staminal tube to 7 mm, filaments 6 mm, base villous, staminodes 2; ovary 8 mm, stipitate, style 5 mm.

*Fl.* February-May

*Distr.* Native of Tropical Africa, widespread in the Tropics. Occasional in dry deciduous forests; *PS 30792* Keerappadi

### Mimosoideae

- |   |                       |
|---|-----------------------|
| 1. Plants armed with prickles .....                           | 2                     |
| 1. Plants unarmed.....  | 5                     |
| 2. Herbs; pods bristly .....                                  | <b>Mimosa</b>         |
| 2. Trees, shrubs or woody climbers; pods glabrous.....        | 3                     |
| 3. Pinnae 1 or 2 pairs .....                                  | 4                     |
| 3. Pinnae more than 3 pairs .....                             | <b>Acacia</b>         |
| 4. Flowers in heads of paniced spikes.....                    | <b>Pithecellobium</b> |
| 4. Flowers in spike.....                                      | <b>Prosopis</b>       |
| 5. Woody climbers; leaf rachis ending in hooked tendrils..... | <b>Entada</b>         |
| 5. Trees; leaves without tendrils .....                       | 6                     |
| 6. Pods circinate.....  | <b>Archidendron</b>   |
| 6. Pods not circinate .....                                   | 7                     |
| 7. Leaves with one pair of pinnae .....                       | <b>Xylia</b>          |
| 7. Leaves with more than 4 pairs of pinnae.....               | <b>Albizia</b>        |

### ACACIA P. Miller

- |   |                   |
|---|-------------------|
| 1. Trees; thorns stipular .....                     | <b>A. catechu</b> |
| 1. Stranglers; thorns throughout the stem .....     | 2                 |
| 2. Pinnae 5 or 6 pairs .....                        | <b>A. caesia</b>  |
| 2. Pinnae 7-15 pairs .....                          | 3                 |
| 3. Pods thick; bracts ovate .....                   | <b>A. sinuata</b> |
| 3. Pods thin; bracts linear-lanceolate .....        | 4                 |
| 4. Flowers pedicellate; leaflets glabrous.....      | <b>A. pennata</b> |
| 4. Flowers sessile; leaflets pubescent beneath..... | <b>A. torta</b>   |

**Acacia caesia** (L.) Willd., Sp. Pl. 4: 1090. 1806; FPM 428. 1919; Chakrab. & Gangop., JETB 20: 604. 1996. *Mimosa caesia* L., Sp. Pl. 522. 1753 p.p. *Acacia intsia* Willd. var. *caesia* (L.) Baker in Hook.f., FBI 2: 297. 1878.

Stout ramblers; old stem 4-6-angled; prickles strong, recurved, bark fibrous. Leaves 20-25 cm long, pinnae 5-8 pairs, to 7 cm long; leaflets 18-22 pairs, to 11 x 3.5 mm, oblong, truncate at base, apiculate at apex; thinly pubescent below, 3-nerved from base. Heads terminal, paniced. Pods to 13 x 2.2 cm, oblong, flat, acuminate at both ends, marginate.

*Fl. & Fr.* February-May

*Distr.* Sri Lanka, Thailand and Malesia. Common in moist deciduous forests; *PS 18966*Vengoli

**Acacia catechu** (L.f.) Willd., Sp. Pl. 4: 1079. 1806; FBI 2: 295. 1878; FPM 427. 1919; Chakrab. & Gangop., JETB 20: 606. 1996. *Mimosa catechu* L. f., Suppl. Pl. 439. 1781.

Tress; bark and branchlets dark brown. Leaves 15-25 cm, pinnae more than 15, 4 to 5 cm; leaflets 7 x 1 mm, oblong, puberulus, stipular spines none or small, recurved. Spike 10-12 cm long; flowers yellowish-white, sepals 1 mm; petals 2 x 0.7 mm, broadly crenate. Pods 5-10 cm long, flat.

*Fl. & Fr.* March-September

*Distr.* India and Myanmar. Fairly common in moist deciduous forests; *PS 19547*Thekkady

**Acacia pennata** (L.) Willd., Sp. Pl. 4: 1090. 1806; FBI 2: 297. 1878p.p.; FPM 429. 1919; FPL 186. 1990; Chakrab. & Gangop., JETB 20: 620. 1996; FTSR 167. 1996. *Mimosa pennata* L., Sp. Pl. 522. 1753.

Ramblers; branchlets slender, terete, prickles few, minute. Leaves to 20 cm long, pinnae 13 pairs, 7 cm long; leaflets *ca.* 6 x 1 mm, oblong, cordate at base, inequilateral, obtuse at apex, overlapping. Spikes 10 mm across, in axillary cymes. Pods 11 x 2.3 cm, oblong, obtuse, flat, yellowish.

*Fl. & Fr.* September-December

*Distr.* Paleotropics. Common in moist deciduous forests; *PS 19913*Parambikulam

**Acacia sinuata** (Lour.) Merr., Trans. Amer. Philos. Soc. n.s.24: 186. 1935; FPL 186. 1990; Chakrab. & Gangop., JETB 20: 625. 1996. *Mimosa sinuata* Lour., Fl. Cochinch. 653. 1790. *M. concinna* Willd., Sp. Pl. 4: 1039. 1806. *Acacia concinna* (Willd.) DC., Prodr. 2: 464. 1825; FBI 2: 296. 1878; FTSR 167. 1996. *A. concinna* var. *rugata* (Benth.) Baker in Hook.f., FBI 2: 297. 1878. *A. rugata* (Lam.) J. Voigt, Hort. Suburb. Calc. 263. 1845, non Benth. 1842; FPM 429. 1919.

Coarse ramblers, densely prickly; branchlets pubescent, black. Pinnae 8-10 pairs, to 5 cm long; leaflets to 6 x 1 mm, oblong, truncate at base, pubescent; rachis prickled, glandular. Heads axillary, solitary or paired, 1 cm across; peduncle 3 cm long. Flowers numerous, 2 mm long; filaments 5 mm long, yellow. Pods 12 x 2 cm, dark-brown; seeds transverse.

*Fl. & Fr.* November-March

*Distr.* India, Sri Lanka, Nepal, South China, Malesia and New Guinea. Common in moist deciduous forests; *PS 18870*Muthalakkuzhi; 19953 Parambikulam

**Acacia torta** (Roxb.) Craib, Kew Bull. 1915: 410. 1915; FPM 428. 1919; FPL 186. 1990; FTSR 167. 1996. *Mimosa torta* Roxb., Fl. Ind. 2: 566. 1832. *Acacia caesia* Wight & Arn., Prodr. 278. 1834, non Willd. 1806.

Rambling shrubs; branchlets puberulus. Leaves to 24 cm long; pinnae 12 pairs; leaflets 8 x 3 mm, oblong, obtuse at apex, subcordate at base, slightly pubescent, 1-nerved from base. Heads 1.5 cm across, in terminal panicles. Flowers many, 3 mm long; filaments 5.5 mm long, yellow. Pods 16 x 2.5 cm, flat, papery, yellowish-brown, densely glandular.

*Fl. & Fr.* December-April

*Distr.* India and Pakistan. Fairly common in moist deciduous forests and riverine areas; *PS 19382* Karimala; 19960 Parambikulam

## ALBIZIA Durazzini

1. Leaflets to 0.5 cm broad..... **A. odoratissima**
1. Leaflets over 1.5 cm broad..... 2
2. Flower heads in axillary fascicles ..... **A. lebbeck**
2. Flower heads in terminal panicles..... **A. procera**

**Albizia lebbeck** (L.) Willd., Sp. Pl. 4: 1066. 1806; FBI 2: 298. 1878; FPM 432. 1919; Chakrab. & Gangop., JETB 20: 589. 1996; FTSR 168. 1996. *Mimosa lebbeck* L., Sp. Pl. 516. 1753. *Mimosa sirissa* Roxb., Fl. Ind. 2: 544. 1832. *Acacia speciosa* Willd., Sp. Pl. 4: 1066. 1806.

Tall trees; bark smooth, dark brown. Leaves 20-30 cm long; pinnae 2 pairs; leaflets 4.5 x 2.5 cm, oblong, obtuse, glabrate. Peduncles 10 cm long, axillary, paired; heads 4 cm across, dull yellow. Flowers pedicelled, 10 mm long; calyx tube 5 mm long, glabrous; corolla glabrous, lobes ovate, acute; filaments 3.5 cm long. Pods 20 x 3.5 cm, smooth with thick margin, yellow.

*Fl. & Fr.* March-September

*Distr.* Indo-Malesia and South China. Rare in moist deciduous forests; *PS 19620* Vengoli

**Albizia odoratissima** (L. f.) Benth, London J. Bot. 3: 88. 1844; FBI 2: 299. 1878; FPM 431. 1919; FPL 187. 1990; Chakrab. & Gangop., JETB 20: 593. 1996; FTSR 168. 1996. *Mimosa odoratissima* L. f., Suppl. Pl. 437. 1781. *Acacia odoratissima* (L.f.) Willd., Sp. Pl. 4: 1063. 1806.

Trees to 20 m high; bark dark brown, rough. Leaves to 25 cm long; pinnae to 15 cm long; leaflets oblong, obtuse at either ends, pubescent below. Panicle 15 cm across, axillary or terminal; heads 3 cm across, 15-25-flowered. Flowers 5 mm long, sessile; calyx 0.5 mm long, cupular; corolla 5-fid to half way down; lobes acute, hispid; staminal filaments 10 mm long. Pods to 21 x 2.5 cm, flat, brown, shining.

*Fl. & Fr.* October-May

*Distr.* Indo-Malesia. Common in moist deciduous forests; *PS 30286* Parambikulam

**Albizia procera** (Roxb.) Benth., London J. Bot. 3: 89. 1844; FBI 2: 299. 1878; FPM 431. 1919; FTSR 169. 1996. *Mimosa procera* Roxb., Pl. Corom. t. 121. 1798.

Large deciduous trees; bark greyish-yellow, smooth, pinkish-red inside; young shoots silky pubescent. Leaves to 45 cm long, pinnae 2-4 pairs; rachis glandular near the terminal pair of leaflets; leaflets 6-9 pairs, oblong or oblong-obovate, obtuse, base oblique, unequal, glabrous above and glaucous below, to 4.5 x 2.5 cm; petiole to 15 cm with a large oblong gland near the base. Flower heads in terminal panicles. Calyx 2 mm long, glabrous, lobes ovate-acute. Corolla 4 mm long, lobes lanceolate. Filaments greenish-yellow, 6 mm long.

*Fl. & Fr.* July-August

*Distr.* Indo-Malesia, Philippines and China. Fairly common in moist deciduous forests; *PS 30798* Vengoli

## ARCHIDENDRON F. H. Jacob von Mueller

**Archidendron monadelphum** (Roxb.) Nielson, Adansonia 19: 21. 1979; FTSR 169. 1996. *Mimosa monadelpha* Roxb., Fl. Ind. 2: 544. 1832. *Pithecellobium bigeminum* sensu Baker in Hook. f., FBI 2: 303. 1878, non (L.) Mart. ex Benth., 1844; FPM 435. 1919. *P. monadelphum* (Roxb.) Kosterm., Reinwardtia 3: 11. 1954; FPL 189. 1990. *Abarema bigemina* (L.) Kosterm., Bull. Org. Sci. Res. Indonesia 51, f. 34,35. 1954.

Small trees, branchlets minutely hairy. Leaves bipinnate, pinnae 2, opposite; leaflets 4 pairs, 15 x 6 cm, opposite, ovate, acuminate, oblique at base, glabrous; rachis glandular. Peduncle 3-8-flowered, axillary or terminal, densely rusty tomentose. Flowers 4 mm long, calyx 4-lobed, connate, lobes acute; petals 4, ovate, acute, united below; stamens 4, monadelphous; filaments 10 mm long; ovary many-ovuled, sessile; stigma minute. Pods twisted, strap-shaped, 2 cm broad; seeds 4-8, ovoid.

*Fl. & Fr.* January-March

*Distr.* South West India, Eastern Himalayas, Myanmar and Sri Lanka. Common in evergreen and semi-evergreen forests at lower altitudes; *PS 30028* Puliya; *30199* Kothala; *19330* Thenkudippara; *18908* Karimala

#### ENTADA Adanson

**Entada rheedei** Spreng., Syst. Veg. 2: 325. 1825 "rheedii"; FPL 188. 1990; FTSR 170. 1996. *Mimosa entada* L., Sp. Pl. 518. 1753. *Entada pursaetha* DC., Prodr. 2: 425. 1825. *E. scandens* sensu Hook. f., FBI 2: 86. 1878, non Benth. 1841; FPM 417. 1919.

Lianas, tendrillate, stem glabrous. Leaves bipinnate, pinnae 2 or 3 pairs, the terminal pair modified into a tendril; leaflets 4-7 pairs, 5 x 2.5 cm, curved-oblong, obtuse, inequilateral. Spikes to 35 x 0.8 cm, axillary, solitary or paired, erect. Flowers 3 mm long, densely packed, yellow; calyx cupular, truncate; petals 4, free, valvate; stamens 10, free; filaments 6 mm long, ovary many-ovuled; style slender; stigma concave. Pods to 1 m long, thick, woody, crenate on both sutures; seeds many, biconvex, 5 cm across, orbicular, smooth.

*Fl. & Fr.* February-June

*Distr.* Indo-Malesia. Common along the margins of evergreen forests; *PS 19406* Kariamchola

#### MIMOSA Linnaeus

1. Pinnae to 3 pairs; stamens 4 ..... **M. pudica**  
1. Pinnae more than 4 pairs; stamen 8 ..... **M. diplotricha**

**Mimosa diplotricha** Wight & Sanvalle, Anal. Real. Acad. Ci. Habana 5: 405. 1865; FTSR 170. 1996. *M. invisita* Mart., Flora 20, Biebl. 8: 121. 1837. *Mimosa invisita* Mart. var. *inermis* Adelb. in Reinwardtia 2(2):359.1953; FPL 190. 1990.

Stout rambling shrubs; stem pubescent, prickles short, in 4-rows. Leaves to 10 cm long; pinnae opposite, to 5 cm long; leaflets to 35 pairs, to 5 x 1 mm, oblong, truncate at base, glabrous; rachis prickled. Spike 1 cm across, in terminal racemes, peduncled. Flowers many, 3 mm long; stamens 10, filaments 6 mm long. Pods 2-5 cm long, bristly, black when mature.

*Fl. & Fr.* December-February

*Distr.* Native of Tropical America, now an aggressive weed in many tropical countries. Occasional along roadsides; *PS 30793* Keerappadi

**Mimosa pudica** L., Sp. Pl. 518. 1753; FBI 2: 291. 1878; FPM 421. 1919; FPL 188. 1990; FTSR 170. 1996.

Woody perennial herbs; prickles scattered. Pinnae to 3.5 cm long; leaflets 20-30 pairs 3 x 1 mm, oblong, cordate at base, acute at apex, spiny along the margins; stipule scarious, prominently fimbriate. Spikes 2 cm across, peduncled, axillary. Flowers 1.5 mm long; calyx minute; corolla tube broaden above, lobes obtuse; filaments 4, 9 mm long. Pods 15-25 x 3-5 mm, 3-5-seeded; joints strongly bristly along the margins.

*Fl. & Fr.* Throughout the year

*Distr.* Native of Tropical America, now run wild in many tropical countries. Very common in moist deciduous forests and plantations; *PS 30802* Thunakkadavu

#### PITHECELLOBIUM C.F.P. Martius

**Pithecellobium dulce** (Roxb.) Benth., Hook. Lond. J.Bot. 3: 199. 1844; FBI 2: 302. 1878; FPM 434. 1919; FPL 189. 1990. *Mimosa dulcis* Roxb., Pl. Corom. 1: 67. t.99. 1798. *Inga dulcis* (Roxb.) Willd., Sp. Pl. 4: 1005. 1806.

Trees; spines straight, branchlets pubescent. Leaves bipinnate, pinnae 3 cm; leaflets 2, 3-4 x 1.2 cm, oblong, lanceolate, inequilateral, sparsely hairy on upper side; petiole to 3 cm. Panicles 15-20 cm, pubescent; flowers 5 mm across, creamy white; stamens numerous, filaments 4 mm,



basally united; ovary 2 mm, pubescent, stigma minute. Pods 9 x 1 cm, circinate, turgid, pubescent.

*Fl. & Fr.* November-March

*Distr.* Native of Tropical America, cultivated in the tropics. Planted in the sanctuary; *PS 18828* Parambikulam

#### PROSOPIS Linnaeus

**Prosopis juliflora** (Sw.) DC., Prodr. 2: 447. 1825. *Mimosa juliflora* Sw., Prodr. 85. 1788.

Small trees; crown spreading, spines 1-1.5 cm, bark dark, fissured. Leaves bipinnate, pinnae 1 or 2 pairs; leaflets 15-20 pairs, to 15 x 2.5 mm, oblong, gland on the rachis; stipules spinescent. Spikes axillary, solitary or 2-3 together, 7-9 cm; peduncle 1 cm; flowers white; calyx lobes 0.8 mm, ovate, basally united; petals 2.5 mm, hairy within; stamens 10, free; ovary 2 mm, stipitate, pubescent, style 2.5 mm. Pods 15-20 x 1 cm, turgid, straight or slightly curved.

*Fl. & Fr.* October-February

*Distr.* Northern South America, C. America to Mexico and Antilles, widely naturalised in Tropical Asia. Very common in scrub jungles; *PS 30405* Keerappadi

#### XYLIA Bentham

**Xylia xylocarpa** (Roxb.) Taub., Bot. Centralbl. 47: 397. 1891; FPM 417. 1919; FPL 190. 1990; FTSR 171. *Mimosa xylocarpa* Roxb., Pl. Corom. t. 100. 1798.

Trees to 20 m tall; bark rough. Leaves bipinnate, pinnae 2; leaflets 5-7 pairs, to 10 x 5 cm, elliptic-oblong, acute, glabrous, rachis glandular between the leaflets. Spike globose, 1.5-2 cm across, racemose. Flowers numerous, 5 mm long, sessile, dull yellow; calyx 4 mm long, tubular, toothed at apex; petals 5, free or united at base, valvate; stamens 10, free, filaments 8 mm long; ovary many-ovuled; stigma minute. Pods 18 x 6 cm, curved-obovate, compressed, woody; seeds 4-10, transverse, oblong.

*Fl. & Fr.* February-November

*Distr.* Indo-Malesia. Occasional in moist deciduous forests; *PS 18807* Anakkalvayal; *NS 19397* Padippara

#### ROSACEAE

1. Trees; stem unarmed ..... **Prunus**  
1. Scandent shrubs; stem armed ..... **Rubus**

#### PRUNUS Linnaeus

**Prunus ceylanica** (Wight) Miq., Fl. Ind. Bot. 1: 366. 1855; FPL 190. 1990; FTSR 172. 1996. *Polydontia zeylanica* Wight, Ill. Indian Bot. 1: 203. 1840, "Polyodontia". *Pygeum zeylanicum* Gaertn., Fruct. 218. t.46. 1788. *P. acuminatum* Colebr., Trans. Linn. Soc. London 12: 300. t.18. 1818; FBI 2: 318. 1878; FPM 439. 1919, non *Prunus acuminata* (Wall.) Dietr. 1803. *Pygeum wightianum* Blume ex Muell. in Walp., Ann. 4: 642. 1857; FBI 2: 319. 1878; FPM 439. 1919. *P. gardneri* Hook.f., FBI 2: 321. 1878; FPM 439. 1919. *P. sisparensense* Gamble, Kew Bull. 1918: 238. 1918.

Large trees; bark black, splitting into rectangular pieces. Leaves alternate, simple, to 12 x 5 cm, ovate, acuminate, entire, nerves 8 pairs, prominent. Racemes to 10 cm long, axillary, erect, densely flowered. Flowers white, 6 mm across; pedicels to 6 mm long, slender; calyx 2 mm long, cupular, campanulate, lobes ovate, acute, densely hairy; petals obovate, stamens many, filaments 3 mm long; ovary sessile, 1-celled, glabrous; ovules 2, pendulous; style 1, subulate; stigma capitate. Fruit a drupe, 2-lobed, 1 x 2 cm, globose, glabrous; seeds 2, globose.

*Fl. & Fr.* May-August

*Distr.* Indo-Malesia. Common in evergreen forests; *PS 18876* Orukomban; *NS 30227* Karimala

## RUBUS Linnaeus

1. Leaves simple, 5-lobed ..... **R. glomeratus**  
1. Leaves pinnate, leaflets 5-7 ..... **R. niveus**

**Rubus glomeratus** Blume, Bijdr. 1111. 1826; FTSR 173. 1996. *R. fulvus* Focke, Biblioth. Bot. 17: 81. 1911, non Sudre 1902; FPM 441. 1919. *R. moluccanus* sensu Hook.f., FBI 2: 330. 1878 p.p., non L. 1753.

Stem reddish, densely cottony hairy. Leaves to 8 x 8 cm, shallowly 5-lobed, cordate at base, rugose above, densely, cottony tomentose below; petiole 4 cm long. Flowers in terminal panicles, bracts 8 mm long, densely hairy; bracteole bifid, filiform; pedicels 7 mm long; sepals 10 mm long, united below; petals 4 x 2 mm, obovate; ovaries glabrous. Drupe 2 mm across, ovoid, yellow.

*Fl. & Fr.* December-May

*Distr.* Endemic to Peninsular India. Occasional along the margins of grasslands; *PS 19165* Karimala

**Rubus niveus** Thunb., Diss. Rub. 9. t. 1., f. 3. 1813; FPM 442. 1919; FTSR 173. 1996. *R. lasiocarpus* Sm. in Rees, Cyclop. 30 n. 6.1815; Hook.f., FBI 2:339. 1878.

Branchlets glabrescent. Leaves to 10 cm long, 5-7 foliolate; leaflets opposite, ovate, acute, serrate, glabrescent above and white hoaray-pubescent below, terminal leaflet to 4.5 x 3 cm; stipules lanceolate. Flowers 1 cm across in axillary solitary or terminal corymbs. Calyx lobes oblong, acuminate, aristate, villous, 4-5 mm long. Petals ovate, pink-red, smaller than the calyx lobes. Carpels *ca.* 50; receptacle villous.

*Fl.* April-May

*Distr.* Indo-Malesia and China; in India temperate Himalayas and South India. Occasional along the margins of grasslands; *PS 19391, 19596* Karimala

## CHRYSOBALANACEAE

### ATUNA Rafin.

**Atuna travancorica** (Bedd.) Kosterm., Reinwardtia 7:423.1969; FTSR 172. 1996. *Parinarium travancoricum* Bedd., Ic. t. 189. 1868-1874; FBI 2: 311. 1878; FPM 437. 1919.

Small to medium evergreen trees, bark thin, brownish, branchlets pubescent. Leaves lanceolate, acuminate, base acute, glabrous, to 15 x 4 cm. Flowers 1.5 cm across, racemes silky-villous, drooping; bracts ovate-lanceolate, villous. Drupe suborbicular, compressed, 3.5 x 3 cm, brown, smooth.

*Fl.* February-May

*Distr.* Endemic to Southern Western Ghats (Kerala). Rare in evergreen forests; *PS 30827* Orukomban

## CRASSULACEAE

### KALANCHOE Adanson

1. Leaves simple, entire ..... **K. olivacea**  
1. Leaves pinnatifid ..... **K. schweinfurthii**

**Kalanchoe olivacea** Dalz. & Gibs., Bombay Fl. 313. 1861; FPM 450. 1919.

Fleshy herbs. Leaves 8-10 x 4-5 cm, obovate, crenate, olive green. Cymes corymbose, axillary and terminal, 5 x 9 cm; flowers white; bracts, 0.5 cm, linear, glandular; calyx 4-lobed to the

base, 6 x 1 mm, elliptic, glandular, corolla tube 11 mm long, lobes 4, 8 x 3 mm, lanceolate, apiculate, glandular; stamens 8, in two rows at the throat of corolla lobes, carpels 9 x 3 mm, stigma oblique; hypogynous bristles 4, subulate. Follicle glabrous.

*Fl. & Fr.* December-March

*Distr.* Endemic to Western Ghats. Rare in moist rocky areas; *PS 20000* Kuchimudi

**Kalanchoe schweinfurthii** Penzig in Atti Congr. Bot. Genova 341. 1893. *Kalanchoe laciniata* sensu Wight, Ic. t. 1158. 1846, non (L.) Pers. 1805; FBI 2: 415. 1878; FPM 451. 1919; FPL 192. 1990.

Fleshy herbs. Leaves to 18 x 15 cm, narrowly lacinate; lobes 0.3 cm broad, thick. Flowers many, in corymbose cymes; pedicels 1 cm long; sepals 5 x 2 mm, lanceolate, acute; corolla tube 10 mm long, dull pink; anthers ovate; lobes ovate, acute, villous; filaments unequal; anthers orbicular ovaries 5 mm long, ovoid, acute, ovules biseriate. Follicles 8 x 2 mm; seeds oblong, reddish brown.

*Fl. & Fr.* December-April

*Distr.* India, Bangladesh, China and Myanmar. Rare in rocky areas; *PS 19224* Vengoli

## DROSERACEAE

### DROSERA Linnaeus

- 1. Leaves radical, spatulate..... **D. burmannii**
- 1. Leaves cauline, otherwise..... 2
- 2. Leaves peltate; flowers white..... **D. peltata**
- 2. Leaves linear; flowers pink..... **D. indica**

**Drosera burmannii** Vahl, Symb. Bot. 3: 50. 1794; FBI 2: 424. 1878; FPM 452. 1919; FPL 193. 1990; FTSR 173. 1996.

Small herbs. Leaves to 10 x 8 mm, obovate, obtuse, prostrate, densely covered with glandular hairs, greenish pink; petioles absent. Flowers few in erect racemes; scape 6-8 cm high; calyx glandular; petals 3 mm across, white.

*Fl.* December-January

*Distr.* Pantropical. Common in wet rocky areas; *PS 30647* Vengoli

**Drosera indica** L., Sp. Pl. 282. 1753; FBI 2: 424. 1878; FPM 452. 1919; FPL 193. 1990; FTSR 173. 1996.

Unbranched herbs, to 8 cm high. Leaves to 3 cm long, green, curved or straight. Flowers 8 mm across, many, in terminal racemes; pedicel 1 cm long; sepals 4 x 1 mm, glandular hairy, petals 5 x 5 mm, obovate, obtuse, glabrous. Capsule 5 x 3 mm, obovoid, 3-valved; seeds many, black, obovoid, densely muriculate.

*Fl. & Fr.* September-December

*Distr.* Paleotropics. Common in wet rocky areas and grasslands; *PS 30631* Vengoli

**Drosera peltata** Smith in Willd., Sp. Pl. 1: 1546. 1797; FBI 2: 424. 1878; FPM 452. 1919; FPL 193. 1990; FTSR 174. 1996.

Erect herbs, to 18 cm high, unbranched. Leaves to 5 mm across, semi-circular to lunar, covered with glandular hairs; petiole 1.5 cm long. Flowers in terminal racemes; pedicels 1 cm long, sepals 5, united at base, petals white, 5 x 4 mm, obovate, obtuse; styles 3, free.

*Fl. & Fr.* November-December

*Distr.* Indo-Malesia to Australia and East Asia. Common in wet rocky areas and grasslands; *PS 19674* Karimala

## RHIZOPHORACEAE

1. Leaves entire, thickly coriaceous; margins entire ..... **Carallia**  
 1. Leaves crenate, membranous; margins crenate ..... **Blepharistemma**

### BLEPHARISTEMMA Wallich ex Benth

**Blepharistemma serratum** (Dennst.) Suresh in Nicols. *et al.*, Interp. Hort. Malab. 214. 1988; FTSR 174. 1996. *Rodschiedia serrata* Dennst., Schluss. Hort. Malab. 16, 24, 31. 1818. *Gynotroches membranifolia* Miq., Anal. Bot. Ind. 3: 7. 1852. *Blepharistemma corymbosum* Benth., J. Proc. Linn. Soc. Bot. 3: 65, 78. 1858; FBI 2: 441. 1878; FPM 460. 1919. *B. membranifolia* (Miq.) Ding Hou in Steenis, Fl. Males. ser. 1, 5: 489. 1958.

Large shrubs to small trees; branchlets lenticellate. Leaves oblong, acute or obtusely acuminate, crenate, glabrous, to 15 x 7 cm; lateral nerves 7 or 8 pairs, slender; petiole 1 cm long. Flowers 4 mm across; calyx glabrous, lobes ovate, acute; petals white. Capsule subglobose, acute, yellowish, 6 mm across.

*Fl. & Fr.* February-July

*Distr.* Endemic to Western Ghats. Rare in evergreen and semi-evergreen forests; *PS 19324* Kothala; *30345* Vengoli

### CARALLIA Roxburgh

**Carallia brachiata** (Lour.) Merr., Philipp. J. Sci. 15: 249. 1919; FPL 194. 1990; FTSR 174. 1996. *Diatoma brachiata* Lour., Fl. Cochinch. 296. 1790. *Carallia integerrima* DC., Prodr. 3: 33. 1828; FPM 459. 1919.

Trees; bark dark brown. Leaves opposite, to 11 x 7 cm, obovate, obtuse at apex, attenuate at base, coriaceous, nerves indistinct; stipule interpetiolar, ovate. Flowers in axillary resinous, peduncled cymes with dichotomous branches, 5 mm across; sepals 8, ovate, acute; petals 8, smaller, reddish, orbicular, lacerate; stamens 16, filaments villous, free; ovary half inferior, 4-celled; ovule 2 in each cell; style slender, 3-5 fid, above. Drupe, 8 x 6 mm, 1-seeded, glabrous.

*Fl. & Fr.* December-March

*Distr.* Indo-Malesia and Australia. Rare in moist deciduous forests; *PS 19267* Anakkalvayal

## COMBRETACEAE

1. Scandent or climbing shrubs ..... 2  
 1. Trees ..... 3  
 2. Leaves tomentose; flowers in axillary and terminal panicles ..... **Calycopteris**  
 2. Leaves glabrous; flowers in elongated spikes ..... **Combretum**  
 3. Flowers in panicles or spikes ..... **Terminalia**  
 3. Flowers in globose heads ..... **Anogeissus**

### ANOGEISSUS (A. P. de Candolle) Guillemen, Perrottet & A. Richard

**Anogeissus latifolia** (Roxb. ex DC.) Wall. ex Guill. & Perr., Fl. Seneg. Tent. 7: 280. 1832; FBI 2: 450. 1878; FPM 466. 1919; FPL 195. 1990; FTSR 176. 1996; Gangop. & Chakrab., JETB 21: 288. 1997. *Conocarpus latifolia* Roxb. ex DC., Prodr. 3: 16. 1828.

Medium trees; bark surface uneven, white. Leaves alternate and subopposite, to 9 x 6.5 cm, broadly ovate, obtuse at apex and base, nerves 8-10 pairs, glabrous; petioles 1 cm long, glabrous. Flowers small, 10-20-together in globose spikes, axillary, shortly pedicelled; calyx 3 mm across, cupular, lobes 5, triangular, acute; petals absent; stamens 10, free, filaments glabrous; ovary 1-celled; ovules 1 or 2, pendulous; style subulate. Fruit a biconvex drupe, 4 x 2 mm, in dense heads.

*Fl. & Fr.* August-December

*Distr.* India, Sri Lanka and Pakistan. Very common in moist deciduous forests; *PS 19184* Rockpoint

#### CALYOPTERIS Lamarck

**Calycopteris floribunda** Lam., Tabl. Encycl. 2: 485. t. 357. 1793; FBI 2: 449. 1878; FPM 467. 1919; FPL 195. 1990; FTSR 176. 1996; Gangop. & Chakrab., JETB 21: 294. 1997. *Getonia floribunda* (Lam.) Roxb., Fl. Corom. t.87. 1795.

Stragglers. Leaves opposite, to 10 x 6 cm, ovate, acuminate, entire, punctuate and tomentose below; nerves 6-8 pairs, nervules reticulate; petioles 1 cm long. Panicles axillary and terminal, 5-10 x 5 cm; bracts leafy, hispid. Flowers sessile; calyx tube 5 mm long, campanulate, enlarging in fruit, lobes oblong; stamens 10, filaments glabrous; ovary 5-ribbed, densely hispid; 1-celled; ovules 1-3, pendulous. Fruit an ellipsoid drupe, 10 x 2.5 cm; fruiting sepals 18 x 6 mm, yellowish, persistent.

*Fl. & Fr.* January-May

*Distr.* Indo-Malesia. Common in moist deciduous forests; *PS 19187* Rockpoint; *NS 19408* Kariamchola

#### COMBRETUM Loefling

**Combretum albidum** G. Don, Trans. Linn. Soc. London 15: 429. 1827; Gangop. & Chakrab., JETB 21: 301. 1997. *C. ovalifolius* Roxb., Fl. Ind. 2: 226. 1832; FBI 2: 458. 1878; FPM 469. 1919; FPL 196. 1990.

Climbers. Leaves opposite, to 14 x 7 cm, ovate, acute at base and apex, entire, glabrous, domatia glandular; petiole 1 cm long, glandular at base. Flowers polygamodioecious, in drooping cylindrical spikes. Spikes to 10 x 2 cm, unbranched. Calyx tube 5 mm long, constricted above the ovary, widening above, lobes 4, ovate, acute; petals 4 or 5, much smaller; stamens 8 or 10; filaments 6 mm long; ovary 5-angled, inferior, 1-celled; ovules 2-5, pendulous, style subulate. Fruit a 5-winged drupe, 3.5 x 3.5 cm, wings broad, leathery, yellow.

*Fl. & Fr.* January-April

*Distr.* Peninsular India and Sri Lanka. Fairly common in dry deciduous forests; *PS 30658* Keerappadi

#### TERMINALIA Linnaeus

- |   |                          |
|---|--------------------------|
| 1. Fruits winged.....                                 | 2                        |
| 1. Fruits not winged.....                             | 3                        |
| 2. Fruits large with 4-5 equal wings.....             | <b>T. elliptica</b>      |
| 2. Fruits small with 3 unequal wings.....             | <b>T. paniculata</b>     |
| 3. Leaves opposite or subopposite; fruits ridged..... | <b>T. travancorensis</b> |
| 3. Leaves alternate; fruit without ridges.....        | <b>T. bellirica</b>      |

**Terminalia bellirica** (Gaertn.) Roxb., Pl. Corom. t. 198. 1805; FBI 2: 445. 1878; FPM 463. 1919; FPL 196. 1990; FTSR 177. 1996; Gangop. & Chakrab., JETB 21: 338. 1997. *Myrobalanus bellirica* Gaertn., Fruct. 2: 90. t. 97. ff. a-d.1791, "*bellerica*".

Large trees; bark smooth, white; branchlets thinly fulvous-hairy. Leaves alternate, to 16 x 8 cm, obtusely acuminate at apex, attenuate to the base; nerves 7 or 8 pairs, prominent, reticulate; petioles to 8 cm long, eglandular. Spikes axillary, to 16 cm long. Flowers sessile, 6 mm across; calyx tube campanulate, lobes triangular, densely villous inside, hispid outside; stamens 5. Drupe 2.5 x 1.8 cm, obovoid, stalked, glabrous.

*Fl. & Fr.* February-August

*Distr.* Indo-Malesia. Common in evergreen and semi-evergreen forests, sparsely in moist deciduous forests; *PS 19320* Kothala

**Terminalia elliptica** Willd., Sp. Pl. 4: 969. 1806; Gangop. & Chakrab., JETB 21: 351. 1997. *T. alata* Heyne ex Roth, Nov. Pl. Sp. 379. 1821. *T. crenulata* Roth, Nov. Pl. Sp. 380. 1821; FPM 465. 1919; FPL 197. 1990; FTSR 178. 1996. *T. coriacea* (Roxb.) Wight & Arn., Prodr. 315. 1834; FPM 465. 1919. *Pentaptera coriacea* Roxb., Fl. Ind. 2: 438. 1832. *Terminalia tomentosa* (Roxb. ex DC.) Wight & Arn. var. *crenulata* (Roth) Clarke in Hook.f., FBI 2: 448. 1878. *Pentaptera crenulata* Roxb., Fl. Ind. 2: 438. 1832.

Large trees, bark black, split into rectangular pieces, red inside. Leaves subopposite, to 20 x 9 cm, oblong, acute, eglandular, nervules parallel; petiole 2 cm long, eglandular. Panicles 15 x 10 cm, terminal, glabrous. Flowers 5 mm across; calyx lobes triangular, densely villous inside; stamens 5, filaments 5 mm long, glabrous; ovary densely long-villous. Drupe 3.5 x 5.5 cm, wings 5 broad, coriaceous, reddish brown.

*Fl. & Fr.* April-August

*Distr.* India and Sri Lanka. Common in moist deciduous forests; *PS 19817* Anakkalvayal; *19488* Thellikkal

**Terminalia paniculata** Roth, Nov. Pl. Sp. 383. 1821; FBI 2: 448. 1878; FPM 465. 1919; FPL 197. 1990; FTSR 178. 1996; Gangop. & Chakrab., JETB 21: 357. 1997. *Pentaptera paniculata* (Roth.) Roxb., Fl. Ind. 2: 442. 1832.

Large trees; bark pale brown, pink inside; branchlets reddish. Leaves to 18 x 7 cm, ovate, oblong, minutely hirsute below; nerves to 10 pairs, nervules reticulate; glands one on either side of the midrib at base; petiole 1.5 cm long. Panicles to 20 cm across, densely tomentose. Flowers 8 mm across, white, closely packed; sepals ovate, densely villous inside; stamens 5, filaments glabrous. Drupe 13 x 12 mm, puberulus, reddish brown.

*Fl. & Fr.* November-February

*Distr.* Endemic to Peninsular India. Very common in moist deciduous forests; *PS 19079* Padippara

**Terminalia travancorensis** Wight & Arn., Prodr. 314. 1834; FPM 464. 1919; FTSR 178. 1996; Gangop. & Chakrab., JETB 21: 361. 1997. *Terminalia angustifolia* sensu Roxb., Fl. Ind. 2: 437. 1832, non Jacq. 1776; FBI 2: 449. 1878.

Large trees; bark smooth, white; branchlets glabrous. Leaves opposite, to 14 x 4.5 cm, elliptic-oblong, acuminate at apex, glabrous; petiole 1 cm long. Panicles 10 x 10 cm, terminal, branches hispid. Flowers 2.5 mm across; sepals hispid outside, densely villous inside; stamens 10, filaments 4 mm long; ovary densely tomentose. Drupe 3 x 1.3 cm, ellipsoid, 5-ridged, glabrous.

*Fl. & Fr.* April-August

*Distr.* Endemic to Western Ghats. Rare in evergreen forests; *PS 30735* Kariamchola

## MYRTACEAE

- |   |                    |
|---|--------------------|
| 1. Leaves alternate.....  | 2                  |
| 1. Leaves opposite.....   | 3                  |
| 2. Inflorescence a spike; petals free .....                     | <b>Callistemon</b> |
| 2. Inflorescence otherwise; petals fused .....                  | <b>Eucalyptus</b>  |
| 3. Fruits more than 4 cm across; calyx limb closed in bud ..... | <b>Psidium</b>     |
| 3. Fruits to 3 cm across; calyx limb open in bud.....           | 4                  |
| 4. Calyx tube produced above the ovary.....                     | <b>Syzygium</b>    |
| 4. Calyx tube not produced above the ovary .....                | <b>Eugenia</b>     |

## CALLISTEMON R. Brown

**Callistemon citrinus** (Curt.) Skeels, U.S. Dept. Agric. Bur.Pl.Ind., Bull. 282: 49. 1913. *Metrosideros citrina* Curt., Bot. Mag. 8, t.260. 1794. *M. lanceolata* Smith, Trans. Linn. Soc. London 3: 272. 1797. *Callistemon lanceolatus* (Smith) Sweet, Fl. Austral. sub. t. 29. 1828.

Shrubs or small trees, branchlets tomentose, drooping. Leaves to 8 x 1 cm, linear-lanceolate, acuminate, base alternate. Spike to 10 cm, terminal; corolla 5, ca 4 mm, sparsely hairy; stamens numerous; filaments free, to 2.5 cm, red; hypanthium ca 4 mm, pubescent; ovary 3-celled. Capsule 9 mm, clustered.

*Fl. & Fr.* Throughout the year

*Distr.* Native in East Australia, widely cultivated. Planted in Parambikulam; *PS 30290* Parambikulam

#### EUCALYPTUS L'Heritier de Brutelle

**Eucalyptus camaldulensis** Dehnh., Cat. Pl. Hort. Camald. (ed. 2) 61: 20. 1832.

Trees, bark decorticating. Leaves to 2.5 x 3.5 cm, lanceolate often falcate, concolorous; petiole to 1.5 mm. Hypanthium ca 6 mm, hemispherical, operculum ca 4 mm across, conical; ovule numerous; stigma capitate. Fruit 1 x 0.7 cm, hemispherical, valves exerted, seeds cuboid.

*Fl. & Fr.* December-April

*Distr.* Native of Australia. Occasional in dry deciduous forests; *PS 30599* Kuchimudi

#### EUGENIA Linnaeus

1. Young shoots and inflorescence glabrous..... **E thwaitesii**
1. Young shoots and inflorescence brown tomentose ..... 2
2. Pedicels more than 1 cm long; leaves oblanceolate ..... **E. indica**
2. Pedicels to 0.5 cm long; leaves elliptic or ovate..... **E. bracteata**

**Eugenia bracteata** (Willd.) Roxb. ex DC., Prodr. 3: 264. 1828; FBI 2: 502. 1879; FPM 484. 1919; FTSR 180. 1996. *Myrtus bracteata* Willd., Sp. Pl. 2: 969. 1799. *Eugenia willdenowii* Wight, Ic. t. 545. 1842 & Ill. 2: 13. 1850, non DC. 1828. *Syzygium bracteatum* (Willd.) Raizada, Indian For. 74: 336. 1948, non Korth. 1847. *Eugenia rothii* Panigrahi, JETB 5: 994. 1984. *Myrtus latifolia* Heyne in Roth, Nov. Pl. Sp. 332. 1821.

Shrubs; branchlets slender. Leaves to 7 x 3.5 cm, elliptic, obtusely acute at apex, acute at base, pale below; nerves 10-13 pairs, sub-prominent below; petiole 3 mm long. Flowers in axillary fascicles, 8 mm across, densely fulvous hairy; pedicels 5 mm long, densely hairy; bracteoles 2, lanceolate; calyx tube short, globose, lobes 5, orbicular; petals 5, 4 x 4 mm, orbicular, glabrous.

*Fl.* March-April

*Distr.* Peninsular India and Sri Lanka. Rare in evergreen forests; *PS 30314* Pooppara

**Eugenia indica** (Wight) Chithra in Nair & Henry, Fl. Tamil Nadu India 1: 153. 1983; FPL 197. 1990. *Jossinia indica* Wight, Ic. t. 523. 1842. *Eugenia jossinia* Duthie in Hook. f., FBI 2: 500. 1879; FPM 484. 1919.

Small trees, branchlets terete, pubescent. Leaves to 5 x 2 cm, oblanceolate, obtuse, base, acute; petiole to 7 mm. Flowers axillary, solitary or paired, pedicels to 2.2 cm, tomentose; calyx tube 4 mm, campanulate, lobes 4, 5 mm across, orbicular, tomentose, glabrous within; petals 10 mm across, orbicular, white; stamens numerous; filaments to 8 mm; disc broad. Berry 7 mm across, globose, rusty crowned with persistent calyx.

*Fl. & Fr.* January-March

*Distr.* Endemic to Southern Western Ghats. Rare in evergreen forests at higher altitudes; *PS 30117* Karimala

**Eugenia thwaitesii** Duthie in Hook.f., FBI 2: 506. 1879; FTSR 180. 1996. *Eugenia mooniana* Wight, Ic. t. 551. 1842 & Ill. 2: 13. 1850, non Gard. 1843; FBI 2: 505. 1879; FPM 484. 1919.

Shrubs; branchlets slender. Leaves to 5 x 2 cm, ovate, caudate-acuminate at apex, rounded at base, pale below, glabrous; nerves few, obscure; petiole 2 mm long. Flowers 2-3 together, 6

mm across, in axillary fascicles; pedicels fulvous hairy; calyx tube short, hairy; sepals orbicular; petals white; filaments 6 mm long. Berry 1 x 1.5 cm, glabrous, reddish; seeds 3, globose.

*Fl. & Fr.* August-December

*Distr.* Peninsular India and Sri Lanka. Rare in evergreen forests; *PS 19124* Kariamchola

#### PSIDIUM Linnaeus

**Psidium guajava** L., Sp. Pl. 470. 1753; FBI 2: 468. 1878, "guayava"; FPM 472. 1919; FPL 201. 1990.

Small trees, bark decorticating; branchlets appressed tomentose. Leaves decussate, oblong, to 10 x 5 cm, acute, base cuneate, tomentose below, gland dotted. Flowers *ca.* 3.5 cm across, axillary, solitary or in pairs; peduncle to 1.5 cm; calyx tube urceolate, tomentose persistent, ovate-lanceolate, unequal; petals 4, white, ovate, *ca.* 3 x 2 cm. Disc broad; stamens numerous, filaments white; ovary globose, cell numerous; style to 1.5 cm. Berry globose, to 8 cm across.

*Fl. & Fr.* March-May

*Distr.* Originally from Tropical America; now naturalised in the tropics. Fairly common around the settlements; *PS 30292* Parambikulam

#### SYZYGIUM R. Brown ex Gaertner

1. Calyx tube funnel shaped..... 2
1. Calyx tube turbinate..... 3
2. Leaves elliptic-oblong with few or without glands ..... **S. lanceolatum**
2. Leaves obovate, prominently glandular ..... **S. palghatense**
3. Flowers more than 1 cm across ..... 4
3. Flowers less than 1 cm across ..... 7
4. Leaves cordate at base ..... 5
4. Leaves acute or acuminate at base..... 6
5. Branchlets distinctly tetragonous; leaf apex acuminate..... **S. munronii**
5. Branchlets terete or subterete; leaf apex acute ..... **S. mundagam**
6. Leaves linear lanceolate, to 15 x 2.5 cm; filaments yellow coloured ..... **S. occidentaleis**
6. Leaves elliptic or ovate, to 11 x 5 cm; filaments crimson coloured ..... **S. laetum**
7. Leaves membranous; cymes slender, terminal and axillary of upper leaves..... **S. gardneri**
7. Leaves coriaceous; cymes stout, axillary and on the scars of fallen leaves ..... 8
8. Cymes mostly from the axils; leaves thickly coriaceous with undulate margin; berry obliquely ventricose ..... **S. chavaran**
8. Cymes mostly from the leafy scars; leaves coriaceous; berry globose or oblong ..... **S. cumini**

**Syzygium chavaran** (Bourd.) Gamble, FPM 480. 1919; FTSR 181. 1996. *Eugenia chavaran* Bourd., For. Trees Travancore 188. 1908.

Large trees; bark greyish-brown, to 2 cm thick, reddish inside. Leaves oblong or elliptic-oblong, obtusely acuminate, base obtuse, coriaceous, glossy above, to 18 x 8 cm; lateral nerves numerous, close and parallel, very slender; petiole, to 2.5 cm long. Cymes 4-5 cm long, axillary to leaves or leafscars; flowers 1 cm across; pedicels not distinct. Petals calyptrate. Berry ellipsoid, obliquely ventricose, purple, to 3-4 x 2-2.5 cm, crowned by the 5 mm long calyx limb.

*Fl. & Fr.* December-April

*Distr.* Endemic to Southern Western Ghats (Kerala). Rare in semi-evergreen forests; *PS 30150* Kariamchola

**Syzygium cumini** (L.) Skeels, U. S. DA. Bur. Pl. Industr. Bull. 248: 2. 1912; FPL 199. 1990; FTSR 181. 1996. *Myrtus cumini* L., Sp. Pl. 471. 1753. *Eugenia jambolana* Lam., Encycl. 3: 198. 1789; FBI 2: 499. 1879. *Syzygium jambolanum* (Lam.) DC., Prodr. 3: 259. 1828; FPM 481. 1919.

Medium trees; bark grey, light pink inside. Leaves to 18 x 8 cm, ovate, oblong, long-acuminate at apex, acute at base; nerves many, close, shining above; petiole 1.5-2 cm long.



Panicles to 10 cm across, on leafless branchlets. Flowers 6-9 mm across, subsessile; calyx tube 3 mm broad, turbinate; filaments 7 mm long. Berry 10 x 7 mm, obovoid, deep blue.

*Fl. & Fr.* January-May

*Distr.* Indo-Malesia. Common in moist deciduous and semi-evergreen forests; *PS 18881* Parambikulam; *19283* Karimala

**Syzygium gardneri** Thw., Enum. Pl. Zeyl. 117. 1859; FPM 479. 1919; FTSR 181. 1996. *Eugenia gardneri* (Thw.) Bedd., For. Man. Bot. 108. 1874; FBI 2: 489. 1878. *E. cymosa* Lam. var. *rostrata* Duthie in Hook.f., FBI 2: 482. 1878.

Large trees; bark white, smooth; branchlets terete. Leaves 10 x 6 cm, elliptic, caudate-acuminate at apex, acute at base; nerves many, close, intramarginal vein 2 mm away from the margin; petiole 1.5 cm long. Cymes 7 x 8 cm, lax, terminal and axillary; branches slender. Flowers globose; pedicels 2-5 mm long; calyx tube 2 x 3 mm, obconical, lobes obtuse; petals calyptrate; filaments 4 mm long.

*Fl.* December-February

*Distr.* Western Ghats and Sri Lanka. Common in evergreen forests; *PS 30093* Kottayali; *19840* Vengoli; *30166* Pezha

**Syzygium laetum** (Buch.-Ham.) Gandhi in Sald. & Nicols., Fl. Hassan Dist. 282. 1976; FPL 200. 1990; FTSR 181. 1996. *Eugenia laeta* Buch.-Ham., Mem. Wern., Nat. Hist. Soc. 5: 338. 1826; FBI 2: 479. 1878. *Jambosa laeta* (Buch.-Ham) Blume, Mus. Bot. Lugd.-Bat. 1: 104. 1849; FPM 474. 1919. *Eugenia pauciflora* Wight, Ic. t. 526. 1842.

Small trees, branchlets terete, slender. Leaves to 12 x 5 cm, elliptic, acuminate at both ends, pale below; nerves to 12 pairs, intramarginal nerves obscure; petiole 5 mm long. Flowers to 6 cm across, solitary or 2-5-together, on axillary or terminal cymes; pedicels 2.5 cm long; calyx tube 15 mm long, obconical; sepals 8 x 8 mm, orbicular, persistent; petals 10 x 10 mm, glabrous; stamens 2-3 cm long, yellow or pink. Berry 25 x 15 mm, oblong, truncate at apex.

*Fl. & Fr.* January-April

*Distr.* Endemic to Southern Western Ghats. Common in evergreen forests; *PS 18830* Kanjirakuthu; *19161* Karimala

**Syzygium lanceolatum** (Lam.) Wight & Arn., Prodr. 330. 1834; FPL 200. 1990; FTSR 183. 1996. *Eugenia lanceolata* Lam., Encycl. 3: 200. 1789. *Syzygium wightianum* Wall. ex Wight & Arn., Prodr. 330. 1834; FPM 478. 1919. *Eugenia wightiana* (Wall. ex Wight & Arn.) Wight, Ic. t. 529. 1842; FBI 2: 485. 1878.

Trees, branchlets terete. Leaves to 11 x 4 cm, elliptic, lanceolate, obliquely acuminate, base cuneate, thinly coriaceous, nerves close, parallel; petiole to 8 mm. Racemes axillary; peduncle to 3 cm; flowers white, 5 mm across; pedicels to 2 mm; calyx tube elongate, to 1.5 cm, widened. Fruit scarlet red.

*Fl. & Fr.* April-August

*Distr.* South India and Sri Lanka. Fairly common in evergreen forests at lower altitudes; *PS 30358* Kariamchola

**Syzygium mundagam** (Bourd.) Chithra in Henry *et al.*, Fl. Tamilnadu 1: 157. 1983; FPL 200. 1990; FTSR 183. 1996. *Eugenia mundagam* Bourd., For. Trees Travancore 182. 1908. *Jambosa mundagam* (Bourd.) Gamble, FPM 473. 1919.

Small to medium trees; branchlets quadrangular. Leaves to 25 x 10 cm, oblong, obtuse, coriaceous; nerves to 20 pairs, irregular, intramarginal nerves indistinct. Cymes terminal, corymbose. Flowers few to many, 3 cm across; pedicels 5 mm long; calyx tube funnel shaped, lobes 6 mm across, orbicular; petals 12 mm diam., white; filaments 2 cm long, glabrous, white.

*Fl.* March-April

*Distr.* Endemic to Southern Western Ghats. Fairly common in evergreen forests; *PS 30238* Pezha; *30283* Kothala; *NS 18914* Karimala

**Syzygium munronii** (Wight) Chandrab., Biol. Mem. 2:58. 1977; FPL 201. 1990; FTSR 183. 1996. *Eugenia munronii* Wight, Ic. t. 546. 1842; FBI 2: 472. 1878. *Jambosa munronii* (Wight) Walp., Rep. 2: 191. 1843; FPM 473. 1919.

Large shrubs or small trees; branchlets quadrangular. Leaves to 22 x 7 cm, lanceolate, subsessile, glabrous, nerves and intramarginal veins prominent. Cymes 5-10 cm broad, terminal. Flowers few, 4 cm across; pedicels 1 cm long; calyx 2.5 cm long, funnel-shaped; lobes 1 x 1 cm, orbicular; petals larger, 15 x 15 mm, yellowish white; filaments 2.5 cm long, white. Berry 25 x 15 mm, ellipsoid, glabrous.

*Fl. & Fr.* December-April

*Distr.* Endemic to Peninsular India. Fairly common in evergreen forests; *PS 30266* Pooppara

**Syzygium occidentalis** (Bourd.) Gandhi in Sald. & Nicols., Fl. Hassan Dist. 282. 1976; FTSR 185. 1996. *Eugenia occidentalis* Bourd., Indian For. 30: 195. t.3. 1904. *Jambosa occidentalis* (Bourd.) Gamble, FPM 474. 1919.

Large shrubs. Leaves to 14 x 2.5 cm, linear-lanceolate, acuminate at both ends, nerves indistinct; petiole 1 cm long. Cymes 10 cm broad, terminal. Flowers yellow; calyx tube 15 mm long, funnel shaped; lobes ovate, obtuse, 6 mm across; petals 4, 8 mm broad, orbicular; filaments 25 mm long, yellow; style 3.5 cm long. Berry 2 x 1.5 cm, obovoid to globose.

*Fl. & Fr.* December-May

*Distr.* Endemic to Southern Western Ghats. Common along the riverine areas of evergreen forests; *PS 19328* Thenkudippara

**Syzygium palghatense** Gamble, Kew Bull. 1918: 240. 1918 & FPM 480. 1919 [Figure 5].

Trees, to 15 m tall; bark smooth, greyish outside and muddy brown inside; branchlets subtetragonus, become terete on maturity. Leaves opposite or subopposite, 3.5-8 x 2-3.5 cm, elliptic to elliptic-oblong, base acute, apex acute sometimes obtusely acuminate, chartaceous, sparsely gland dotted on lower surface, lateral nerves slender, many, 2-4 mm apart with numerous secondary laterals, intramarginal nerve close to the margin; petiole 3-5 mm long, slender. Flowers in terminal or axillary, 2-3 cm long, cymes; pedicel to 2 mm long. Calyx tube funnel shaped, 8-12 mm long, 5 mm at mouth, petals 2.5 mm across, creamy white, calyprate, cauducous at early stage. Stamens to 8 mm long. Berry 10-13 x 4-5 mm, obconic with a hollow depression at apex, crowned by the calyx limb, prominently ribbed on drying.

*Fl. & Fr.* January-June

*Distr.* Endemic to Southern Western Ghats (Kerala). Very rare in evergreen forests at higher altitudes; *PS 30379, 30527, NS 30615* Pandaravarai

**Note:** This species was first collected by Beddome from Palghat hills. The present collection is the rediscovery after a gap of 140 years.

## LECYTHIDACEAE

1. Flowers in small erect spikes; fruit globose ..... **Careya**
1. Flowers in long pendent racemes; fruit angular ..... **Barringtonia**

### BARRINGTONIA J.R. Forster & J. G. A. Forster

**Barringtonia acutangula** (L.) Gaertn., Fruct. 2: 97, t.101. 1790; FBI 2: 508. 1879; FPM 487. 1919 FTSR 185. 1996. *Eugenia acutangula* L., Sp. Pl. 471. 1753.

Small trees. Leaves obovate, subacute, base cuneate, subcoriaceous, finely serrate, to 11 x 4.5 cm; lateral nerves 8-10 pairs, slender; petiole to 0.6 cm long. Flowers 1 cm across, in pendulous, to 30 cm long racemes. Calyx campanulate, lobes 4, ovate, acute. Petals ovate, obtuse, 4 mm long. Filaments pink, 1 cm long. Fruit oblong, 4-angled, to 2.5 x 0.8 cm.

*Fl. & Fr.* March-May

*Distr.* Indo-Malesia to Australia. Along the riverine areas; *PS 30169* Orukomban

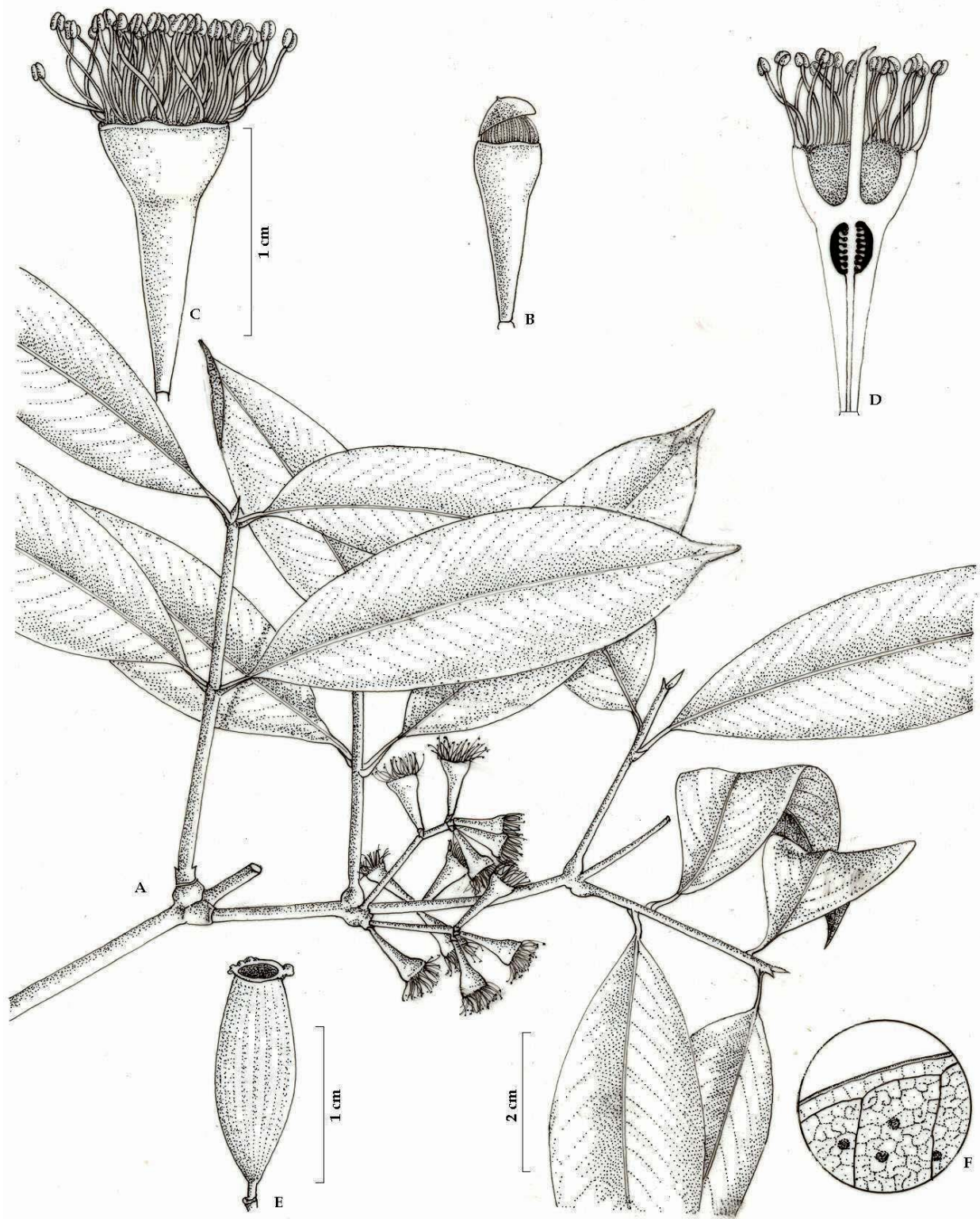


Figure 5. *Syzygium palghatense* Gamble **A.** flowering twig; **B.** flower bud with calyptra; **C.** flower; **D.** flower L.S.; **E.** fruit; **F.** leaf a portion enlarged

### CAREYA Roxburgh

**Careya arborea** Roxb., Pl. Corom. t. 218. 1811; FBI 2: 511. 1879; FPM 488. 1919; FPL 201. 1990; FTSR 185. 1996.

Small trees; branchlets puberulus; bark thick, pink inside. Leaves alternate, to 20 x 13 cm, obovate, obtuse, cuneate to the base; petiole 1.5 cm long, channelled. Flowers 6-7 cm across, in axillary small racemes on old branches; sepals 4, orbicular, 2 cm across; petals 4, white, 3 cm across, orbicular; stamens many, filaments long, connate at base; ovary 4-5-celled inferior, ovule; numerous on axils placentation; style 4 cm long. Fruit a berry 5-7 cm across, globose, crowned by sepals.

*Fl. & Fr.* February-May

*Distr.* India and Sri Lanka. Common in moist deciduous forests; *PS 30794* Anappadi

### MELASTOMATACEAE

1. Leaves penninerved some times faint; flowers blue; ovary 1-celled ..... **Memecylon**
1. Leaves 3 or more ribbed at base; flowers purple pink or white; ovary many celled ..... 2
2. Inflorescence scorpioid; flowers tri-merous ..... **Sonerila**
2. Inflorescence otherwise; flowers tetra or pentamerous ..... 3
3. Epiphytic shrubs; tender shoot fleshy ..... **Medinilla**
3. Terrestrial herbs or shrubs; leaves not fleshy ..... 4
4. Flowers white in axillary cymes; leaves crenate ..... **Clidemia**
4. Flowers pink or purple in terminal cymes; leaves entire..... **Osbeckia**

### CLIDEMIA D. Don

**Clidemia hirta** L., D. Don Mem. Wern. Soc. 4: 309. 1823.

Shrubs, to 1.5 m high; stem pilose. Leaves to 14 x 7 cm, ovate, acuminate, cordate at base, 5-ribbed, regular, hispid-tomentose, crenate, intercostae parallel; petiole 2 cm long. Cymes axillary. Flowers 2 cm across; pedicels slender, pilose; calyx tube 3 mm long, densely covered with simple bristles, lobes 5, acute; petals 7 mm long, ovate, acute, white, glabrous; stamens 10, all fertile; anthers not appendaged. Ovary many-celled, many-ovuled. Berry 7 x 5 mm, ovate, hispid; seeds many, 0.5 mm long, ovoid, brown, muriculate, glabrous.

*Fl. & Fr.* Throughout the year

*Distr.* Native of South America; naturalised in old world tropics. Rare in degraded forest areas; *PS 30667* Anakkalvayal

### MEDINILLA Gaudinchaud

1. Leaves orbicular, to 3 cm across; stem terete; tender shoot greenish ..... **M. beddomei**
1. Leaves elliptic oblong; stem subquadrangular or quadrangular; tender shoot crimson coloured .....  
..... **M. anamalaiana**

**Medinilla anamalaiana** Sasidh. & Sujanalpal, Sida 20: 109. 2002 [Figure 6].

Epiphytic subshrubs; branches fleshy, acutely quadrangular or subquadrangular, sparingly branched, sometimes rooting from lower nodes, smooth, on drying forms a winged appearance; stem 20-35 cm long, young shoots reddish-brown. Leaves membranous, opposite pairs unequal, sometimes equal, larger one 7-11.5 x 3-5 cm, smaller 4-6 x 2.5-3.5 cm, elliptic-oblong, base subcordate or obtuse, apex obtusely acuminate, acumen sometimes twisted, margin entire, 3-nerved, lateral nerves ribs near the margins, faint towards apex; petiole 2-4 mm, flattened, glabrous. Flowers 4-merous, 2-5 in axils or from leafless nodes in horizontal row, sometimes 2 or 3 on a short stalk (1-2 mm); pedicel with 2 minute bracteoles at base, jointed, 2 mm at anthesis, elongating to 4 mm in fruit; hypanthium obovate, subquadrangular, 3 mm across, thinly puberulus, shortly narrowed at mouth with 8 minute teeth; petals 5-7 x 4 mm, rose-pink,

obliquely obovate, minutely apiculate; stamens 8, filaments 3 mm long; anthers 2 mm long; ovary 1.5 mm across, obovoid, 4-celled, connected to hypanthium with 8 membranous appendages; style to 7 mm long; stigma minutely capitate, papillate. Berries 4 mm across, globose, glabrous; crowned by a small hypanthial limb; seeds many, yellowish-brown, 1.5 x 1 mm, smooth, ovoid, concave on the side of raphe.

*Fl. & Fr.* January-June

*Distr.* Endemic to Southern Western Ghats (Kerala). Rare in evergreen forests at higher altitudes; *PS 19431* Shekkal mudi; *30043* Puliya

**Medinilla beddomei** Clarke in Hook.f., *FBI* 2: 548. 1879; *FPM* 496. 1919; *FPL* 202. 1990; *FTSR* 186. 1996. *M. radicans* sensu Bedd., *IC* t. 184. 1868-1874, non Blume 1831.

Epiphytic shrubs; branches terete, pendulous. Leaves 2.5 cm across, obtuse at base and apex, very succulent, ribs indistinct; petiole 5 mm long. Cymes axillary, 1-3 flowered; pedicels 2 cm long, glabrous. Flowers white; calyx tube 7 mm long, wavy along the rim; petals white, 1.5 x 1.2 cm, obovate, spreading; stamens 10, anthers 8 mm long, acuminate, spur at the base of the anther, 1.5 mm long, curved up.

*Fl. & Fr.* April-June

*Distr.* Endemic to Southern Western Ghats. Common in evergreen and semi-evergreen forests; *PS 30309* Puliya; *30664* Orukomban

#### MEMECYLON Linnaeus

- |   |                         |
|---|-------------------------|
| 1. Leaves sessile; base cordate or rounded .....                  | <b>M. deccanense</b>    |
| 1. Leaves petioled; base acute .....                              | 2                       |
| 2. Flowers sessile in fascicles.....                              | <b>M. lawsonii</b>      |
| 2. Flowers pedicellate in a distinct peduncle .....               | 3                       |
| 3. Berry yellow; leaves yellowish dry; calyx campanulate.....     | <b>M. umbellatum</b>    |
| 3. Berry purple; leaves black when dry; calyx saucer shaped ..... | <b>M. angustifolium</b> |

**Memecylon angustifolium** Wight, *IC* t. 276. 1840; *FBI* 2: 562. 1879; *FPM* 504. 1919.

Shrubs; branchlets terete. Leaves to 8 x 2 cm, obtusely acuminate, acute at base; nerves indistinct. Cymes 2 cm across, many-branched; peduncle 3-5 mm long; pedicels slender. Berry 4 mm across, globose, glabrous.

*Fl. & Fr.* May-July

*Distr.* South India and Sri Lanka. Fairly common in evergreen forests; *PS 30308* Pezha

**Memecylon deccanense** Clarke in Hook. f., *FBI* 2: 560. 1879; *FPM* 505. 1919. *M. wightianum* Triana, *Trans. Linn. Soc. London* 28: 158. 1871.

Large shrubs to small slender trees, branchlets subterete. Leaves oblong-lanceolate or elliptic-oblong, acute or acuminate, base rounded, glabrous, brown on drying, to 12 x 4.5 cm; lateral nerves ca. 15 pairs, slender, faint. Flowers mostly fascicled on tubercles; pedicels slender, 2.5 mm long; calyx cupular, lobes obscure, pink; petals blue.

*Fl. & Fr.* January-March

*Distr.* Endemic to Southern Western Ghats. Fairly common in evergreen forests; *PS 19360* Pezha

**Memecylon lawsonii** Gamble, *Kew Bull.* 1919: 226. 1919 & *FPM* 503. 1919; *FTSR* 187. 1996.

Shrubs; branches few, terete. Leaves to 18 x 3.5 cm, lanceolate, acuminate; nerves 10-12 pairs, pale; petiole 1 cm long. Flowers 1-3, axillary; calyx 1 mm long, lobes ovate, acute, pale pink; petals 2.5 mm long, obovate-oblong, keeled, blue. Berry 8 x 9 mm; yellow, sessile.

*Fl. & Fr.* March-May

*Distr.* Endemic to Southern Western Ghats. Rare in evergreen forests at higher altitudes; *PS 19788* Kanthalppara

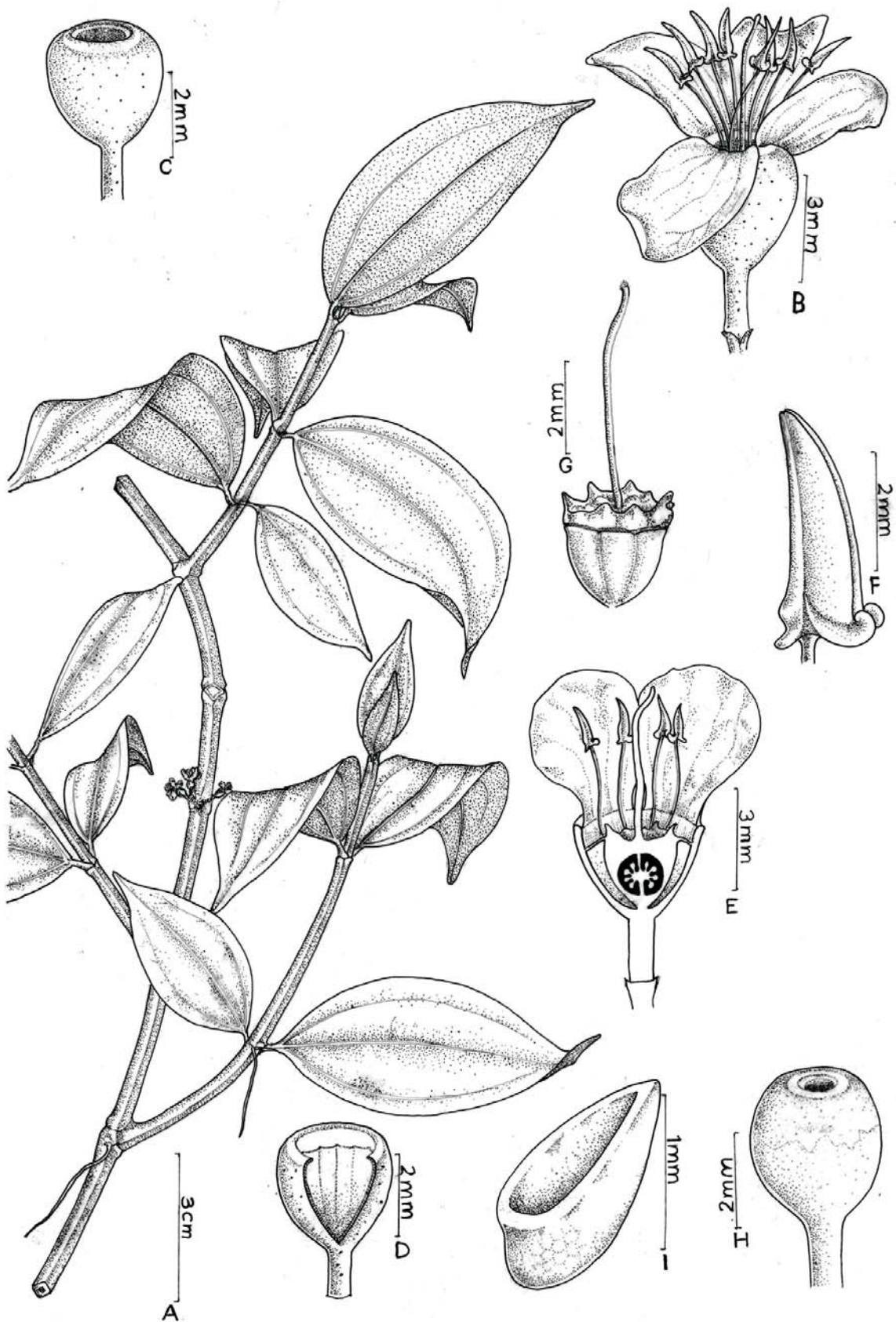


Figure 6. *Medinilla anamalaiana* Sasidharan & Sujanalpal. **A.** flowering twig; **B.** flower; **C.** hypanthium; **D.** hypanthium cut open; **E.** flower L.S; **F.** anther; **G.** pistil; **H.** fruit; **I.** seed

**Memecylon umbellatum** Burm.f., Fl. Ind. 87. 1768; FPM 504. 1919; FPL 202. 1990; FTSR 187. 1996. *M. edule* Roxb., Pl. Corom. t. 82. 1798; FBI 2: 563. 1879p.p.; FPM 504. 1919.

Small trees, branchlets terete. Leaves to 5 x 2 cm, elliptic, apex obtuse or emarginate, cuneate at base, shining above, nerves faint, dark green when dry; petiole to 3 mm. Umbels axillary; calyx 1.5 mm across, lobes short; petals orbicular, blue. Berry 0.5 mm across, yellow.

*Fl. & Fr.* August-December

*Distr.* Peninsular India and Sri Lanka. Fairly common in evergreen forests; *PS 19836* Vengoli

#### OSBECKIA Linnaeus

- |   |   |
|---|---|
| 1. Flowers tetramerous.....   | 2   |
| 1. Flowers pentamerous.....   | 3   |
| 2. Calyx tube covered with simple hairs only .....                            | <b>O. gracilis</b>                        |
| 2. Calyx tube covered with simple and stalled stellate hairs .....            | <b>O. muralis</b>                         |
| 3. Calyx tube with few large peltate scales or hairs.....                     | 4   |
| 3. Calyx tube densely bristled or hairy.....                                  | 5   |
| 4. Flowers many in terminal paniced cymes; leaves 5-ribbed, to 18 x 3 cm..... | <b>O. wynadensis</b>                      |
| 4. Flowers few in terminal cymes; leaves 3-ribbed, to 5 x 2 cm.....           | <b>O. virgata</b>                         |
| 5. Branchlets reddish pilose; leaves sessile, to 3 x 1 cm.....                | <b>O. leschenaultiana</b>                 |
| 5. Branchlets otherwise; leaves petiolate, more than 5 x 2 cm .....           | 6   |
| 6. Leaves 3-ribbed; leaves to 5 x 2 cm.....                                   | <b>O. aspera</b> var. <b>aspera</b>       |
| 6. Leaves 5-7 ribbed, to 15 x 3 cm .....                                      | <b>O. aspera</b> var. <b>travancorica</b> |

**Osbeckia aspera** (L.) Blume, Bijdr. Natuurk. Wetensch. 6: 220. 1831 var. **aspera**, Hansen, Ginkgoana 4: 82. 1977; FPL 203. 1990; FTSR 189. 1996. *Melastoma asperum* L., Sp. Pl. 389. 1753. *Osbeckia kleinii* Wight & Arn., Prodr. 323. 1834. *O. courtallensis* Gamble, Kew Bull. 1918: 242. 1918. *O. kewensis* Fischer, Kew Bull. 1938: 34. 1938. *O. lawsonii* Gamble, Kew Bull. 1918: 242. 1918 & FPM 503. 1919.

Shrubs; branches shortly atrorsely scabrid. Leaves to 5 x 2 cm, elliptic-oblong, acute at both ends, hairy; hairs half adnated; petiole 5 mm long. Flowers 3-9-together, in terminal cymes, sessile; calyx tube 8 x 12 mm, densely covered with stalked tufts of bristles; stalk 1 mm long, with about 30 bristles, bristles 1-3 mm long; sepals 4 x 2.5 mm, oblong, retuse, ciliate and bristled; petals 17 x 12 mm, obovate, pink, ciliate; anthers 8 mm long.

*Fl. & Fr.* February-August

*Distr.* South India and Sri Lanka. Fairly common in degraded forest areas; *PS 19831* Vengoli

**Osbeckia aspera** (L.) Blume var. **travancorica** (Bedd. ex Gamble) Hansen, Ginkgoana, 4: 84. 1977; FTSR 190. 1996. *O. travancorica* Bedd. ex Gamble, Kew Bull. 1919: 404. 1919 & FPM 493. 1919 [Figure 7].

Shrubs or perennial herbs; branches covered with reddish retrorse bristles. Leaves to 15 x 5 cm, ovate-oblong, acuminate, 7-ribbed, covered with adpressed hairs above and below; petiole 1 cm long. Flowers 6 cm across, 5-15 together in terminal cymes, bracts 1 cm across, orbicular; calyx cup 13 mm long, densely covered with stalked bristles, lobes 7 x 4 mm, obovate, emarginate, bristled; intersepalal emergences with stellate bristles; petals 3.5 x 2.5 cm, obovate, pink; filaments 13 mm long, anthers 9 mm long, acuminate, constricted at base.

*Fl. & Fr.* October-January

*Distr.* Endemic to Southern Western Ghats. Fairly common in wet rocky areas; *PS 19652* Vengoli

**Osbeckia gracilis** Bedd., Madras J. Lit. Sci. ser. 3, 1: 45. 1864; FBI 2: 518. 1879. *O. sublaevis* Cogn. in DC., Monogr. Phan. 7: 321. 1891; FPM 492. 1919. *O. lineolata* Gamble, Kew Bull. 1918: 241. 1918 & FPM 492. 1919. *O. lineolata* Gamble var. *anamalayana* Giri & Nayar, Bull. Bot. Surv. India 25: 241-245. 1983.

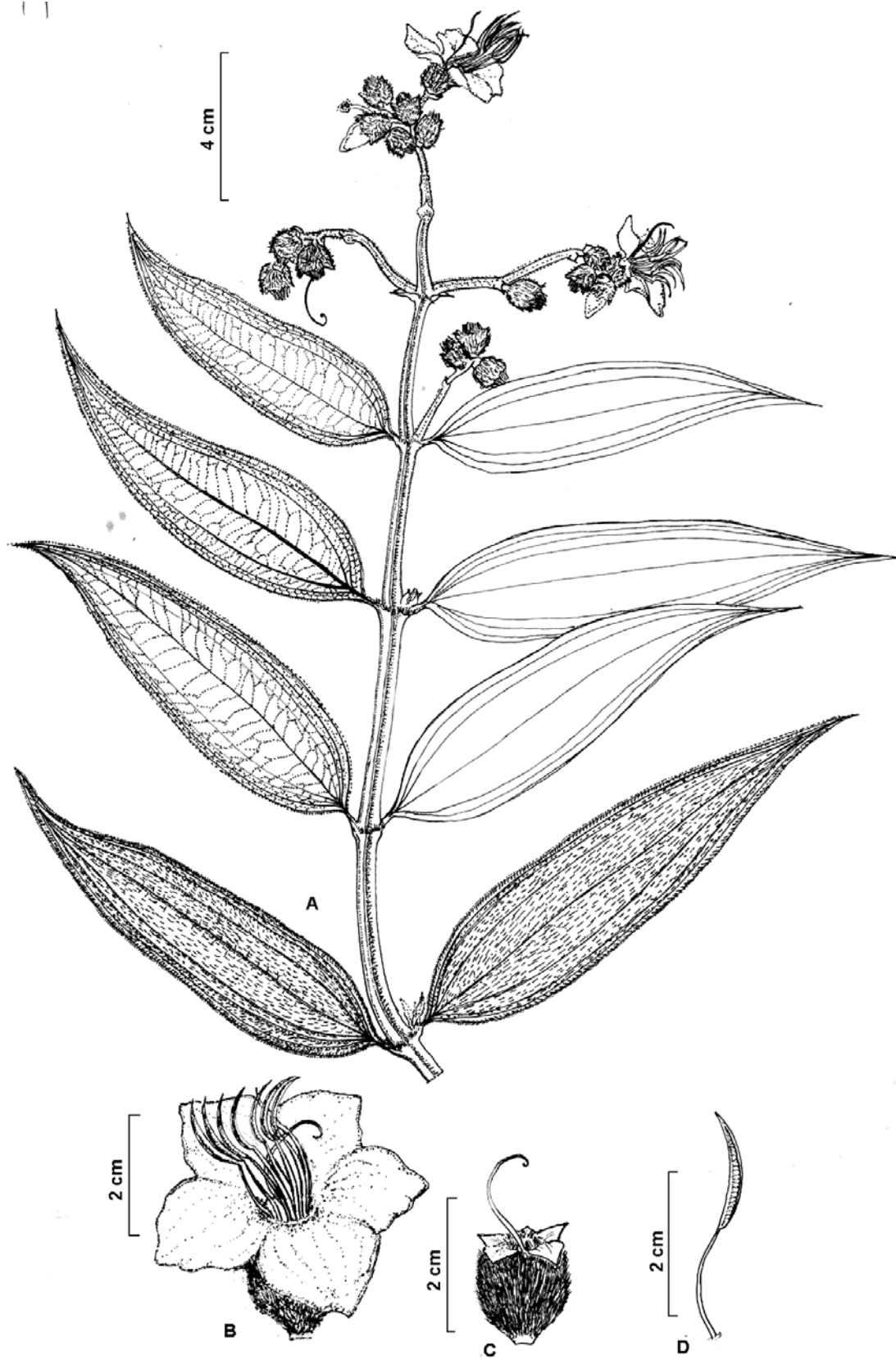


Figure 7. *Osbeckia aspera* (L.) Blume var. *travancorica* (Bedd. ex Gamble) Hansen A- flowering branch, B- flower, C- hypanthium with sepals, D- stamens



Stout shrubs; branches glaucous, glabrous. Leaves to 3.5 x 2 cm, elliptic-oblong, obtuse at apex and base, cuspidate, yellowish green, densely covered with half-adnated hairs spreading from midrib, 3-ribbed; petiole 3 mm long. Flowers in terminal cymes, pedicelled; calyx tube 7 mm long, densely simple-hairy, lobes 4 x 3 mm, ovate-oblong, obtuse, ciliate; petals 15 x 12 mm, obovate, ciliate, pink; anthers 5 mm long.

*Fl.* September

*Distr.* Endemic to Southern Western Ghats. Rare in grasslands; *PS 19675* Karimala

***Osbeckia leschenaultiana*** DC., Prodr. 3: 142. 1828; FBI 2: 520. 1879; FPM 493. 1919. *O. gardneriana* Wight, Ic. t. 997. 1843-45.

Shrubs; branchlets reddish, pilose. Leaves 1.5-3 x 1 cm, ovate, acute at apex, rounded at base, 3-ribbed, hairy; hairs and lineoles parallel to the midrib, black above, pale green below. Flowers 3-5-together, sessile in terminal clusters; calyx tube 7 mm long, densely covered with stalked bristles, stalk 1.5 mm long, to 15-bristled; lobes 4 x 3 mm, ovate, obtuse, with a tuft of 3-9 bristles at apex, ciliate; petals 15 x 17 mm, orbicular, ciliate; anthers 9 mm long, acuminate; filaments clavate.

*Fl. & Fr.* April-May

*Distr.* Endemic to Southern Western Ghats. Rare in wet rocky areas; *PS 30666* Karimala

***Osbeckia muralis*** Naud., Ann. Sci. Nat. Bot. ser.3, 14: 456. 1850; FTSR 190. 1996. *O. truncata* D. Don ex Wight & Arn., Prodr. 322. 1834, p.p.; FBI 2: 514. 1879; FPM 494. 1919. *O. truncata* var. *kurzii* Clarke in Hook. f., FBI 2: 514. 1879.

Erect annual herbs, stem patently hairy. Leaves elliptic or elliptic-oblong, acute, to 4 x 2 cm, 3-5 ribbed; petiole 2-3 mm. Flowers 0.6 cm across, in terminal clusters. Hypanthium with simple hairs only. Calyx lobes and intersepalal emergences bristly at apex; petals light purple, 3 mm long.

*Fl. & Fr.* September-December

*Distr.* Endemic to Western Ghats. Fairly common in rocky areas; *PS 30710* Vengoli; *30665* Vengoli

***Osbeckia virgata*** D. Don ex Wight et Arn., Prodr. 1: 323. 1834; FTSR 190. 1996. *O. octandra* auct. non (L.) DC., 1828; Hook. f., FBI 2: 521. 1879; FPM 493. 1919.

Shrubs; branchlets quadrangular, sparsely adpressed hairy. Leaves to 5-9 cm, elliptic, acute at both ends; hairs adnate its major length above, free below; petiole 5 mm long. Flowers 15 mm across, in terminal cymes, 3-9 together; calyx cup 6 mm long, emergences 2 mm long, 2-4-bristled at tip; sepals 4 mm long, acuminate, bristled; petals 7 x 6 mm, anthers 4 mm long, acuminate.

*Fl. & Fr.* October-January

*Distr.* South India and Sri Lanka. Rare in degraded forest areas; *PS 18880* Parambikulam; *18962* Vengoli

***Osbeckia wynaadensis*** Clarke in Hook.f., FBI 2: 521. 1879; FPM 493. 1919; FTSR 190. 1996.

Tall shrubs; branches densely scabrid. Leaves to 18 x 3 cm, lanceolate, acute, 3-5-nerved, hairy; hairs adnated and spreading from the midrib. Flowers many, in terminal paniced cymes; pedicels 4 mm long; calyx tube 8 mm long, bristles 4 or 5 in a tuft, to 3 mm long; lobes 11 x 5 mm, lanceolate, ciliate; petals 20 x 10 mm, obovate, anthers 7 mm long. Seeds 0.5 x 0.3 mm obovoid, minutely muriculate.

*Fl. & Fr.* October-January

*Distr.* Endemic to Southern Western Ghats. Common in moist localities in moist deciduous forests; *PS 19266* Anakkalvayal

## SONERILA Roxburgh

- |   |                        |
|---|------------------------|
| 1. Scapigerous herbs .....                                | 2                      |
| 1. Caulescent herbs .....                                 | 3                      |
| 2. Leaves and calyx glabrous.....                         | <b>S. rotundifolia</b> |
| 2. Leaves and calyx sparsely crispate hairy.....          | <b>S. wallichii</b>    |
| 3. Capsule with a corky rim; sepals glandular hairy ..... | <b>S. rheedii</b>      |
| 3. Capsule without a corky rim; sepals otherwise .....    | <b>S. brunonis</b>     |

**Sonerila brunonis** Wight & Arn., Prodr. 321. 1834; FBI 2: 531. 1879; FPM 499. 1919. *S. arnottiana* Thw. var. *tenella* Bedd., Trans. Linn. Soc. London 25: 217. 1865; FBI 2: 532. 1879.

Stem to 20 cm high, reddish, glandular. Leaves 1.5-2.5 x 1-2 cm, ovate, acute at either ends, 5-nerved from base, serrulate, pilose above; petiole 1 cm long. Peduncle to 3 cm long, slender; raceme 3-6-flowered. Flowers 1 cm across; sepals ovate, acute, puberulus outside; petals obovate, obtusely acute, pink; anthers 2 mm long. Capsule 7 mm long, oblong; seeds curved, dark brown, glabrous.

*Fl. & Fr.* November-January

*Distr.* South India and Sri Lanka. Rare in wet rocks in evergreen forests; *PS 30663* Karimala

**Sonerila rheedii** Wight & Arn., Prodr. 321. 1834; FPM 500. 1919; FTSR 193. 1996. *Sonerila wallichii* sensu Clarke in Hook.f., FBI 2: 538. 1879 p.p., non Bennet 1844.

Stem to 15 cm high, quadrangular, hispid. Leaves to 12 x 6 cm, ovate, penninerved, acute at apex; rounded or cordate at base, hirtus, green; nerves 4 pairs; petiole 4 cm long, hispid. Peduncle terminal or upper axillary, 8-12-flowered. Flowers 1 cm across; pedicel 8 mm long; sepals triangular, glandular hairy; petals 4 x 3 mm, elliptic, with a hairy midrib; pink; anthers 3 mm long, acute. Capsule 4 x 3 mm, glandular hairy; seeds obovoid, brown, glandular.

*Fl. & Fr.* September-December

*Distr.* Endemic to Southern Western Ghats. Rare in wet rocks in evergreen forests; *PS 19736* Pezha

**Sonerila rotundifolia** Bedd., Madras J. Lit. Sci. ser. 2, 22: 74. 1861 & Ic. t. 169. 1868-1874; FBI 2: 538. 1879; FPM 500. 1919; FPL 204. 1990; FTSR 193. 1996.

Stemless herbs. Leaves few, 6.5-8 cm across, orbicular, deeply cordate at base, crenate, 9-ribbed from base, pilose along the nerves, reddish brown, petiole to 12 cm long. Peduncle to 15 cm long, 8-10 flowered. Flowers 2.5 cm across, confined to the apex of the scape in scorpioidal cyme; pedicel 1 cm long, pink; sepals 1.5 x 3 mm, triangular; petals 12 x 9 mm, obovate, pink; anthers 6 mm long, acuminate, deeply cleft at base; filaments 7 mm long; style 11 mm long.

*Fl. & Fr.* June-August

*Distr.* Endemic to Southern Western Ghats. Common in wet rocks in evergreen forests at higher altitudes; *PS 19582* Karimalagapuram

**Sonerila wallichii** Bennet, Pl. Jav. Rar. 215. 1844; FBI 2: 538. 1879,p.p.; FPM 500. 1919; FTSR 193. 1996.

Leaves one or very few; 5 x 3 cm, ovate, acute, cordate at base, serrulate, crispate hairy above, 3 pairs of nerves from the base; petiole 1-3 cm long. Peduncles to 9 cm long, glandular hairy; 4-6 flowered. Flowers 10 mm across; pedicels 5 mm long; sepals triangular, hairy; petals 5 x 4 mm, elliptic, acute, pink; anther 2 mm long, acute; style 5 mm long, glabrous. Capsule 2.5 x 2.5 mm, hemispheric, glandular hairy.

*Fl. & Fr.* September-November

*Distr.* Endemic to Southern Western Ghats. Common in evergreen forests at higher altitudes; *PS 19699* Karimala

## LYTHRACEAE

- |                                       |                      |
|---------------------------------------|----------------------|
| 1. Trees; petals clawed .....         | <b>Lagerstroemia</b> |
| 1. Herbs; petals not clawed .....     | 2                    |
| 2. Flower axillary, solitary .....    | <b>Rotala</b>        |
| 2. Flowers in axillary clusters ..... | <b>Ammannia</b>      |

### AMMANNIA Linnaeus

**Ammannia baccifera** L., Sp. Pl. (ed.2) 175. 1762, ssp. **baccifera** Koehne in Engl., Bot. Jahrb. 1: 260. 1880; FPL 204. 1990. *A. vesicatoria* Roxb., Fl. Ind. 1: 426. 1832.

Herbs. Leaves to 6 x 1 mm, oblong-elliptic, acute, cuneate. Cymes axillary, dichasial, subsessile, flowers *ca* 3 mm; calyx tube *ca* 1 mm, campanulate, lobes 4; petals absent; stamens 4, *ca* 1 mm long; ovary 4-celled. Capsule *ca* 2 mm across; seed globose, turgid.

*Fl. & Fr.* September-December

*Distr.* Tropical Africa, Asia, Europe and Australia. Common in degraded forest areas; *PS 19103* Peruvripallam; *30143* Kariamchola

### LAGERSTROEMIA Linnaeus

- |   |                      |
|---|----------------------|
| 1. Leaves to 20 cm long; flowers to 5 cm across .....   | <b>L. hirsuta</b>    |
| 1. Leaves to 10 cm long; flowers to 0.8 cm across ..... | <b>L. microcarpa</b> |

**Lagerstroemia hirsuta** (Lam.) Willd., Sp. Pl. 2: 1178. 1799; FTSR 195. 1996. *Adambea hirsuta* Lam., Encycl. 1: 39. 1783. *Lagerstroemia reginae* Roxb., Pl. Corom. t. 65. 1796. *L. flos-reginae* Retz., Obs. Bot. 5: 25. 1788; FBI 2: 577. 1879; FPM 513. 1919. *L. speciosa* (L.) Pers., Syn. 2: 72. 1806.

Medium trees; bark smooth, yellowish-grey, peels off in thin small linear flakes. Leaves subopposite, elliptic-oblong, acute or acuminate, base obtuse, coriaceous, to 20 x 8.5 cm; lateral nerves 15-18 pairs, joining along the margins; petiole 0.5 cm. Calyx tube many-ribbed, lobes ovate-acuminate, glabrous. Petals mauve to pink, rhomboid, prominently veined, 2.5 x 2 cm. Capsule globose, 6-valved, 2 cm across.

*Fl. & Fr.* March-November

*Distr.* Indo-Malesia. Common along the riverine areas; *PS 18937* Kothala

**Lagerstroemia microcarpa** Wight, Ic. t. 109. 1839; FPL 205. 1990; FTSR 195. 1996. *L. lanceolata* Wall. ex Clarke in Hook.f., FBI 2: 576. 1879; FPM 513. 1919. *L. thomsonii* Koehne in Engl., Pflanzenr. 17: 251. 1903; FPM 513. 1919.

Large trees; bark smooth, white; branchlets terete. Leaves to 10 x 5 cm, elliptic-lanceolate, glaucous below; nerves 8 pairs; petiole to 1 cm long, subopposite. Flowers pedicellate; calyx lobes triangular, pubescent; petals 3 mm long, obovate, white, clawed; filaments erect, ovary 5-6-celled. Capsule 10 x 6 mm, obovoid, 6-valved; seeds 3-4 in each cell, 8 x 3 mm, flat.

*Fl. & Fr.* November-May

*Distr.* Endemic to Western Ghats. Common in moist deciduous forests; *PS 19080* Padippara

### ROTALA Linnaeus

- |   |                        |
|---|------------------------|
| 1. Capsule 4-valved; bracts cordate at base ..... | <b>R. rotundifolia</b> |
| 1. Capsule 2-valved; bracts acute at base .....   | <b>R. indica</b>       |

**Rotala indica** (Willd.) Koehne, Bot. Jahrb. 1: 172. 1880; FPM 508. 1919; FPL 206. 1990; FTSR 196. 1996. *Peplis indica* Willd., Sp. Pl. 2: 244. 1799. *Ameletia indica* (Willd.) DC., Mem. Soc. Phys. Geneva 3: 82. t. 3. f. A. 1826. *Ammannia peploides* Spreng., Syst. 1: 444. 1825; FBI 2: 566. 1879. *A. nana* Roxb., Fl. Ind. 1: 427. 1832.

Erect or procumbent herbs; stem winged. Leaves to 10 x 7 mm, obovate-oblong, obtusely acute, 5-nerved. Flowers in lax racemes; bracts 8 x 2 mm, oblanceolate, glabrous; bracteoles 3 mm long, linear; calyx 3 mm long, campanulate, lobes ovate, acuminate; petals 0.5 mm long, elliptic, acute; filaments attached at the middle of calyx tube.

*Fl. & Fr.* November-January

*Distr.* Tropical Asia; naturalised in Europe, Africa and America. Fairly common in degraded forest areas; *PS 30128* Karimala

***Rotala rotundifolia*** (Buch.-Ham. ex Roxb.) Koehne, Bot. Jahrb. 1: 175. 1880; FPM 509. 1919. *A. rotundifolia* Buch.-Ham. ex Roxb., Fl. Ind. (ed. 1) 1: 446. 1820; FBI 2: 566. 1879.

Erect herbs, to 15 cm high; stem reddish, 4-angled. Leaves to 8 x 6 mm, oblong-orbicular, sessile, glabrous, 5-nerved. Racemes 1-1.5 cm long, bracteoles 2 mm long, lanceolate; calyx tube 2.5 mm long, lobes triangular, acute; intersepalal appendages absent; petals 1.5 x 1 mm, obovate; filaments attached near the base of calyx tube; ovary 1 x 1 mm, obovoid, truncate, obtuse, 4-angled; style 1 mm long.

*Fl. & Fr.* Throughout the year

*Distr.* South and South East Asia and also in Japan. Fairly common in moist deciduous forests; *PS 19967* Vengoli

## ONAGRACEAE

### LUDWIGIA Linnaeus

1. Branchlets hirsute; flowers more than 2 cm.....**L. peruviana**
1. Branchlets glabrous or puberulus; flowers to 1 cm across..... 2
2. Branchlets glabrous; stamens 8..... **L. hyssopifolia**
2. Branchlets puberulus at least on apices; stamens 4 ..... **L. perennis**

***Ludwigia hyssopifolia*** (G. Don) Exell, Garcia de Orta 5: 471. 1957; FPL 208. 1990; FTSR 197. 1996. *Jussiaea hyssopifolia* G. Don, Gen. Syst. 2: 693. 1832. *J. linifolia* Vahl, Ecolg. Amer. 2: 32. 1798, non *L. linifolia* Poir., 1813; FPM 1875. 1936. *Jussiaea suffruticosa* Ridley, J. Bot. 59: 257. 1921, non *L. Fissendocarpa linifolia* (Vahl) Bennet., JBNHS 67: 126. 1970.

Herbs or subshrubs, branchlets angled or winged. Leaves elliptic-lanceolate, base cuneate, glabrous, membranous, to 6 x 2 cm; petiole to 1 cm. Flowers solitary, axillary. Calyx lobes 4, lanceolate, 3 mm long, persistent. Petals 4, yellow, obovate. Stamens 8. Capsule to 2 x 0.2 cm; seeds dimorphic, upper ones larger.

*Fl. & Fr.* August-December

*Distr.* Pantropical. Common in degraded forest areas; *PS 30762* Vengoli

***Ludwigia perennis*** L., Sp. Pl. 119. 1753; FPL 208. 1990. *L. parviflora* Roxb., Fl. Ind. 1: 440. 1820; FBI 2: 588. 1879; FPM 517. 1919. *Jussiaea perennis* (L.) Brenan., Kew Bull. 8: 163. 1953.

Erect herbs with spreading roots, stem narrowly winged. Leaves to 5 x 2 cm, elliptic, acute at apex, attenuate to the petiole, nerves many, close; petiole 2.5 cm long. Flowers axillary, solitary, subsessile; calyx lobes 4, 4 x 1 mm, lanceolate; petals 6 x 3 mm, obovate, yellow; stamens 4, equal; ovary 4-celled, inferior; ovules many, style 1, stigma capitate. Capsule 2 x 0.2 cm, terete, glabrous.

*Fl. & Fr.* Throughout the year

*Distr.* Tropical Africa, Asia and Australia. Common in degraded forest areas; *PS 19027* Thunakkadavu

***Ludwigia peruviana*** (L.) H. Hara, J. Jap. Bot. 28: 293. 1953; FPL 208. 1990. *Jussiaea peruviana* L., Sp. Pl. 388. 1753. *J. speciosa* Ridley, J. Bot. 59. 1921; FPM 1875. 1936.

Subshrubs, branchlets hirsute. Leaves to 12 x 4 cm, oblong-lanceolate, acute, base attenuate, hirsute; petiole to 1.5 cm. Flowers *ca.* 5 cm across; bracteoles to 1 cm, deciduous; pedicel to 2 cm; calyx tube *ca.* 2 cm, hirsute, 4-lobed, 1 x 0.5 cm, lanceolate; petals 4, to 3 x 2 cm, sub-orbicular, yellow; stamens 8; ovary 4-celled, ovules numerous. Capsule oblong, 3 cm, slightly 4-angled.

*Fl. & Fr.* March-April

*Distr.* Originally from America now naturalised throughout the Old World. Rare along riverine areas; *PS 19733* Orukomban

## PASSIFLORACEAE

- |  |                   |
|--|-------------------|
| 1. Stem glabrous; flowers unisexual .....        | <b>Adenia</b>     |
| 1. Stem glandular hispid; flowers bisexual ..... | <b>Passiflora</b> |

### ADENIA Forsskal

**Adenia hondala** (Gaertn.) Wilde, Blumea 15: 265. 1967; FPL 210. 1990; FTSR 197. 1996. *Granadilla hondala* Gaertn., Fruct. 2: 480. t.180. f.10. 1791. *Adenia palmata* (Lam.) Engl., Bot. Jahrb. Syst. 14: 375. 1892; FPM 525. 1919. *Modecca palmata* Lam. Encycl. 4: 209. 1797; FBI 2: 603. 1879.

Climbers with tuberous roots, tendrils simple. Leaves palmately 3-5-lobed, lobes to 16 x 6 cm, oblong, membranous, with large circular sessile glands between lobes; petiole to 8 cm long. Flowers monoceous, in axillary cymes, 10 mm across; calyx gamosepalous, 13 mm long, lobes 5, ovate; petals 5, 13 x 2 mm, linear-oblong, ciliate, attached at the rim of calyx tube; stamens 5, free, staminodes in female flowers 5, free; ovary stipitate, globular, superior, 1-celled; ovules many, parietal, style 1, 3-fid at apex. Capsule 5 cm across, globose, 3-valved.

*Fl. & Fr.* February-July

*Distr.* Western Ghats and Sri Lanka. Rare in semi-evergreen forests; *PS 30742* Karimala

### PASSIFLORA Linnaeus

**Passiflora foetida** L., Sp. Pl. 959. 1753; FPM 524. 1919; FPL 210. 1990; FTSR 198. 1996.

Densely pilose climber; tendrils leaf-opposed. Leaves to 10 x 9.5 cm, shallowly, 3-lobed, cordate at base; lobes triangular, acute; petiole to 5 cm long. Flowers solitary, axillary; bracteoles much divided into linear lobes, glandular; sepals 1.5 x 1 cm, ovate, acute, hairy outside; petals 1.8 x 1 cm, ovate, acute, white, glabrous; corona 4-seriate, pale violet; gynandrophore 0.8 cm long, stout. Berry 1.5 cm across, yellow; seeds black.

*Fl. & Fr.* December-April

*Distr.* Native of Tropical America; now naturalised in India, China and Africa. Common in degraded forest areas; *PS 18976* Vengoli

## CUCURBITACEAE

- |  |                      |
|--|----------------------|
| 1. Tendrils simple .....   | 3                    |
| 1. Tendrils branched .....   | 2                    |
| 2. Petals lacinate .....   | <b>Trichosanthes</b> |
| 2. Petals entire .....   | <b>Diplocyclos</b>   |
| 3. Male flowers with large spathaceous bracts .....                    | <b>Momordica</b>     |
| 3. Male flowers without spathaceous bracts .....                       | 4                    |
| 4. Stem glabrous; all stamens 2-celled .....                           | <b>Zehneria</b>      |
| 4. Stem scabrid or variously pubescent; all stamens not 2-celled ..... | 5                    |
| 5. Leaves lobed or angled .....  | 6                    |
| 5. Leaves neither lobed nor angled .....                               | <b>Cerasiocarpum</b> |

6. Leaves amplexicaule..... **Solena**  
 6. Leaves not amplexicaule..... 7  
 7. Female flowers in axillary fascicles; berry globose..... **Mukia**  
 7. Female flowers solitary; berry fusiform or ellipsoid..... 8  
 8. Stem angular, pilose; fruits fusiform not beaked ..... **Cucumella**  
 8. Stem terete, globose; fruits ellipsoid beaked..... **Corallocarpus**

**CERASIOCARPUM** Hooker f.

**Cerasiocarpum bennettii** (Miq.) Cogn. in DC., Monogr. Phan. 3: 729. 1881; FPM 541. 1919; Chakrav., Fasc. Fl. Ind. 2: 18. 1982. *Bryonopsis bennettii* Miq., Fl. Ind. Bat. 1: 657. 1855. *Cerasiocarpum zeylanicum* (Thw.) Hook. f., Gen. Pl. 1: 832. 1862 & Hook. f., FBI 2: 629. 1879.

Scabrous creeper. Leaves to 13 x 7 cm, ovate-oblong, entire, distantly denticulate, acuminate at apex, cordate at base, coarsely scabrous. Flowers monoecious; male flowers in axillary racemes, female flowers axillary, solitary, 3 mm across; calyx tube campanulate; petals 5, obovate, free; stamens in male flowers 3, free, anthers straight; ovary in female flowers globular, 1-celled; ovules 5-6; style columnar, stigma 3-fid. Fruit globose, 8 mm across. smooth; seeds ovoid, marginate.

*Fl. & Fr.* July-October

*Distr.* Indo-Malesia. Common along the margins of evergreen forests at lower altitudes; *PS 18992* Orukomban

**CORALLOCARPUS** Welwitsch ex Hooker f.

**Corallocarpus epigaeus** (Rottl. & Willd.) Clarke in Hook.f., FBI 2: 628. 1879; FPM 541. 1919; Chakrav., Fasc. Fl. Ind. 2: 28. 1982. *Bryonia epigaea* Rottl. & Willd., Ges. Naturf. Freunde Berlin Neue Schriften ser. 4. 212. 1803.

Vines. Leaves 3-5 angled, to 8 x 8 cm, pubescent, apex acute, base cordate, dentate; petiole to 3 cm. Flowers monoecious, yellow; male flowers in racemes, to 1 cm; peduncles to 5 cm, stout; corolla 2 mm across, pubescent; stamens 3, erect; female flowers solitary, 2 mm across; ovary 4 mm, oblong, beaked. Fruit 1.5 x 1 cm, ellipsoid, beaked, circumscissile at base; seeds *ca.* 8.

*Fl. & Fr.* December-March

*Distr.* India, Tropical Africa and West Asia. Rare in dry deciduous forests; *PS 30489* Kuchimudi

**CUCUMELLA** Chiovenda

**Cucumella silentvalleyi** Manilal *et al.*, Acta. Bot. India 13: 283. 1985; FTSR 199. 1996.

Creepers, stem scabrid. Leaves to 4.5 x 5.5 cm, obtusely 5-angular, cordate at base crenate, scabrid; petiole 6 cm long. Flowers monoecious, axillary, solitary, pedicellate; calyx tube tubular; lobes ovate, acute; petals 5, 10 x 6 mm, obovate, obtuse, yellow. Stamens 3, free, erect, connective produced into a hood; anthers flexuous, hispid; ovary fusiform, hispid. Fruit 1.5 x 0.8 cm, ellipsoid, hispid; seeds 3.5 x 2 mm, obovate, compressed, smooth.

*Fl. & Fr.* August-December

*Distr.* Endemic to Southern Western Ghats (Kerala). Common in degraded forest areas; *PS 19277* Karimala

**DIPLOCYCLOS** Post & O. Kuntze

**Diplocyclos palmatus** (L.) Jeffrey, Kew Bull. 15: 352. 1962; Chakrav., Fasc. Fl. Ind. 2: 48. 1982; FPL 212. 1990; FTSR 202. 1996. *Bryonia palmata* L., Sp. Pl. 1012. 1753. *B. laciniosa* L., Sp. Pl. 1013. 1753, p.p. excl. typus; Wight, Ic. t. 500. 1841; FBI 2: 622. 1879. *Bryonopsis laciniosa* sensu Naubl., Ann. Sci. Nat. Bot. Ser. 4. 12: 141. 1859; FPM 534. 1919.

Slender climbers, tendrils bifid. Leaves to 12 cm across, palmately deeply 5-lobed, serrate, lobes scabrous; petiole 3-5 cm long. Flowers monoecious, fascicled, axillary, 3-7-together; pedicel 1.5 cm long; calyx tube 3 mm long, campanulate, lobes subulate; petals 5, 7 x 4 mm, obovate, 3

mm long; stamens 3, anthers conduplicate, 3 mm long; pistillode clavate, 3-lobed above; ovary globose, ovules horizontal; style slender; stigmas 3. Berry, 2 cm across, globose, red with white lines; seeds 6 x 7 mm, pyriform, compressed, thinly rugose.

*Fl. & Fr.* January-March

*Distr.* Indo-Malesia, China and Africa. Fairly common along the margins of evergreen forests; *PS 19566* Kariamchola

#### MOMORDICA Linnaeus

1. Branchlets and leaves villous; plant monoecious ..... **M. charantia**
1. Branchlets and leaves glabrous or glabrescent; plant dioecious ..... 2
2. Calyx lobes linear-lanceolate, acute..... **M. dioica**
2. Calyx lobes ovate-oblong, obtuse..... **M. subangulata**

**Momordica charantia** L., Sp. Pl. 1009. 1753; FBI 2: 616. 1879; FPM 532. 1919; Chakrav., Fasc. Fl. Ind. 2: 89. 1982; FPL 214. 1990.

Stem puberulus. Leaves 5-7 lobed to 7-12 cm across, lobes ovate to 5 cm, oblong, base cordate, margin dentate, pubescent below, petiole pubescent; tendrils simple. Bracts to 1 x 8 cm, reniform-orbicular on the base of the peduncle, pedicel to 7 cm; male flowers 1.5-2 cm across, solitary, axillary, calyx to 12 mm, lobes ovate, petals to 1.5 x 1 cm, obovate, rounded; stamens 3, pistillode 3-lobed; ovary 1 cm, fusiform, mucronate. Fruit 8-15 cm, oblong, tubercled, seeds ovoid.

*Fl. & Fr.* October-January

*Distr.* Old World tropics; widely cultivated in the Tropical countries. Common in degraded forest areas; *PS 19076* Amakkundu

**Momordica dioica** Roxb. ex Willd., Sp. Pl. 4: 605. 1805; FBI 2: 617. 1879; FPM 531. 1919; Chakrav., Fasc. Fl. Ind. 2: 94. 1982; FPL 214. 1990; FTSR 204. 1996.

Slender climbers. Leaves to 8 x 7 cm, ovate, cordate at base, entire or shallowly 3-lobed, distantly glandular-toothed, scabrous below; petiole 2 cm long; tendrils simple. Flowers dioecious, solitary, axillary; pedicels 4-6 cm long, bracteate at middle; bracts of male flowers 1.5 cm across; calyx tube short, campanulate, lobes 10 x 1.5 mm, lanceolate; petals 27 x 18 mm, obovate, yellow; stamens 3, anthers free, conduplicate. Female flowers few; ovary densely muricate, ovules horizontal; stigma 3-lobed. Fruit 5 x 2 cm, ellipsoid, densely echinate, red; seeds 8 x 7 mm, irregular, rugose, black.

*Fl. & Fr.* September-December

*Distr.* Indo-Malesia and China. Common in moist deciduous forests; *PS 18986* Orukomban

**Momordica subangulata** Blume, Bijdr. 928. 1826; FPM 532. 1919; Chakrav., Fasc. Fl. Ind. 2: 95. 1982.

Branchlets glabrescent. Leaves 5-9 x 4-8 cm, broadly ovate, deeply 3-5 lobed, acuminate, base cordate, margin denticulate, petiole 2-4 cm, glabrescent; tendrils simple glabrous. Male flowers solitary, pedicel 5-10 cm long, slender, villous, apex bracteate, bract sessile, cucullate, reniform, 5 mm across, margin ciliate, calyx lobes to 8 x 4 mm, ovate, oblong, obtuse, densely villous; corolla 4-6 cm, broad yellow, female flowers solitary, axillary, pedicel to 7 cm, minutely bracteate at base. Fruit to 7 x 4 cm, ovoid, densely echinate; seeds 10-12 mm long, oblong.

*Fl. & Fr.* June-October

*Distr.* Indo-Malesia. Rare in moist deciduous forests; *PS 19906* Kariamchola

#### MUKIA Arnott

1. Leaves villous below; mature fruits reddish, shortly peduncled..... **M. leiosperma**
1. Leaves scabrid below; mature fruits yellowish, sessile..... **M. maderaspatana**

**Mukia leiosperma** (Wight & Arn.) Wight, Ann. Mag. Nat. Hist. Ser. 8: 208. 1842; FBI 2: 623. 1879. *Bryonia leiosperma* Wight & Arn., Prodr. 1: 345. 1834. *Melothria leiosperma* (Wight & Arn.) Cogn. in DC., Monogr. Phan. 3: 622. 1881; FPM 539. 1919; Chakrav., Fasc. Fl. Ind. 2: 81. 1982.

Climbers, stem densely pilose. Leaves 6 x 6 cm, shallowly 5-lobed, lobes obtuse, cuspidate, spineus serrate along the margins, coarsely scabrous above, densely tomentose below; petiole 3 cm long, densely villous. Male flowers 2-3 together, fascicled; pedicel 1 cm long, villous; calyx tube 5 mm long, densely villous; petals yellow, glabrous. Berry 8 mm across, globose, glabrous; seeds few, 5 x 2.5 mm, obovate, smooth, emarginate, yellow.

*Fl. & Fr.* January-March

*Distr.* Peninsular India and Sri Lanka. m. Rare in moist deciduous forests and degraded forest areas; *PS 30307* Pezha

**Mukia maderaspatana** (L.) Roem., Syn. Monogr. 2: 47. 1846; FTSR 204. 1996. *Cucumis maderaspatanus* L., Sp. Pl. 1012. 1753. *Bryonia cordifolia* L., Sp. Pl. Pl. 1012. 1753. *B. scabrella* L.f., Suppl. Pl. 424. 1781. *Mukia scabrella* (L. f.) Arn. in Hook.'s J. Bot. 3: 276. 1841; FBI 2: 623. 1879. *Melothria maderaspatana* (L.) Cogn. in A. DC., Monogr. Phan. 3: 623. 1881; FPM 539. 1919; FPL 213. 1990.

Stem coarsely scabrous. Leaves to 9 x 7 cm, ovate, cordate at base; entire or shallowly 5-lobed; spineus serrate, densely scabrous from peltate tubercles; petiole 6 cm long. Male flowers 8-12 together, 4 mm across, yellow; pedicel 6 mm long; calyx densely hairy outside, lobes subulate; petals 2.5 mm long, obovate, yellow; anthers 1 mm long. Female flowers solitary or 2-3 together. Berry 1 cm across; seeds 5 x 3 mm, obovate, marginate, yellowish white, rugose.

*Fl. & Fr.* October-January

*Distr.* Indo-Malesia to Australia, China, New Zealand and Africa. Rare in moist deciduous forests; *PS 30648* Padippara

#### SOLENA Lourerio

**Solena amplexicaulis** (Lam.) Gandhi in Sald. & Nicols., Fl. Hassan Dist. 179. 1976; FPL 215. 1990. *Bryonia amplexicaulis* Lam., Encycl. 1: 496. 1785. *Solena heterophylla* Lour., Fl. Cochinch. 514. 1790. *Bryonia umbellata* Klein in Willd., Sp. Pl. 4: 618. 1805. *Zehneria umbellata* (Klein) Thw., Enum. Pl. Zeyl. 125. 1859; FBI 2: 625. 1879. *Melothria amplexicaulis* (Lam.) Cogn. in DC., Monogr. Phan. 3: 621. 1881. *M. heterophylla* (Lour.) Cogn. in DC., Monogr. Phan. 3: 618. 1881; FPM 539. 1919.

Slender climbers; stem scabrous. Leaves to 15 x 7.5 cm, ovate, hastate and amplexicaule at base, coriaceous, scabrous. Flowers dioecious. Male flowers in axillary racemes; pedicels 8 mm long, bracteate at middle; calyx tube 6 mm long, campanulate, lobes minute; petals 1.5 mm long, triangular; stamens 3, erect, anthers transverse, connective produced into a globose hood. Female flowers solitary, pedicellate. Berry 2 x 2.5 cm, globose, smooth; seeds 8 x 8 mm, globose, rugose along the margins, dark brown.

*Fl. & Fr.* December-May

*Distr.* Indo-Malesia to Australia. Rare in open rocky grasslands; *PS 30380* Pandaravarai

#### TRICHOSANTHES Linnaeus

1. Leaves unlobed; ovate..... **T. nervifolia**  
1. Leaves palmately lobed..... **T. tricuspidata**

**Trichosanthes nervifolia** L., Sp. Pl. 1008. 1753; FPM 529. 1919; Chakrav., Fasc. Fl. Ind. 2: 119. 1982; FTSR 206. 1996. *T. cuspidata* Lam., Encycl. 1: 190. 1789; FPM 529. 1919.

Slender climber. Leaves to 15 x 9 cm, ovate, acute, cordate at base, distantly denticulate, coarsely reticulate, glabrous; petiole 2 cm long. Male racemes 5 cm long, zig-zag, many flowered,



glabrous; pedicel 1.5 cm long; calyx tube 3.5 cm long, narrow; petals 2 cm long, fimbriate into narrow lobes. Female flowers solitary. Berry to 11 x 7 cm, ellipsoid, smooth, yellow; seeds many, 10 x 10 mm, irregularly lobed; dark brown.

*Fl. & Fr.* November-March

*Distr.* South West India and Sri Lanka. Common in moist deciduous and semi-evergreen forests; *PS 30660* Padikkundu

**Trichosanthes tricuspидata** Lour., *Fl. Cochinch.* 589. 1790. *T. bracteata* (Lam.) Voigt, *Hort. Sub.Calc.* 58. 1845; *FPL* 215. 1990. *Modecca bracteata* Lam., *Encycl.* 4: 210. 1797. *Trichosanthes palmata* Roxb., *Fl. Ind.* 3: 704. 1832; *FBI* 2: 606. 1879; *FPM* 529. 1919. *T. lepiniana* (Naud.) Cogn. in *DC., Monogr. Phan.* 3: 377. 1881; *FPM* 530. 1919. *Involucraria lepiniana* Naud. in *Huber, Cat.* 11. 1868.

Glabrous climbers. Leaves to 12 x 15 cm, palmately 3-lobed, lobes oblong, acuminate; petiole 1 cm long. Male flowers in peduncled cymes; peduncle 6 cm long; bracts 3 x 2 cm, obovate, coarsely fimbriate; calyx tube 2.5 cm long, lobes lanceolate, 1.8 cm long.

*Fl.* June

*Distr.* Indo-Malesia to Australia and East Asia. Rare along the margins of evergreen forests; *PS 19332* Pooppara

#### ZEHNERIA Endlicher

1. Petals glabrous; plant monoecious..... 2
1. Petals villous within; plant dioecious ..... 3
2. Female flowers solitary, axillary..... **Z. maysorensis** var. **maysorensis**
2. Female flowers in axillary clusters..... **Z. maysorensis** var. **umbellata**
3. Leaves triangular base cordate..... **Z. scabra**
3. Leaves deltoid base truncate..... **Z. thwaitesii**

**Zehneria maysorensis** (Wight & Arn.) Arn. in *Hook.'s, J. Bot.* 3: 275. 1841, var. **maysorensis**; *FPL* 216. 1990; *FTSR* 206. 1996. *Bryonia maysorensis* Wight & Arn., *Prodr.* 345. 1834. *Melothria mucronata* sensu Chakrav. *Monogr. Indian Cucurb.* 148. 1959, non (Blume) Cogn. 1881. *M. perpusilla* var. *subtruncata* Cogn. in *DC., Monogr. Phan* 3: 606. 1881; *FPM* 538. 1919. *M. perpusilla* sensu Gamble, *FPM* 538. 1919, non (Blume) Cogn. 1881.

Branchlets glabrous. Leaves to 10 x 8 cm, widely cordate at base, shallowly 5-lobed, lobes glandular-serrate, glabrous; petiole to 5 cm long. Female flowers solitary, 5 mm across; pedicels 3 cm long; petals 2.5 x 1.5 mm, densely hispid; staminodes subulate; style 3-fid at apex. Male flowers 3-10, on peduncled umbels, 6 mm across; filaments bearded. Berry 13 x 6 mm, oblong, cylindrical, reddish; seeds 1.7 x 1.2 mm, obovoid, smooth, white.

*Fl. & Fr.* September-January

*Distr.* India to South East Asia. Rare in grasslands; *PS 30204* Karimala

**Zehneria maysorensis** (Wight & Arn.) Arn. var. **umbellata** (Chakrav.) Kumari in Nair & Henry, *Fl. Tamil Nadu I*, 1: 175. 1983. *Melothria mucronata* var. *umbellata* Chakrav., *Monogr. Indian Cucurb.* 150. 1959.

Branches scabrous. Leaves to 7 x 6 cm, ovate-deltoid, truncate or shallowly cordate at base, acuminate at apex, glabrous, coarsely toothed; petiole 1.5 cm long. Male flowers 6 mm across, 2-6 in umbels, pedicellate; peduncles 1.5 cm long; pedicel 3-5 mm long; petals white, glabrous. Female flowers in axillary fascicles; pedicel to 1 cm long. Berry 8 mm across, globose; seeds obovoid, smooth, white.

*Fl. & Fr.* August-December

*Distr.* Endemic to Southern Western Ghats. Rare in grasslands; *PS 19576* Karimalagopuram

**Zehneria scabra** (L. f.) Sond. in Harv. & Sond., Fl. Cap. 2: 486. 1862; FPL 217. 1990. *Bryonia scabra* L. f., Suppl. Pl. 423. 1781. *Zehneria hookeriana* Arn. in Hook., J. Bot. 3: 275. 1841; FBI 2: 624. 1879. *Melothria perpusilla* sensu Chakrav., Monogr. Indian Cucurb. 146. 1959 p.p., *M. mucronata* sensu Gamble, FPM 538. 1919, non (Blume) Cogn. 1881.

Glabrous climbers. Leaves to 7 x 7 cm, triangular, cordate at base, 3-lobed or entire, glandular toothed; petiole to 3 cm long. Umbel 3-5 flowered; peduncle 1.5 cm long. Female flowers 5 mm across; calyx tube 2 mm long, campanulate; petals 2.5 x 2 mm, obovate; stigma 3-lobed. Male flowers larger, 8 mm across; petals ovate, acute; anthers 1 mm long, connective pubescent. Berry 7 mm across, globose; seeds 5 x 4 mm, obovate, biconvex, smooth, not marginate.

*Fl. & Fr.* August-December

*Distr.* Tropical Africa, India and South East Asia. Rare along the margins of evergreen forests; *PS 19175* Karimala

**Zehneria thwaitesii** (Schweinf.) Jeffrey, Kew Bull. 15: 371. 1962; FPL 217. 1990. *Melothria thwaitesii* Schweinf. Relique. Kotschy 44. t. 29. 1868. *M. zeylanica* Clarke in Hook.f., FBI 2: 626. 1879; FPM 538. 1919.

Creeping prostrate herbs; stem sulcate; tendrils undivided. Leaves to 4 x 5 cm, deltoid, acute, truncate at base, distantly glandular-toothed, scabrous above; petiole 1 cm long. Male flowers axillary, fascicled, 8 mm across; petals ovate, acute, spreading, glabrous; anthers 2 mm long. Female flowers solitary. Berry 4 x 1.5 cm, ribbed.

*Fl. & Fr.* Throughout the year

*Distr.* Western Ghats and Sri Lanka. Rare in evergreen and moist deciduous forests; *PS 30374* Pandaravarai; *30513* Karimala

## BEGONIACEAE

### BEGONIA Linnaeus

1. Scapigerous herbs ..... **B. floccifera**
1. Caulescent herbs ..... 2
2. Capsule more the 2.5 cm across; male sepals 4 ..... **B. fallax**
2. Capsule less than 2 cm across; male sepals 2 ..... **B. malabarica**

**Begonia fallax** A. DC., Prodr. 15: 329. 1864; Clarke in Hook.f. FBI 2: 645. 1879; Ansari, Nair & Nair, JETB 5: 125. 1984; FTSR 207. 1996. *Diploclinium lindleyanum* Wight, Ic. t. 1817. 1852.

Shrubs; stem reddish, glabrous. Leaves to 18 x 10 cm, ovate, unequally cordate at base, entire or shallowly and broadly dentate, glabrous, nerves prominent, reddish, dividing after the middle of the lamina; petiole 2-5 cm long; stipules 2.5 x 0.8 cm, oblong-lanceolate, glabrous, whitish. peduncle 3-4 cm long, axillary, dichotomously branched; cymes 5 cm across. Flowers few; pedicels 1 cm long; male sepals 4, outer 10 mm across, orbicular, pale pink; inner smaller, anthers truncate. Capsule 2 x 3.5 cm, obovate, 3-winged; wing horizontal at apex; placentas 2-fid; seeds many, minute, oblong, cylindrical, ridged and reticulate at one end.

*Fl. & Fr.* December-March

*Distr.* Endemic to Southern Western Ghats. Rare in moist localities of evergreen forests; *PS 30265* Pooppara

**Begonia floccifera** Bedd., Ic. t. 11. 1868-1874; FBI 2: 654. 1879; FPM 546. 1919; FPL 218. 1990; FTSR 207. 1996.

Leaves to 18 cm across, reniform or orbicular, obliquely cordate, distantly toothed, floccose-pubescent below, nerves 11, prominent; petiole to 30 cm long. Peduncle solitary or 2-3 together, pubescent; cymes 10 cm across, branched; pedicels filiform. Flowers many; male sepals 4, outer

sepals 7 x 7 mm, orbicular; anthers truncate at apex; female sepals 2, 6 x 7 mm, orbicular; styles 3, stigmas branched. Capsule 12 x 15 mm; seeds many, vertically ridged 0.5 x 0.25 mm, brown.

*Fl. & Fr.* January-May

*Distr.* Endemic to Southern Western Ghats. Rare in evergreen forests; *PS 30027* Puliya

**Begonia malabarica** Lam., *Encycl.* 1: 393. 1785; *FPM* 546. 1919; *FPL* 219. 1990; *FTSR* 207. 1996.

Shrubs, to 2 m high; stem terete, glabrous. Leaves to 15 x 8 cm, ovate, strongly unequal at base, toothed and serrate along the margins, hispid; petiole to 6 cm long; stipule 13 x 5 mm, lanceolate. Peduncles to 3 cm, axillary; cymes 5-10 cm across, dichotomous. Flowers many; male sepals 2, 15 mm across, orbicular, pink; anthers 2 mm long, connective produced into a orbicular appendage; female sepals 7 x 13 mm, reniform. Capsule 2 x 1.5 cm, wings obtuse.

*Fl. & Fr.* Throughout the year

*Distr.* South India and Sri Lanka. Common along the riverine areas of evergreen forests; *PS 19311* Kothala; *NS 19842* Vengoli

## DATISCACEAE

### TETRAMELES R. Brown

**Tetrameles nudiflora** R. Br. in Bennet, *Pl. Jav. Rar.* 79. t.17. 1638; *FBI* 2: 627. 1879; *FPM* 544. 1919; *FPL* 217. 1990; *FTSR* 208. 1996. *T. grahamiana* Wight, *lc.* t. 1956. 1853.

Tall trees with large buttresses; bark greyish-white, smooth. Leaves alternate, 15 cm across, orbicular, cordate at base, 2-3 lobed, glandular-serrate, densely pubescent below; petiole 5-10 cm long. Flowers dioecious in paniced drooping racemes. Male flowers 4 mm across; sepals 4, ovate, united at base, stamens 4, free. Female flowers 4 mm long, 3 mm across; ovary 1-celled; inferior; ovules many, on 4-parietals placentas, styles 4, free, bulged at tip. Fruit a capsule, 6 x 4 mm, ovoid, opening by terminal pore; seeds brown.

*Fl. & Fr.* February-May

*Distr.* Paleotropics. Occasional in moist deciduous forests; *PS 30765* Vengoli

## CACTACEAE

### OPUNTIA P. Miller

**Opuntia striata** Haw. var. **dillenii** (Ker-Gawl.) L., Benso, *Car. Succ. J.* (Los Angeles) 41: 126. 1969. *Cactus strictus* Haw., *Misc. Nat.* 188. 1803. *Opuntia dillenii* (Ker-Gawl.) Haw., *Suppl. Pl. Succ.* 79. 1819; *FBI* 2: 657. 1879; *FPM* 548. 1919; *FPL* 219. 1990. *Cactus dillenii* Ker-Gawl. in Edwards, *Bot. Reg.* 3: t. 255. 1818. *C. indica* Roxb., *Fl. Ind.* 2: 475. 1832.

Shrubs, fleshy, areoles woolly, spines 1-4 cm. Leaves linear, deciduous. Flowers solitary, sessile; calyx lobes to 7 mm, broadly ovate, acuminate; corolla to 7 cm across, lobes mucronate, yellow; stamens many, filaments to 1.5 cm; ovary inferior, ovules many, style 1.5 cm, stigma branched, stout. Berry 6 x 4 cm, obovoid.

*Fl. & Fr.* November-February

*Distr.* Native of Tropical America. Occasional in rocky areas of dry deciduous and moist deciduous forests; *PS 30057* Anappadi

## MOLLUGINACEAE

1. Flowers in terminal and axillary cymes or in panicles ..... **Mollugo**
1. Flowers in terminal and axillary clusters ..... **Glinus**

## GLINUS Linnaeus

1. Plants glabrous..... **G. oppositifolius**  
1. Plants densely covered with stellate hairs..... **G. lotoides**

**Glinus lotoides** L., Sp. Pl. 463. 1753; FPL 220. 1990. *Mollugo lotoides* (L.) O. Ktze., Rev. Gen. Pl. 1: 214. 1891; FPM 552. 1919. *M. hirta* Thumb., Prodr. Fl. Cap. 24. 1794; FBI 2: 662. 1879. *Glinus dictamnoides* L., Mant. Pl. 2: 243. 1771.

Prostrate herbs. Leaves whorled, 3 or 4 at each node, to 3 x 1.5 cm, obovate to orbicular, obtuse, penninerved; petiole 5-10 mm long. Flowers in greenish-white, axillary fascicles of 3-5; pedicels 5-10 mm long; sepals 6 x 3 mm, densely stellate hairy, keeled; stamens 10-15, mixed with staminodes; ovary 3-celled, ellipsoidal, glabrous; styles 3, short.

*Fl. & Fr.* December-April

*Distr.* Widespread in tropics and subtropics. Common in degraded forest areas; *PS 18983* Thunakkadavu

**Glinus oppositifolius** (L.) A. DC., Bull. Herb. Boissier ser. 2, 1: 552. 1901; FPL 220. 1990; FTSR 208. 1996. *Mollugo oppositifolia* L., Sp. Pl. 89. 1753; FPM 552. 1919. *M. spergula* L., Syst. Nat. (ed. 10) 881. 1759; FBI 2: 662. 1879.

Prostrate herbs, rooting at nodes. Leaves fascicled at nodes, to 4 x 2 cm, oblanceolate, acute or obtuse at apex. Flowers 3-6 together; pedicels to 1 cm long; sepals 3 mm long, ovate, acute; stamens 5; ovary 5-celled, oblong; styles 3. Capsule 3 mm long, oblong, glabrous; seeds subreniform, muricate, dark brown.

*Fl. & Fr.* Throughout the year

*Distr.* Pantropical. Common in degraded forest areas; *PS 19334* Thenkudippara

## MOLLUGO Linnaeus

1. Cymes in axillary umbels or in whorls..... **M. cerviana** var. **spathulifolia**  
1. Cymes in elongate racemes ..... **M. pentaphylla**

**Mollugo cerviana** (L.) Ser. in DC., Prodr. 1: 392. 1824, var. **spathulifolia** Fenzl, Ann. Wiener Mus. Naturgesch 1: 379. 1836. *Pharnaceum cerviana* L., Sp. Pl. 272. 1753.

Prostrate herbs, branchlets, glaucous. Radical leaves to 1.3 cm, spathulate, obtuse, rosulate, cauline leaves 1.5 cm, leaner, apiculate, subsessile. Cymes terminal, polycasial, umbellate; bracts subulate; flowers *ca* 3 mm across; pedicel *ca* 5 mm; sepals 5, *ca.* 2 mm, elliptic, obtuse subequal; stamens 6-8; ovary 3-lobed, 3-celled; styles 3. Capsule to 3 mm across, ellipsoid; seeds many, ovoid.

*Fl. & Fr.* December-March

*Distr.* Widespread in tropics and subtropics of the Old World. Rare in moist localities of disturbed forest areas; *PS 30421* Parambikulam

**Mollugo pentaphylla** L., Sp. Pl. 89. 1753; FPM 553. 1919; FPL 221. 1990; FTSR 209. 1996. *M. stricta* sensu Clarke in Hook.f., FBI 2: 663. 1879 p.p., non L. 1762.

Erect herbs, to 20 cm high; stem quadrangular. Leaves whorled, 3-5 at each node, to 3 x 1 cm, obovate to lanceolate, obtuse or acute. Flowers 3 mm across, greenish-white, in terminal paniced cymes; pedicels 5-10 mm long, filiform; sepals 5, 2 x 1 mm, obovate, obtuse, glabrous, white turning green; stamens 3, free; ovary 3-5 celled, ovules many, axile, styles 3, free. Capsule ellipsoid, glabrous; seeds many, sub-reniform, muriculate, dark brown.

*Fl. & Fr.* Throughout the year

*Distr.* Pantropical. Common in moist localities of moist deciduous forests and degraded forest areas; *PS 30455* Vengoli

## APIACEAE

1. Prostrate herbs; leaves simple ..... 2
1. Erect herbs; leaves pinnate ..... 3
2. Leaves digitately lobed ..... **Hydrocotyle**
2. Leaves not lobed ..... **Centella**
3. Mericarps subglobose, not winged ..... **Pimpinella**
3. Mericarps dorsally compressed, laterally winged ..... 4
4. Leaflets linear-lanceolate; petals radiant ..... **Peucedanum**
4. Leaflets ovate; petals not radiant ..... **Heracleum**

### CENTELLA Linnaeus

**Centella asiatica** (L.) Urban in Mart., Fl. Bras. 11: 287. t. 78. f. 1879; FPM 556. 1919; FPL 222. 1990; Mukh. & Const., Umbell. India 15.1993; FTSR 209. 1996. *Hydrocotyle asiatica* L., Sp. Pl. 234. 1753.

Herbs, rooting at nodes. Leaves orbicular-reniform, crenate or sub-entire, glabrous, to 5 cm across, nerves radiating; petiole to 12 cm long, sheathing at base. Flowers sessile, pink, in 2-5 flowered umbels; peduncles 1-2 cm long, axillary; calyx tube 1 mm long, adnate to the ovary, lobes minute; petals 4, 1 mm long, oblong, recurved at apex, pink; stamens 4, filaments erect; ovary 2-celled, ovule solitary in each cell; style erect, bilobed at apex. Fruit ovoid, 3-4 mm long, reticulate-rugose, 7-9-ribbed.

*Fl. & Fr.* August-November

*Distr.* Tropical Asia and Africa. Fairly common in moist deciduous and secondary forests; *PS 19197*Vengoli

### HERACLEUM Linnaeus

**Heracleum candolleianum** (Wight & Arn.) Gamble, FPM 565. 1919; Mukh. & Const., Umbell. India 243.1993; FTSR 209. 1996. *Pastinaca candolleiana* Wight & Arn., Prodr. 372. 1834. *Heracleum rigens* Wall. ex DC. var. *candolleiana* (Wight & Arn.) Clarke in Hook.f., FBI 2: 715. 1879, p.p. *H. rigens* var. *ligusticifolium* (Wight) Clarke in Hook.f., FBI 2: 716. 1879. *H. courtallense* Gamble, FPM 565. 1919.

Shrubs; stem ridged, branched. Leaves to 45 x 25 cm, 1 or 2 pinnate; leaflets 7-9 or more, to 15 x 10 cm, lobed, acute, serrate, scabrous, coriaceous. Umbels compound, terminal, corymbose; secondary peduncles to 6 cm long; rays 13, each 3-5 cm long, spreading; pedicels 6-10 mm long, many-together, spreading. Flowers 5-merous, 2 mm across, calyx 5-toothed; petals 3, ovate, acuminate, with a strong midrib, glabrous; stamens 5, free, anthers ovate; ovary compressed. Fruit 7-10 x 4-7 mm, biconvex, dorsally compressed, winged, glabrous.

*Fl. & Fr.* November-February

*Distr.* Endemic to Southern Western Ghats. Rare in grasslands; *PS 19578*Karimalagapuram

### HYDROCOTYLE Linnaeus

**Hydrocotyle javanica** Thunb., Diss. Hydroc. n. 17. t. 2. 1798; FPM 556. 1919; FPL 222. 1990; Mukh. & Const., Umbell. India 11.1993; FTSR 210. 1996. *H. hispida* Buch.-Ham ex D. Don, Prodr. Fl. Nepal 182. 1825. *H. polycephala* Wight & Arn., Prodr. 366. 1834.

Creepers, stem villous, rooting at nodes. Leaves 9-lobed, crenate, obtuse, 9-ribbed from base; sparsely villous. Umbels fascicled; peduncles 1.5 cm long. Flowers 20-30 together, pedicellate; petals 0.6 mm long, ovate, acute. Fruit 1.5 x 2 mm, mericarps compressed, hemispherical, smooth.

*Fl. & Fr.* Throughout the year

*Distr.* Tropical Asia. Common in moist localities in evergreen forests; *PS 19179*Karimala

## PEUCEDANUM Linnaeus

**Peucedanum anamallayense** Clarke in Hook.f., FBI 2: 710. 1879; FPM 563. 1919; FPL 222. 1990; Mukh. & Const., Umbell. India 218.1993; FTSR 210. 1996.

Decumbent herbs with tuberous rootstock, to 40 cm high. Leaves decomposed, to 20 x 15 cm, leaflets 4 x 0.7 cm, oblong, acute, penninerved, serrulate; rachis widely sheathing at base. Umbels terminal, compound; rays 5-7, each 3 cm long. Flowers polygamous, 1.5 mm across, pedicels 1 cm long, villous; calyx shortly 5 toothed; petals yellow, ovate, cuspidate with a strong midrib; stamens 5, erect, filaments 1 mm long; pistillode biglobose; ovary glabrous, 2-celled, compressed. Mericarps orbicular, 8 mm across, biconvex, striate, winged.

*Fl. & Fr.* November-January.

*Distr.* Endemic to Southern Western Ghats. Rare in grasslands; *PS 19593* Karimalagopuram

## PIMPINELLA Linnaeus

**Pimpinella heyneana** (DC.) Kurz, J. Asiat. Soc. Bengal 46: 115. 1877; FPM 560. 1919; FPL 223. 1990; Mukh. & Const., Umbell. India 145.1993; FTSR 212. 1996. *Helosciadium heyneanum* DC., Prodr. 4: 106. 1830.

Erect or decumbent herbs, to 65 cm high; stem terete. Leaves alternate, 5-7 cm across, lower leaves orbicular, upper ones 3-lobed, cordate at base, toothed; petiole 1-6 cm long, sheathing at base. Umbels terminal, paniced; rays 10; secondary rays many, each 3 cm long. Flowers 9-16 in an umbellule, 1.5 mm across, white; pedicels 5 mm long; calyx shortly 5-toothed; petals 5, 1 mm long, orbicular; stamens 5. Fruit 3 x 2 mm, ovate, densely villous, rugose.

*Fl. & Fr.* November-January

*Distr.* India, Myanmar and Sri Lanka. Fairly common in moist deciduous and secondary forests; *PS 30014* Parambikulam

## ARALIACEAE

1. Stem and leaves armed; leaves bipinnate..... **Aralia**
1. Stem and leaves unarmed; leaves digitate..... **Schefflera**

## ARALIA Linnaeus

**Aralia malabarica** Bedd., Fl. Sylv. t. 15. 1871; FBI 2: 722. 1879; FPM 567. 1919; FPL 223. 1990; FTSR 212. 1996.

Large prickly shrubs. Leaves to 1 m long, bipinnately compound; leaflets opposite, to 18 x 7 cm, ovate, oblique at base, acuminate, sharply serrate, penninerved, sessile; rachis prickly, sheathing at base. Inflorescence large paniced umbels, 30 cm across; bracts ovate, acuminate. Flowers 3-4 mm across; 12-16 together; pedicels 1 cm long; sepals 5, ovate, acute; petals ovate-oblong, obtuse, spreading, yellow; stamens 5, inflexed in bud; ovary inferior, 5-celled, globose; ovule 1 in each cell; styles 5, free. Berry 7 x 7 mm, 5-angled, rugose; seeds five, 3 mm across, 3-angled, light brown.

*Fl. & Fr.* August-September

*Distr.* Endemic to Southern Western Ghats. Rare in semi-evergreen and moist deciduous forests; *PS 30458* Parambikulam

## SCHEFFLERA J. R. Forster & J. G. A. Forster

1. Panicle slender; flowers to 5 per umbel..... **S. venulosa**
1. Panicle stout; flowers more than 6 per umbel..... **S. wallichiana**

**Schefflera venulosa** (Wight & Arn.) Harms in Engl. & Prantl, Pflanzenf. 3: 39. 1894; FPM 570. 1919; FPL 224. 1990; FTSR 212. 1996. *Paratropia venulosa* Wight & Arn., Prodr. 377. 1834. *Heptapleurum venulosum* (Wight & Arn.) Seem., J. Bot. 3: 80. 1865; FBI 2: 729. 1879, p.p.

Small trees; branchlets 0.5-0.7 cm thick. Leaves 5 or 6 foliolate; leaflets to 14 x 8 cm, ovate-oblong, abruptly acuminate, rounded at base; nervules prominently reticulate; petiolule 7-10 cm long; stipule 5 mm broad, black. Panicles 20 cm across, glabrous; umbels 2 cm across, 3-12-flowered. Flowers brown; pedicel 8-12 mm long; calyx truncate; petals 2 x 2.5 mm, triangular. Berry 4 x 4 mm, globose, 5-angled.

*Fl. & Fr.* April-July

*Distr.* India, Myanmar and Indo-China. Common in evergreen forests; *PS 30337* Orukomban

**Schefflera wallichiana** (Wight & Arn.) Harms in Engl. & Prantl, Pflanzenf. 3: 38. 1894; FPM 570. 1919; FTSR 212. 1996. *Paratropia wallichiana* Wight & Arn., Prodr. 77. 1834. *Heptapleurum wallichianum* (Wight & Arn.) Clarke in Hook.f., FBI 2: 730. 1879.

Small trees or robust epiphytes; branchlets 2 cm thick. Leaves 5-8-foliolate, leaflets 20 x 10 cm, oblong, acute at apex, rounded at base, nervules not prominent; petiolule 5 cm long; stipule 1.5 cm broad, hyaline. Panicles large, terminal; umbels 20-30-flowered, peduncled; peduncle 2 cm long. Flowers 6 mm across; pedicels 0.7 cm long; calyx truncate; petals 5, 3 x 3 mm, triangular; style absent; stigma sessile. Berry 6 x 6 mm, 5-angled.

*Fl. & Fr.* April-August

*Distr.* South India and Sri Lanka. Common in evergreen forests; *PS 19433* Shekkalmudi

## CORNACEAE

### MASTIXIA Blume

**Mastixia arborea** (Wight) Bedd. var. **meziana** (Wang.) Matthew, Blumea 23: 89. 1976 & Fasc. Fl. Ind. 19: 27. 1988; FPL 225. 1990; FTSR 213. 1996. *M. meziana* Wang., Feddes Repert 4: 336. 1907. *M. pentandra* sensu Clarke in Hook.f., FBI 2: 746. 1879, non Blume 1826; FPM 574. 1919.

Large trees. Leaves to 15 x 7 cm, cuneate at base, nerves 5-7 pairs, pale beneath; nervules parallel; petiole 3 cm long. Panicles densely tomentose. Flowers sessile, 7 mm across; petals villous. Drupe 3 x 1.5 cm, oblong, glabrous.

*Fl. & Fr.* March-June

*Distr.* Endemic to Southern Western Ghats. Fairly common in evergreen forests; *PS 19506* Orukomban

## ALANGIACEAE

### ALANGIUM Lamarck

1. Trees; leaves oblong lanceolate, appressed tomentose.....**A. salvifolium** ssp. **salvifolium**
1. Scandent shrubs; leaves obovate-oblong, glabrous.....**A. salvifolium** ssp. **sundanum**

**Alangium salvifolium** (L. f.) Wang. ssp. **sundanum** (Miq.) Bloem., Bull. Jard. Bot. Buitenz. III, 16: 156. 1939; FTSR 213. 1996. *A. salvifolium* (L.f.) Wang. ssp. *hexapetalum* (Lam.) Wang. in Engl., Pflanzenz. 41: 9. 1910; FPM 572. 1919. *A. glandulosum* Thw., Enum. Pl. Zeyl. 133. 1859.

Leaves to 18 x 7 cm, obovate-oblong, acuminate at apex, round to subcordate at base, nerves 5 pairs, lowest pair from the base, rib-like; nervules reticulate, subparallel; petiole to 1 cm long. Flowers 2 cm long, in axillary fascicles; pedicels 8 mm long pubescent; calyx cupular, 5 mm across, 7-toothed, densely tomentose; petals 7, each 17 x 2 mm, linear-oblong, tomentose; stamens 14, filaments 8 mm long, ciliate below; anthers 7 mm long, linear; ovary inferior, 1-celled, ovule solitary; style 1, elongate, stigma capitate. Berry 2 x 1.3 cm, ellipsoid, tomentose

*Fl. & Fr.* March-August

*Distr.* Indo-Malesia. Common in evergreen and semi-evergreen forests; *PS 19551* Kariamchola

**Alangium salvifolium** (L. f.) Wang. in Engl., Pflanzenr. 41: 9. 1910, ssp. **salvifolium**: FPM 572. 1919; FPL 224. 1990. *Grewia salvifolia* L. f., Suppl. Pl. 409. 1781. *A. lamarckii* Thw., Enum. Pl. Zeyl. 133. 1859; FBI 2: 741. 1879.

Small trees; branchlets tomentose. Leaves to 15 x 4 cm, oblong, ovate or elliptic, acute, base oblique, obtuse, puberulus below; petiole to 1 cm, tomentose. Flowers in axillary cymes or clusters, pedicel to 4 mm, jointed; bracts 4 mm, ovate; calyx ca 3 mm, cupular, adnate to the ovary, tomentose, lobes 10, triangular-ovate; petals to 2.5 x 5 cm, linear oblong, white, tomentose; stamens to 20; filaments to 1 cm, base fleshy, villous; ovary to 2 mm, turbinate, 1-celled; style to 2 cm; stigma capitate. Berry 3 x 1 cm, globose, crowned with calyx lobes.

*Fl. & Fr.* March-June

*Distr.* India, Sri Lanka, China, Vietnam, Thailand and Africa. Common in dry deciduous forests; *PS 19208*, 30399 Keerappadi

## CAPRIFOLIACEAE

### VIBURNUM Linnaeus

**Viburnum punctatum** Buch.-Ham. ex D. Don, Prodr. Fl. Nepal 142. 1825; FBI 3: 5. 1880. *V. acuminatum* Wall. ex DC., Prodr. 4: 325. 1830; FPM 575. 1919.

Small evergreen trees. Leaves to 13 x 5 cm, elliptic, acuminate, punctate below, nerves 8 pairs; petiole 1.5 cm long. Panicle 8 cm across. Flowers 5 mm across, pedicelled; calyx tube 2 mm long, lobes obtuse; corolla 2.5 mm long, white, lobes ovate, obtuse; ovary 1-celled. Drupe 8 x 5 mm, oblong, compressed, 1-seeded, reddish brown.

*Fl. & Fr.* February-May

*Distr.* Indo-Malesia. Rare along riverine areas of moist deciduous forests; *PS 30532* Pandaravarai

## RUBIACEAE

- |  |                    |
|--|--------------------|
| 1. Herbs or herbaceous climbers.....                       | 2                  |
| 1. Shrubs, lianas or trees.....                            | 14                 |
| 2. Herbaceous climbers; leaves whorled .....               | <b>Rubia</b>       |
| 2. Erect diffuse or prostrate herbs; leaves opposite ..... | 3                  |
| 3. Prostrate herbs, rooting at nodes .....                 | 4                  |
| 3. Erect or diffuse herbs .....                            | 5                  |
| 4. Leaves obovate or spatulate, subsessile .....           | <b>Dentella</b>    |
| 4. Leaves cordate, long petioled.....                      | <b>Geophila</b>    |
| 5. Cells of ovary 1-ovuled.....                            | 6                  |
| 5. Cells of ovary 2 or more ovuled.....                    | 8                  |
| 6. Flowers in dense or lax terminal corymbs.....           | <b>Knoxia</b>      |
| 6. Flowers in axillary fascicles or umbels .....           | 7                  |
| 7. Fruits dehiscence apical .....                          | <b>Spermacoe</b>   |
| 7. Fruits dehiscence circumscissile.....                   | <b>Mitracarpus</b> |
| 8. Fruit a fleshy berry.....                               | 9                  |
| 8. Fruit capsular .....                                    | 10                 |
| 9. Inflorescence terminal; flowers large .....             | <b>Acranthera</b>  |
| 9. Inflorescence axillary; flowers small .....             | <b>Mycetia</b>     |
| 10. Flowers in axillary pendulous racemes .....            | <b>Neurocalyx</b>  |
| 10. Inflorescence otherwise .....                          | 11                 |
| 11. Leaves opposite or in whorls, to 3 pairs.....          | <b>Argostemma</b>  |
| 11. Leaves opposite, many .....                            | 12                 |



12. Calyx lobes 5; fruits compressed, obcordate .....	<b>Ophiorrhiza</b>
12. Calyx lobes 4; fruits subglobose or 4 angled .....	13
13. Capsule to 5 seeded; seeds with a ventral cavity .....	<b>Neanotis</b>
13. Capsule many seeded; seeds without a ventral cavity .....	<b>Hedyotis</b>
14. Flowers in globose heads .....	15
14. Inflorescence otherwise .....	18
15. Calyx tube confluent .....	<b>Morinda</b>
15. Calyx tube not confluent .....	16
16. Flowers ebracteate; calyx lobes imbricate .....	<b>Neolamarckia</b>
16. Flowers bracteate; calyx lobes valvate .....	17
17. Leaf base cordate; calyx lobed .....	<b>Haldina</b>
17. Leaf base truncate; calyx entire .....	<b>Mitragyna</b>
18. Leaves whorled .....	<b>Wendlandia</b>
18. Leaves opposite .....	19
19. Cells of ovary 2 or more ovuled .....	20
19. Cells of ovary 1 ovuled .....	25
20. Inflorescence spicate; seeds winged .....	<b>Hymenodictyon</b>
20. Inflorescence otherwise; seeds not winged .....	21
21. One calyx lobe enlarged, petaloid .....	<b>Mussaenda</b>
21. Calyx lobes equal .....	22
22. Climbing shrubs .....	<b>Oxyceros</b>
22. Shrubs or small trees .....	23
23. Plants unarmed .....	<b>Gardenia</b>
23. Plants armed with spines .....	24
24. Spine short, one or two pairs at the end of arrested branches .....	<b>Tamilnadia</b>
24. Spines long, axillary, solitary .....	<b>Catunaregam</b>
25. Flowers axillary, solitary or fascicled, cyme or umbels .....	26
25. Inflorescence terminal, corymbs; panicles or cymes .....	30
26. Corolla lobes valvate in bud .....	27
26. Corolla lobes twisted in bud .....	29
27. Corolla tube without deflexed hairs inside; ovary 3 or more celled .....	<b>Lasianthus</b>
27. Corolla tube with a row of deflexed hairs inside; ovary 2 celled .....	28
28. Leaves coriaceous; style two or more times longer than the corolla .....	<b>Psychrax</b>
28. Leaves membranous; style equal to the length of the corolla .....	<b>Canthium</b>
29. Corolla 4-lobed; tube 5 mm long .....	<b>Nostolachma</b>
29. Corolla 5-lobed; tube to 1.5 cm long .....	<b>Psilanthus</b>
30. Corolla lobes valvate in bud .....	31
30. Corolla lobes twisted in bud .....	33
31. Flowers solitary or a few in cymes; plants with foetid smell .....	<b>Saprosma</b>
31. Flowers in corymbs or panicles; plants without foetid smell .....	32
32. Corolla elongated, curved .....	<b>Chassalia</b>
32. Corolla short, strait .....	<b>Psychotria</b>
33. Corolla 5-lobed .....	34
33. Corolla 4-lobed .....	35
34. Style glabrous; stigma bilobed .....	<b>Prismatomeris</b>
34. Style hairy; stigma fusiform .....	<b>Tarenna</b>
35. Style much longer than the corolla; stigma entire .....	<b>Pavetta</b>
35. Style equal to the corolla; stigma two .....	<b>Ixora</b>

**ACRANTHERA** Arnott

**Acranthera anamallica** Bedd., Ic. t. 25. 1868-1874; FBI 3: 93. 1880; FPM 611. 1921.

Herbs. Leaves 12-15 x 3-5 cm, obovate-obtuse, base attenuate, pubescent on veins beneath, sparsely hairy above; petiole 2-3 cm long, stipules ovate, acute, 5-8 x 3 cm, cymes terminal, sessile; bracts *ca* 5 mm, linear. Flowers blue, pedicel 2-3 cm; calyx cup shaped, lobes 5, *ca*. 8 mm, obovate, glabrous within, corolla 2.5-3.5 cm, tawny villous outside, lobes 5, broadly oblong; stamens 5, included in the corolla tube, filaments *ca* 2 cm; ovary 1-celled, style *ca* 2 cm, filiform, stigma clavate. Berry oblong.

*Fl. & Fr.* April-June

*Distr.* Endemic to Southern Western Ghats. Rare in evergreen forests; *PS 19451* Valiyathode

#### ARGOSTEMMA Wallich

1. Opposite pairs of leaves unequal; calyx larger than the corolla.....**A. anupama**
1. Opposite pairs of leaves equal; calyx much smaller than the corolla .....**A. courtallense**

**Argostemma anupama** Sivar., J. Indian Bot. Soc. 63: 462. 1984; FTSR 216. 1996. *A. courtallense* sensu Deb & Basu, JBNHS 87: 332. 1990, in part, non Arn., 1839.

Erect delicate annual herbs, puberulus on the young parts, base tuberous. Leaves usually 6, sometimes 4, pairs unequal, ovate or ovate-lanceolate, acute, base cuneate, sparsely scabrous on both sides, to 7 x 1.8 cm; lateral nerves 4 or 5 pairs; peduncle usually solitary; pedicels *ca.* 1 cm long; calyx campanulate, sparsely hairy outside; corolla white, 0.5 cm across. Seeds angled, minutely tuberculate.

*Fl. & Fr.* July-September

*Distr.* Endemic to Southern Western Ghats (Kerala). Common in wet shades of evergreen forests; *PS 18985* Orukomban

**Argostemma courtallense** Arn., Ann. Nat. Hist. 3: 22. 1839; FBI 3: 42. 1880; FPM 590. 1921; FPL 227. 1990; FTSR 216. 1996.

Erect herbs with a tuberous root stock. Leaves to 8 cm across, few, orbicular, cordate at base, villous above; petiole 0-2 cm; stipule 8 mm long, ovate, entire. Cymes terminal, 1-3 cm across; peduncle 3-6 cm long, 1-3 together. Flowers few, 10 mm long, pedicelled; calyx tube turbinate, lobes 4, ovate; corolla tube broad, glabrous; lobes 4, ovate, white; stamens 4, included, anthers lanceolate; ovary 2-celled; ovules many; style slender, stigma terminal, globose.

*Fl. & Fr.* August-October

*Distr.* Endemic to South West India. Common in wet shades of evergreen forests; *PS 30007, NS 18991* Orukomban

#### CANTHIUM Lamarck

1. Plants unarmed.....**C. travancoricum**
1. Plants armed with supra-axillary thorns..... 2
2. Flowers in lax cymes; stamens 4.....**C. coromandelicum**
2. Flowers in fascicles; stamens 5 ..... **C. rheedei**

**Canthium coromandelicum** (Burm. f.) Alston in Trimen, Handb. Fl. Ceylon (Suppl.) 6: 152. 1903. *Gmelina coromandelica* Burm. f., Fl. Ind. 132. 1768. *Canthium parviflorum* Lam., Encycl. 1: 602. 1788; FBI 3: 136. 1880. *Plectronia parviflora* (Lam.) Bedd., For. Man. Bot. 134/5. 1872; FPM 625. 1921.

Armed small trees, spines supra axillary, straight. Leaves to 6 x 4.5 cm, obovate-oblongate or sub-orbicular, membranous. Cymes axillary; flowers white; pedicels 5 mm, filiform; calyx lobes curved; corolla tube 2 mm long, with hairs inside, lobes 3 mm, ovate, acuminate, reflexed; ovary 2-celled, 0.7 mm long, style 2 mm. Drupe 0.8 x 1 cm, globose.

*Fl. & Fr.* May-August

*Distr.* Indo-Malesia. Occasional in moist deciduous forests; *PS 30732* Vengoli

**Canthium rheedei** DC., Prodr. 4: 474. 1830; FBI 3: 134. 1880; FPL 229. 1990; FTSR 217. 1996. *Plectronia rheedii* (DC.) Bedd., For. Man. Bot. 134/5. 1872; FPM 625. 1921.

Stout shrubs with scandent branches; stem strigose, thorn 1-2 cm long, stout, recurved. Leaves to 5 x 4 cm, broadly ovate, acute at apex; nerves 4-6 pairs, domatia hairy; petiole short, 3 mm long, hairy. Flowers 12 mm long, in axillary fascicles; calyx obconical, teeth minute; corolla tube 4 mm long, globose, with a row of hairs inside; lobes 7 x 3 mm, lanceolate, acuminate, spreading; anthers with a hispid beak; style 5 mm long, densely bearded at middle. Drupe 15 x 12 mm, obovoid, black; seeds rugose, hard.

*Fl. & Fr.* February-April

*Distr.* Endemic to Peninsular India. Occasional along the margins of evergreen forests; *PS* 30670 Orukomban

**Canthium travancoricum** (Bedd.) Hook.f., FBI 3: 134. 1880; FPL 229. 1990; FTSR 217. 1996. *Plectronia travancorica* Bedd., Ic. t. 239. 1868. 1874; FPM 625. 1921.

Unarmed shrubs or small trees with scandent branches. Leaves on short arrested branchlets, 7 x 4.5 cm, ovate, acute, membranous; nerves 4-7 pairs; petiole 1-1.5 cm long; stipule orbicular, densely villous inside. Cymes 1-3 cm across, peduncled, with many slender villous branches. Flowers 6 mm long; calyx 2 mm long, teeth acute, glabrous; corolla tube densely villous near the mouth, lobes ovate, acute; style glabrous, 4 mm long.

*Fl. & Fr.* February-April

*Distr.* Endemic to Southern Western Ghats. Rare in rocky areas of moist deciduous forests; *PS* 18961 Vengoli

#### CATUNAREGAM Adanson

**Catunaregam spinosa** (Thunb.) Tirveng., Bull. Must. Hist. Nat. (Paris) ser. 3, 35: 13. 1978; FPL 230. 1990; FTSR 218. 1996. *Gardenia spinosa* Thunb., Diss. Gard. 7: 16. t.2. f.4. 1780. *Randia dumetorum* (Retz.) Poir. in Lam., Encycl. Suppl. 2: 829. 1811; FBI 3: 110. 1880; FPM 615. 1921. *R. dumetorum* (Retz.) Poir. var. *floribunda* (DC.) Gamble, FPM 616. 1921. *R. floribunda* DC., Prodr. 4: 386. 1830. *R. longispina* (Roxb.) DC., Prodr. 4: 386. 1830; FPM 616. 1921. *R. spinosa* (Thunb.) Poir. in Lam., Encycl. Suppl. 2: 329. 1811; FBI 3: 110. 1880. *Xeromphis spinosa* (Thunb.) Keay, Bull. Jard. Bot. Etat. 28: 37-38. 1958.

Small trees with short straight axillary spines. Leaves on short lateral branchlets, to 4.5 x 2 cm, obovate, obtuse, tomentose below, petiolate; stipule ovate, cuspidate. Flowers solitary, terminal on lateral branches, pedicellate; calyx tube 5 mm long, lobes obovate, hispid; corolla tube 6 mm long, broad, densely villous at the base inside; lobes 5, 12 mm long, obovate, twisted, white; stamens 5, anthers sessile at the mouth of the corolla; ovary 2-6-celled; ovules many; style 12 mm long, stout; stigma fusiform, ribbed. Fruit an obovoid berry, 4 x 3 cm, glabrous; seeds many, embedded in pulp.

*Fl. & Fr.* May-November

*Distr.* Tropical Asia and Africa. Common in moist deciduous forests; *PS* 18955 Vengoli; 19496 Thellikkal

#### CHASSALIA Commerson ex Poiret

**Chassalia curviflora** (Wall. ex Kurz) Thw. var. **ophioxyloides** (Wall.) Deb. & Krishna, Bull. Bot. Surv. India 24: 222. 1982(1983); FTSR 218. 1996. *Psychotria ophioxyloides* Wall. in Roxb., Fl. Ind. 2: 167. 1824. *Chassalia curviflora* Wall. ex Kurz, For. Fl. Burma 2: 14. 1877; FBI 3: 176. 1880, p.p; FPM 643. 1921. *C. ophioxyloides* (Wall.) Craib, Gard. Bul. s.s. 6: 474. 1930, var. *ophioxyloides*. *Psychotria curviflora* Wall. in Roxb., Fl. Ind. 2: 167. 1824.

Shrubs, to 1.5 m tall. Leaves to 22 x 8 cm, oblanceolate, abruptly acuminate; nerves 12 pairs, regular; petiole to 3 cm long, stipule connate, ovate, membranous, 2-fid. Cymes 7 x 4 cm,

terminal, paniced, glabrous. Flowers 15 mm long, subsessile; calyx 1.5 mm long, globose, lobes 5, ovate; corolla 8 mm long, curved, lobes ovate, obtuse; stamens 5, included; anthers linear. Ovary 2-celled, ovule one in each cell; style 2-fid at apex. Fruit 6 mm across, globose, glabrous, 2-seeded.

*Fl. & Fr.* January-July

*Distr.* Indo-Malesia. Common in disturbed areas of all types of forests; *PS 30674* Orukomban; *18857* Kanthalppara

#### DENTELLA J. R. Forster & J. G. A. Forster

**Dentella repens** (L.) J. R. & G. Forst., Char. Gen. Pl. 26. t.13. 1776; FBI 3: 42. 1880; FPM 590. 1921; FPL 230. 1990; FTSR 219. 1996. *Oldenlandia repens* L., Mant. Pl. 1: 40. 1767.

Prostrate branching herbs; stem villous. Leaves to 5 x 2.5 mm, obovate, petiolate; stipule connate, chartaceous, toothed. Flowers 6-8 mm long, axillary, solitary, sessile; calyx lobes 5, lanceolate, hispid; corolla tube 5 mm long, ovate, dentate, white; stamens 5, inserted in the tube below the middle; filaments very short, anthers linear; ovary 2-celled; ovules many, style short, stigmas 2, filiform. Fruit a capsule, 5 x 2 mm, oblong, indehiscent; seeds many, angled.

*Fl. & Fr.* Throughout the year

*Distr.* Indo-Malesia. Common in reservoirs beds; *PS 30422* Parambikulam

#### GARDENIA J. Ellis

**Gardenia resinifera** Roth, Nov. Pl. Sp. 150. 1821; FPL 231. 1990. *Gardenia lucida* Roxb., Fl. Ind. 1: 707. 1832; FBI 3: 115. 1880; FPM 618. 1921.

Resiniferous trees. Leaves to 15 x 9 cm, elliptic, obtuse at apex, hairy in the leaf axils below, nerves 20-22 pairs, subsessile. Flowers axillary, solitary, or in lax cymes, white turns to yellow; calyx tube 0.7 cm, lobes 5, 1 cm, triangular, acuminate; corolla tube 3 cm long, lobes 3 x 2 cm long, obovate, puberulus without; anthers 1.5 cm long, oblong, exserted; ovary 6 mm, style 3.5 cm. Berry 2 x 1.5 cm, ellipsoid.

*Fl. & Fr.* December-May

*Distr.* India, Bangladesh and Myanmar. Occasional in dry deciduous forests; *PS 30065* Kuchimudi

#### GEOPHILA D. Don

**Geophila repens** (L.) Johnst., Sargentia 8: 281. 1949; FPL 231. 1990; FTSR 219. 1996. *Rondeletia repens* L., Syst. Nat. (ed.10) 928. 1759. *Geophila reniformis* D. Don, Prodr. Fl. Nepal 136. 1825; FBI 3: 178. 1880; FPM 643. 1921. *Geophila herbacea* (Jacq.) K. Schum. in Engl. & Prantl, Pflanzenf. 4199. 1891.

Prostrate herbs; stem stoloniferous, rooting at nodes. Leaves 2.5 cm across, orbicular, cordate at base; petiole 2.5 cm long, hispid; stipules ovate, entire. Flowers 8 mm long, in 1-3 flowered axillary peduncled cymes; calyx tube globose, lobes 4, lanceolate, fimbriate; corolla tube 6 mm long, villous inside, lobes 4 or 5, 6 mm long, spreading, white; stamens included; anthers linear; ovary 2-celled, ovule one in each cell; style slender 2-fid at apex. Drupe 0.8 cm across, red, globose; seeds 2, 4 x 3 mm, plano-convex, rugose.

*Fl. & Fr.* February-June

*Distr.* Pantropical. Fairly common in evergreen and semi-evergreen forests; *PS 19521* Orukomban

#### HALDINA Ridsdale

**Haldina cordifolia** (Roxb.) Ridsd., Blumea 24: 361. 1978; FPL 231. 1990; FTSR 219. 1996. *Nauclea cordifolia* Roxb., Pl. Corom. t. 53. 1796. *Adina cordifolia* (Roxb.) Hook. f. ex Brand., For. Fl. 263. t.33. 1874; FBI 3: 24. 1880; FPM 584. 1921.

Large trees; bark pale brown; branchlets tomentose. Leaves to 15 cm across, orbicular, cordate at base, tomentose below; petiole 5-8 cm long; stipule 13 mm long, obovate, obtuse.

Heads 2 cm across, globose, 2-3 together, axillary, peduncled; receptacle hispid. Flowers 9 mm long, sessile; calyx tube obovoid, lobes 1.5 mm long, spathulate; corolla tube 8 mm long, 5-ridged; lobes 5, ovate, acute, small; stamens 5, exerted; ovules many; style 12 mm long, stigma globose. Capsule 5 x 3 mm, obovoid; seeds with tail at one end and a bifid wings at other end.

*Fl. & Fr.* April-November

*Distr.* India, Myanmar, Sri Lanka and Indo-China. Common in moist deciduous forests; *PS 19257*Thellikkal; *NS 30451* Vengoli

#### HEDYOTIS Linnaeus

- |   |                       |
|---|-----------------------|
| 1. Leaves linear, less than 5 mm broad.....   | 2                     |
| 1. Leaves ovate, elliptic or oblong; more than 1 cm broad .....                         | 5                     |
| 2. Erect herbs.....   | 3                     |
| 2. Prostrate herbs.....   | 4                     |
| 3. Flowers axillary, solitary or paired; leaves to 5 mm broad.....                      | <b>H. herbacea</b>    |
| 3. Flowers in terminal dichotomous cymes; leaves 1 mm broad .....                       | <b>H. affinis</b>     |
| 4. Flowers solitary or few flowered cymes, sessile or subsessile .....                  | <b>H. brachypoda</b>  |
| 4. Flowers in axillary umbel, pedicelled.....   | <b>H. corymbosa</b>   |
| 5. Lateral nerves of the leaves obscure; branchlets scabrous.....                       | <b>H. nitida</b>      |
| 5. Lateral nerves of the leaves prominent; branchlets pubescent.....                    | 6                     |
| 6. Leaves sessile, fascicled at apex of stem; flowers in terminal paniculate cymes..... | <b>H. ovatifolia</b>  |
| 6. Leaves petiolate, equidistant on stem; flowers in axillary fascicles .....           | <b>H. auricularia</b> |

**Hedyotis affinis** Roem. & Schult., Syst. 3: 194. 1818. *Oldenlandia affinis* (Roem. & Schult.) DC., Prodr. 4: 428. 1830. *Hedyotis dichotoma* Koen. ex Roth, Nov. Pl. Sp. 93. 1821, non Cav., 1801. *Oldenlandia dichotoma* (Koen. ex Roth) Hook. f., FBI 3: 67. 1880, non Spreng. 1850; FPM 601. 1921.

Erect herbs with slender filiform branches, to 30 cm high, glabrous. Leaves to 25 x 1 mm, linear, entire, sessile; stipule ovate, entire or 2-3 toothed. Flowers 2 mm long, in terminal dichotomous cymes; pedicel and peduncles filiform, 1.5-2 cm long; calyx 1 mm long, lobes acute, scabrid; corolla white, tube villous inside. Capsule 2 x 1.5 mm, obovoid, truncate at apex.

*Fl. & Fr.* June-August

*Distr.* South Western India. Rare in moist deciduous forests; *PS 30076* Kuchimudi; *19919* Karimala

**Hedyotis auricularia** L., Sp. Pl. 101. 1753; FBI 3: 58. 1880; FTSR 220. 1996. *Oldenlandia auricularia* (L.) K. Schum. in Engl. & Prantl, Pflanzenf. 4:25. 1891; FPM 597. 1921. *Exallage auricularia* (L.) Bremek., Verh. Acad. Wet. afd. Natuurk. Sect. 2, 48: 142. 1952.

Herbs to 50 cm high; branches pubescent. Leaves to 8 x 3 cm, elliptic, acute, scabrous below; nerves 5 pairs, prominent; petiole 5 mm long; stipules obovate, teeth 7, 3-5 mm long, hairy. Cymes axillary, 1 cm across. Flowers 10-20 together, to 3 mm long; calyx lobes spreading; corolla white. Capsule 2 mm across, globose; glabrous.

*Fl. & Fr.* Throughout the year

*Distr.* Indo-Malesia. Common in moist deciduous forests; *PS 30293* Parambikulam

**Hedyotis brachypoda** (DC.) Sivar. & Biju, Taxon 39: 672. 1990. *Oldenlandia brachypoda* DC., Prodr. 4: 424. 1830. *O. diffusa* sensu Roxb., Fl. Ind. 1: 444. 1820; FBI 3: 65. 1880; FPM 601. 1921, non *Hedyotis diffusa* Willd., 1768.

Creeping herbs; stem terete, glabrous. Leaves to 3 x 0.2 cm, linear-lanceolate, serrulate; stipule triangular, 2-3-bristled. Flowers 4 mm long, axillary, solitary, sessile or shortly pedicelled; calyx lobes ovate, acute, serrulate; corolla white, lobes acute, spreading, glabrous; stigma deeply bifid to the base. Capsule 3 mm across, glabrous, opening apically; seeds black.

*Fl. & Fr.* Throughout the year

*Distr.* Tropical and Subtropical Asia. Very common in disturbed areas and vayals; *PS 30669* Anakkalvayal

**Hedyotis corymbosa** (L.) Lam. Encycl. 1: 272. 1792. *Oldenlandia corymbosa* L., Sp. Pl. 119. 1753; FBI 3: 64. 1880; FPM 600. 1921.

Diffuse herbs, stem 4-angled, scabrous. Leaves to 25 x 4 mm, lanceolate, acute, lineolate-serrate, subsessile. Umbels axillary; peduncle to 1.5 cm long, slender. Flowers 2-3, 5 mm long; pedicels to 7 mm long, slender; calyx 3 mm long, lobes ovate, serrate; corolla white, capsule 3 x 3 mm, globose, opening apically; seeds many, angled.

*Fl. & Fr.* Throughout the year

*Distr.* Pantropical. Common in open areas of moist deciduous forests and plantations; *PS 30417* Parambikulam; *NS 18982, 19064* Thunakkadavu

**Hedyotis herbacea** L., Sp. Pl. 102. 1753; R.Rao. & Hemadri, Indian For. 99: 376. 1973; FTSR 221. 1996. *Oldenlandia herbacea* (L.) Roxb., Fl. Ind. 1: 495. 1820; FPM 601. 1921; FPL 240. 1990. *O. heynei* R. Br. ex G. Don, Gen. Syst. 3: 531. 1834; FBI 3: 65. 1880.

Erect herbs, to 30 cm high; stem 4-angled, glabrous. Leaves to 30 x 2-5 mm, linear-oblong, acute, serrulate, sessile; stipule triangular, shortly toothed. Flowers axillary, solitary; pedicel 1.5-2 cm long, filiform; calyx 2 mm long; lobes lanceolate, toothed. Capsule 2 x 1.5 mm, septicidal at apex; seeds angled, black.

*Fl. & Fr.* Throughout the year

*Distr.* Tropical Africa and Asia. Common in wet rocky areas; *PS 19624* Vengoli; *NS 30630* Thellikkal

**Hedyotis nitida** Wight & Arn., Prodr. 412. 1834; FBI 3: 61. 1880; FTSR 221. 1996. *H. glabella* R. Br. ex Bedd., Ic. t. 36. 1868-74. *Oldenlandia nitida* (Wight & Arn.) Gamble, FPM 597. 1921.

Prostrate woody herbs; stem 4-angled, coarsely scabrid. Leaves to 7 x 1 cm, linear-lanceolate to elliptic, coriaceous, pale below; stipule 8 mm long, ovate, rounded at apex, strongly long-toothed, villous. Flowers sessile in axillary clusters, 1-3 together; calyx 4 mm long, lobes acute, ciliate; corolla 4-5 mm long, lobes spreading, white. Capsule 3 x 2 mm, ovoid, glabrous; seeds angled; deep brown, ovoid, glabrous; seeds angled, deep brown.

*Fl. & Fr.* Throughout the year

*Distr.* Peninsular India and Sri Lanka. Common in open areas of all types of forests; *PS 18999* Orukomban; *NS 18906* Karimalagapuram

**Hedyotis ovatifolia** Cav., Ic. 6:52. 1801. *Oldenlandia nudicaulis* Roth, Nov. Pl. Sp. 95. 1821; Hook.f., FBI 3:70. 1880; FPM 602. 1921. *Hedyotis nudicaulis* (Roth) Wight & Arn., Prodr. 416. 1834. *Thecagonum ovatifolium* (Cav.) Babu, Bull. Bot. Surv. India 11:214. 1971.

Annual small slender herbs, stem 4-angled. Leaves ovate or ovate-oblong, acute, base obtuse, minutely hispid, to 5 x 2.5 cm; lateral nerves 5-7 pairs, petiole to 0.5 cm long; upper leaves sessile and fascicled. Peduncles terminal, 2 or 3, slender, dichotomous branched, to 7 cm long, pedicels slender, 1 cm long. Corolla white, with a ring of hairs at mouth, 1 mm long. Capsule subglobose, 2.5 x 3 mm, calyx lobes indistinct.

*Fl. & Fr.* August-September

*Distr.* Indo-Malesia. Common in moist deciduous forests and degraded forest areas; *NS 30795* Anappadi

#### HYMENODICTYON Wallich

**Hymenodictyon orixense** (Roxb.) Mabb., Taxon 31: 66. 1982; FTSR 223. 1996. *Cinchona orixensis* Roxb., Bot. Descr. Swietenia 21. 1793 & in Med. Facts Obs. 6: 152. 1795. *Cinchona excelsa* Roxb., Pl. Corom. t. 106. 1799. *Hymenodictyon excelsum* (Roxb.) Wall. in Roxb., Fl. Ind. 2: 149. 1824; FBI 3: 35. 1880; FPM 589. 1921.

Large trees. Leaves to 20 x 12 cm, abruptly acuminate at apex, pubescent below; nerves 10 pairs; petiole 2-6 cm long; stipule ovate, obtuse. Panicle cylindrical, contracted, densely tomentose. Flowers 7 mm long; calyx tube hispid; lobes ovate, acute; corolla tube slender, lobes triangular, tomentose outside; stamens exserted, anthers mucronate; style 7 mm long, stigma globose. Capsule 22 x 13 mm, ellipsoid, glabrous.

*Fl. & Fr.* February-August

*Distr.* Indo-Malesia. Common in moist deciduous forests; *PS 30384* Kuchimudi; *NS 30459* Vengoli

#### IXORA Linnaeus

- |   |                      |
|---|----------------------|
| 1. Peduncles more than 10 cm long .....                         | <b>I. elongata</b>   |
| 1. Peduncles to 5 cm long.....                                  | 2                    |
| 2. Calyx lobes equal to the tube .....                          | 3                    |
| 2. Calyx lobes minute.....                                      | 4                    |
| 3. Corolla tube to 10 mm long .....                             | <b>I. monticola</b>  |
| 3. Corolla tube more than 15 mm long.....                       | <b>I. cuneifolia</b> |
| 4. Calyx 4-lobed; leaves membranous.....                        | <b>I. nigricans</b>  |
| 4. Calyx 4-toothed; leaves coriaceous.....                      | 5                    |
| 5. Leaves subsessile; flower buds ellipsoid.....                | <b>I. pavetta</b>    |
| 5. Leaves petiolate, petiole to 2 cm; flower buds globose ..... | <b>I. brachiata</b>  |

**Ixora brachiata** Roxb. ex DC., Prodr. 4: 488. 1830; FBI 3: 142. 1880; FPM 631. 1921; FPL 233. 1990; FTSR 225. 1996.

Trees, to 5 m tall; branchlets terete, glabrous. Leaves to 15 x 6 cm, oblong to oblanceolate, obtusely acute; nerves 8-10 pairs, reticulate, pale above; petiole 1.5 cm long; stipule triangular, acute. Cymes to 20 x 15 cm, peduncled, puberulus; bracts and bracteoles minute. Flowers sessile; calyx 1 mm long, shortly 4-toothed; corolla tube 6 mm long, slender, lobes 2 x 1 mm, oblong; style 7 mm long, pubescent. Berry 5 mm across, globose, glabrous.

*Fl. & Fr.* November-January.

*Distr.* Endemic to Western Ghats. Common in all types of forests; *PS 18819* Parambikulam; *19111* Kariamchola; *18945* Kothala

**Ixora cuneifolia** Roxb. ex DC., Prodr. 4: 487. 1830; FBI 3: 144. 1880; FPM 631. 1921; FPL 234. 1990.

Glabrous shrubs. Leaves to 14 x 4.5 cm, elliptic, acuminate at apex, acute at base; nerves 6-9 pairs, irregular; petiole 1 cm long; stipule 8 mm long, ovate, acuminate into a long mucro, glabrous. Cymes 5-7 cm across, sessile or subsessile, trichotomously branched with a pair of large basal bracts. Flowers 21 mm long, sessile, 3-9 together; bracts and bracteoles filiform, hispid; calyx 4 mm long, hispid, lobes ovate; corolla tube 18 mm long, slender, lobes 3.5 x 1.5 mm, oblong, puberulus; anthers 4 mm long, tailed at base; style 20 mm long, glabrous.

*Fl. & Fr.* December-January

*Distr.* Endemic to Peninsular India. Rare in evergreen forests at higher elevations; *PS 19710* Karimala

**Ixora elongata** Heyne ex G. Don, Gen. Syst. 3: 572. 1834; FBI 3: 141. 1880; FPM 630. 1921; FPL 234. 1990; FTSR 225. 1996.

Large shrubs, young shoots glabrous. Leaves elliptic-oblong or oblanceolate, acute, base

acute, chartaceous, glabrous, to 15 x 6 cm; lateral nerves 12-15 pairs; petiole 1.5 cm long. Flowers in densely congested corymbs, peduncle to 15 cm long, sparsely pubescent. Calyx tube and lobes pubescent, lobes lanceolate. Corolla tube 1 cm long, lobes reflexed.

*Fl.* November

*Distr.* Endemic to Western Ghats. Common in evergreen forests; *PS 19363* Pezha; *30035* Meenkara; *NS 19515* Orukomban

***Ixora monticola*** Gamble, Kew Bull. 1920: 247. 1920 & FPM 631. 1921; FPL 234. 1990.

Glabrous shrubs. Leaves to 8 x 3 cm, ovate, acute-acuminate, rounded at base; nerves to 10 pairs, prominently reticulate; petiole 1 cm long; stipule 5 mm long, ovate, acuminate. Cymes 4-5 cm across, trichotomous, glabrous. Flowers 10 mm long, sessile, 3-together; bracts and bracteoles subulate; calyx tube 1.5 mm long, lobes 1.5 mm long, ovate; corolla tube 8 mm long, slender, lobes 2.5 x 1 mm, oblong, deflexed; anthers 2 mm long, acute; style 8 mm long. Berry 6 x 7 mm, biglobose, glabrous.

*Fl. & Fr.* December-May

*Distr.* Endemic to Southern Western Ghats. Rare in evergreen forests; *PS 30672* Orukomban

***Ixora nigricans*** R. Br. ex Wight & Arn., Prodr. 428. 1834; FBI 3: 148. 1880; FPM 631. 1921; FPL 234. 1990; FTSR 225. 1996.

Shrubs, glabrous. Leaves to 13 x 4 cm, elliptic to oblanceolate, long-acuminate, attenuate at base; nerves 8-10 pairs, reticulate; petiole 1 cm long; stipule 7 mm long, ovate, acuminate. Cymes 10 cm across; peduncles 4-6 cm long. Flowers pedicelled, many; calyx 2.5 mm long, lobes 1.5 mm long, acuminate; corolla tube 11 mm long, slender; lobes 5 x 2 mm, ovate, acute; style 16 mm long.

*Fl.* December-May

*Distr.* Indo-Malesia. Common in evergreen forests; *PS 18846, 30049* Kanthalppara; *19530* Orukomban; *NS 30030, 19345* Puliwala

***Ixora pavetta*** Andrews, Bot. Rep. t. 78. 1799. *I. arborea* Roxb. ex Smith in Rees, Cyclop. 19: 5. 1811. *I. parviflora* Vahl, Symb. 3: 11. t.52. 1794, non Lam. 1791; FBI 2: 142. 1880; FPM 631. 1921.

Trees; branchlets woody. Leaves to 14 x 7 cm, elliptic-oblong, apex obtuse, glossy, subsessile; stipules ovate-acuminate. Cymes 10-12 cm long; calyx 1 mm, truncate, teeth 4, minute; corolla tube 6 mm, lobes 4 x 2 mm, oblong, spreading; ovary 1.7 mm, style 7 mm; stigma 2 fid.

*Fl.* December-January

*Distr.* India, Sri Lanka and Bangladesh. Common in dry deciduous forests; *PS 30070* Kuchimudi

#### KNOXIA Linnaeus

***Knoxia sumatrensis*** (Retz.) DC., Prodr. 4: 570. 1830; FPL 235. 1990; FTSR 226. 1996. *Spermacoce sumatrensis* Retz., Obs. Bot. 4: 23. 1786. *Knoxia corymbosa* sensu Wight, Ill. Indian Bot. t.126. 1850, non Willd. 1798; FBI 3: 128. 1880; FPM 622. 1921.

Erect subshrubs; stem white-tomentose. Leaves to 13 x 3 cm, lanceolate, acuminate, hispid; nerves 10-13 pairs; petiole 5-10 cm long; stipules orbicular, membranous, long-toothed. Cymes 5-15 cm across, pilose. Flowers 6 mm long, sessile; calyx lobes ovate, acute, hispid; corolla tube 3 mm long, narrow, densely villous at mouth, lobes ovate, obtuse, lilac or pink; style 5 mm long. Capsule 2 x 1 mm, oblong, glabrous.

*Fl. & Fr.* November-January

*Distr.* Indo-Malesia and Australia. Common in moist deciduous and secondary forests; *PS 30673* Parambikulam

#### LASIANTHUS W. Jack



- |  |                        |
|--|------------------------|
| 1. Branchlets glabrous .....                                     | <b>L. acuminatus</b>   |
| 1. Branchlets hairy .....  | 2                      |
| 2. Transverse nervules of leaves close; calyx teeth hispid ..... | <b>L. strigillosus</b> |
| 2. Transverse nervules distant; calyx teeth villous .....        | <b>L. rostratus</b>    |

**Lasianthus acuminatus** Wight, Calcutta J. Nat. Hist. 6: 511. 1846; FBI 3: 185. 1880, p.p.; FPM 647. 1921; Deb & Gangop., JETB 15: 274. 1991. *L. coffeoides* Fyson, Kew Bull. 1914: 185. 1914.

Large shrubs. Leaves to 9 x 4 cm, elliptic, oblong, apiculate, glabrous; nerves 4 pairs, prominent; nervules closely parallel; petiole 5-7 mm long; stipule triangular, acute, glabrous. Flowers 1-3 together, sessile; calyx lobes acute, triangular, villous; corolla 8 mm long, tube slender, lobes ovate, obtuse, densely villous. Drupe 5 x 5 mm, globose, glabrous.

*Fl. & Fr.* July-October

*Distr.* Endemic to Southern Western Ghats. Common in evergreen forests; *PS 19426, 19762* Pooppara

**Lasianthus rostratus** Wight, Calcutta J. Nat. Hist. 6: 510. 1846; FPM 647. 1921; FTSR 226. 1996. *L. ciliatus* Wight var. *rostratus* (Wight) Hook. f., FBI 3: 185. 1880.

Shrubs, branchlets densely brown hirsute. Leaves elliptic-lanceolate, caudate-acuminate, base obtuse, glabrous above, tomentose beneath, to 12 x 4.5 cm; lateral nerves 7 or 8 pairs, intercostae scalariform; petiole to 1 cm. Flowers sessile, in axillary fascicles; calyx lobes 4, triangular, acute, villous; corolla white, 4 mm long, lobes 4, tomentose outside; ovary 3-celled; style glabrous. Drupe globose, 0.6 cm across.

*Fl. & Fr.* April-May

*Distr.* Endemic to Southern Western Ghats. Common in evergreen forests; *PS 30021* Karappara; *19514* Orukomban

**Lasianthus strigillosus** Hook.f., FBI 3: 185. 1880; FPM 647. 1921; Deb & Gangop., JETB 15: 300. 1991.

Large shrubs, stem densely strigose-hairy. Leaves to 12 x 4 cm, elliptic-oblong, acuminate at apex, acute at base; nerves 6 pairs, oblique, nervules closely parallel, 1-2 mm apart; petiole 5-10 mm long; stipule 3 mm long, ovate, obtuse, densely hairy. Flowers 5 mm long in axillary fascicles, sessile; calyx hirsute; corolla tube short, lobes densely hairy.

*Fl. & Fr.* August-January

*Distr.* Endemic to Southern Western Ghats. Common in evergreen forests; *PS 30622* Pooppara

#### MITRACARPUS Zuccarini

**Mitracarpus villosus** (Sw.) DC., Prodr. 4: 572. 1830; FTSR 227. 1996. *Spermacoce villosa* Sw., Prodr. 29. 1788. *Mitracarpus verticillatus* (Schum. & Thonn.) Vatke, Linnaea 40: 196. 1876. *M. hirtus* (L.) DC., Prodr. 4: 572. 1830. *Staurospermum verticillatum* Schum. & Thonn., Beskr. Guin. Pl. 73. 1827.

Erect herbs, to 50 cm high, little or not branched; stem 4-angled. Leaves to 3.5 x 1.5 cm, elliptic, acute, sessile, 3-5-nerved, plicate; stipules connate, membranous, fimbriate. Flowers minute, in axillary clusters; calyx lobes 4, unequal; corolla 2.5 mm long, tube slender, lobes ovate, obtuse; stamens 4, anthers sessile at mouth of corolla tube; ovary 2-celled; ovule solitary in each cell; style 2-fid at apex. Capsule 2 mm long, obovoid, with persistent calyx lobes, hirtus, circumscissile; seeds 2, 1 x 0.5 mm, oblong, rugose.

*Fl. & Fr.* Throughout the year

*Distr.* Tropical Africa and America; now common in South India. Common in degraded forest areas; *PS 19857, 19626* Vengoli

#### MITRAGYNA P. W. Korthals

- |   |                    |
|---|--------------------|
| 1. Leaf apex rounded or obtuse; corolla truncate..... | <b>M. tubulosa</b> |
|---|--------------------|

1. Leaf apex acuminate or acute; corolla 4 or 5 lobed.....**M. parvifolia**

**Mitragyna parvifolia** (Roxb.) Korth., Obs. Naocl. Ind. 19. 1839; FPM 585. 1921; FPL 236. 1990; FTSR 227. 1996. *Nauclea parvifolia* Roxb., Pl. Corom. t. 52. 1796. *Stephegyne parvifolia* (Roxb.) Korth., Verh. Nat. Gesch. Ned. Bezitt. Bot. 161. 1842; FBI 3: 25. 1880.

Large trees. Leaves to 17 x 12 cm, ovate, acute, rounded at base nerves 7-9 pairs, regular, villous below, nervules parallel, domatia hairy; petiole 2-5 cm long; stipule large, lanceolate, entire. Heads 3 cm across, terminal, solitary; bracteoles spatulate. Flowers 12 mm long, shortly pedicelled, calyx tube truncate; corolla tube 8 mm long, villous inside, lobes 4, oblong, deflexed; anthers sessile; ovules many; style 12 mm long, filiform. Capsule 6 x 4 mm, 6-ribbed, ellipsoid.

*Fl. & Fr.* August-January

*Distr.* Indo-Malesia. Common in moist deciduous forests; *PS 19808* Anakkalvayal

**Mitragyna tubulosa** (Arn.) Hav., J. Linn. Soc. Bot. 33: 71. 1897; FPM 585. 1921; FPL 237. 1990; FTSR 227. 1996. *Nauclea tubulosa* Arn. in Thw., Enum. Pl. Zeyl. 137. 1859. *Stephegyne tubulosa* (Arn.) Hook.f. ex Bedd., Fl. Sylv. t. 29. f.1. 1869; FBI 3: 25. 1880.

Medium deciduous trees; bark greyish, branches horizontal. Leaves ovate-oblong or ovate, acute to acuminate, base truncate or obtuse, to 20 x 8 cm; lateral nerves ca. 10 pairs, domatia absent; petiole to 3 cm long; stipules oblong, obtuse 0.8 cm long. Flower heads 2 cm across. Calyx tube truncate, glabrous. Corolla funnel-shaped, yellow with purple tinge, tube 3 mm long, lobes reflexed.

*Fl. & Fr.* April-May

*Distr.* Endemic to Peninsular India. Fairly common in moist deciduous forests; *PS 30729* Vengoli

#### MORINDA Linnaeus

1. Trees; heads simple.....**M. pubescens**  
 1. Climbing shrubs; heads umbellate.....**M. reticulata**

**Morinda pubescens** J. E. Smith in Rees, Cyclop. 24: 3. 1813; FPL 237. 1990; FTSR 228. 1996. *M. tinctoria* Roxb. ex DC., Prodr. 4: 447. 1130; FBI 3: 156. 1880; FPM 651. 1921. *M. exserta* Roxb., Fl. Ind. 1: 545. 1832. *M. coreia* Buch.-Ham., Trans. Linn. Soc. London 13: 537. 1822.

Small trees; bark pale-brown, thick, vertically fissured and irregularly cracked, turmeric-yellow inside. Leaves elliptic-lanceolate or oblanceolate, acuminate, to 13 x 5.5 cm; lateral nerves 7 or 8 pairs; petiole 1 cm long; stipules bifid at apex. Flowers white, in globose heads. Calyx limb truncate. Corolla 2 cm long, mouth hairy. Syncarpium globose, 2.5 cm across.

*Fl. & Fr.* March-May

*Distr.* Indo-Malesia. Common in dry deciduous forests; *PS 30081* Kuchimudi; *NS 30282* Thunakkadavu

**Morinda reticulata** Gamble, Kew Bull. 1920: 248. 1920 & FPM 652. 1921.

Climbing shrubs, branches yellowish-white. Leaves oblong or oblanceolate, caudate-acuminate, glabrous, shining, nerves and nervules very prominent, to 13 x 4.5 cm. Flowers white, in umbellate heads. Calyx annular, fleshy. Corolla hairy inside. Syncarpium orange-yellow, 1.5 cm across.

*Fl. & Fr.* March-September

*Distr.* Endemic to Southern Western Ghats. Rare in evergreen forests; *PS 30184* Kottayali

#### MUSSAENDA Linnaeus

1. Cymes lax; berry obovoid.....**M. belilla**

1. Cymes congested; berry globose..... **M. hirsutissima**

**Mussaenda belilla** Buch.-Ham., Trans. Linn. Soc. London 14: 203. 1824; FPL 237. 1990; FTSR 228. 1996. *M. laxa* (Hook. f.) Hutch. ex Gamble, FPM 610. 1921. *M. frondosa* L. var. *laxa* Hook.f., FBI 3: 89. 1880.

Climbing shrubs. Leaves to 10 x 8 cm, broadly ovate, acuminate, rounded at base, thinly hairy; nerves 10-12 pairs, parallel; petiole 5 cm long, slender; stipule 12 mm long. Flowers pedicelled; larger calyx lobes 8-9 cm across, orbicular, hirsute, white; other calyx lobes 10 mm long, linear; corolla tube 28 mm long, slender, adpressed hairy; petals yellow, densely villous inside. Fruits 8 x 6 mm, ovoid.

*Fl. & Fr.* June-October

*Distr.* Endemic to Western Ghats. Common in moist deciduous forests; *PS 19474* Thellikkal

**Mussaenda hirsutissima** (Hook. f.) Hutch. ex Gamble, FPM 610. 1921. *M. frondosa* L. var. *hirsutissima* Hook.f., FBI 3: 90. 1880.

Scandent shrubs; branchlets densely white-hispid. Leaves to 11 x 5 cm, broadly elliptic, acuminate at either ends, densely hispid; nerves 6-8 pairs, not prominent; petiole 1-3 cm long; stipule 12 mm long, densely hispid. Cymes terminal, congested. Flowers densely arranged; larger calyx lobes, 8 x 4.5 cm, elliptic, acute, long-clawed; corolla tube 30 mm long, narrow, densely hispid, lobes 12 x 10 mm, cuspidate.

*Fl. & Fr.* December-February

*Distr.* Endemic to Southern Western Ghats. Occasional along the margins of evergreen forests at higher altitudes; *PS 30436* Karimala

#### MYCETIA Reinwardt

**Mycetia acuminata** (Wight) O. Ktze., Rev. Gen. Pl. 1: 289. 1891; FPM 612. 1921; FPL 238. 1990; FTSR 299. 1996. *Lawia acuminata* Wight, Ic. t. 1070. 1846. *Adenosacme lawii* Hook.f., FBI 3: 96. 1880.

Erect fleshy herbs. Leaves to 27 x 10 cm, elliptic-oblong, acuminate at apex; nerves to 20 pairs, prominent, parallel; petiole 5-8 cm long, stipule 12 mm long, ovate, acute, membranous. Cymes 5-7 cm across, axillary, peduncled. Flowers 6 mm long, pedicelled; calyx 6 mm long, lobes 5, acuminate; corolla blue, spreading, tube short, lobes 5, ovate, spreading; stamens adnate to the corolla tube, anthers linear; ovules many on peltate placentas; style short; stigmas linear. Berry, 8 mm across, white, fleshy; seeds many, angular.

*Fl. & Fr.* November-January

*Distr.* Endemic to Western Ghats. Rare in evergreen forests and moist shady areas; *PS 30042* Meenkara

#### NEANOTIS W. H. Lewis

1. Flowers in fascicles.....**N. tubulosa**  
 1. Flowers in cymes .....**N. decipiens**

**Neanotis decipiens** (Hook. f.) Lewis, Ann. Miss. Bot. Gard. 53: 37. 1966; FTSR 230. 1996. *Anotis decipiens* Hook.f., FBI 3: 72. 1880; FPM 604. 1921.

Procumbent herbs, rooting at lower nodes; stem glabrous. Leaves ovate, acuminate, sparsely villous; nerves 7-9 pairs; petiole 3 cm long, hairy. Cymes 3-5 cm across, terminal; branches glabrous, slender. Flowers 5-6 mm long, blue or pink, subsessile; calyx lobes ovate, ciliate; corolla tube slender, shortly villous inside, lobes ovate, villous.

*Fl. & Fr.* September-December

*Distr.* Endemic to Western Ghats. Occasional in grasslands; *PS 30108, NS 19672* Karimala

**Neanotis tubulosa** (G. Don) Mabb. in Manilal, Bot. Hist. Hort. Malab. 92. 1980; FTSR 230. 1996. *Oldenlandia tubulosa* G. Don, Gen. Syst. 3: 531. 1834p.p. *Anotis quadrilocularis* (Thw.)

Hook.f., FBI 3: 74. 1880; FPM 605. 1921. *Hedyotis quadrilocularis* Thw., Enum. Pl. Zeyl. 144. 1859. *Neanotis quadrilocularis* (Thw.) Lewis, Ann.Miss. Bot. Gard. 53. 40. 1966.

Procumbent annual herbs; stem glabrous. Leaves ovate, acute at both ends, minutely villous; nerves 3-4 pairs; petiole 5 mm long; stipule orbicular, ciliate, membranous. Flowers 2-5 together; calyx lobes ovate, acute, glabrous, corolla tube 3 mm long, lobes 2 x 1 mm, ovate. Capsule 3 x 2 mm, glabrous, 3-celled; seeds 2-5 in each cell, pitted, concave on faces.

*Fl. & Fr.* July-December

*Distr.* Peninsular India and Sri Lanka. Common in grasslands; *PS 19698* Karimala

#### NEOLAMARCKIA Bosser

**Neolamarckia cadamba** (Roxb.) Bosser, Adansonia ser. 4. 6: 247. 1984; FTSR 232. 1996. *Nauclea cadamba* Roxb., Fl. Ind. 2: 121. 1824. *Anthocephalus chinensis* sensu A. Rich ex Walp. Repert. 2: 491. 1843, non *Cephalanthus chinensis* Lam. 1785, *Anthocephalus cadamba* (Roxb.) Miq. Fl. Ind. Bat. 2: 135. 1850; FBI 3: 23. 1880. *A. indicus* A. Rich., Mem. Rubiac. 157. 1830; FPM 583. 1921.

Large trees. Leaves opposite, to 22 x 12 cm, oblong, obtuse, apiculate, tomentose when young; nerves ca. 14 pairs, nervules parallel; stipule lanceolate, entire. Heads 4-6 cm across, terminal, peduncled. Flowers sessile, densely packed; calyx lobes 5, each 6 mm long, oblong; corolla tube 10 mm long, slender, glabrous, lobes oblong, 6 mm long; anthers 3 mm long, sessile, sagittate at base, apiculate; ovary 2 or 4 celled; ovules numerous; style entire, stigma clavate. Capsule membranous; seeds many, compressed.

*Fl. & Fr.* May-August

*Distr.* Asia, Pacific and Australia. Rare along the riverine areas; *PS 19723* Parambikulam

#### NEUROCALYX Hooker

**Neurocalyx calycinus** (R. Br. ex Bennet) Robins., Proc. Amer. Acad. Arts 45: 402. 1910; FPL 238. 1990. *Argostemma calycinum* R. Br. ex Bennet, Pl. Jaw. Rar. 97. 1838. *Neurocalyx hookeriana* Wight, Ic. t. 52. 1838. *N. wightii* Arn., Ann. Nat. Hist. ser. 1. 3: 22. 1839; FBI 3: 47. 1880; FPM 591. 1921.

Large herbs, pubescent. Leaves to 26 x 7 cm, oblanceolate, acute at apex, rusty puberulus; nerves to 18 pairs, prominent below; stipule 2 cm long, obovate, 2-fid at apex. Racemes 10-13 cm long, axillary, rarely branched; bracts lanceolate. Flowers white, pedicelled; calyx tube hemispherical, lobes 5, 8 x 5 mm, ovate; corolla tube absent, lobes 5 x 3 mm, ovate, twisted; stamens 5, anthers connate into a conical tube; ovary 2-celled, ovules many, style slender. Capsule irregularly bursting, 4 x 4 mm; seeds many, pitted.

*Fl. & Fr.* August-December

*Distr.* South West India. Common in moist shades of evergreen forests; *PS 19454* Valiyathode

#### NOSTOLACHMA Durand

**Nostolachma crassifolia** (Gamble) Deb & Lahiri, Bull. Bot. Surv. India 17: 162. 1975(1978). *Coffea crassifolia* Gamble, Kew Bull. 1920: 248. 1920 & FPM 637. 1921.

Small trees, branchlets compressed, becoming terete, glabrous. Leaves elliptic, obtusely acute, base acute, to 9 x 4 cm. Flowers white, in subsessile axillary cymes. Corolla 5-6 mm long, mouth hairy. Fruit ellipsoid.

*Fl. & Fr.* January-October

*Distr.* Endemic to Western Ghats. Fairly common in evergreen forests at higher altitudes; *PS 30213, 30130, 30133* Karimala; *NS 30373* Pandaravarai;

#### OPHIORRHIZA Linnaeus

1. Flowers deep pink ..... **O. pectinata**

1. Flowers white ..... 2
2. Procumbent herbs; leaves to 5 x 2.5 cm ..... **O. rugosa** var. **prostrata**
2. Erect herbs or subshrubs; leaves to 10 x 5 cm ..... 3
3. Flowers ebracteate ..... **O. mungos**
3. Flowers bracteate ..... **O. brunonis**

**Ophiorrhiza brunonis** Wight & Arn., Prodr. 404. 1834; FBI 3: 79. 1880; FPM 608. 1921; FTSR 232. 1996.

Small subshrubs; branches pubescent. Leaves to 20 x 7 cm, lanceolate, acuminate, glabrous except the nerves; nerves 10-12 pairs, arching; petiole 2-4 cm long, hispid; stipule 10 mm long, lanceolate, glabrous. Cymes 5-7 cm broad, terminal, corymbose; peduncle 2-6 cm long, hispid. Flowers 15 mm long, densely arranged; bracteoles 13 mm long, filiform, villous; calyx lobes 2 mm long, hairy; corolla tube 8 mm long, hispid, lobes ovate, obtuse; anthers 2.5 mm long, linear.

*Fl.* Almost throughout the year

*Distr.* Endemic to Southern Western Ghats. Common in evergreen forests; *PS* 19434, 30676 Pooppara; 30257 Pezha

**Ophiorrhiza mungos** L., Sp. Pl. 150. 1753; FBI 3: 77. 1880; FPM 607. 1921; FPL 241. 1990; FTSR 232. 1996.

Erect subshrubs; stem scabrous. Leaves to 15 x 7 cm, ovate, acuminate at apex, decurrent or cuneate at base; nerves 14 pairs, regular, parallel, scabrid below; petiole 2-3 cm long; stipule triangular, acute. Cymes 5-8 cm broad, spreading, branches rusty tomentose. Flowers pedicelled; calyx glabrous; corolla tube, villous in a ring at mouth. Capsule 4 x 8 mm, glabrous; seeds angled, brown.

*Fl. & Fr.* Throughout the year

*Distr.* India, Myanmar and Sri Lanka. Common in evergreen and semi-evergreen forests; *PS* 19503 Orukomban; 19462 Pooppara

**Ophiorrhiza pectinata** Arn., Acta Phys.-Med. Acad. Caes. Leop. Carol. Nat. Cur. 18: 338. 1836; FBI 3: 81. 1880; FPM 608. 1921.

Erect herbs, to 40 cm high, glabrous. Leaves to 17 x 5 cm, elliptic-lanceolate, acuminate at both ends; nerves *ca.* 8 pairs; petiole to 5 cm long; stipule ovate, acute. Cymes 2-5 cm broad; peduncle to 6 cm long. Flowers densely packed; bracteoles 8 x 4 mm, curved-oblong, acute; calyx lobes ovate, glabrous; corolla tube 8 mm long with a ring of erect hairs at throat, lobes ovate, acute; anthers nearly sessile. Capsule 5 x 1.2 mm, 2-winged, glabrous; seeds squarish, brown.

*Fl. & Fr.* Throughout the year

*Distr.* Peninsular India and Sri Lanka. Common in evergreen forests; *PS* 30677 Karimala

**Ophiorrhiza rugosa** Wall. var. **prostrata** (D. Don) Deb. & Mondal, Bull. Bot. Surv. India 24: 228. 1982. *Ophiorrhiza prostrata* D. Don, Prodr. Fl. Nepal 136. 1825; FPL 241. 1990. *Ophiorrhiza harrisonii* G. Don, Gen. Syst. 3: 523. 1834; FBI 3: 78. 1880; FPM 607. 1921.

Procumbent herbs. Leaves ovate, obtusely acute at apex, rounded at base, pubescent along the nerves below, chartaceous; nerves 4-6 pairs; petiole 1-2 cm long; stipule triangular, hairy. Cymes 1-2 cm across, congested; peduncle 5 cm long. Flowers minute, white; calyx 1 mm long, lobes ovate; corolla 3 mm long, white. Capsule 2.5 mm across, compressed; seeds 3-5, rugose, folded.

*Fl. & Fr.* August-December

*Distr.* Sri Lanka, India, Nepal and Myanmar. Common in evergreen forests at lower altitudes; *PS* 19519 Orukomban

#### OXYCEROS Loureiro

**Oxyceros rugulosus** (Thw.) Tirveng., Nord. J. Bot. 3: 466. 1983. *Griffithia rugulosa* Thw., Enum. Pl. Zeyl. 159. 1859. *Randia rugulosa* (Thw.) Hook. f., FBI 3: 113. 1880; FPM 617. 1921. *Aidia rugulosa* (Thw.) Swamin., Boil. Mem. 2: 67. 1977.

Climbing shrubs. Leaves to 16 x 7 cm, elliptic, acuminate, glabrous; nerves 8-10 pairs; petiole 1.5 cm long, thick; stipule 6 mm long, ovate, acuminate. Cymes lateral or axillary, 5-8 cm across; shortly peduncled; calyx tube 6 mm long, obconical, teeth 5, obsolete; corolla tube 12 mm long, densely villous in a ring inside; lobes 13 mm long, oblong, deflexed, white; stamens 5, filaments short, inserted at the mouth of corolla tube; anthers 8 mm long, linear, apiculate; ovary 2-celled; ovules many, sunken in the axile placentae; style 18 mm long, stigma clavate. Berry 10 x 10 mm; seeds few, rugose.

*Fl. & Fr.* March-April

*Distr.* South India and Sri Lanka. Rare in open areas of evergreen forests; *PS 30033* Meenkara

#### PAVETTA Linnaeus

- |   |                      |
|---|----------------------|
| 1. Leaves glabrous and glabrescent.....                                       | 2                    |
| 1. Leaves variously pubescent.....  | 3                    |
| 2. Leaves elliptic; calyx lobes keeled.....                                   | <b>P. calophylla</b> |
| 2. Leaves oblong-obovate; calyx lobes not keeled.....                         | <b>P. indica</b>     |
| 3. Branchlets sub-tetragonous; corolla tube greenish white, to 1 cm long..... | <b>P. tomentosa</b>  |
| 3. Branchlets terete; corolla white, to 2 cm long.....                        | <b>P. hispidula</b>  |

**Pavetta calophylla** Bremek., Feddes Repert. 37: 90. 1934; FPM 1879. 1936; FTSR 232. 1996.

Glabrous shrubs. Leaves elliptic, acuminate, attenuate at base and apex; nerves 9 pairs, hispid below; petiole 2 cm long; stipule 7-8 mm long, ovate, acuminate. Cymes 6-10 cm broad, hispidulous. Flowers pedicelled; calyx 2 mm long, obconical, lobes ciliate; corolla tube 18 mm long, slender, glabrous outside, villous inside, lobes 9 x 4 mm, oblong, white; anthers 7 mm long; style 6.5 cm long.

*Fl. & Fr.* January

*Distr.* Endemic to Southern Western Ghats. Common in evergreen forests; *PS 30041* Meenkara

**Pavetta hispidula** Wight & Arn., Prodr. 431. 1834; FBI 3: 151. 1880; FPM 633. 1921; FPL 241. 1990; FTSR 233. 1996. *Pavetta siphonantha* Dalz. in Hook.'s J. Bot. Kew Gard. Misc. 2: 133. 1850; FPM 1878. 1936.

Small shrubs; stem hispid. Leaves to 15 x 4.5 cm, oblanceolate, acuminate, narrowed to the base, glabrous above, hispid below; nerves 6-8 pairs, looping below the margins; petiole 2 cm long; stipules ovate, mucronate. Cymes 5-8 cm broad, lax, hispidulous. Flowers white, pedicels 8 mm long; calyx 3 mm long, teeth short, recurved, hispid; corolla tube 15 mm long, thinly hispid, lobes 8 x 3 mm, oblong, glabrous; style 37 mm long.

*Fl. & Fr.* May-July

*Distr.* Western Peninsular India and Sri Lanka. Common in evergreen forests; *PS 30255* Pezha; *NS 30359* Kariamchola

**Pavetta indica** L., Sp. Pl. 110. 1753; FBI 3: 150. 1880; FPM 633. 1921; FPL 242. 1990.

Shrubs, branchlets glabrescent. Leaves 13-16 x 7-9 cm, obovate or oblanceolate, acuminate, base acute, glabrescent in both surface; petiole to 2 cm. Cymes corymbose, axillary and terminal; calyx *ca* 3 mm, lobes obovate; stamens 4; ovary 2 mm, style *ca* 3 cm. Berry 6 mm across, subglobose.

*Fl. & Fr.* April-July

*Distr.* India and Sri Lanka. Common in moist deciduous and secondary forests; *PS 30219* Karimala; *19837* Vengoli

**Pavetta tomentosa** Roxb. ex J. E. Smith in Rees, Cyclop. 26: n.52. 1813; FPM 1879. 1936; FPL 242. 1990; FTSR 233. 1996. *P. indica* L. var. *tomentosa* (Roxb. ex J. E. Smith) Hook.f., FBI 3: 150. 1880.

Large shrubs; stem densely white-tomentose. Leaves to 13 x 7 cm, ovate, acuminate, tomentose; nerves 10 pairs, reticulate; petiole 3 cm long; stipule triangular, cuspidate, tomentose. Cymes 10 cm broad, terminal, densely tomentose, shortly peduncled. Flowers pedicelled; pedicels 6 mm long; calyx 2.5 mm long, retrose hairy, 4-toothed; corolla tube 12 mm long, glabrous, lobes 7 x 1.5 mm, oblong, hairy at base; anthers 7 mm long, linear; style 28 mm long, glabrous.

*Fl. & Fr.* May-July

*Distr.* India and Indo-China. Common in moist deciduous forests; *PS 19883* Velayudhankai; *19644* Vengoli; *30431* Karimala

#### PRISMATOMERIS Thwaites

**Prismatomeris tetrandra** (Roxb.) K. Schum. in Engl. & Prantl, Pflanzenf. 4:1381. 1891; FTSR 233. 1996. *Prismatomeris albidiflora* Thw. in Hook.'s J. Bot. Kew Gard. Misc. 8: 286. t.7A.1856 & Enum. Pl. 154. 1859; FBI 3: 159. 1880; FPM 653. 1921.

Small trees; bark grey, fissured. Leaves obovate or oblong, abruptly acuminate, base cuneate, glabrous, and glossy, to 15 x 5 cm; lateral nerves 7-9 pairs, reticulations thin, prominent; petiole to 1.2 cm long; stipules glabrous, shining. Flowers, white, slightly fragrant, 2.5 cm long. Calyx limb truncate. Berry crowned by the calyx limb.

*Fl. & Fr.* December-January

*Distr.* South India and Sri Lanka. Common in evergreen forests; *PS 19358* Pezha; *19793* Orukomban

#### PSILANTHUS Hooker f.

**Psilanthus wightianus** (Wight & Arn.) Leroy, Bull. Mus. Hist. Nat. (Paris) ser.4, 3. Sect. B. Adansonia 3: 252. 1981. *Coffea wightiana* Wight & Arn., Prodr. 436. 1834; FBI 3: 154. 1880; FPM 636. 1921.

Shrubs; with spinescent branches and branchlets. Leaves to 3 x 1.5 cm, elliptic-ovate, apex obtuse, membranous; petiole 5 mm, stipule broad, ovate-acuminate. Flowers solitary or in cymes, white; bracteoles form a calyculus; calyx irregularly many toothed, 1.5 mm; corolla tube 6 mm, lobes 8 mm long, twisted, elliptic-oblong; stamens 4 mm, oblong; style 3 mm, bifid at apex, linear.

*Fl.* February-March

*Distr.* Peninsular India and Sri Lanka. Common in dry deciduous forests; *PS 30569* Keerappadi

#### PSYCHOTRIA Linnaeus

- |  |                        |
|--|------------------------|
| 1. Leaves in whorls of three; stipules more than 25 cm long..... | <b>P. anamallayana</b> |
| 1. Leaves opposite; stipules to 2 cm long.....                   | 2                      |
| 2. Leaves with domatia.....                                      | 3                      |
| 2. Leaves without domatia.....                                   | 4                      |
| 3. Cymes racemose.....   | <b>P. glandulosa</b>   |
| 3. Cymes globose.....  | <b>P. nigra</b>        |
| 4. Flowers mixed with rufous hairs.....                          | <b>P. globicephala</b> |
| 4. Flowers not mixed with rufous hairs.....                      | 5                      |
| 5. Branches of inflorescence opposite or subopposite.....        | <b>P. johnsoni</b>     |
| 5. Branches of inflorescence whorled.....                        | 6                      |
| 6. Corolla tube glabrous within.....                             | <b>P. nudiflora</b>    |
| 6. Corolla tube villous within.....                              | <b>P. keralensis</b>   |

**Psychotria anamallayana** Bedd., Ic. t. 236. 1868-1874; FBI 3: 171. 1880; FPM 641. 1921; FTSR 236. 1996.

Shrubs, 2.5 m tall; branchlets stout. Leaves 15-20 x 6-7 cm, oblanceolate, obtuse, apiculate, attenuate to the base, coriaceous; nerves 10-12 pairs, regular, 12-13 mm apart, reticulate towards the margins; domatia absent; petiole to 4.5 cm long, stipule 3 cm long, lanceolate, glabrous within. Cymes 3-6 cm across, glabrous. Flowers 5 mm long, sessile; calyx 4-toothed; corolla tube villous at the base. Drupe 13 x 7 mm, obovoid, 4-angled, glabrous.

*Fl. & Fr.* February-March

*Distr.* Endemic to Southern Western Ghats. Common in evergreen forests; *PS 19386* Karimala

**Psychotria glandulosa** (Dennst.) Suresh in Nicols. *et al.*, An Interpr. Hort. Malab. 229. 1988. *Baldingera glandulosa* Dennst., Schluss. Hort. Malab. 9, 19, 31. 1818. *Grumilea elongata* Wight, Ic. t. 1036. 1845. *Psychotria elongata* (Wight) Hook.f., FBI 3: 163. 1880; FPM 641. 1921.

Shrubs, to 2.5 m high. Leaves 10 x 6 cm, obovate, obtusely acute, nerves 12-15 pairs, 5 mm apart, parallel, nervules reticulate, domatia glandular; petiole 1 cm long; stipule ovate, acute, rufous hairy inside. Cymes 5-7 x 1-1.5 cm, hispid. Flowers 7 mm long, grouped; calyx 2 mm long, lobes ovate, acuminate, ciliate; corolla tube 4 mm long, broadly villous inside, lobes 5, ovate, acute. Drupe 6 x 5 mm, globose, glabrous.

*Fl. & Fr.* October-December

*Distr.* Peninsular India and Sri Lanka. Common along the margins of evergreen forests at higher altitudes; *PS 30334* Pezha; *NS 18907* Karimalagapuram

**Psychotria globicephala** Gamble, Kew Bull. 1920: 249. 1920 & FPM 640. 1921.

Shrubs. Leaves to 12 x 6 cm, oblanceolate, acuminate, acute, base attenuate, nerves looped near the margin, petiole 5-1 cm, stipule with long hairs. Flowers in terminal globose heads mixed rufous hairs; calyx *ca* 1.5 mm, ciliate, lobes 5, style *ca* 4 mm, stigma bifid.

*Fl. & Fr.* August-January

*Distr.* Endemic to Southern Western Ghats. Rare in evergreen forests; *PS 19365* Pezha

**Psychotria johnsonii** Hook.f., FBI 3: 175. 1880; FPM 640. 1921.

Shrubs. Leaves to 8 x 3 cm, obovate-oblanceolate, abruptly acuminate, base attenuate, nerves with domatia; petiole to 5 mm; stipule *ca* 5 mm, broadly ovate, acute. Cymes terminal, branches opposite, calyx *ca* 1 mm, 5 toothed, ciliate along the margin, corolla *ca* 3 mm, throat densely hairy interspersed with 5 stamens, lobes 5, acute; style 2 mm, stigma bifid. Drupe *ca* 5 mm across.

*Fl. & Fr.* August-December

*Distr.* Endemic to Southern Western Ghats; Rare in evergreen forests; *PS 30249* Pezha

**Psychotria keralensis** Deb & Gangop., Bull. Bot. Surv. India 25: 213. 1983 (1985) & JETB Addl. ser. 7: 48. 1989.

Shrubs. Leaves to 15 x 6 cm, obovate, obtusely acuminate, cuneate at base; nerves 11-13 pairs, intercostae, reticulate, distinct; stipules 11 x 9 mm, ovate, densely rufous hairy inside. Cymes 4 x 4 cm, branches opposite, glabrous. Flowers 7 mm long, sessile; calyx 2 mm long, lobes ovate, glabrous; corolla tube equal to the lobes, lobes 4, deflexed. Pyrene 17 x 10 mm, ellipsoid, glabrous.

*Fl. & Fr.* January-May

*Distr.* Endemic to Southern Western Ghats (Kerala). Rare in evergreen forests; *PS 19529* Orukomban

**Psychotria nigra** (Gaertn.) Alston in Trimen, Handb. Fl. Ceylon 6 (Suppl.):152. 1931; FPL 243. 1990; FTSR 236. 1996. *Grumilea nigra* Gaertn., Fruct. 1: 138. t.28. 1788. *Psychotria thwaitesii* Hook. f., FBI 3: 162. 1880, p.p; FPM 640. 1921.



Large shrubs, 2-3 m tall. Leaves to 19 x 8.5 cm, obovate, obtuse, broadly apiculate, nerves to 16 pairs, regular, 8-10 mm apart, domatia glandular; stipule 12 mm long, ovate, strongly mucronate. Cymes 1-1.5 cm across, 3-6-together, globose, densely fulvous hairy; peduncle 2-3 cm long, stout. Flowers many, densely packed, 5 mm long; calyx 1.5 mm long, campanulate, 5-toothed, ciliate; corolla white, 3 mm long, tube hairy at mouth, lobes reflexed. Drupe 6 mm across, subglobose, pyrenes smooth.

*Fl. & Fr.* January-May

*Distr.* Peninsular India and Sri Lanka. Common along the margins of evergreen forests at higher altitudes; *PS 30338* Pezha; *18916* Karimala

**Psychotria nudiflora** Wight & Arn., Prodr. 434. 1834; FBI 3: 175. 1880; FPM 641. 1921; FTSR 236. 1996. *Psychotria sekharana* Ramam. & Rajan, JBNHS 80: 621. 1983.

Shrubs. Leaves to 13 x 4 cm, elliptic to oblanceolate, acuminate, narrowed to the base, reddish brown when dried; nerves 10-13 pairs, reticulate; petiole 1 cm long, slender; stipule ovate, obtuse. Cymes 4 cm across, peduncled, rusty puberulus, branches whorled. Flowers sessile; calyx 1 mm long, membranous; corolla 5.5 mm long, lobes 4, short; style 2-fid at apex.

*Fl. & Fr.* December-January

*Distr.* Endemic to Southern Western Ghats. Common in evergreen forests; *PS 30675* Orukomban

#### PSYDRAX J. Gaertner

**Psydrax umbellata** (Wight) Bridson, Kew Bull. 48: 762. 1993. *Canthium umbellatum* Wight, Ic. t. 1034. 1845; FBI 3: 132. 1880. *Plectronia didyma* (Gaertn. f.) Kurz var. *umbellata* (Wight) Gamble, FPM 624. 1921. *Canthium dicoccum* (Gaertn.) Teijsm. & Binn., var. *umbellatum* (Wight) Sant. & Merch., Bull. Bot. Surv. India 3: 107. 1961; FPL 229. 1990; FTSR 217. 1996.

Small to medium evergreen trees; bark yellowish-grey, shallowly fissured, pale brown inside; branchlets tetragonous. Leaves elliptic-oblong or obovate, caudate-acuminate, base cuneate, glabrous and glossy, to 15 x 6 cm; lateral nerves ca. 5 pairs, slender; petiole 1 cm long. Flowers 3 mm across in few-flowered, short umbels. Calyx glabrous, shortly 5-lobed. Corolla greenish-yellow, lobes oblong, acute, 1.5 mm long.

*Fl. & Fr.* February-May

*Distr.* Indo-Malesia and China. Common in evergreen forests; *PS 30122* Karimala; *18964* Vengoli; *NS 30618* Kariamchola

#### RUBIA Linnaeus

**Rubia cordifolia** L., Syst. Nat. (ed.12) 3: 229. 1768; FBI 3: 202. 1880; FPM 655. 1921; FPL 243. 1990. *R. munjista* Roxb., Fl. Ind. 1: 383. 1820.

Scabrous climber, stem 4-angled, articulate. Leaves whorled, 4 in each node, equal or unequal, to 7 x 3 cm, ovate, cordate at base, acuminate at apex, 3-5-ribbed from base; petiole 2-5 cm long. Flowers 3 mm across; in axillary dichotomous cymes; calyx tube turbinate, lobes 4, minute; corolla lobes ovate, valvate, spreading, white; anthers globose; ovules solitary in each cell, styles 2, stigmas capitate.

*Fl. & Fr.* May-July

*Distr.* Asia, Africa and Europe. Common in semi-evergreen forests; *PS 19113* Kariamchola

#### SAPROSMA Blume

**Saprosma glomerata** (Gard.) Bedd., For. Man. Bot. 134/11. 1872; FPL 243. 1990; Gangop., JETB 15: 86. 1991 FTSR 237. 1996. *Dysodidendron glomeratum* Gard., Calcutta J. Nat. Hist. 7: 3. 1847. *Saprosma indicum* Dalz. in Hook.'s J. Bot. Kew Gard. Misc. 3: 37. 1851; FBI 3: 192. 1880; FPM 649. 1921. *Serissa glomerata* (Gard.) Bedd., Ic. t.16. 1868-1874.

Shrubs, to 1.5 m tall. Leaves to 12 x 5 cm, ovate-oblong, acute, subcordate at base; domatia glandular; nerves 10-15 pairs. Flowers 3-6 together, in terminal clusters, 7 mm long, shortly pedicelled; calyx 2 mm long, lobes 4, ovate, acute; corolla white, densely hairy within; anthers sessile. Berry 1 cm across, globose, emarginate, deep blue.

*Fl. & Fr.* March-July

*Distr.* Endemic to Western Ghats. Common in evergreen forests; *PS 18858* Kanthalppara; *19527* Orukomban

#### SPERMACOCE Linnaeus

- 1. Stem angle ciliate; calyx lobes 2..... **S. mauritiana**
- 1. Stem angle not ciliate; calyx lobes 4..... 2
- 2. Stem winged; leaves more than 4 cm long..... **S. latifolia**
- 2. Stem not winged; leaves to 3 cm long..... **S. articularis**

**Spermacoce articularis** L. f., Suppl. Pl. 119. 1781; FTSR 238. 1996. *Borreria articularis* (L.f.) F.N. Will., Bull. Herb. Borss. 2. ser.5: 956. 1905. *Borreria articularis* (L.f.) F.N. Will. var. *articularis* Sivar. & Manilal, New Botanist II:2: 88-90. 1975. *Spermacoce hispida* Hook.f., FBI 3: 200. 1881, non L. 1753.

Erect woody herbs, stem 4-angld, scabrid. Leaves to 6 x 1.3 cm, acute at both ends, mucronate at apex, glabrous; nerves 6 or 7 pairs, very oblique; petiole 5-10 mm long, slender; stipule membranous, teeth, 5-7, to 7 mm long, glabrous. Flowers many; calyx lobes acute, glabrous; corolla white. Capsule 2 x 2 mm, obcordate, glabrous; seeds black.

*Fl. & Fr.* October-December

*Distr.* Tropical Asia and Africa. Common in wet rocky and disturbed areas; *PS 30468* Vengoli

**Spermacoce latifolia** Aublet, Hist. Pl. Guinea Fr. 1: 55. t.19/1. 1775; FTSR 238. 1996. *Borreria latifolia* (Aubl.) K. Schum. in Mart., Fl. Bras. 4:61. 1888. *B. articularis* Mukerjee, Rec. Bot. Surv. India 20: 116. 1973, non K. Schum. 1888. *B. eradii* Ravi, JBNHS 6: 539. 1970.

Decumbent herbs; stem 4-angled, scabrous. Leaves to 5 x 2.5 cm, acute, scabrous; nerves 5 pairs; petiole very short, broad; stipular teeth 4-6, hispid. Flowers in clusters of 2-5, axillary, sessile; calyx tube 2 mm long, lobes hispid; corolla tube short, lobes erect. Capsule 4 x 3 mm, compressed, hispid; seeds ellipsoid, minutely pitted, dark brown.

*Fl. & Fr.* Throughout the year

*Distr.* Native of Tropical America; now established in Tropical Africa and Asia. Common in degraded forest areas; *PS 18952* Vengoli

**Spermacoce mauritiana** Osea Gideon ex Verdc., Kew Bull. 37: 547. 1983; FTSR 238. 1996. *S. ocyroides* sensu Hook. f., FBI 3: 200. 1881, p.p., non Burm. f. 1708. *Borreria ocyroides* Gamble, FPM 654. 1921, non (Burm. f.) DC. 1830. *Spermacoce decandollei* Deb & Dutta, JETB 5: 1044. 1984.

Diffuse herbs; stem hispid. Leaves to 2.5 x 1.5 cm, ovate, acute, cuneate at base, subsessile, glabrous; stipule membranous, bristled. Flowers minute, many-together, densely packed; calyx lobes linear; corolla white, lobes erect, glabrous. Capsule 1 x 1 mm, with wings like persistent sepals; seeds 1 x 0.5 mm, oblong, minutely pitted, dark brown.

*Fl. & Fr.* Throughout the year

*Distr.* Pantropical. Common in degraded forest areas; *PS 30294* Parambikulam

#### TARENNA Gaertner

- 1. Cells of ovary many ovuled; plant with sticky exudation..... **T. asiatica**
- 1. Cells of ovary one ovuled; plant without sticky exudation..... **T. monosperma**

**Tarennia asiatica** (L.) O.Ktze. ex K. Schum., Bot. Tidsskr. 24: 332. 1902; FPL 244. 1990. *Rondeletia asiatica* L., Sp. Pl. 172. 1753; FBI 3: 102. 1880. *Webera corymbosa* Willd., Sp. Pl. 1: 1224. 1798. *W. asiatica* (L.) Bedd., Fl. Sylv. S. India, Anal. Gen. 16. f. 2. 1869. *Chomelia asiatica* (L.) O. Ktze., Rev. Gen. Pl. 1: 278. 1891; FPM 613. 1921. *Stylocoryne webera* A. Rich., Mem. Soc. Hist. Nat. Paris 5: 248. 1834.

Glabrous shrubs. Leaves to 17 x 6 cm, elliptic-oblong, acuminate at apex and base, nerves 13 pairs; petiole 3-4 cm long. Cymes peduncled, axillary, 10 cm across; peduncle to 6 cm long; branches slender. Drupe 6 mm across, globose; seeds 2, black.

*Fl. & Fr.* January-June

*Distr.* Indo-Malesia. Common in dry deciduous forests; *PS 19994* Kuchimudi; *19545* Thekkady

**Tarennia monosperma** (Wight & Arn.) Raju, Sci. & Cult. 32: 554. 1966; FTSR 240. 1996. *Stylocoryne monosperma* Wight & Arn., Prodr. 401. 1834; FPM 635. 1921. *Webera monosperma* (Wight & Arn.) Hook. f., FBI 3: 103. 1880.

Shrubs to 2 m high. Leaves to 18 x 6.5 cm, elliptic-oblong, acuminate at apex; nerves 12-14 pairs, regular, petiole 1.5 cm long, stout. Cymes peduncled, to 15 cm across, corymbose. Flowers 3.5 cm long; calyx 3 mm long, hispid; corolla tube glabrous, white; style entire, hairy towards the base. Drupe 1 x 1 cm, globose, glabrous.

*Fl. & Fr.* January-May

*Distr.* Endemic to Southern Western Ghats; Common in evergreen forests; *PS 19518* Orukomban; *30250* Pezha

#### TAMILNADIA Trivengadam

**Tamilnadia uliginosa** (Retz.) Tirveng. & Sastry, Mauritius Inst. Bull. 8: 85. 1979; FTSR 239. 1996. *Gardenia uliginosa* Retz., Obs. Bot. 2:14. 1781. *Randia uliginosa* (Retz.) DC., Prodr. 4:386. 1830; FBI 3: 110. 1880; FPM 615. 1921. *Xeromphis uliginosa* (Retz.) Mahes., Bull. Bot. Surv. India 3:92. 1961.

Small trees; branchlets 4-angled, terminating with 1 or 2 pairs of sharp thorns. Leaves mostly confined to the apex of branchlets, obovate or oblong, obtuse, base narrowed, coriaceous, glabrous above and pubescent below, to 10 x 5 cm; lateral nerves 6-8 pairs; petiole to 3 mm long. Flowers solitary at the end of branchlets, to 5 cm across. Calyx tube 2.5 cm long, lobes 6, rounded. Corolla white, lobes 6, orbicular, imbricate. Berry ovoid or ellipsoid, smooth, yellow, 5 cm long.

*Fl. & Fr.* August-March

*Distr.* India and Myanmar. Occasional along the sides of vayals. *PS 30836* Thellikkal

#### WENDLANDIA Bartling ex A. P. de Candolle

**Wendlandia thyrsoidea** (Schult.) Steud. Nomencl. (ed. 2) 2: 786. 1841; FPL 244. 1990. *Canthium thyrsoideum* Schult. in Roem. & Schult., Syst. Veg. 6: 207. 1820. *Wendlandia notoniana* Wall. ex Wight & Arn., Prodr. 403. 1834; FBI 3: 40. 1880; FPM 588. 1921.

Large stiff shrubs; stem terete, tomentose. Leaves ternate, to 12 x 4.5 cm, elliptic, acute, tomentose beneath; nerves 5-12, regular; petiole 1 cm long; stipule 6 mm long, ovate, acute. Panicle terminal, ca. 15 cm across, hispid. Flowers 6 mm long, many, sessile; calyx globose, hispid, lobe 5, ovate; corolla tube slender, villous within, lobes orbicular, spreading; stamens 5, exserted; ovary 2-celled; ovules many, on globose placentas; style slender, stigma bifid. Capsule globose, 2 valved; seeds many, reticulate.

*Fl. & Fr.* March-June

*Distr.* Peninsular India and Sri Lanka. Common along the margins of evergreen forests at higher altitudes and grasslands; *PS 19305* Karimala

## ASTERACEAE

1. Capitula dimorphic; unisexual .....	<b>Xanthium</b>
1. Capitula nor dimorphic; bisexual .....	2
2. Capitula homogamous.....	3
2. Capitula heterogamous .....	17
3. Leaves opposite .....	4
3. Leaves alternate .....	10
4. Capitula 1-flowered .....	<b>Lagascea (p.p)</b>
4. Capitula many flowered .....	5
5. Weak climbing shrubs .....	<b>Mikania</b>
5. Erect or prostrate herbs or shrubs .....	6
6. Receptacle condensed, spicate .....	<b>Spilanthes</b>
6. Receptacle not spicate .....	7
7. Pappus to 3, bristle like.....	<b>Adenostemma</b>
7. Pappus 5 to many, setaceous.....	8
8. Weak annual herbs; anthers appendaged at apex.....	<b>Ageratum</b>
8. Perennial subshrubs; anthers not appendaged at apex .....	9
9. Branches and petiole pale purple; ovary glabrous .....	<b>Ageratina</b>
9. Branches and petiole green; ovary scaly.....	<b>Chromolaena</b>
10. Leaves radical; capitula supported by spathes .....	<b>Elephantopus</b>
10. Leaves cauline; capitula not supported by spathes .....	11
11. Capitula long peduncled.....	12
11. Capitula short peduncled.....	15
12. Capitula 1-flowered .....	<b>Lagascea (p.p.)</b>
12. Capitula many flowered .....	13
13. Capitula bracteate; flowers yellow or white .....	<b>Gynura</b>
13. Capitula not bracteate; flowers pink .....	14
14. Capitula in racemes; achenes 10 ribbed .....	<b>Crassocephalum</b>
14. Capitula corymbose; achenes 5-ribbed.....	<b>Emilia</b>
15. Pappus in two series, dissimilar .....	<b>Vernonia</b>
15. Pappus uniseriate, similar .....	16
16. Flowers yellow; bracts 1 or 2 seriate .....	<b>Senecio</b>
16. Flowers otherwise; bracts many seriate .....	<b>Phyllocephalum</b>
17. Leaves opposite, rarely upper only alternate .....	18
17. Leaves all alternate .....	23
18. Capitula axillary, sessile .....	19
18. Capitula terminal or axillary, peduncled.....	20
19. Achenes densely covered with hooked spines.....	<b>Acanthospermum</b>
19. Achenes not covered with hooked spines .....	<b>Synedrella</b>
20. Leaves pinnately compound or pinnatifid .....	<b>Bidens</b>
20. Leaves simple, entire.....	21
21. Pappus absent or reduced into minute teeth .....	<b>Eclipta</b>
21. Pappus well developed .....	22
22. Corolla white; leaf margins serrate not pinnatisect .....	<b>Blainvillea</b>
22. Corolla yellow; leaves pinnatisect at least lower ones .....	<b>Tridax</b>
23. Capitula more than 4 cm across; large shrubs.....	<b>Tithonia</b>
23. Capitula less than 2 cm across; hers or subshrubs .....	24
24. Leaves pinnatifid .....	<b>Parthenium</b>
24. Leaves not pinnatifid.....	25
25. Anthers bases tailed .....	26
25. Anthers bases not tailed.....	28
26. Bracts spreading; bisexual flowers all sterile.....	<b>Anaphalis</b>
26. Bracts not spreading; bisexual flowers usually fertile.....	27

27. Bracts hyaline; plants aromatic .....	<b>Gnaphalium</b>
27. Bracts green; plants not aromatic .....	<b>Blumea</b>
28. Capitula solitary .....	<b>Grangea</b>
28. Capitula cymose or panicked .....	29
29. Anther bases sagitate .....	30
29. Anther bases obtuse or entire .....	31
30. Leaf base decurrent; flowers pink .....	<b>Laggera</b>
30. Leaf base amplexicaule not decurrent; flowers yellow .....	<b>Vicoa</b>
31. Pappus present .....	<b>Conyza</b>
31. Pappus absent .....	<b>Dichrocephala</b>

#### ACANTHOSPERMUM Shrank

**Acanthospermum hispidum** DC., Prodr. 5: 522. 1836; FPM 704. 1921; FPL 247. 1990; Chowdhery, Fl. Ind. 12:361.1995; FTSR 243. 1996.

Erect, densely hispid herbs. Leaves 2-4 x 1-2 cm, ovate, acute, entire. Heads 4-5 mm long, axillary, sessile; receptacle paleate; bracts 1-seriate, 5 mm long. Outer row of flowers female, ligulate, yellow, 3-lobed at apex. Inner flowers bisexual; corolla 2 mm long, tubular, 5-toothed at apex, yellow. Achenes 5 x 3 mm, obovate, with two diverging long spines at apex, compressed; pappus absent.

*Fl. & Fr.* October-January

*Distr.* Pantropical. Common in degraded forest areas; *PS 19001* Thunakkadavu

#### ADENOSTEMMA J. R. Forster & J. G. A. Forster

**Adenostemma lavenia** (L.) O. Ktze., Rev. Gen. Pl. 1: 304. 1891; FPM 677. 1921; FPL 247. 1990; Uniyal, Fl. Ind. 12:346.1995; FTSR 244. 1996. *Verbesina lavenia* L., Sp. Pl. 902. 1753. *Adenostemma latifolium* D. Don, Prodr. Fl. Nepal 181. 1825. *A. viscosum* Forst., Char. Gen. 90. t. 45. 1776. *A. viscosum* Forst. var. *lavenia* Hook. f., FBI 3: 242. 1881, p.p.

Herbs, 30-90 cm high; stem viscid, glandular. Leaves 6-12 x 5-7 cm, broadly ovate, acute at apex, cuneate at base, crenate-serrate; nerves scabrous below. Heads many, 7-8 x 5 mm, hemispherical, pedunculate; bracts 4 mm long, obovate, obtuse, brown, glabrous. Flowers many, white; corolla 2.5 mm long; tube puberulus; lobes hairy. Achenes 4 mm long, curved-obovoid, 3-angled, black; pappus 3-4 glandular bristles.

*Fl. & Fr.* October-January

*Distr.* Paleotropics. Common in moist deciduous and secondary forests; *PS 19152* Karimala

#### AGERATINA Spach

**Ageratina adenophora** (Spreng.) King & Robins., Phytologia 19: 211. 1970; FTSR 244. 1996. *Eupatorium adenophorum* Spreng., Syst. Veg. (ed. 16) 3: 420. 1826; Uniyal, Fl. Ind. 12:350.1995. *E. glandulosum* Kunth, Nov. Gen. Sp. 4: 122, t. 346. 1820.

Subshrubs, glandular hairy; stem violet-blue. Leaves to 8 x 4 cm, ovate, acute, serrate; petiole 2 cm long. Heads 7 mm across, 5 mm long, packed, in terminal corymbose panicle; bracts 3-seriate, 4 x 1 mm, lanceolate, strongly 3-ribbed. Outer florets bisexual; corolla white, 5-lobed, hispid. Inner florets female. Achenes 2 mm long, curved, ellipsoid, 5-angled, brown, smooth; pappus 5-10, 4 mm long, white, barbed.

*Fl. & Fr.* December-May

*Distr.* Originally from South America; now introduced in Peninsular India. Common along the margins of evergreen forests at higher altitudes and grasslands; *PS 30124* Karimala

#### AGERATUM Linnaeus

**Ageratum conyzoides** L., Sp. Pl. 839. 1753; Clarke, Comp. Ind. 30. 1876; FBI 3: 243. 1881; FPM 677. 1921; FPL 248. 1990; Uniyal, Fl. Ind. 12:348.1995; FTSR 244. 1996.

Herbs, viscid hairy. Leaves to 7 x 5 cm, ovate, acute at apex, crenate, rounded at base; petiole 1-3 cm long. Heads white, to 7 mm across, in terminal corymbose panicle; bracts 1-3-seriate, 3-4 mm long, elliptic, toothed at apex, 3-ribbed. Flowers all similar, bisexual; corolla 2.5 mm long, tubular, white, glabrous, 5-lobed at apex; stamens 5, anthers linear. Achenes 2 mm long, linear, 5-angled, hirsute along the angles; pappus 3-4 mm long, many, setaceous.

*Fl. & Fr.* Throughout the year

*Distr.* Pantropical. Common in degraded forest areas; *PS 19058* Thunakkadavu; *19393* Karimala

#### ANAPHALIS A. P. de Candolle

**Anaphalis lawii** (Hook. f.) Gamble, FPM 696. 1921; Pant, Fl. Ind. 13:66.1995; FTSR 245. 1996. *A. oblonga* DC. var. *lawii* Hook.f., FBI 3: 283. 1881.

Branched herbs; stem white wooly. Leaves 4-5 x 0.7 cm, oblong, acute at apex, amplexicaule at base. Heads 4 x 4 mm, in densely branched corymbose cymes; bracts 3-seriate, 3-4 mm long, elliptic, acute, dentate at apex; brown at lower part; outer ones wooly. Bisexual flowers 5-7, central; corolla 2.5 mm long, white, 5-toothed at apex. Achenes 1 mm long, cylindrical, scaly, brown.

*Fl. & Fr.* August-December

*Distr.* Endemic to Peninsular India. Fairly common in grasslands; *PS 30511* Karimala

#### BIDENS Linnaeus

**Bidens pilosa** L., Sp. Pl. 832.1753, var. **minor** (Blume) Sherff, Bot. Gaz. 80:387.1925; FPL 248. 1990; Chowdhery, Fl. Ind. 12:373.1995.

Herbs, stem quadrangular. Leaves opposite, to 18 cm, pinnate; lobes to 6 x 3 cm, ovate-lanceolate, acute, base truncate, serrate, hairy. Heads to 1 cm across; peduncles to 8 cm, flexuous involucre bracts biseriate, outer *ca* 3 x 1 mm, linear, spatulate, inner to 5 x 2 mm, ovate, obtuse; rays 2-5, corolla bilobed, yellow; disc many. Achenes *ca* 2.5 mm, setae 2-4, *ca* 3 mm long.

*Fl. & Fr.* November-February

*Distr.* Pantropical. Occasional in rocky areas of moist deciduous forests; *PS 19011* Thunakkadavu

#### BLAINVILLEA Cassini

**Blainvillea acmella** (L.) Philip, Blumea 6: 350. 1950; Chowdhery, Fl. Ind. 12:377.1995; FTSR 246. 1996. *Verbesina acmella* L., Sp. Pl. 901. 1753. *Blainvillea latifolia* (L. f.) DC. in Wight, Contrib. 17. 1834; FBI 3: 305. 1880. *Eclipta latifolia* L. f., Suppl. 378. 1781. *Blainvillea rhomboidea* Cass., Dict. Sci. Nat. 29: 494. 1823; FPM 706. 1921.

Erect branching annual herbs, pilose. Upper leaves alternate, to 8 x 3.5, ovate, crenate, pubescent, tri-nerved; petiole 1 cm, pilose. Capitulum solitary, 4-5 mm across; palea 5-6 mm; peduncles to 1.5 cm; phyllaries 5 x 2 mm, ovate-oblong, pubescent; ray florets 2 mm across; disc florets 2 mm across. Achenes truncate, 3.5 mm, black; pappus of 3-4 bristles, 1 mm.

*Fl. & Fr.* November-April

*Distr.* Pantropical. Common in dry deciduous forests; *PS 30083* Kuchimudi

#### BLUMEA A. P. de Candolle

- |  |                        |
|--|------------------------|
| 1. Prostrate herbs.....                            | <b>B. oxyodonta</b>    |
| 1. Erect herbs or subshrubs.....                   | 2                      |
| 2. Leaves white silky beneath.....                 | 3                      |
| 2. Leaves glabrescent beneath.....                 | <b>B. lanceolaria</b>  |
| 3. Heads few in axillary and terminal corymbs..... | <b>B. belangeriana</b> |
| 3. Heads in close spiciform cymes or panicles..... | <b>B. barbata</b>      |

**Blumea barbata** DC. in Wight, Contrib. 14. 1834; FBI 3: 262. 1881; FPM 687. 1921; Kumar, Fl. Ind. 13:119.1995.

Stiff herbs, 1 m high, stem reddish, hispid. Leaves to 7 x 3 mm, obovate-oblongate, obtuse, distantly serrate, glabrous above, fulvous-tomentose below, nearly sessile. Heads 7 x 6 mm, in terminal and axillary congested cymes; bracts 7 x 0.5 mm, linear-lanceolate, silky hairy. Flowers many; corolla 4 mm long, glabrous; bisexual corolla broader. Achenes 1 mm long, ribbed, hairy, brown.

*Fl. & Fr.* November-March

*Distr.* South India and Sri Lanka. Common in grasslands; *PS 19930* Karimala

**Blumea belangeriana** DC., Prodr. 5: 444. 1836; FBI 3: 266. 1881; FPM 686. 1921; FPL 249. 1990; FTSR 246. 1996; Kumar, Fl. Ind. 13:119.1995.

Stem reddish-brown, young shoots villous, mixed with gland-tipped hairs. Leaves sessile, elliptic or obovate, acute or obtuse, base attenuate, irregularly dentate, to 6.5 x 4.5 cm; lateral nerves 6-8 pairs. Heads 7 mm across, peduncles and phyllaries villous, mixed with gland-tipped hairs. Corolla yellow. Achenes ribbed, hairy along the ribs.

*Fl. & Fr.* October-December

*Distr.* India and Sri Lanka. Common in grasslands; *PS 19148* Karimala

**Blumea lanceolaria** (Roxb.) Druce, Bot. Soc. Exch. Club. Brit. Isles 4: 609. 1917; Kumar, Fl. Ind. 13:130.1995; FTSR 247. 1996. *Conyza lanceolaria* Roxb., Fl. Ind. 3: 432. 1832. *Blumea myriocephala* DC., Prodr. 5:445.1836; FBI 3:269.1881. *B. wallichii* Clarke, Comp. Ind. 87.1876.

Subshrubs, to 1.5 m tall. Leaves clustered towards the apex of branches, oblongate or lanceolate, acuminate, base attenuate, distantly serrate or subentire, glabrescent, to 18 x 4 cm; lateral nerves ca. 10 pairs. Heads 8 mm across, in large terminal pyramidal panicles; phyllaries pubescent. Receptacle pilose. Achenes ribbed, hairy.

*Fl. & Fr.* March-May

*Distr.* Indo-Malesia. Common in disturbed forest areas; *PS 30022* Karappara

**Blumea oxyodonta** DC. in Wight, Contrib. 15. 1834; FBI 3: 266. 1881; FPM 686. 1921; Kumar, Fl. Ind. 13:139.1995; FTSR 247. 1996.

Prostrate herbs; stem slender, radiating from the root stock, pubescent. Radical leaves 8 x 3 cm, oblongate, obtuse, dentate; cauline leaves sessile, smaller. Heads few, 8 mm long, globose, in terminal panicles; bracts densely tomentose; outer 3 x 0.3 mm, lanceolate; inner 6 x 0.3 mm, linear. Female flowers yellow, many; corolla 3 mm long, lobes glandular hairy. Bisexual flowers few; corolla 4 mm long, broad. Achenes 3 mm long, ribbed, pubescent.

*Fl. & Fr.* November-February

*Distr.* Indo-Malesia and South China. Very common in disturbed forest areas and reservoir beds; *PS 19065* Thunakkadavu

#### CHROMOLAENA A. P. de Candolle

**Chromolaena odorata** (L.) King & Robins., Phytologia 20: 204. 1970; FPL 250. 1990; FTSR 248. 1996. *Eupatorium odoratum* L., Syst. Nat. (ed. 10) 1205. 1759; FBI 3: 244. 1881.

Shrubs, glandular hairy. Leaves to 12 x 8 cm, ovate, acute at apex, cuneate at base, crenate, hispid; petiole 2-3 cm long, cylindrical-oblong. Heads to 10 mm long, in terminal corymbose cymes; bracts 3-5-seriate, to 8 mm long, ovate, obtuse; outer smaller, inner linear, acute, 3-ribbed. Flowers few to many, similar, bisexual; corolla 5 mm long, white, tubular, 5-lobed, pubescent at apex. Achenes 4 mm long, linear, 5-angled, scabrous, black; pappus many, 4-7 mm long, setaceous, yellowish.

*Fl. & Fr.* November-February

*Distr.* Native of America; naturalised in Tropical Asia. Very common weeds in the disturbed areas of all forests types; *PS 19041* Thunakkadavu

CISSAMPELOPSIS (A. P. de Candolle) Miquel

**Cissampelopsis corymbosa** (Wall. ex DC.) Jeffrey & Chen., Kew Bull. 39: 341. 1984; Mathur, Fl. Ind. 13:199.1995. *Senecio corymbosus* Wall. ex DC. in Wight, Contrib. 22. 1834; FBI 3: 351. 1881; FPM 723. 1921.

Large climbing shrubs; stem covered with fulvous-woolly hairs. Leaves 6-8 x 6-8 cm, broadly ovate, cordate at base, 5-7-ribbed, glabrous above, distantly serrulate; petiole 3-4 cm long. Heads 9 x 6 mm, in woolly panicles, axillary or terminal; bracts 1-seriate, 6 x 1.5 mm, oblong, with thick midrib, glabrous. Corolla 7 mm long; lobes acute, yellow; anthers tailed at base. Achenes oblong, glabrous, brown; pappus 7 mm long.

*Fl. & Fr.* March-November

*Distr.* India and Sri Lanka. Common in secondary forests; *PS 19180* Karimala

CONYZA Lessing

- 1. Leaves petiolate; capitula bright yellow ..... **C. stricta**
- 1. Leaves subsessile; capitula green ..... **C. bonariensis**

**Conyza bonariensis** (L.) Cronq., Bull. Torrey Bot. Club 70. 632. 1943; FPL 251. 1990; Hajra, Fl. Ind. 12:104.1995. *Erigeron bonariensis* L., Sp. Pl. 863. 1753. *E. linifolius* Willd., Sp. Pl. 3: 1955. 1803; FBI 3: 254. 1881. *Conyza ambigua* DC., Fl. Fr. 6: 468. 1815; FPM 683. 1921.

Stout erect herbs; stem ribbed, hispid. Leaves 8-20 x 1-3 cm, linear-elliptic to oblanceolate, distantly serrate, hispid; petiole 1-2 cm long. Panicle 30-60 cm long, oblong, leafy. Heads 7 x 2 mm, oblong, cylindrical; bracts oblong, obtuse, 4 x 0.5 mm, glabrous; outer bracts smaller, hispid; corolla of female flowers 3 mm long, slender. Bisexual flowers inner, few; corolla 4 mm long, widening upward. Achenes 1.5 mm long, biconvex, truncate, hairy, yellow; pappus 4 mm long, yellow.

*Fl. & Fr.* December-March

*Distr.* Originally from America; now Pantropical. Common in wet rocky areas; *PS 18954* Vengoli

**Conyza stricta** Willd., Sp. Pl. 3: 1922. 1803; FBI 3: 258. 1881; FPM 683. 1921; Hajra, Fl. Ind. 12:109.1995; FTSR 248. 1996.

Erect woody herbs; stem terete or ridged, pubescent. Leaves to 2-5 x 1 cm, oblanceolate to spatulate, obtuse, entire or serrate, pubescent. Heads 3 x 3 mm, in dense corymbose panicle; bracts lanceolate, acute, pubescent outside. Corolla similar, 2.5 mm long, bright yellow. Achenes 1 mm long, ribbed, hairy; pappus 3 mm long, yellow.

*Fl. & Fr.* Throughout the year

*Distr.* Indo-Malesia and Africa. Common in wet rocky areas; *PS 18953* Vengoli

CRASSOCEPHALUM Moench

**Crassocephalum crepidioides** (Benth.) S. Moore, J. Bot. 50: 211. 1912; FPL 251. 1990; Mathur, Fl. Ind. 13:201.1995; FTSR 248. 1996. *Gynura crepidioides* Benth in Hook., Niger Fl. 438. 1849. *Erechtites valerianifolia* sensu Fischer in Gamble, FPM 1882. 1936, non (Wolf.) DC. 1838.

Tall herbs. Leaves to 12 x 6 cm, lower ones lyrate pinnatifid, elliptic, oblanceolate, apex acute, dentate, sparsely pubescent; petiole to 3 cm. Racemes terminal; phyllaries 1-seriate, 8 mm, lanceolate. Calyculus free at base of the phyllaries, to 3 mm; flowers yellow, 9-10 mm long; ovary 2 mm, oblong, style 9 mm, bifid at apex. Achenes 4 mm, brown; pappus numerous, 8 mm long, white.

*Fl. & Fr.* December-April

*Distr.* India, Sri Lanka, China, Africa and Madagascar. Occasional in marshy areas of grasslands; *PS 19159* Karimala

DICHROCEPHALA L' Heritier ex A. P. de Candolle



**Dichrocephala integrifolia** (L. f.) O. Ktze., Rev. Gen. Pl. 333. 1891; FPL 251. 1990; Hajra, Fl. Ind. 12:114.1995; FTSR 249. 1996. *Hippia integrifolia* L. f., Suppl. Pl. 389. 1781. *Grangea latifolia* (Pers.) Lam., Encycl. t. 699. f. 1. 1796. *Dichrocephala latifolia* (Pers.) DC. in Wight, Contrib. 11. 1834; FBI 3: 245. 1881; FPM 679. 1921. *Cotula latifolia* Pers., Syn. 2: 464. 1805; FBI 3: 245. 1881. *Dichrocephala bicolor* (Roth) Schlecht in Linnaea 25: 209. 1952.

Diffuse herbs, hispid. Leaves alternate, to 4 x 3 cm, ovate, obtuse, irregularly lobed. Heads 3-4 mm across, globose, in terminal panicles; bracts 1-seriate, lanceolate, acute, ciliate. Flowers two types. Female flowers in several outer rows; corolla tubular, 2-4-toothed at apex, glabrous. Bisexual flowers few, central; corolla 4-lobed at apex, white; anthers 4, connate, included. Achenes 1 mm long, obovate, compressed, 4-ribbed, glabrous; pappus 4 deciduous bristles.

*Fl. & Fr.* October-February

*Distr.* Tropical and Subtropical Asia, Africa, Pacific Islands and Australia. Occasional in grasslands; *PS 19946* Karimala

#### ECLIPTA Linnaeus

**Eclipta prostrata** (L.) L., Mant. Pl. 286. 1771; Chowdhery, Fl. Ind. 12:381.1995; FTSR 249. 1996. *Verbesina prostrata* L., Sp. Pl. 902. 1753. *Eclipta alba* (L.) Hassk., Pl. Jav. Rar. 528. 1848; FBI 3: 304. 1881; FPM 705. 1921. *Verbesina alba* L., Sp. Pl. 902. 1753.

Erect or prostrate annual herbs, stem strigose. Leaves to 2 x 0.8 cm, alternate, entire, elliptic, acute at either ends, hispid. Heads 8 x 10 mm, depressed, conical, solitary, axillary, peduncled; bracts elliptic, acute, biseriate; receptacle covered with slender paleae. Female flowers usually in outer 2 rows; corolla slender; limb 2 mm long, 2-lobed, white. Bisexual flowers central, tubular; corolla slender, 4-5-toothed at apex; anthers obtuse at base. Achenes of outer flowers compressed, inner 3-angled, truncate, warted; pappus of 2 or 3 minute scales.

*Fl. & Fr.* Throughout the year

*Distr.* Pantropical. Rare in disturbed forest areas; *PS 19071* Thunakkadavu

#### ELEPHANTOPUS Linnaeus

**Elephantopus scaber** L., Sp. Pl. 814. 1753; FBI 3: 242. 1881; FPM 676. 1921; FPL 252. 1990; Uniyal, Fl. Ind. 13:333.1995; FTSR 249. 1996.

Stout perennial herbs. Leaves basal, rosetted, 10-15 x 4-5 cm, oblanceolate, obtuse at apex, decurrent along the petiole. Heads 5-6-flowered, 3-5 together, supported by cucullate spathes in lax cymes. Involucral bracts 10 x 2 mm, lanceolate, calycine. Flowers similar, bisexual; corolla tubular, 8-10 mm long, 5-lobed; pink. Achenes 4 mm long, obovoid, ribbed, hairy; pappus 6, bristle-like, scabrid, connate at base.

*Fl. & Fr.* October-March

*Distr.* Pantropical. Very common in moist deciduous and semi-evergreen forests, and degraded forest areas; *PS 19088* Padippara

#### EMILIA Cassini

1. Leaves crisped pubescent; stigma truncate ..... **E. scabra**
1. Leaves glabrescent; stigma acute ..... **E. sonchifolia**

**Emilia scabra** DC., Prodr. 6: 303. 1838; FPM 716. 1921; Mathur, Fl. Ind. 13:211.1995; FTSR 251. 1996. *E. sonchifolia* (L.) DC. var. *scabra* (DC.) Hook.f., FBI 3: 336. 1881.

Herbs, decumbent at base, crisped-pubescent. Leaves usually basal, few are cauline, 2.5-4 x 1-1.5 cm, oblong, entire or lyrate, crenate, base auricled, crispately pubescent. Heads few, 1.2-1.5 cm long; bracts 8 x 1 mm, oblong, herbaceous, acute, glabrous. Flowers many; corolla 7 mm long, glandular, pink, lobes acute. Achenes 3 mm long, ribbed, hispid along the angles.

*Fl. & Fr.* Throughout the year

*Distr.* India. Occasional on wet rocky areas; *PS 19145* Karimala

**Emilia sonchifolia** (L.) DC. in Wight, Contrib. 24. 1884; FBI 3: 336. 1881; FPM 716. 1921; FPL 252. 1990; Mathur, Fl. Ind. 13:212.1995; FTSR 251. 1996. *Cacalia sonchifolia* L., Sp. Pl. 835. 1753.

Herbs, to 30 cm high. Leaves 3-8 cm long, ovate-oblong, entire or lyrate, pinnatisect, crenate with large terminal lobe. Heads 1.2 cm long, few, on long terminal peduncles; bracts 7 mm long, oblong, with hyaline margins, acute; receptacle rugose. Flowers many; corolla 8 mm long; lobes oblong, glandular; anthers 1 mm long, entire at base. Achenes 2 mm long, tetragonal, hispid along the angles; pappus 13 mm long, white.

*Fl. & Fr.* Throughout the year

*Distr.* Tropical and Subtropical Africa and Asia. Occasional in wet rocky areas; *PS 19864* Vengoli

#### GNAPHALIUM Linnaeus

**Gnaphalium pulvinatum** Delile, Fl. Egypt. 266, t. 44. 1812; FBI 3: 289. 1881; FPM 698. 1921; Pant, Fl. Ind. 13:92.1995.

Prostrate branched woolly herbs, 10-25 cm long. Leaves to 4 x 0.6 cm, oblanceolate, acute at apex, narrowed at base into a petiole. Heads 3 x 3 mm, globose, in terminal leafy branched spikes; peduncle short or absent; bracts 2.5 x 0.5 mm, oblanceolate, acute, cottony hairy; outer bracts brown; inner bracts hyaline. Bisexual flowers 9-10, central; corolla 1.5 mm long, reddish. Female flowers numerous; corolla 1.5 mm long, lobes glandular. Achenes terete, brown.

*Fl. & Fr.* November-March

*Distr.* India, Pakistan, China, Egypt and Sinai. Common in degraded forest areas; *PS 30103* Parambikulam

#### GRANGEA Adanson

**Grangea maderaspatana** (L.) Poir. in Lam, Encycl. Suppl. 2: 825. 1812; FBI 3: 247. 1881; FPM 680. 1921; Hajra, Fl. Ind. 12:127.1995; FTSR 251. 1996. *Artemisia maderaspatana* L., Sp. Pl. 849. 1753.

Prostrate herbs, densely hispid. Leaves alternate, 2-3 x 1.5 cm, oblanceolate, irregularly pinnate-lobed, auricled at base, sessile. Heads 8 mm across, globose, axillary, solitary, pedunculate; bracts 2-3 seriate; 5 mm long, oblong, obtuse, hairy; receptacle convex, naked. Outer few rows of flowers female; corolla 2 mm long, slender, tubular, yellow. Inner flowers bisexual; corolla 2 mm long, campanulate, 5-lobed; anthers obtuse at base. Achenes obovate, compressed, hispid along margins; pappus a fimbriate crown.

*Fl. & Fr.* December-April

*Distr.* Indo-Malesia and Africa. Common in reservoir beds; *PS 30419* Parambikulam

#### GYNURA Cassini

**Gynura nitida** DC. in Wight, Contrib. 24. 1834; FBI 3: 333. 1881; FPM 714. 1921; FPL 253. 1990; Mathur, Fl. Ind. 13:221.1995; FTSR 251. 1996.

Stout herbs; stem furrowed, glabrous. Leaves basal and cauline, similar, 10-15 x 3-4 cm, oblanceolate, entire, obtusely acute at apex, narrowed and amplexicaule at base. Heads 16 x 12 mm, cylindrical, 10-20 together, in paniced cymes; bracts 10 x 2 mm, lanceolate, acute; receptacle rugose. Flowers not all fertile; corolla 10 mm long, lobes obtuse, glandular. Achenes 3.5 x 1 mm, ellipsoid, 11-ribbed, truncate, black; pappus 14 mm long, white.

*Fl. & Fr.* August-January

*Distr.* Endemic to Peninsular India. Occasional in grasslands; *PS 30512* Karimala

#### LAGASCEA Cavanilles

**Lagascea mollis** Cav., Ann. Sci. Nat. 6: 331. t. 44. 1803, "Lagasca"; FBI 3: 302. 1881; FPM 703. 1921; FPL 254. 1990; Chowdhery, Fl. Ind. 12:397.1995.

Herbs, pubescent. Leaves to 5 x 2 cm, ovate-lanceolate, opposite or alternate, acuminate, base acute, pubescent; petiole to 2 cm. Head terminal, 1.5 cm, across, pubescent, subtended by bracts, phyllaries 4 or 5, to 5 mm, linear-lanceolate, acuminate, connate below; florets bisexual, white; corolla 4 mm, tubular campanulate, lobes 5, ovate; ovary 2.5 mm, oblong, pubescent above; style ca 7 mm, bifid; stigma pubescent. Achenes compressed.

*Fl. & Fr.* April-November

*Distr.* Pantropical. Common in moist deciduous forests; *PS 19556* Padippara

#### LAGGERA C. H. Schultz-B.p. ex K.H. E. Koch

**Laggera crispata** (Vahl) Hepper & Wood in Kew Bull. 38: 83. 1983; Kumar, Fl. Ind. 13: 151. 1995. *Conyza crispata* Vahl, Symb. Bot. 1: 71. 1790. *Laggera pterodonta* (DC.) Sch.-Bip. ex Oliver in Trans. Linn. Soc. London 29: 94. 1873; Hook. f. FBI 3: 271. 1881; FPM 689. 1921.

Tall herbs, pubescent, branchlets winged, interrupted. Leaves to 8 x 2.5 cm, oblanceolate, apex acute, serrate, membranous, puberulus, subsessile. Capitula in panicles; phyllaries many-seriate, unequal, inner longer, to 9 mm, lanceolate; bisexual florets 5 mm; ovary 0.5 mm, pubescent. Achenes 1 mm, black, puberulus.

*Fl. & Fr.* December-April

*Distr.* Africa, Sri Lanka, India Himalaya, China Thailand Indo China. Common in open areas of moist deciduous forests; *PS 30804* Keerappadi

#### MIKANIA Willdenow

**Mikania micrantha** Kunth in HBK, Nov. Gen. Sp. 4: 134. 1820; Uniyal, Fl. Ind. 12:357.1995. *M. scandens* Clarke, Comp. Ind. 34. 1876, non L.; FBI 3: 144. 1881. *M. cordata* (Burm. f.) Robins., Contrib. Gray Herb. 104: 65. 1934; Nair, Rubb. Board.f. Bull. 9: 28-29. 1967. *Eupatorium cordatum* Burm. f., Fl. Ind. 176. t. 58. 1768.

Climbers; stem glandular-hispid. Leaves opposite, to 8 x 6 cm, ovate, acute at apex, cordate at base, crenate, glabrate; petiole 2-4 cm long. Heads 5 mm long, in axillary panicles; bracts biseriolate, outer 2 smaller, inner 3-5, 4 x 1.5 mm, ovate, obtuse. Flowers 3-5, similar, bisexual; corolla 3 mm long, tubular, lobes 5, glandular, white; anthers linear. Achenes 2 mm long, 5-ribbed, black, glabrous; pappus 4 mm long, many, hispid.

*Fl. & Fr.* November-February

*Distr.* Pantropical. A fast growing weed in the plantations and secondary forests; *PS 19019* Thunakkadavu

#### PARTHENIUM Linnaeus

**Parthenium hysterophorus** L., Sp. Pl. 988. 1753; FPL 259. 1990; Chowdhery, Fl. Ind. 12:403.1995.

Erect herbs. Leaves alternate, deeply pinnatisect, lobes to 10 x 1 cm, oblong-lanceolate, entire, acute at apex, pubescent, base decurrent. Heads in terminal, lax panicles; bracts 2-seriate, to 3 x 1.5 mm, ovate, obtuse, ciliate. Florets dissimilar; outer florets 5, rayed, female; corolla ligulate; limb short, entire; inner florets male; corolla tubular, white; anthers obtuse at base. Achenes 2 x 1.5 mm; pappus absent or with two short hooks.

*Fl. & Fr.* August-February

*Distr.* Native of America; now naturalised in India. Fairly common in degraded forest areas; *PS 19294* Karimala

#### PHYLLOCEPHALUM Blume

**Phyllocephalum scabridum** (DC.) Kirkman, Rhodora 83: 10. 1981; Uniyal, Fl. Ind. 13:344.1995; FTSR 252. 1996. *D. scabridum* DC. in Wight, Contrib. 7. 1834. *Centratherum molle* (DC.) Benth. in Benth. & Hook. f., Gen. Pl. 2: 225. 1873; FBI 3: 227. 1881; FPM 666. 1921. *C. courtallense* (Wight) Benth. ex Hook.f., FBI 3: 227. 1881. *Decaneurum molle* DC., Prodr. 5: 67. 1836. *Phyllocephalum courtallense* (Wight) Narayana, Curr. Sci. 51: 438. 1982.

Fleshy herbs. Leaves 15 x 6.5 cm, elliptic, acuminate at both ends, thinly scabrid above, deeply serrate. Peduncles 1.5 cm long, tomentose. Heads 1.3 x 1 cm, few; inner bracts 9 x 2 mm; outer bracts 8 x 4 mm, white-tomentose, ciliate along the margins. Flowers 12-15; corolla 8 mm long; lobes oblong, glabrous. Achenes 1.5 mm long; pappus few, 2.5 mm long.

*Fl. & Fr.* November-February

*Distr.* Endemic to Western Ghats. Occasional in grasslands; *PS 19740* Pezha; *NS 19281* Karimala

#### SPILANTHES N. J. Jacquin

***Spilanthes paniculata*** Wall. ex DC., Prodr. 5: 625. 1836; Chowdhery, Fl. Ind. 12:410.1995; FTSR 254.1996. *S. acmella* var. *paniculata* (DC.) Clarke, Comp. Ind. 139.1876; FBI 3:307. 1881.

Procumbent herbs, stem scabrid. Leaves to 4 x 2.5 cm, ovate, acute, scabrous above and below; petiole 1 cm long. Heads 10 x 7 mm, solitary, conical; peduncles to 10 cm long, bracts 4 x 2 mm, ovate, obtuse, glandular; receptacle spicate, paleaceous. Flowers similar; corolla tubular, 2.5 mm long, campanulate above; lobes 0.5 mm long, ovate, acute, glabrous; anthers black. Achenes 2 x 1 mm, obovate, biconvex, dark brown, glandular.

*Fl. & Fr.* October-January

*Distr.* Indo-Malesia, America and New Guinea. Common in degraded forest areas; *PS 19009* Thunakkadavu

#### SYNEDRELLA J. Gaertner.

***Synedrella nodiflora*** (L.) Gaertn., Fruct. 2: 456. t. 171. 1791; FBI 3: 308. 1881; FPM 708. 1921; FPL 256. 1990; Chowdhery, Fl. Ind. 12:413.1995; FTSR 254. 1996. *Verbesina nodiflora* L., Cent. Pl. 1: 28. 1755 & Ameen. Acad. 4: 290. 1759.

Subshrubs. Leaves opposite, to 8 x 5 cm, ovate, acute, membranous, serrulate; nerves 2-pairs; petiole 1-3 cm long. Heads 1-3 together, axillary, sessile; bracts biseriate, 4-6 mm long, lanceolate, acute, hyaline, coriaceous. Flowers yellow, dissimilar. Female flowers few, peripheral, ligulate; corolla limb 1 mm long, 4-lobed at apex. Bisexual flowers central, few; corolla 4 mm long, tube narrow, lobes 5, oblong; anthers linear, sagittate at base. Achenes compressed, shortly winged; of bisexual florets trigonous.

*Fl. & Fr.* October-February

*Distr.* Native of West Indies; naturalised in India, China, Malesia and Polynesia. Very common in moist deciduous forests and plantations; *PS 19010* Thunakkadavu

#### TITHONIA Desfontaines ex A. L. Jussieu

***Tithonia diversifolia*** (Hemsl.) A. Gray, Proc. Amer. Acad. Sci. 19: 5. 1883; Chowdhery, Fl. Ind. 12:416.1995. *Mirasolia diversifolia* Hemsl. Biol. Contrib. Amer. 2: 168. t. 47. 1881.

Shrubs. Leaves alternate, 10-25 cm long, 3-5 lobed; lobes acute to acuminate, crenulate, decurrent at base, tomentose below. Heads 8-12 cm across, solitary, axillary, on long hollow peduncle; bracts 4-seriate, outer smaller, obtuse, puberulus; inner 10-14 mm long, oblong, obtuse. Flowers 2-types; outer female, ligulate; limb 3-5 x 1.5 cm, oblong, entire or 2-toothed, yellow. Inner flowers tubular, bisexual; corolla 8-10 mm long, 5-lobed, yellow; anthers erect, base obtuse, black. Achenes 6 mm long, dark brown, hairy; pappus of two bristles.

*Fl. & Fr.* October-March

*Distr.* Cosmopolitan. Planted in settlement areas; *PS 19032* Kannimara

#### TRIDAX Linnaeus

***Tridax procumbens*** L., Sp. Pl. 900. 1753; FBI 3: 311. 1881; FPM 711. 1921; FPL 256. 1990; Chowdhery, Fl. Ind. 12:418.1995; FTSR 255. 1996.

Procumbent herbs. Leaves 3-6 x 1.5-3 cm, ovate, acute, serrate, bulbous-based hairy; petiole 5-10 mm long. Heads 1.3 x 1.5 cm, solitary, on long peduncles; bracts in 3-series, lanceolate,

hairy. Outer row of flowers ligulate, female, limb 3 x 2 mm, 3-toothed, white; inner flowers bisexual, tubular; corolla 6 mm long, 5-lobed at apex, yellow. Achenes 2 mm long, obovoid, densely hairy; pappus many, setaceous.

*Fl. & Fr.* Throughout the year

*Distr.* Native of Tropical America; now widespread throughout tropics and subtropics. *PS 19066* Thunakkadavu

#### VERNONIA Schreber

1. Trees ..... **V. arborea**
1. Herbs or shrubs ..... 2
2. Achenes ribbed ..... **V. divergens**
2. Achenes not ribbed ..... 3
3. Leaves obtuse, densely tomentose ..... **V. albicans**
3. Leaves acute, glabrous or thinly pubescent ..... **V. cinerea**

**Vernonia albicans** DC. in Wight, Contrib. 6. 1834; FPM 676. 1921; Uniyal, Fl. Ind. 13:351.1995. *V. cinerea* sensu Hook.f., FBI 3: 233. 1881, p. p. non Less. 1829.

Shrubs. Leaves to 5 x 4 cm, broadly ovate, rounded or cordate at base, crenate. Heads 12 x 7 mm, in large terminal panicle, peduncled; bracts 5 mm long, elliptic, acute, tomentose outside; corolla 5 mm long, 5-toothed at apex, glabrous; anthers 1.5 mm long. Achenes 2 mm long, densely adpressed hairy; outer pappus paleaceous, fimbriate; inner pappus 4 mm long, white.

*Fl. & Fr.* July-December

*Distr.* Endemic to Western Ghats. Common in degraded forest areas; *PS 18963* Vengoli

**Vernonia arborea** Buch.-Ham., Trans. Linn. Soc. London 14: 218. 1824; FBI 3: 239. 1881; FPL 257. 1990; Uniyal, Fl. Ind. 13:359.1995; FTSR 256. 1996. *Monosis wightiana* DC. in Wight, Contrib. 1. 1834 & Ic. t. 1085. 1846. *Vernonia monosis* Benth. ex Clarke, Comp. Ind. 24. 1876, non Schultz.-Bip., 1847; FPM 672. 1921.

Trees; branchlets brown silky hairy. Leaves 15-17 x 7-10 mm, obovate, abruptly acuminate, densely pubescent, nerves 10-12 pairs, regular, prominent; petioles 1-2 cm long, stout. Panicle 25 x 20 cm, terminal, densely pubescent. Heads many, 10 x 2 mm; bracts similar, 4 x 2 mm, ovate, obtuse, inner bracts acute, pubescent. Flower solitary; corolla 9 mm long, glabrous; lobes acute. Achenes 4 mm long, 10-ribbed, hairy between the ribs; pappus similar, setaceous.

*Fl. & Fr.* February-March

*Distr.* Indo-Malesia. Common in semi-evergreen and evergreen forests; *PS 19169* Karimala

**Vernonia cinerea** (L.) Less., Linnaea 4: 291. 1829; FBI 3: 233. 1881; FPM 676. 1921; FPL 257. 1990; Uniyal, Fl. Ind. 13:367.1995; FTSR 256. 1996. *Conyza cinerea* L., Sp. Pl. 862. 1753.

Annuals or perennial herbs; stem ribbed, smooth or puberulus. Leaves variable, 2-8 x 1-3 cm, ovate, acute at apex and base, thinly hairy below; petiole 1-2 cm long, slender. Heads 5 x 3 mm, in terminal corymbose cymes, peduncled; outer bracts minute, inner oblong, acute, cuspidate, hairy. Flowers 5-10, similar; corolla 3 mm long, glabrous. Achenes 1.5 mm long, hairy; outer pappus 1 mm long, setaceous, inner 3 mm long.

*Fl. & Fr.* Throughout the year

*Distr.* Pantropical. Common in degraded forest areas and moist deciduous forests; *PS 19023* Thunakkadavu

**Vernonia divergens** (Roxb.) Edgew., J. Asiat. Soc. Bengal 21: 172. 1853; FBI 3: 234. 1881; FPM 673. 1921; FPL 258. 1990; Uniyal, Fl. Ind. 13:370.1995; FTSR 256. 1996. *Eupatorium divergens* Roxb., Fl. Ind. 3: 414. 1832.

Erect shrubs; stem reddish, grey-tomentose. Leaves to 10 x 5 cm, elliptic, acute at both ends, serrate, scabrous above, pubescent beneath; nerves 6-8 pairs, regular; petiole 1-2 cm long.

Heads 6 x 4 mm, globose; bracts oblong, acute, grey tomentose. Flowers few, corolla 12 mm long, glabrous. Achenes 2 mm long, glandular; pappus all setaceous, brown.

*Fl. & Fr.* December-March

*Distr.* Indo-Malesia. Common in degraded forest areas; *PS 19147* Karimala; *NS 18872* Orukomban

#### VICOA Cassini

**Vicoa indica** (L.) DC. in Wight, Contrib. 10. 1834; FPM 701. 1921; FTSR 256. 1996. *Inula indica* L., Sp. Pl. ed. 2, 2: 1237. 1763. *Vicoa auriculata* Cass., Ann. Sci. Nat. Ser. 1, 17: 418. 1829; FBI 3: 297. 1881.

Erect herbs. Leaves 6 x 1-2 cm, elliptic, acute at apex, amplexicaule and auricled at base. Heads 10-12 x 0.8 cm, depressed-globose, solitary, usually on lateral small branches; bracts many, linear, acuminate. Flowers outer ligulate, female; inner bisexual, tubular; corolla linear-oblong, yellow; anthers sagittate at base. Achenes 1 mm long, cylindrical, hairy; pappus of 10-12 bristles, 3 mm long, setaceous.

*Fl. & Fr.* December-March

*Distr.* Indo-China and Tropical Africa. Occasional in moist deciduous forests; *PS 30829* Keerappadi

#### XANTHIUM Linnaeus

**Xanthium indicum** Koen. in Roxb., Fl. Ind. 3: 601. 1832; Chowdhery, Fl. Ind. 12:427.1995; FTSR 256. 1996. *X. strumarium* L., Sp. Pl. 987. 1753, p. p; FBI 3: 303. 1881; FPM 703. 1921.

Stiff erect herbs; stem terete, scabrid. Leaves 8-15 x 9-10 cm, broadly ovate, shallowly lobed, cordate at base, 3-veined from the base, scabrous; petiole 8-10 cm long. Heads axillary; bisexual heads in upper axils and sterile female heads in lower axils; bracts few, free in bisexual heads, united into a two horned utricle in female heads, covered with hooks; corolla absent in female flowers, tubular in bisexual flowers; anthers free, filaments connate; bases obtuse. Achenes 1.5 x 0.7 cm, paired on each head, enclosed in a 2-beaked utricle; pappus absent.

*Fl. & Fr.* Throughout the year

*Distr.* Indo-Malesia. Occasional in the openings of dry deciduous forests; *PS 19978* Keerappadi

#### CAMPANULACEAE

- 1. Stigma bifid; corolla zygomorphic.....**Lobelia**
- 1. Stigma trifid; corolla actinomorphic.....**Wahlenbergia**

#### LOBELIA Linnaeus

- 1. Tall erect herbs; stem terete..... 2
- 1. Small decumbent herbs; stem angled or winged..... 3
- 2. Leaves softly villous; racemes dense, un-branching ..... **L. leschenaultiana**
- 2. Leaves glabrescent; racemes lax, branching..... **L. nicotianifolia** var. **trichandra**
- 3. All anthers penicillate at tip; seeds trigonous ..... **L. alsinoides**
- 3. Two anthers only penicillate at tip; seeds not trigonous ..... 4
- 4. Flowers axillary solitary; leaves ovate or elliptic ..... **L. heyneana**
- 4. Flowers in terminal short racemes; leaves oblong or rhomboid..... **L. dichotoma**

**Lobelia alsinoides** Lam., Encycl. 3: 588. 1792; Haridasan & Mukherjee, Fasc. Fl. Ind. 19: 42. 1988; FPL 260. 1990; FTSR 257. 1996. *L. trigona* Roxb., Fl. Ind. 2: 111. 1824; FBI 3: 423. 1881; FPM 736. 1921.

Decumbent herbs, rooting from lower nodes; stem 3-winged. Leaves 1-2 x 1-1.5 cm, ovate-orbicular, crenate, obtuse, petiolate; petiole 3 mm broad; upper leaves sessile, elliptic, acute,

smaller. Flowers in terminal raceme; sepals 5 mm long, lanceolate; corolla blue, 10 mm long, upper 3 lobes obovate, lower 2 lobes narrower. Capsule 6 mm long, glabrous; seeds trigonous, brown.

*Fl. & Fr.* Throughout the year

*Distr.* Indo-Malesia. Common in marshy areas; *PS 19877* Velayudhankai; *NS 19070* Thunakkadavu

**Lobelia dichotoma** Miq., *Fl. Ind. Bat.* 2: 576. 1856; Haridasan & Mukherjee, *Fasc. Fl. Ind.* 19: 47. 1988. *L. zeylanica* Clarke in Hook.f., *FBI* 3: 425. 1881, incl. var. *walkeri*, p.p.; *FPM* 736. 1921.

Diffuse herbs, to 20 cm high; stem 3-winged, glabrous. Leaves obovate, obtuse or acute, base narrowly winged on the petiole, crenate-serrate; nerves 4 pairs; upper leaves sessile. Flowers in terminal, short raceme; sepals 4.5 x 1 mm, lanceolate, glabrous; corolla blue, 10 mm long, ventral lobe broader; lateral and dorsal lobes lanceolate; anthers 2.5 mm long, 2 anthers with penicillate black hairs at apex; style stout, curved; stigma with a ring of hairs below.

*Fl. & Fr.* Throughout the year

*Distr.* Indo-Malesia. Common in marshy areas; *PS 30645* Kariamchola

**Lobelia heyneana** Schult. in Roem. & Schult., *Syst. Veg.* 5: 50. 1819; Haridasan & Mukherjee, *Fasc. Fl. Ind.* 19: 51. 1988; *FTSR* 257. 1996. *L. trialata* Buch.-Ham. ex D. Don, *Prodr. Fl. Nepal* 157. 1825; *FBI* 3: 425. 1881, incl. var. *lamifolia*; *FPM* 736. 1921. *L. zeylanica* sensu Hook.f., *FBI* 3: 425. 1881, p.p., non L. 1753; *FPM* 736. 1921.

Erect or decumbent herbs, rooting at lower nodes; stem triangular, winged. Leaves ovate, acute, serrate; petioles 2-3 mm long. Flowers axillary, solitary; pedicel 7 mm long, slender, glabrous; calyx lobes 2 mm long, subulate; corolla 3-4 mm long, blue; two anthers with penicillate black hairs at apex. Capsule 2.5 mm long, obconical, truncate; seeds biconvex, ovoid, glabrous, brown.

*Fl. & Fr.* July-December

*Distr.* Indo-Malesia, China and Africa. Rare in grasslands; *PS 19945* Karimala

**Lobelia leschenaultiana** (Presl) Skottsb., *Acta Horti Gothob.* 4: 4. ff. 3-7. 1928; Haridasan & Mukherjee, *Fasc. Fl. Ind.* 19: 52. 1988; *FPL* 260. 1990. *Rapuntium leschenaultianum* Presl, *Prodr. Monogr. Lobel.* 24. 1836. *Lobelia excelsa* Lesch. ex Wall. in Roxb., *Fl. Ind.* 2: 114. 1824; *FBI* 3: 427. 1881; *FPM* 737. 1921. *L. beddomeana* Wimmer in Engl., *Pflanzenr.* 2: 645. 1953.

Stout erect shrubs, usually unbranched. Leaves 15-25 x 3-6 cm, linear-elliptic, densely pubescent below, shortly and broadly petiolate. Racemes terminal, 25-60 cm long; bracts 2.5 cm long, linear, pubescent; flowers numerous, densely packed; pedicel pubescent; bracts 2.5 cm long, linear; sepals 14 x 2 mm, linear, acuminate, serrate, pubescent; corolla pale pink, 25 mm long, lobes linear; staminal tube narrow, 2.5 cm long, anthers 7 mm long, all glabrous. Capsule 8 x 8 mm, depressed globose, scabrid; seeds biconvex, brown.

*Fl. & Fr.* December-April

*Distr.* India and Sri Lanka. Rare in grasslands; *PS 30111* Karimala

**Lobelia nicotianifolia** Roth ex Roem. & Schult. var. **trichandra** (Wight) Clarke in Hook.f., *FBI* 3: 427. 1881; *FPM* 737. 1921; *FPL* 260. 1990. *L. trichandra* Wight,  *Ic. t.* 1171. 1848.

Herbs. Leaves 5-20 x 3-7 cm, elliptic-lanceolate, puberulent below, crenate. Racemes large, to 20 cm, terminal or axillary, glabrescent, sepals to 10 mm long, elliptic, corolla to 2.5 cm, ventral lobe ovate, white with violet tinge; anthers with white spreading hairs on back. Capsule to 10 mm across, globose.

*Fl. & Fr.* February-May

*Distr.* India and Sri Lanka. Rare in grasslands; *PS 30228* Karimala

WAHLENBERGIA H. A. Schrader ex A. W. Roth

**Wahlenbergia erecta** (Roth ex Schult.) Tuyn in Steenis, Fl. Males. I, 6: 113. 1960; FPL 261. 1990; FTSR 258. 1996. *Dentella erecta* Roth ex Schult. in Roem. & Schult., Syst. Veg. 5: 25. 1819. *Cephalostigma schimperii* Hochst. ex Rich., Tent. Fl. Abyss. 2: 2. 1851; FBI 3: 428. 1881; FPM 738. 1921.

Small herbs, hirsute. Leaves to 3 x 0.8 cm, oblong, lanceolate, apex acute, puberulus, sessile. Flowers solitary, axillary and terminal; pedicels filiform; calyx lobes 3 mm long, lanceolate, hirsute, persistent; corolla deeply 5-lobed, lobes 3 mm long, oblong, blue; ovary 2-3-celled, style dilated, 2 mm. Capsule 4 x 3 mm, hirsute, tip pointed; seeds many, oblong.

*Fl. & Fr.* December-February

*Distr.* Indo-Malesia and Tropical East Africa. Rare in grasslands; *PS 19950* Karimala

PLUMBAGINACEAE

PLUMBAGO Linnaeus

**Plumbago zeylanica** L., Sp. Pl. 151. 1753; FBI 3: 480. 1882; FPM 744. 1921; FPL 262. 1990.

Subscandent subshrubs; stem striate. Leaves alternate, to 6 x 4 cm, ovate, acute at apex, cuneate at base; petiole 1-2 cm long, sheathing at base. Flowers white, in terminal racemes; bracts broadly ovate, bracteoles smaller; calyx 11 mm long, tubular, 5-ribbed, lobes small, obtuse, glandular hairy; corolla tube 2.5 cm long, slender, lobes 5, obovate, spreading; stamens 5, included, filaments adnate at the base of corolla tube; ovary 1-celled, ellipsoid; ovules solitary, pendulous, style 1, 5-fid at apex. Capsule 2 mm long, circumscissile at base, glandular hairy.

*Fl. & Fr.* August-December

*Distr.* Pantropical. Occasional in moist deciduous forests; *PS 19008* Thunakkadavu

MYRSINACEAE

- 1. Climbing or scandent shrubs ..... **Embelia**
- 1. Erect shrubs or small tree ..... 2
- 2. Flowers densely clustered in fascicles ..... **Rapanea**
- 2. Flowers in panicles, umbels or racemes ..... 3
- 3. Flowers in umbels or racemes; corolla pink ..... **Ardisia**
- 3. Flowers in terminal and axillary short panicles; corolla white ..... **Maesa**

ARDISIA O. Swartz

- 1. Flowers in paniculate umbels; leaves margin crenulate ..... **A. sonchifolia**
- 1. Flowers in racemes; leaves margin entire ..... 2
- 2. Leaves lanceolate; flowers to 1 cm across ..... **A. pauciflora**
- 2. Leaves obovate or oblanceolate; flowers more than 2 cm across ..... **A. solanacea**

**Ardisia pauciflora** Heyne ex Roxb., Fl. Ind. 2: 279. 1824; FBI 3: 529. 1882; FPM 755. 1928; FPL 263. 1990; FTSR 259. 1996.

Shrubs, branchlets radiate, densely punctuate with red glands. Leaves elliptic, acuminate at both ends, densely punctuate with black glands below; nerves indistinct; petiole 5 mm long. Racemes umbellate, axillary; peduncles to 1.5 cm long. Flowers few-together; pedicels short; sepals ovate, acute, hairy, punctate; corolla lobes 2.5 mm long, ovate, acute, reddish brown, glabrous; anthers apiculate. Berry 6 mm across, globose, black, smooth.

*Fl. & Fr.* August-January

*Distr.* South India and Sri Lanka. Common in evergreen forests; *PS 19177* Karimala; *19444*, *19463* Pooppara; *19516* Orukomban



**Ardisia solanacea** Roxb., Pl. Corom. t. 27. 1795 & Fl. Ind. 1: 580. 1832; FPM 756. 1921; FPL 263. 1990; FTSR 259. 1996. *A. humilis* sensu Wight, Ic.t.1212. 1848, non Vahl. 1794; FBI 3: 529. 1882.

Shrubs to small trees. Leaves broadly lanceolate or obovate, acuminate, base cuneate, coriaceous, punctate, to 18 x 6 cm; lateral nerves 15-20 pairs, slender; petiole to 1 cm long. Peduncles axillary, to 5 cm long; bracts concave, 1.5-2 mm long, deciduous. Calyx lobes broadly ovate, obtuse, 3 mm long. Corolla pink, punctate. Berry globose, 8 mm across.

*Fl. & Fr.* March-August

*Distr.* Indo-Malesia and West China. Rare in the sides of streams; *PS 19402* Padippara

**Ardisia sonchifolia** Mez in Engl., Pflanzenr. 9: 116. 1902; FPM 755. 1921; FTSR 259. 1996. *A. villosa* Roxb. var. *obtusata* Clarke in Hook.f., FBI 3: 525. 1882.

Shrubs; branchlets gland-dotted. Leaves 10-22 x 4-6 cm, oblanceolate, acute to acuminate at apex, attenuate and auricled at base, entire; nerves ca. 16 pairs, strongly punctate along the margins; petiole 5 mm long. Umbels terminal, 5 x 5 cm, tomentose, peduncled; pedicels 5-6 mm long, rusty-tomentose. Flowers 5-15 in an umbel, pale pink; sepals 3 x 1.5 mm, ovate, acute, hairy; corolla lobes 4 mm long, ovate, acute, punctate.

*Fl. & Fr.* February-May

*Distr.* Endemic to Southern Western Ghats. Fairly common in evergreen forests; *PS 19452* Valiyathode

#### EMBELIA N. L. Burman

1. Leaf margins entire; flowers in large terminal panicles..... **E. ribes**  
1. Leaf margins serrulate; flowers in short axillary racemes..... **E. tsjeriam-cottam**

**Embelia ribes** Burm. f., Fl. Ind. 62. t.23. 1768; FBI 3: 513. 1882; FPM 752. 1921; FPL 264. 1990; FTSR 263. 1996. *Embelia glandulifera* Wight, Ic. t. 1207. 1948.

Climbers; branchlets slender, white, without lenticellate. Leaves to 7 x 3 cm, elliptic, acute at both ends; nerves many, parallel, faint; petiole 1 cm long. Panicles 15 x 15 cm, glabrous, branches long, slender racemose; pedicels 1.5 cm long. Flowers white, many; sepals small, triangular, tomentose; petals 2 mm long, ovate, acute, densely tomentose. Berry 2.5 mm across, globose.

*Fl. & Fr.* January-May

*Distr.* Indo-Malesia and South China. Rare along the margins of semi-evergreen forests; *PS 30264* Orukomban

**Embelia tsjeriam-cottam** (Roem. & Schult.) DC., Trans. Linn. Soc. London 17: 131. 1834; FPM 753. 1921; FTSR 263. 1996. *Ardisia tsjeriam-cottam* Roem. & Schult., Syst. Veg. 4: 518. 1819. *Embelia villosa* Wall. ex Roxb., Fl. Ind. 2: 289. 1824; FPM 753. 1921. *E. robusta* sensu Clarke in Hook.f., FBI 3: 515. 1882, non Roxb. 1832.

Scandent deciduous shrubs with short spinescent branches. Leaves elliptic, acuminate, base acute, margin serrulate, glabrous, to 9 x 4.5 cm; lateral nerves and reticulations prominent, impressed above and raised below; petiole to 1 cm long. Flowers appear along with leaves; racemes glabrous. Calyx lobes ovate-acuminate. Petals yellow with a thick callous at base inside. Anthers with red gland at the back.

*Fl. & Fr.* February-March

*Distr.* India and Myanmar. Common in moist deciduous forests; *PS 30659* Padippara

#### MAESA Forsskal

**Maesa indica** (Roxb.) DC., Trans. Linn. Soc. London 17: 134. 1834; FPL 264. 1990; FTSR 263. 1996. *Baeobotrys indica* Roxb., Fl. Ind. 2: 230. 1824. *Maesa dubia* (Wall.) DC., Trans. Linn. Soc.

London 17: 134. 1834; FBI 3: 510. 1882; FPM 749. 1921. *M. perrottetiana* A. DC. in DC., Prodr. 8: 80. 1844; FPM 749. 1921. *M. indica* (Roxb.) DC. var. *perrottetiana* (A. DC.) Clarke in Hook.f., FBI 3: 509. 1882.

Large shrubs; branchlets glandular. Leaves 10-15 x 4-8 cm, ovate, acute at apex, rounded and cuneate at base, serrate, glandular, membranous, with many glandular lines; nerves 10 pairs, regular; petiole 1.5-3 cm long. Flowers in axillary, 3-6 cm long racemes; pedicels 2 mm long; bracteoles 2, opposite, inserted, below the calyx; calyx, lobes 5, orbicular, 0.5 mm long; corolla white, 4 mm across, lobes obovate; stamens 5; anthers orbicular; ovary 1-celled, ovules many, immersed in globose placenta, stigma capitate. Berry 4 mm across; seeds few, angular, black.

*Fl. & Fr.* Throughout the year

*Distr.* Indo-Malesia and Pakistan. Common in evergreen and secondary forests. *PS 30716* Vengoli

#### RAPANEA Aublet

**Rapanea daphnoides** Mez in Engl., Pflanzenr. 9: 357. 1902; FPM 751. 1921.

Shrubs, branchlets slender, rough with persistent leafscars. Leaves to 7 x 1.5 cm, linear-lanceolate, obtuse at apex, glabrous, subcoriaceous; petiole 5-10 mm long. Flowers densely fascicled; sepals 1 mm long, ovate, glandulose; corolla 3 mm long, densely papillose, glandular lineolate. Berry 5 mm across, globose, densely covered with glands.

*Fl. & Fr.* February-May

*Distr.* Endemic to Southern Western Ghats. Rare in evergreen forests at higher altitudes; *PS 30114, 30136* Karimala

#### SAPOTACEAE

- |   |                      |
|---|----------------------|
| 1. Corolla lobes 18-24 .....  | <b>Mimusops</b>      |
| 1. Corolla lobes to 12 .....  | 2                    |
| 2. Older branches thorny; staminodes present .....                        | <b>Xantolis</b>      |
| 2. Branches unarmed; staminodes absent .....                              | 3                    |
| 3. Tender shoots brown tomentose; lateral nerves close and parallel ..... | <b>Chrysophyllum</b> |
| 3. Tender shoots otherwise; lateral nerves distant .....                  | 4                    |
| 4. Calyx lobes 6 .....  | <b>Palaquium</b>     |
| 4. Calyx lobes 4 .....  | 5                    |
| 5. Stamens more than 16; ovary 6-8 celled .....                           | <b>Madhuca</b>       |
| 5. Stamens 8; ovary 4-celled .....  | <b>Isonandra</b>     |

#### CHRYSOPHYLLUM Linnaeus

**Chrysophyllum roxburghii** G. Don, Gen. Syst. 4: 33. 1838; FBI 3: 535. 1882; FPL 265. 1990; FTSR 264. 1996. *Donella roxburghii* (Don) Pierre ex Lecomte, Fl. Indo-China 3: 897. 1930. *Chrysophyllum lanceolatum* (Blume) DC., Prodr. 8: 162. 1844. *Nycterisition lanceolatum* Blume, Bijdr. 676. 1826.

Large trees; branchlets slender, rusty tomentose. Leaves to 15 x 5 cm, oblong, abruptly acuminate at base and apex, glabrous, nerves many, closely placed, parallel, forming an intramarginal vein; petiole 5 mm long. Flowers in axillary fascicles; pedicel 5 mm long, slender; sepals 2.5 x 2 mm, ovate, obtuse; corolla white, 3 mm long, lobed to the middle; lobes obtuse, glabrous, white; stamens 5, filaments 1 mm long, anthers acute, sagittate at base; ovary globose, densely hairy; style conical. Berry 4-5 cm across, globose, glabrous.

*Fl. & Fr.* May-August

*Distr.* Tropical Asia. Rare in evergreen forests; *PS 30619* Kariamchola

## ISONANDRA Wight

1. Branchlets stout; lateral nerves inconspicuous; leaf apex obtuse-emarginate ..... **I. stocksii**
1. Branchlets slender; lateral nerves prominent; leaf apex caudate-acuminate ..... **I. lanceolata**

**Isonandra lanceolata** Wight, Ic. t. 359. 1840, forma **lanceolata**: FBI 3: 539. 1882; FPM 761. 1921; FPL 266. 1990; FTSR 264. 1996. *I. wightiana* DC., Prodr. 8: 187. 1844; FBI 3: 539. 1882.

Small trees or large shrubs. Leaves thin, to 16 x 7 cm, abruptly acuminate at apex, cuneate at base, 9-13-nerved, distinct below; petiole 10 mm long. Flowers in axillary fascicles, shortly pedicelled; bracts acute; bracteoles rounded; sepals 1.5 x 1 mm, ovate, acute, tomentose; corolla greenish yellow or dull white, 7 mm long, lobes acute; stamens 8, anthers cuspidate at apex. Berry 1.5 x 1 cm, ellipsoid, smooth, reddish.

*Fl. & Fr.* Throughout the year

*Distr.* South India and Sri Lanka. Common in evergreen forests; *PS 30110* Karimala; *30339* Pezha

**Isonandra stocksii** Clarke in Hook.f., FBI 3: 539. 1882; FPM 761. 1921; FTSR 264. 1996.

Small trees. Leaves to 9 x 5 cm, obovate, obtusely acute, acute at base; lateral nerves 7 pairs, regular, nervules not prominent; petiole 7 mm long. Flowers in the axils of fallen leaves, fascicled, sessile; sepals 2 x 2 mm, orbicular, obtuse, hairy outside; corolla dull yellow, 5 mm long, lobes oblong, emarginate, curved in; stamens 8, anthers oblong, acute; ovary tomentose.

*Fl.* January

*Distr.* Endemic to Southern Western Ghats. Rare in evergreen forests at higher altitudes; *PS 30112* Karimala

## MADHUCA Hamilton ex J. F. Gmelin

1. Pedicels and calyx fulvous tomentose ..... **M. indica**
1. Pedicels and calyx glabrous ..... **M. neriifolia**

**Madhuca indica** J. Gmelin, Syst. Nat. 2:799. 1791. *M. longifolia* (Koenig) Macbr. var. *latifolia* A. Chev., Rev. Int. Bot. Appl. Agric. Trop. 23:149. 1943; FPL 267. 1990. *Bassia longifolia* Koen. in L., Mant. Pl. 563. 1771; FBI 3: 544. 1882; FPM 763. 1921.

Medium trees, exudation milky. Leaves to 20 x 10 cm, broadly elliptic, apex acute, clustered mostly at apex of branchlets, coriaceous, nerves ca. 12 pairs. Flowers crowded at the tip of branchlets or rarely from the scars of fallen leaves, pedicels tomentose, stout 3-4 cm; calyx lobes 11 x 6 cm, obovate, acuminate, densely brown tomentose; corolla lobes 12, 5 x 2 mm, twisted; stamens 3 series, sessile; anthers apiculate, hairy on back; ovary tomentose, 6-celled, 6-ovuled.

*Fl. & Fr.* February-May

*Distr.* Sri Lanka, India and Tropical Himalaya. Rare in moist deciduous forests; *PS 30697* Anappadi

**Madhuca neriifolia** (Moon) H. J. Lam, Bull. Jard. Bot. Buitenz. ser. 3, 7. 182, 265. 1925; FTSR 265. 1996. *Bassia neriifolia* Moon, Cat. Pl. Ceylon 36. 1824. *B. malabarica* Bedd., For. Man. Bot. 140. 1872; FBI 3: 544. 1882; FPM 763. 1921.

Small to medium trees; branchlets stout. Leaves closely packed, to 15 x 4 cm, oblong, acute or obtuse at apex, entire, 12-15-nerved. Flowers in axillary fascicles; pedicels 2-3 cm long, thinly tomentose; sepals 4, biseriolate, outer sepals 8 x 4 mm, ovate, hairy, inner smaller; corolla yellowish red, 15 mm long, campanulate; densely hairy within, lobes equal to the tube, oblong, obtuse; stamens 20, filaments short, densely hairy; anthers lanceolate, long-ciliate at base, connective produced; ovary densely hairy, 8-celled; style 2 cm long. Berry ellipsoid.

*Fl. & Fr.* January-May

*Distr.* India and Sri Lanka. Common along the river banks; *PS 18888* Muthalakkuzhi; *30610* Anappadi

### MIMUSOPS Linnaeus

**Mimusops elengi** L., Sp. Pl. 349. 1753; FBI 3: 548. 1882; FPM 765. 1921; FTSR 267. 1996.

Medium trees; branchlets rusty tomentose. Leaves to 12 x 6 cm, broadly elliptic, abruptly acuminate, glabrous, glossy above; nerves many, close, parallel; petioles to 2.5 cm long. Flowers 2-5 together, in axillary fascicles; rusty tomentose; sepals 4 + 4; outer sepals 8 x 4 mm, ovate, acute, brown-tomentose, inner smaller, white, tomentose; corolla yellowish brown, to 12 mm across, tube short, lobes biseriate; stamens 8, filaments densely hairy, anthers villous on back, staminodes lanceolate, tomentose; ovary ridged, tomentose. Berry 4 x 2.5 cm, ovoid, glabrous.

*Fl. & Fr.* December & May

*Distr.* Indo-Malesia. Common in evergreen forests; *PS 30177* Kottayali; *30370* Kariamchola

### PALAQUIUM Blanco

**Palaquium ellipticum** (Dalz.) Baill., *Traite, Bot. Med. Phan.* 1500. 1884; FPM 764. 1921; FPL 267. 1990; FTSR 267. 1996. *Bassia elliptica* Dalz. in Hook.'s *J. Bot. Kew Gard. Misc.* 3: 36. 1851. *Dichopsis ellipticum* (Dalz.) Benth., *Gen. Pl.* 2: 658. 1876; FBI 3: 542. 1882.

Large trees; bark reddish inside; branches glabrous. Leaves to 8 x 4 cm, elliptic, abruptly acuminate at apex, attenuate at base; lateral nerves 9 pairs. Flowers in axillary fascicles; pedicels 1.5 cm long, slender; outer sepals 7 x 5 mm, ovate, acute, pubescent, inner smaller; corolla yellowish brown, 10 mm long, tube cylindrical, hairy inside, lobes 6, ovate, acute; stamens 16-20, attached at the base of the corolla tube; anthers tomentose, crested; ovary white-tomentose. Berry 3 x 1 cm, ellipsoid, ridged, curved, smooth.

*Fl. & Fr.* December-May

*Distr.* Endemic to Western Ghats. Common in evergreen forests; *PS 19436, 19772* Pooppara

### XANTOLIS Rafinesque-Schmaltz

**Xantolis tomentosa** (Roxb.) Rafin. var. **elengioides** (DC.) Vajrav., *Biol. Mem.* 20: 86. 1977; FPL 267. 1990. *Sideroxylon tomentosum* Roxb. var. *elengioides* (DC.) Gamble, FPM 759. 1923. *Sapota elengioides* DC., *Prodr.* 8: 176. 1844. *Achras elengioides* (DC.) Bedd., *Fl. Sylv. t.* 235. 1872.

Small trees, older parts with stout thorns, branchlets thinly pubescent, reddish when young. Leaves to 6 x 3 cm, obovate, acute, base attenuate, nerves hairy below, petiole *ca* 5 mm. Flowers fascicled in the axils of fallen leaves, sepals 6, biseriate, ovate, acute, hairy, inner small, corolla to 10 mm, campanulate, throat densely hairy, lobes lanceolate; stamens 6, filaments hairy at base; style to 10 mm long. Berry 2.5-3 x 1.5 cm, ovoid, apiculate.

*Fl. & Fr.* October-March

*Distr.* Endemic to South India. Occasional in evergreen forests at higher altitudes; *PS 30378* Pandaravarai; *30528* Pandaravarai

## EBENACEAE

### DIOSPYROS Linnaeus

1. Leaves under 5 cm long; ciliate along margins.....**D. buxifolia**
1. Leaves more than 6 cm long; not ciliate along the margin..... 2
2. Leaves tomentose on both sides.....**D. cordifolia**
2. Leaves otherwise..... 3
3. Calyx 4-lobed..... 4
3. Calyx 5-lobed..... 6
4. Branchlets glabrous; stamens 24.....**D. sylvatica**
4. Branchlets or leaves below tomentose; stamens to 16..... 5
5. Corolla urceolate; leaf apex acute; stamens 16 in 8 pairs.....**D. montana**
5. Corolla tubular; leaf apex acuminate; stamens 14.....**D. assimilis**

6. Female flowers on old stem; calyx lobes erect in fruit.....**D. bourdillonii**  
 6. Female flowers axillary or just below the leaves; calyx lobes deflexed in fruit..... 7  
 7. Female flowers fascicled; male flowers without large bracts ..... **D. candolleana**  
 7. Female flowers solitary; male flowers with large bracts ..... **D. paniculata**

**Diospyros assimilis** Bedd., Madras For. Rep. 20. t.1. 1866-1867; FBI 3: 558. 1882; FPM 775. 1923.

Large trees; branchlets thinly tomentose. Leaves to 15 x 7 cm, ovate-lanceolate, acuminate, base acute or rounded, glabrous; nerves 5-7 pairs; nervules obscure, reticulate; petiole 1 cm long. Flowers in dense axillary cymes, sessile; peduncles 3-5 mm long, covered with imbricating bracts; calyx 2 mm long, cupular, lobes 4, ovate, obtuse, densely tomentose; corolla 10 mm long, salver-shaped, broaden at base, densely minutely tomentose, lobes 6 x 4 mm, ovate, acute, tomentose outside; stamens 14, filaments unequal, glabrous, anthers shortly unequal, acute, connective thinly villous along the back.

*Fl.* March

*Distr.* Endemic to Western Ghats. Fairly common in evergreen forests; *PS 30123* Karimala

**Diospyros bourdillonii** Brandis, Indian Trees 435. 1906; FPM 777. 1923; FPL 268. 1990; FTSR 269. 1996.

Medium trees; bark black, smooth, pale pink inside; branchlets glabrous. Leaves to 17 x 8 cm, ovate-oblong, abruptly acuminate, tip pointed, rounded at base; nerves 5-8 pairs, parallel; nervules subparallel, prominent; petiole 8 mm long. Male flowers in shortly peduncled axillary cymes; calyx 10 mm long, brown-tomentose outside, lobes 5, ovate; corolla tube 13 mm long, urceolate, hispid, lobes orbicular, 7 mm across, deflexed; stamens 20; filaments equal, anthers cuspidate. Female flowers solitary or clustered on old branches or on trunks. Berry 4 cm across, globose, calyx accrescent, 3.5 cm across, not deflexed.

*Fl. & Fr.* February-April

*Distr.* Endemic to Southern Western Ghats. Rare in evergreen forests; *PS 18896* Muthalakkuzhi; *19361* Pezha

**Diospyros buxifolia** (Blume) Hiern, Trans. Cambridge Philos. Soc. 12: 218. 1873; FPL 269. 1990; FTSR 270. 1996. *Leucoxyllum buxifolium* Blume, Bijdr. 1169. 1827. *Diospyros microphylla* Bedd., Ic. t. 133. 1868-1874; FBI 3: 559. 1882; FPM 776. 1923.

Large trees with whorled branches on juvenile trees; bark brownish red, smooth; branchlets densely hispid. Leaves 1-4.5 x 1-1.5 cm, ovate-lanceolate, densely hispid below, subsessile. Cymes axillary, shortly peduncled, densely hispid, 3-flowered; calyx 2 mm long campanulate, hairy; lobes 4, orbicular; corolla greenish yellow, 3 mm long, campanulate, lobes orbicular, obtuse, hairy outside; stamens 16, paired, filaments unequal, hairy. Drupe 15 x 8 mm, elliptic-oblong, reddish-brown, glabrous; seed 1.

*Fl. & Fr.* January-May

*Distr.* Indo-Malesia. Common in evergreen forests; *PS 30260* Pezha

**Diospyros candolleana** Wight, Ic. t. 1221 & 1222. 1848; FBI 3: 566. 1882; FPM 773. 1923; FPL 269. 1990. *D. canarica* Bedd., Ic. t.134. 1868-1874.

Large trees; branchlets glabrous, black. Leaves to 15 x 6.5 mm, oblong, obtusely acuminate, base acute, glabrous; nerves obscure, pale beneath; petiole 1 cm long. Flowers in axillary fascicles, 3-15 together, densely fulvous tomentose; calyx 5 mm long, lobes 5, ovate, acute; corolla urceolate, 8 mm long, lobes 5, ovate, acute; anthers unequal, filaments glabrous. Berry 2.5 cm across, globose, yellowish brown; seeds 15 x 8 mm, oblong, black, shining.

*Fl. & Fr.* January-March

*Distr.* Endemic to Western Ghats. Common along the river banks in evergreen forests; *PS 30020* Karappara

**Diospyros cordifolia** Roxb., Pl. Corom. t. 50. 1795; FPM 776. 1923. *D. montana* Roxb. var. *cordifolia* (Roxb.) Clarke in Hook.f., FBI 3: 555. 1882.

Trees, spinous at base, especially when young; branchlets tomentose. Leaves to 8 x 3.5 cm, oblong-lanceolate, apex obtuse, base truncate or cordate, pubescent; petiole 0.5 cm. Racemes axillary, pubescent; flowers greenish-yellow, tetra-merous; male flowers-calyx tube 2 mm, lobes 3 mm, villous; corolla 6 mm, urceolate, lobes twisted, broadly ovate, acute; stamens 16, in pairs of unequal size, longer 7 mm, smaller 5 mm, acuminate. Berry 2 cm across, yellow, fruiting calyx enlarged to 1.5 cm, ovate, cordate.

*Fl. & Fr.* February-June

*Distr.* Indo-Malesia to Australia. Fairly common in dry deciduous forests; *PS 30393* Kuchimudi

**Diospyros montana** Roxb., Pl. Corom. t. 48. 1795; FBI 3: 555. 1882; FPM 776. 1923; FTSR 271. 1996.

Medium trees; bark greyish or reddish brown, thin, smooth, yellowish inside; trunk sometimes thorny when young. Leaves to 8 x 4 cm, ovate-oblong, acute at apex, base rounded, subcoriaceous; nerves 7-10 pairs, minutely reticulate. Male flowers in axillary cymes, sessile, 6 mm across; calyx 3 mm long, lobes 4, ovate, acute, ciliate; corolla greenish yellow, 6 mm long, urceolate, glabrous, lobes shorter than the tube; stamens 16. Female flowers usually solitary, axillary. Berry 1.5 cm across, globose, smooth, yellow; fruiting calyx 2 cm across, flat or reflexed.

*Fl. & Fr.* April-February

*Distr.* Indo-Malesia to Australia. Fairly common in moist and dry deciduous forests and plantations; *PS 19782* Kanthalppara; *19806* Anakkalvayal

**Diospyros paniculata** Dalz. in Hook.'s J. Bot. Kew Gard. Misc. 4: 109. 1852; FBI 3: 570. 1882; FPM 775. 1923; FPL 269. 1990; FTSR 271. 1996.

Small to medium trees; bark black, smooth. Leaves to 16 x 5 cm, oblong, acute, base round or cuneate; nerves 5 or 6 pairs, strongly reticulate, glossy above; petiole 8 mm long. Male flowers 3-5 together in long peduncled cymes; calyx 10 x 12 mm, globose, 5-angled, minutely hispid, lobes ovate or orbicular, margins revolute; corolla dull or creamy white, tube 12 mm long, narrowed above; lobes 8 x 4 mm, oblong; stamens 16-20 in 2-3 series, filaments paired, unequal. Female flowers axillary, solitary. Berry 4 x 3 cm, ovoid to obovoid, obtuse, obtusely 5-angled, yellowish brown, puberulus; seeds few, 2 x 0.8 cm, ellipsoid; fruiting calyx 1.5 x 3 cm, saccate.

*Fl. & Fr.* January-August

*Distr.* Endemic to Western Ghats. Common in evergreen forests; *PS 19350* Neyyandanchira

**Diospyros sylvatica** Roxb., Pl. Corom. t. 47. 1795; FBI 3: 559. 1882; FPM 773. 1923; FPL 270. 1990; FTSR 271. 1996.

Large trees; bark light brown, smooth; branchlets adpressed-hairy. Leaves 7-13 x 2-5 cm, elliptic, acuminate, base acute or narrowed, black when dry, membranous; nerves 7-9 pairs, obscure; petiole 6 mm long. Flowers 6 mm across, in short axillary cymes; peduncle 5 mm long, glabrous; calyx 3 mm long, campanulate, lobes ovate, acute, pubescent outside; corolla 6 mm long, campanulate, lobes triangular, obtuse; stamens about 24, filaments ciliate at apex. Female flowers 8-10 mm across; ovary globular, glabrous, styles 4 or 5, free, staminodes absent.

*Fl. & Fr.* January-May

*Distr.* Indo-Malesia. Occasional in evergreen forests; *PS 18883* Orukomban

## SYMPLOCACEAE

### SYMPLOCOS N. J. Jacquin

1. Petals white; fruits ampulliform, ribbed ..... **S. cochinchinensis** ssp. **laurina**
1. Petals pink; fruits cylindric, entire ..... **S. macrophylla** ssp. **rosea**

**Symplocos cochinchinensis** (Lour.) Moore ssp. **laurina** Nooteb., Rev. Symplocac. 156. 1975 & in Dassan & Fosb., Rev. Handb. Fl. Ceylon 3: 458. 1981; FPL 271. 1990; FTSR 272. 1996. *Drupatris cochinchinensis* Lour., Fl. Cochinch. 314. 1790. *Symplocos spicata* Roxb., Fl. Ind. 2: 542. 1832; FBI 3: 573. 1882. *S. spicata* Roxb. var. *laurina* (Retz.) Clarke in Hook.f., FBI 3: 573. 1882; FPM 782. 1921. *S. spicata* Roxb. var. *malasica* Clarke in Hook.f., FBI 3: 573. 1882. *S. spicata* Roxb. var. *attenuata* (A.DC.) Clarke in Hook.f., FBI 3: 573. 1882. *S. laurina* (Retz.) Wall. ex G. Don, Gen. Syst. 4: 3. 1837.

Small trees. Leaves to 13 x 6 cm, elliptic, acute at base and apex, dentate-crenulate, coriaceous, glabrous; lateral nerves 7-10 pairs, intercostae reticulate; petiole 1.5 cm long, glabrous. Spikes to 7 cm long, solitary or branched, axis hispid. Flowers white, sessile, many, sepals rounded, 1 mm across, hairy; corolla 7 mm across, glabrous, lobes orbicular; stamens numerous, equal, arranged in 5 groups; style glabrous. Drupe 5 mm long, glabrous.

*Fl. & Fr.* December-January

*Distr.* Indo-Malesia and China. Common along the margins of evergreen forests at higher altitudes; *PS 19383* Karimala; *19508* Orukomban; *19594* Karimalagapuram

**Symplocos macrophylla** Wall. ex A. DC ssp. **rosea** (Bedd.) Nooteb., Rev. Symplocac. 229. 1975; FPL 272. 1990; FTSR 272. 1996. *S. rosea* Bedd., Trans. Linn. Soc. London 25: 219. 1866; FBI 3: 583. 1882; FPM 783. 1921. *S. barberi* Gamble, Kew Bull. 1921: 219. 1921 & FPM 783. 1921.

Shrubs 3 m high; branchlets hispid. Leaves oblanceolate, bluntly acuminate, spineous serrate, coriaceous, glabrous; nerves 4 or 5 pairs, midrib hairy below; petiole 1 cm long. Spikes 4 cm long, unbranched, hispid; bracts ovate, acute, hispid. Flowers few, shortly pedicelled; sepals rounded, densely hairy; corolla 10 mm across, glabrous, lobes rounded; stamens 50, unequal; disk hairy. Drupe 15 x 4 mm, cylindrical, blue, glabrous.

*Fl. & Fr.* February-April

*Distr.* Endemic to Southern Western Ghats. Common in evergreen and semi-evergreen forests; *PS 18820* Parambikulam

## OLEACEAE

- |  |                    |
|--|--------------------|
| 1. Stem quadrangular; leaves 3-ribbed .....  | <b>Myxopyrum</b>   |
| 1. Stem terete; leaves not 3-ribbed .....  | 2                  |
| 2. Climbers.....   | <b>Jasminum</b>    |
| 2. Scandent shrubs or trees .....  | 3                  |
| 3. Seeds winged; leaves imparipinnate, leaflets 7-9.....                               | <b>Schrebera</b>   |
| 3. Seeds not winged; leaves simple .....   | 4                  |
| 4. Corolla deeply divided to the base or free; fruit ribbed .....                      | <b>Chionanthus</b> |
| 4. Corolla divided to half of the length; fruit smooth .....                           | 5                  |
| 5. Panicles terminal; corolla lobes as long as the tube .....                          | <b>Ligustrum</b>   |
| 5. Panicles axillary or from leaf scars; corolla lobes 1/3 of length of the tube ..... | <b>Olea</b>        |

## CHIONANTHUS Linnaeus

**Chionanthus mala elengi** (Dennst.) Green, Bull. Bot. Surv. India 26. 124. 1984; FPL 273. 1990; Srivastava & Kapoor, JETB 15: 133. 1991; FTSR 273. 1996. *Forsythia mala-elengi* Dennst., Schluss. Hort. Malab. 12,21&31. 1818. *Linociera malabarica* Wall. ex G. Don, Gen. Syst. 4: 53. 1847; FBI 3: 607. 1882. *Chionanthus malabaricus* (Wall. ex G. Don) Bedd., Fl. Sylv. t. 239. 1872.

Small trees; branchlets thinly tomentose. Leaves to 10 x 5.5 cm, obovate, abruptly acuminate, acumen twisted, glabrous, glaucous beneath; nerves 11-13 pairs; petiole 1 cm long. Cymes congested, pedunculate. Flowers sessile; calyx lobes 1.5 mm long, ovate, obtuse; corolla 7 mm long, lobes attached in pairs, linear acuminate, glabrous; ovary densely hairy. Drupe 10 x 5 mm, ellipsoid, slightly curved, acute, ridged.

*Fl. & Fr.* December-February

*Distr.* Endemic to Peninsular India. Common in evergreen and moist localities of moist deciduous forests; *PS 19934* Karimala

### JASMINUM Linnaeus

1. Leaves 3-foliolate..... 2
1. Leaves simple ..... 3
2. Lateral leaflets much smaller than the terminal leaflet ..... **J. auriculatum**
2. Lateral leaflets similar to the terminal leaflet ..... **J. azoricum**
3. Calyx and leaves glabrous ..... **J. cordifolium**
3. Calyx pubescent; leaves variously hairy ..... 4
4. Bracts ovate, white..... **J. rotterianum**
4. Bracts lanceolate, green..... **J. multiflorum**

**Jasminum auriculatum** Vahl, *Symb. Bot.* 3: 1. 1794; *FBI* 3: 600. 1882; *FPM* 790. 1923; *FPL* 274. 1990. *J. affine* Wight,  *Ic. t.* 1255. 1848. *J. ovalifolium* Wight,  *Ic. t.* 1256. 1848.

Climbing shrubs, pubescent. Lower leaves smaller 1 x 0.5 cm, ovate, mucronate, larger 4 x 3 cm. Cymes paniced, axillary and terminal; bracts 0.5 cm, ovate, bracteoles 2, linear; flowers white; calyx 5-lobed, 2 mm; corolla lobes 8, 8 mm long, twisted, lanceolate, shortly mucronate; ovary 1 mm, oblong; style 4.5 mm, stigma bifid.

*Fl. & Fr.* February-April

*Distr.* India and Sri Lanka. Common in scrub jungles; *PS 30493* Kuchimudi

**Jasminum azoricum** L., *Sp. Pl.* 7. 1753; *FPL* 274. 1990. *J. flexile* Vahl, *Symb. Bot.* 3: 1. 1794 & *Enum. Pl.* 1: 31. 1804; *FBI* 3: 601. 1882; *FPM* 791. 1923.

Climbing shrubs. Terminal leaflet to 6 x 4 cm ovate, mucronate, subcoriaceous; petiole 2 cm. Cymes axillary and terminal, bracteoles 2 mm, linear; flowers white; calyx 5 lobed, 2 mm, puberulus; corolla tube 2 cm long, lobes twisted, 1 cm long, lanceolate; ovary 2 mm, oblong; style 2.5 cm, stigma 2-fid.

*Fl. & Fr.* January-March

*Distr.* Peninsular India and Sri Lanka. Common along the margins of evergreen forests; *PS 19704, 30115* Karimala; *19114* Kariamchola

**Jasminum cordifolium** Wall. ex G. Don, *Gen. Syst.* 4: 60. 1837-38; *FBI* 3: 596. 1882; *FPM* 790. 1923.

Scandent shrubs. Leaves to 10 x 6.5 cm, broadly ovate, acuminate, truncate or cordate at base; nerves 3 or 4 pairs, nearly basal, glabrous; petiole 1.5 cm long. Flowers many, in terminal or axillary cymes; bracts 6 mm long, subulate; calyx tube 3 mm long, lobes 13 mm long, narrow, glabrous; corolla tube 12 mm long, lobes 5, 8 x 3 mm, oblong, acute, glabrous, white. Berry 12 x 8 mm, oblong, obtuse, glabrous.

*Fl. & Fr.* Throughout the year

*Distr.* Endemic to Southern Western Ghats. Common in moist deciduous forests; *PS 30051* Kamamudi

**Jasminum multiflorum** (Burm. f.) Andr., *Bot. Repos.* 8,t.496. 1807; *FPL* 275. 1990; *FTSR* 274. 1996. *Nyctanthes multiflora* Burm. f., *Fl. Ind.* 5. t.3. f.1. 1768. *Jasminum pubescens* Willd., *Sp. Pl.* 1: 37. 1797; *FBI* 3: 592. 1882; *FPM* 789. 1923. *J. bracteatum* Roxb., *Fl. Ind.* 1: 92. 1820.

Climbing shrubs; stem densely pubescent. Leaves to 8 x 4 cm, ovate, acute to acuminate, round or cordate at base; petiole 1 cm long, hairy. Cymes terminal, congested, pubescent; peduncle 4-8 cm long; bracts 15 x 5 cm, acuminate, hispid. Flowers densely packed; calyx tube



short, lobes 8 mm long, subulate, hairy; corolla tube 15 mm long, lobes 5-8, to 10 mm long, oblong, acute, white.

*Fl. & Fr.* Throughout the year

*Distr.* Indo-Malesia and China. Common in moist deciduous forests and plantations; *PS 30256* Pezha

**Jasminum rotlerianum** Wall. ex DC., Prodr. 8: 305. 1844; FBI 3: 593. 1882; FPM 789. 1923; FPL 275. 1990; FTSR 274. 1996.

Climbing shrubs; stem pubescent. Leaves 7-10 x 4 cm, oblong, acuminate, base rounded; nerves 4 pairs; petiole 1 cm long. Cymes terminal, congested; peduncle 1.5-2 cm long, tomentose; bracts 8 x 3 mm, hairy. Flowers many, densely packed; calyx tube 2 mm long, lobes 4 mm long, subulate, densely hairy; corolla tube 2 cm long, lobes 7, to 8 mm long, oblong, obtuse, white with pink tinge, glabrous.

*Fl. & Fr.* December-June

*Distr.* Peninsular India and Sri Lanka. Rare in secondary forests; *PS 19344* Thenkudippara

#### LIGUSTRUM Linnaeus

**Ligustrum perrottetii** DC., Prodr. 8: 294. 1844; FBI 3: 615. 1882; FPM 797. 1923; Srivastava, JETB 22: 624. 1998. *L. neilgherrense* Wight, Ic. t. 1243. 1848.

Large shrubs or smaller trees; branchlets with circular lenticels. Leaves 7-10 x 2-5 cm, acute to acuminate, glabrous; nerves 6-8 pairs, regular faint towards the margins; petiole 1 cm long. Panicle effuse, pubescent. Flowers many, closely packed; pedicel 1-2 mm long; calyx 2 mm long, lobes obovate; corolla white, 3-5 mm across, lobes ovate, obtuse, white; ovary conical, style short. Drupe 6-7 mm long, obovoid, obtuse.

*Fl. & Fr.* August-December

*Distr.* Endemic to Western Ghats. Common in grasslands and margins of evergreen forests; *PS 30409* Kuchimudi

#### MYXOPYRUM Blume

**Myxopyrum smilacifolium** (Wall.) Blume, Mus. Bot. Ludg.-Bat. 1: 320. 1851; FBI 3: 618. 1882; FTSR 275. 1996. *M. serratum* Hill., Kew Bull. 1910: 41. 1910; FPM 798. 1923. *Chionanthus smilacifolia* Wall. in Roxb., Fl. Ind. 1: 108. 1820.

Climbing shrubs; stem quadrangular, scabrous. Leaves to 15 x 5 cm, elliptic, acute at either ends, sharply serrulate, glabrous; petiole 1 cm long. Panicle axillary, 5 x 5 cm. Flowers sessile; calyx deeply 4-lobed, lobes triangular, acute; corolla tube 2 mm long, cylindrical, lobes 3 mm long, oblanceolate, terete; stamens 2, anthers cleft at base; ovary 2-celled, style absent, stigma 2-toothed. Berry 1 x 1 cm, smooth, yellowish brown; seeds 2, spherical, black, rough.

*Fl. & Fr.* August-March

*Distr.* South East Asia and India. Common in evergreen forests; *PS 18917* Karimala

#### OLEA Linnaeus

**Olea dioica** Roxb., Fl. Ind. 1: 105. 1820; FBI 3: 612. 1882; FPM 796. 1923; FPL 276. 1990; FTSR 275. 1996.

Small to medium trees; bark rough. Leaves 10-15 x 3-6 cm, elliptic-oblong, acute, serrate or entire, glabrous; nerves 8-10 pairs; petiole to 1 cm long. Flowers many, in axillary panicles; pedicel 3 mm long; calyx campanulate; lobes 4, obtuse, ciliate; corolla 2.5 mm long, lobes 4, shorter than the tube, triangular, obtuse, hairy within; anthers sessile; ovary 2-celled, 4-ovuled; style short, stigma capitate. Drupe ellipsoid, 8 x 6 mm; seeds 6 x 4 mm, muriculate.

*Fl. & Fr.* February-June

*Distr.* Endemic to India. Common in all types of forests; *PS 19207* Kariamchola

#### SCHREBERA Roxburgh

**Schrebera swietenoides** Roxb., Pl. Corom. t. 101. 1798; FBI 3: 604. 1882; FPM 792. 1923.

Medium trees. Leaves to 16 cm long, imparipinnate, leaflets 7-9, opposite, to 5-6 x 2-2.5 cm, elliptic-lanceolate, acute, base cuneate. Cymes terminal, trichotomous, flowers *ca* 1 cm, yellowish, calyx puberulent, obscurely 6 toothed, accrescent, corolla salver shaped, lobes 6, *ca* 4 mm across, rounded; stamens 2; ovary 2-celled, cells 3 or 4 ovuled, style *ca*. 6 mm long. Capsule woody, 5 x 2.5 cm, obovoid, loculicidally 2-valved; seeds pendulous, winged.

*Fl. & Fr.* April-May

*Distr.* India and Myanmar. Rare in dry deciduous forests; *PS 30387* Kuchimudi

## APOCYNACEAE

1. Annual erect herbs .....	<b>Catharanthus</b>
1. Erect or scandent shrubs, climbers or trees .....	2
2. Leaves whorled .....	3
2. Leaves opposite .....	4
3. Fruit linear follicles; seeds comose .....	<b>Alstonia</b>
3. Fruit drupaceous; seeds without coma .....	<b>Rauvolfia</b>
4. Plants with axillary spines .....	<b>Carissa</b>
4. Plants without axillary spines .....	5
5. Erect or scandent shrubs or trees .....	6
5. Climbers .....	9
6. Fruit a drupe .....	<b>Hunteria</b>
6. Fruit a follicle .....	7
7. Follicles divaricate, obliquely ovoid, to 4 cm long .....	<b>Tabernaemontana</b>
7. Follicles not divaricate, elongate, cylindrical, to 30 cm long .....	8
8. Corolla with several coronal scales .....	<b>Holarrhena</b>
8. Corolla without scales .....	<b>Wrightia</b>
9. Flowers large, more than 6 cm across .....	<b>Chonemorpha</b>
9. Flowers small, to 2 cm across .....	10
10. Anthers exserted; staminal filaments twisted .....	<b>Parsonia</b>
10. Anthers included; staminal filaments not twisted .....	11
11. Tips of the corolla lobes deflexed or twisted .....	<b>Ichnocarpus</b>
11. Tips of the corolla lobes not deflexed or twisted .....	12
12. Branchlets tomentose; corolla tube bearded behind the anthers .....	<b>Aganosma</b>
12. Branchlets glabrous; corolla tube not bearded behind the anthers .....	13
13. Disc cupular; seeds comose .....	<b>Anodendron</b>
13. Disc absent; seeds winged .....	<b>Kammetia</b>

### AGANOSMA G. Don

**Aganosma cymosa** (Roxb.) G. Don, Gen. Syst. 4: 77. 1837-1838; FPL 277. 1990; FTSR 276. 1996. *Echites cymosa* Roxb., Fl. Ind. 2: 16. 1832. *A. elegans* G. Don, Gen. Syst. 4: 77. 1837. *A. doniana* Wight, Ic. t. 1306. 1848.

Twining climber, stem adpressed-hairy. Leaves to 15 x 5 cm, elliptic, obtuse or acute, glabrous; lateral nerves 6 pairs, reddish brown, nervules reticulate; petiole hairy. Flowers in terminal peduncled congested cymes; pedicels 3 mm long, hairy; sepals 7 mm long, lanceolate, acuminate, pubescent; corolla tube 8 mm long, inflated below the middle, lobes ovate, 5 mm long, acute, pubescent outside; stamens included; anthers sagitate; ovary hairy at apex. Follicle 20 cm long, oblong, acuminate, densely tomentose; seeds 15 x 5 mm, long-comose.

*Fl. & Fr.* December-May

*Distr.* Peninsular India and Sri Lanka. Common in evergreen forests; *PS 19800, 30360* Kariamchola

### ALSTONIA R. Brown

1. Flowers in umbellate cymes; follicles to 35 cm long.....**A. scholaris**  
 1. Flowers in corymbose cymes; follicles to 15 cm long .....**A. venenata**

**Alstonia scholaris** (L.) R. Br., Mem. Wern. Nat. Hist. Soc. 1: 76. 1811; FPL 278. 1990; FTSR 277. 1996. *Echites scholaris* L., Mant. Pl. 53. 1767.

Large trees; bark grey, corky. Leaves to 18 x 6 cm, oblanceolate, obtuse, glabrous; lateral nerves 40, parallel; petiole to 1 cm long. Cymes globose, in paniced umbels, pedicels short, puberulus; sepals ovate, obtuse, puberulus; corolla tube broad, lobes 4 mm across, obovate to orbicular, creamy yellow. Follicle terete; seeds elliptic-oblong, papillose.

*Fl. & Fr.* December-April

*Distr.* South and South East Asia to Australia. Common in all types of forests; *PS 30678* Parambikulam

**Alstonia venenata** R. Br., Mem. Wern. Nat. Hist. Soc. 1: 77. 1811; FPL 278. 1990; FTSR 277. 1996.

Shrubs or small trees. Leaves 12-20 x 1.2-3 cm, linear-oblong, acuminate at both ends, 5 at each node; lateral nerves many, very close. Cymes terminal, to 20 cm across, corymbose. Flowers many; pedicels stout; sepals 1 mm long, ovate, acute, ciliate; corolla tube slender, hairy inside; lobes 13 mm long, oblong, acute, white. Follicle 2-angled, acute; seeds smooth.

*Fl. & Fr.* Throughout the year

*Distr.* Peninsular India. Common along the sides of streams; *PS 18944* Kothala

#### ANODENDRON A.P. de Candolle

1. Leaves narrow to 3 cm broad; sepals obtuse.....**A. rhinosporum**  
 1. Leaves broad more than 5 cm broad; sepals acute.....**A. manubriatum**

**Anodendron manubriatum** Merr., Philipp. J. Sci. 7: 333. 1912; FTSR 277. 1996. *A. paniculatum* (Roxb.) A. DC. in DC., Prodr. 8: 444. 1844. *Echites paniculata* Roxb., Fl. Ind. 2: 17. 1832, non Poir. 1812.

Large climbers. Leaves to 12 x 6 cm, elliptic-oblong, abruptly acuminate at apex, rounded at base; nerves 12-16 pairs; petiole 1.5 cm long. Panicles axillary and terminal; bracts ovate, acute, white. Flowers yellow; sepals 1 mm long, ovate, glabrous, white; corolla tube 2 mm long, lobes 3 mm long, spreading, oblong, obtuse; anthers penicillate at apex. Follicle to 13 x 2.5 cm, terete, glabrous; seeds to 2.5 cm long, linear elliptic, beaked

*Fl. & Fr.* February-October

*Distr.* Indo-Malesia. Common in evergreen forests; *PS 19322* Kothala

**Anodendron rhinosporum** Thw., Enum. Pl. Zeyl. 194. 1860; FPL 279. 1990; FTSR 278. 1996.

Large climbers. Leaves to 10 x 3 cm, oblanceolate, obtusely acuminate at apex, acute to cuneate at base; lateral nerves 9-11 pairs, irregular; petiole 0.7 cm long. Panicles terminal, glabrous. Flowers shortly pedicelled, yellow; sepals ovate, acute, follicle to 10 x 1.2 cm, terete, glabrous; seeds to 4 cm long, linear.

*Fl. & Fr.* May-June

*Distr.* Peninsular India and Sri Lanka. Common in evergreen forests; *PS 19118* Kariamchola

#### CARISSA Linnaeus

1. Spines strait, forked.....**C. spinarum**  
 1. Spines carved not forked .....**C. inermis**

**Carissa inermis** Vahl, Symb. Bot. 3: 43. 1794; FPM 805. 1923; FPL 279. 1990; FTSR 278. 1996. *C. macrophylla* Wall. ex A. DC. in DC., Prodr. 8: 332. 1844; FBI 3: 691. 1882.

Stout woody climbing shrubs; thorns 1-3 cm long. Leaves 5-8 x 3-4 cm, ovate, acuminate at apex, rounded at base, glabrous; lateral nerves 6 or 7 pairs; petiole 5 mm long. Flowers in sessile or peduncled terminal cymes; pedicel 3 mm long, stout; sepals 4 mm long, lanceolate, reddish, pubescent; corolla white, tube 2 cm long, cylindrical, curved, bulged towards the apex, lobes 9 mm long, oblong, acute; anthers lanceolate, inserted near the mouth of the corolla tube; carpels united; ovules 1-4 in each. Berry 2 cm across, globose; seeds compressed.

*Fl. & Fr.* January-June

*Distr.* Endemic to Peninsular India. Common in secondary forests; *PS 30049* Kanthalppara

**Carissa spinarum** L., Mant. Plant. 559. 1771; FBI 3: 631. 1882; FPM 805. 1923. *C. diffusa* Roxb., Fl. Ind. 2: 524. 1824, var. *macrophylla* Gamble, FPM 805. 1923.

Armed shrubs, spines to 3 cm, often forked. Leaves to 5 x 3 cm, ovate-orbicular, acute, mucronate; petiole *ca* 4 mm. Cymes terminal, to 7-flowered; calyx lobes 3 mm, lanceolate, acuminate; corolla 1.5 cm; lobes 1 cm, oblong, acute; stamens 5, to 5 mm; ovary 1 mm, style 4 mm, stigma forked. Berry globose, 1.5-2 cm across.

*Fl. & Fr.* April-July

*Distr.* India, Sri Lanka and Myanmar. Common in dry deciduous forests; *PS 30695* Keerappadi

#### CATHARANTHUS G. Don

**Catharanthus pusillus** (Murr.) G. Don, Gen. Syst. 4: 95. 1837; FPL 279. 1990; FTSR 278. 1996. *Vinca pusilla* Murr., Comment. Goetting. 3: 66. t. 2, f. 1. 1773; FBI 3: 640. 1882. *Lochnera pusilla* (Murr.) K. Schum. in Engl. & Prantl, Pflanzenf. 4: 145. 1895; FPM 809. 1923.

Annual small erect herbs. Leaves lanceolate, acute at both ends, 3-7 x 0.5-2 cm; lateral nerves 6-8 pairs, slender, faint; petiole 3-5 mm long, axils glandular. Corolla white, tube 7 mm long, mouth pilose, lobes obovate 2 mm long. Follicles 2-3 cm long; seeds black.

*Fl. & Fr.* April-October

*Distr.* India and Sri Lanka. Common in wet rocky areas; *PS 18974* Vengoli; *30679* Anappadi

#### CHONEMORPHA G. Don

**Chonemorpha fragrans** (Moon) Alston, Ann. Roy. Bot. Gard. (Peradeniya) 11: 203. 1929. *Echites fragrans* Moon, Cat. 20. 1824. *E. grandiflora* Roth, Nov. Pl. Sp. 136. 1821. *E. macrophylla* Roxb., Fl. Ind. 2: 13. 1832. *Chonemorpha macrophylla* (Roxb.) G. Don, Gen. Syst. 4: 76. 1837; FBI 3: 661. 1882; FPM 818. 1923. *C. grandiflora* (Roth) M. R. & S. M. Almeida, JBNHS 90: 427. 1993; FTSR 279. 1996.

Leaves broadly elliptic or ovate-orbicular, shortly acuminate, base cordate, pubescent above and tomentose beneath, 20-25 x 15-22 cm. Flowers white, in terminal tomentose paniculate cymes. Calyx 1 cm long, glabrous.

*Fl.* April-May

*Distr.* India, Myanmar, Sri Lanka and Andaman and Nicobar Islands. Common in semi-evergreen forests; *PS 18939* Kothala

#### HOLARRHENA R. Brown

**Holarrhena pubescens** (Buch.-Ham.) Wall. ex G. Don, Gen. Syst. 4: 78. 1837; FPL 280. 1990; FTSR 280. 1996. *Echites pubescens* Buch.-Ham., Trans. Linn. Soc. London 13: 521. 1821. *E. antidysenterica* Roth in Roem. & Schult., Syst. Veg. 4: 394. 1819, non (L.) Roxb. ex Flem. 1810. *Holarrhena antidysenterica* (Roth) A. DC. in DC., Prodr. 8: 413. 1844; FBI 3: 644. 1882; FPM 811. 1923. *Chonemorpha antidysenterica* (L.) G. Don, Gen. Syst. 4: 76. 1837.

Large shrubs or small trees. Leaves 10-18 x 5-10 cm, ovate-oblong, abruptly acuminate at apex, rounded and oblique at base; nerves 10-13 pairs; petiole to 5 mm long. Flowers in terminal or axillary cymes; bracts lanceolate; calyx 3 mm long, lobes lanceolate; corolla yellowish white, tube 10 mm long, pubescent outside; lobes 13 x 6 mm, oblong, obtuse; stamens

included, anthers linear, mucronate; carpels free; ovules many, stigma oblong, bifid above. Mericarps 40 x 0.5 cm, terete; seeds 1-2 cm long, linear oblong, acute, concave, comose.

*Fl. & Fr.* April-October

*Distr.* Tropical Himalaya, India, Myanmar, Indo-China and Malaya. Common in moist deciduous forests; *PS 19403* Padippara

#### HUNTERIA Roxburgh

**Hunteria zeylanica** (Retz.) Gard. ex Thw., Enum. Pl. Zeyl. 191. 1860; FTSR 280. 1996. *Cameraria zeylanica* Retz., Obs. Bot. 4: 24. 1786. *Hunteria corymbosa* Roxb., Fl. Ind. 1: 695. 1832; FBI 3: 637. 1882; FPM 808. 1923; FPL 281. 1990. *H. roxburghiana* Wight, Ic. t. 1294. 1848.

Small evergreen trees, young shoots glabrous; bark, thick, yellowish-grey, with small lenticular tubercles. Leaves elliptic or oblong-lanceolate, acuminate, base obtuse or rounded, glabrous, coriaceous, to 15 x 4 cm; petiole to 1.5 cm long. Calyx lobes 1.5 mm long, glabrous. Corolla creamy white, tube 0.8 mm long, lobes acuminate. Drupes 2.5 cm long, yellow.

*Fl. & Fr.* February-June

*Distr.* Indo-Malesia. Rare in evergreen forests; *PS 30503* Orukomban

#### ICHNOCARPUS R. Brown

**Ichnocarpus frutescens** (L.) R. Br. in Ait., Hort. Kew. (ed. 2) 2: 69. 1811; FBI 3: 669. 1882; FPM 820. 1923; FPL 281. 1990; FTSR 280. 1996. *Apocynum frutescens* L., Sp. Pl. 213. 1753.

Climbers, branchlets brown-tomentose. Leaves to 6 x 3 cm, ovate, obtusely acute, rounded at base; nerves 5 pairs, brown-pubescent below; petiole to 5 mm long. Flowers 3.5 mm long, in terminal or axillary paniced cymes; pedicels 3 mm long; calyx 1 mm long, lobes ovate, acute, pubescent; corolla white, salver shaped, contracted at mouth, tube 2 mm long, hairy inside, throat densely white-villous; lobes twisted, oblong, acuminate; stamens included, anthers deeply sagittate at base, apiculate at apex; carpels free, stigma columnar. Mericarps follicular, to 15 cm long, slender, rusty puberulus; seeds many, compressed, crowned with long silky coma.

*Fl. & Fr.* August-March

*Distr.* Indo-Malesia and Australia. Common in moist deciduous and secondary forests; *PS 19629* Vengoli

#### KAMMETIA Kosteletzky

**Kammetia caryophyllata** (Roxb.) Nicols. & Suresh, Taxon 35: 354. 1986. *Echites caryophyllata* Roxb., Hort. Beng. 20. 1814. *Kammetia malabarica* Kostel., All. Med. -Pharm. Fl. 3: 1062. 1834. *Ellertonia rheedii* Wight, Ic. t.1295. 1848.

Large climbers, glabrous; tender stem reddish. Leaves 3-4 at nodes, 12 x 4 cm, oblong, abruptly acuminate; nerves to 14 pairs; petiole 5 mm long. Flowers in terminal peduncled cymes; bracts subulate; calyx 2 mm long, lobes acuminate, glabrous, reddish; corolla tube 10 mm long, curved; lobes 5 mm long, oblong, obtuse; stamens included; anthers penicillate at apex; carpels free, style filiform, stigma oblong, 2-fid at apex. Follicles 8-11 cm long, divaricate, linear, terete; seeds many, 2 cm long, oblanceolate, winged.

*Fl. & Fr.* September-January

*Distr.* Endemic to Southern Western Ghats. Rare in evergreen forests; *PS 30332* Pezha

#### PARSONSIA R. Brown

**Parsonsia inodora** (Lour.) M.R. & S.M. Almeida, JBNHS 90:428.1993; FTSR 281. 1996. *Cynanchum inodorum* Lour., Fl. Cochinch. 166. 1790. *Parsonsia alboflavescens* (Dennst.) Mabb., Taxon 26:532.1977; FPL 282. 1990. *Periploca alboflavescens* Dennst., Schluss. Hort. Malab.12,23, 35.1818.

Young shoots glabrous. Leaves elliptic or oblong-lanceolate, acuminate, base rounded or subcordate, glabrous, subcoriaceous, to 13 x 6 cm; lateral nerves 6-8 pairs; petiole to 2 cm long. Flowers in axillary corymbose cymes. Corolla greenish-yellow, tube 5mm long, lobes 6 mm long.  
*Fl. & Fr.* March-April  
*Distr.* Indo-Malesia to South China. Fairly common in semi-evergreen forests; *PS 30824*  
 Kariamchola

#### RAUVOLFIA Linnaeus

1. Drupe slightly connate; obliquely ovoid, peduncles red.....**R. serpentina**  
 1. Drupe distinct; ellipsoid, peduncles green ..... **R. verticillata**

**Rauvolfia serpentina** (L.) Benth. ex Kurz, For. Fl. Burma 2: 171. 1877; FBI 3: 632. 1882; FPM 807. 1923; FPL 282. 1990; FTSR 282. 1996. *Ophioxylon serpentinum* L., Sp. Pl. 1043. 1753.

Subshrubs; rootstock thick, sap watery. Leaves to 10 x 3 cm, oblanceolate, acuminate at either ends, glabrous; lateral nerves to 12 pairs. Cymes axillary and terminal, densely flowered; peduncles to 5 cm long. Flowers white; sepals 4 mm long, oblong, acute; corolla white, tube 15 mm long, lobes 5 mm long, oblong, obtuse. Capsules 5 mm, ovoid, obtuse, black; fruiting calyx crimson.

*Fl. & Fr.* November-March

*Distr.* India, Myanmar, Sri Lanka and South East Asia. Occasional in openings of moist deciduous forests and plantation; *PS 19015* Thunakkadavu

**Rauvolfia verticillata** (Lour.) Baill., Bull. Soc. Linn. Paris 1: 768. 1888; FTSR 282. 1996. *Dissolena verticillata* Lour., Fl. Cochinch. 137. 1790. *Tabernaemontana densiflora* Wall., Edward's Bot. Reg. 15: t. 1273. 1829. *Rauvolfia densiflora* (Wall.) Benth. ex Hook.f., FBI 3: 633. 1882; FPM 808. 1923. *Ophioxylon neilgherrense* Wight, Ic. t. 1292. 1848. *O. ceylanicum* Wight, Ic. t. 1291. 1848.

Shrubs with milky latex, to 1.5 m high. Leaves to 14 x 6 cm, obovate, abruptly acuminate, base acute to attenuate, subcoriaceous; lateral nerves 14 pairs, prominent, nervules slender; petiole 2 cm long. Cymes terminal or axillary; peduncles 5-8 cm long. Flowers white; pedicels 1 cm long; calyx lobes acuminate, glabrous, reddish; corolla 1 cm long, lobes ovate, acute. Capsule 10 x 7 mm, oblong, black.

*Fl. & Fr.* March-October

*Distr.* India, Sri Lanka and South East Asia. Occasional in semi-evergreen forests; *PS 19286*  
 Karimala

#### TABERNAEMONTANA Linnaeus

1. Calyx lobes ciliate along margins; capsule 1-seeded..... **T. gamblei**  
 1. Calyx shortly lobed not ciliate along the margins; capsule many seeded ..... **T. heyneana**

**Tabernaemontana gamblei** Subram. & Henry, Bull. Bot. Surv. India 12: 1. 1970; FPL 283. 1990; FTSR 282. 1996. *Ervatamia caudata* Gamble, Kew Bull. 1921: 310. 1921 & FPM 813. 1923, non *Tabernaemontana caudata* Merr. 1909.

Shrubs, to 1.5 m high; branchlets white. Leaves opposite, often unequal, to 10 x 4 cm, elliptic, caudate acuminate, acute at base, lateral nerves 7 pairs, petiole 1 cm long. Cymes terminal. Flowers white; pedicels stout, 1 cm long; sepals ovate, obtuse; corolla tube to 17 mm long, cylindrical; lobes 15 mm long, oblong, obtuse. Capsule 3 x 1.25 cm, not curved; aril red.

*Fl. & Fr.* April-July

*Distr.* Endemic to Southern Western Ghats. Common in evergreen forests; *PS 19422* Pooppara; *30053* Thelliyalimattukkal

**Tabernaemontana heyneana** Wall. in Edward's Bot. Reg. 15: t. 1273. 1829; FBI 3: 646. 1882; FPL 283. 1990; FTSR 283. 1996. *Ervatamia heyneana* (Wall.) Cooke, Fl. Pres. Bombay 2: 134. 1904; FPM 813. 1923.

Large shrubs or small trees; bark corky with shallow fissures. Leaves to 18 x 7 cm, elliptic-oblong, acuminate at apex, acute at base; lateral nerves 12-15 pairs; petiole 2 cm long. Cymes terminal or axillary; peduncles to 4 cm long. Flowers pedicellate; calyx 4 mm long, lobes short, oblong, obtuse; corolla white, tube 25 mm long; lobes 15 mm long, oblong, obtuse, apex crisped. Capsule yellow, 5 x 1.5 cm, beak acuminate; aril red.

*Fl. & Fr.* April-October

*Distr.* Endemic to Southern Western Ghats. Common in evergreen and semi-evergreen forests; *PS 19348* Puliya

#### WRIGHTIA R. Brown

- 1. Branchlets tomentose; follicles fused..... **W. arborea**
- 1. Branchlets glabrous; follicles fused at the tip only..... **W. tinctoria**

**Wrightia arborea** (Dennst.) Mabb., Taxon 26: 533. 1977; FTSR 283. 1996. *Periploca arborea* Dennst., Schluss. 13: 23 & 25. 1818. *Wrightia tomentosa* Roem. & Schult., Syst. Veg. 4: 414. 1819; FBI 3: 653. 1882; FPM 816. 1923.

Small trees. Leaves to 10 x 6 cm, elliptic, acuminate at apex, base acute, scabrous above; nerves 9 or 10 pairs, regular; petiole 5 mm long. Cymes terminal, sessile. Flowers reddish brown; pedicels 1 cm long, stout; sepals 4 mm long, obtuse, hairy; corolla tube 5 mm long, lobes 15 x 10 mm, obovate, puberulus; corona thick, erect, toothed, reddish brown; anthers conical, 8 mm long, hairy. Follicles to 16 x 2 cm, subterete, sparsely white-tubercled.

*Fl. & Fr.* April-December

*Distr.* Indo-Malesia. Rare in semi-evergreen forests; *PS 18909* Karimala

**Wrightia tinctoria** (Roxb.) R. Br., Mem. Wern. Nat. Hist. Soc. 1: 47. 1811; FBI 3: 653. 1882; FPM 815. 1923; FPL 283. 1990; FTSR 283. 1996. *Nerium tinctorium* Roxb., Orient. Repert. 1: 39. 1791.

Small trees. Leaves 8-10 x 3.5 cm, elliptic-oblong, acuminate, base acute; nerves 7-10 pairs; petiole 3-5 mm long. Cymes peduncled, terminal; pedicels 10-12 mm long, slender; bracts ovate. Flowers white; sepals ovate, obtuse, ciliate; corolla tube 4 mm long, broad, lobes 12 x 5 mm, oblong, obtuse; corona many, erect, linear; anthers acuminate, coriaceous, 6 mm long. Mericarps 30 cm long, terete, joined at apex, glabrous; seeds oblong.

*Fl. & Fr.* February-December

*Distr.* Indo-Malesia. Very common in moist deciduous forests; *PS 18973* Vengoli

#### ASCLEPIADACEAE

- 1. Erect herbs or shrubs ..... 2
- 1. Twiners ..... 6
- 2. Plant leafless; stem succulent..... 3
- 2. Plant leafy; stem not succulent..... 4
- 3. Branchlets angled ..... **Caralluma**
- 3. Branchlets terete ..... **Sarcostemma**
- 4. Leaves sessile, auricled at base ..... **Calotropis**
- 4. Leaves petioled, not auricled at base ..... 5
- 5. Flowers bright red; petioles to 1.5 cm long ..... **Asclepias**
- 5. Flowers white; petioles more than 2.5 cm long ..... **Utleria**
- 6. Epiphytes; leaves thick, fleshy ..... **Hoya**
- 6. Terrestrial plants; leave not thick and fleshy ..... 7

7. Corolla tube inflated basally, lobes connate at tip.....	<b>Ceropegia</b>
7. Corolla tube not inflated or absent.....	8
8. Inflorescence an umbel or subumbellate cymes.....	9
8. Flowers in branched or branched cymes, racemes or in axillary fascicles.....	11
9. Stipular leaves present; pollinia pendulous.....	<b>Cynanchum</b>
9. Stipular leaves absent; pollinia erect or horizontal.....	10
10. Leaves glabrous; staminal column shorter than the corolla tube.....	<b>Tylophora</b>
10. Leaves tomentose; staminal column as long or longer than the corolla tube.....	<b>Gymnema</b>
11. Leaf base cordate to hastate; corona reduced to a fleshy annulus.....	<b>Holostemma</b>
11. Leaf base acute, truncate or rounded; corona well developed.....	12
12. Follicle oblong or lanceolate, more than 3 cm dia.....	13
12. Follicle linear or linear-lanceolate, less than 2 cm dia.....	15
13. Corona processes connate with corolla.....	<b>Cryptolepis</b>
13. Corona processes connate with stamens.....	14
14. Leaves membranous; style apex flat, 5 angled with a wavy rim.....	<b>Cosmostigma</b>
14. Leaves coriaceous; style apex convex, 5 grooved without a wavy rim.....	<b>Decalepis</b>
15. Flowers in sub-sessile axillary fascicles; style included.....	<b>Hemidesmus</b>
15. Flowers in axillary dichotomous or trichotomous cymes; style exerted.....	<b>Secamone</b>

#### ASCLEPIAS Linnaeus

**Asclepias curassavica** L., Sp. Pl. 215. 1753; FBI 4: 18. 1883; FPM 833. 1923; FPL 293. 1990; FTSR 284. 1996.

Herbs, to 1 m tall; stem terete, glaucous. Leaves lanceolate to linear-lanceolate, to 10 x 3 cm, glabrous; nerves 8-13 pairs, narrow; petiole 1 cm long. Flowers in axillary peduncled cyme; peduncle to 5 cm long, solitary, erect, dichotomous; pedicels 6-15 together, 1.5-2 cm long, slender; sepals 2.5 mm long, ovate; corolla *ca.* 1.2 cm across, tube short, lobes oblong, yellow, deflexed; coronal lobes yellow, 7 mm long. Follicle to 7 x 1.5 cm, terete or fusiform; seeds many.

*Fl. Fr.*: March-November

*Distr.* Originally from Tropical America; now naturalised throughout the tropics. Common in wet open areas; *PS 19017*Thunakkadavu

#### CALOTROPIS R. Brown

**Calotropis gigantea** (L.) R. Br. in Ait., Hort. Kew (ed. 2) 2: 78. 1811; FBI 4: 17. 1883; FPM 832. 1923; FPL 285. 1990; FTSR 285. 1996. *Asclepias gigantea* L., Sp. Pl. 214. 1753.

Shrubs, to 1.5 m tall; stem rounded. Leaves to 16 x 10 cm, of branchlets much smaller; elliptic-ovate to obovate, acute or obtuse, base cordate; lateral nerves 5-7 pairs, adpressed pubescent when young, becoming glabrous on maturity. Flowers pale purple or greenish-white, 3 cm across; pedicels to 3 cm long, stout; calyx lobes to 3 mm long; corolla campanulate, tube short, lobes ovate to oblong, recurved; staminal corona of 5 vertical lobes, 1 cm long. Fruit saccate, to 6 x 3 cm, ovoid; seeds many.

*Fl. & Fr.* Throughout the year

*Distr.* Tropical Asia. Common in degraded forest areas; *PS 19097*Peruvaripallam

#### CARALLUMA R. Brown

**Caralluma umbellata** Haw., Syn. Pl. Succ. 47. 1812; FPM 861. 1923. *Boucerosia umbellata* (Haw.) Wight & Arn. in Wight, Contrib. 34. 1834; FBI 4: 77. 1883. *Caralluma campanulata* (Wight) N. E. Br. in Gard. Chron. 2: 369. 1892; FPM 861. 1923; FPL 285. 1990. *Boucerosia campanulata* Wight, Ic. t. 1287. 1848.

Tall fleshy leafless herbs, leaf scars spiny. Umbels terminal, more than 20-flowered; pedicels 3.5 cm, flat; calyx lobes 4 mm, lanceolate, ciliate; corolla recurved, lanceolate,



concentrically ringed with fine red lines; pollinal bags 0.5 mm; ovaries 2. Follicle 15 x 0.7 cm, terete, hooked at apex.

*Fl. & Fr.* July-October

*Distr.* India, Sri Lanka and Nepal. Rare in dry deciduous forests; *PS 30578* Keerappadi

#### CEROPEGIA Linnaeus

1. Leaves fleshy; outer corona lobes minute..... **C. bulbosa** var. **lushii**
1. Leaves membranous; outer corona lobes well developed..... 2
2. Flowers 5-7 cm long; outer corona deltoid, bifid ..... **C. metziana**
2. Flowers to 3 cm long; outer corona truncate or capsular ..... 3
3. Corolla beaked, outer corona truncate ..... **C. candelabrum**
3. Corolla not beaked, outer corona cupular ..... **C. omissa**

**Ceropegia bulbosa** Roxb. var. **lushii** (Grah.) Hook. f., *FBI* 4: 68. 1883; *FPM* 857. 1923. *C. lushii* Grah. in *Bot. Mag.* t. 3300. 1834. *C. acuminata* Roxb., *Pl. Corom.* 1: 12, t. 8. 1795; *FBI* 4: 70. 1883. *C. tuberosa* Dalz. & Gibs., *Bombay Fl.* 154. 1861. *C. bulbosa* var. *esculenta* (Edgew.) Hook. f., *FBI* 68. 1883.

Twining herbs. Leaves 6-8 x 7-1.3 cm, linear-lanceolate, acuminate, base acute; petiole to 1 cm. Cymes axillary, umbellate; peduncle to 1.5 cm; bracts 3 mm, linear; pedicel 5 mm; calyx 5-lobed, to 5 mm, beaked, dark purple, tube yellow with dark blotches. Pollinia 3, obovoid-circular, caudicle minute, receptacle small; outer corolla *ca* 1mm, cupular, membranous, inner corona 5, *ca* 2 mm, spatulate, connivent.

*Fl. & Fr.* November-January

*Distr.* India and Pakistan. Rare in moist deciduous forests; *NS 5520* Parambikulam

**Ceropegia candelabrum** L., *Sp. Pl.* 211. 1753; *FBI* 4: 70. 1883; *FPM* 857. 1923; *FPL* 286. 1990; *FTSR* 286. 1996; *Bruyns, Rheede* 7:109.1997. *C. tuberosa* Roxb., *Pl. Corom.* t. 9. 1795; *FBI* 4: 70. 1883; *FPM* 857. 1923.

Glabrous twining herbs. Leaves to 7 x 5 cm, linear-elliptic to ovate-orbicular, obtuse to apiculate, base acute or rounded, nerves 3 pairs, reticulate; petiole to 1.5 cm long. Cymes few to many flowered; peduncles longer than the petioles; pedicels 11 mm long; sepals 3 x 0.5 mm, lanceolate; corolla 26 mm long, tube slightly inflated below, greenish-white with purple streaks, hispid, lobes 6 x 3 mm, yellow, hairy within, beak purplish; outer corona 3 x 1.5 mm, of 5 entire or truncate hairy lobes; inner corona erect, linear-spatulate, glabrous.

*Fl. & Fr.* September-November.

*Distr.* Peninsular India and Sri Lanka. Common in moist deciduous forests; *PS 19729* Parambikulam; *19823* Kannimara

**Ceropegia metziana** Miq., *Anal. Bot. Ind.* 3: 11. 1852; *Sasidh. & Swarup.*, *JETB* 18: 633.1994; *FTSR* 286. 1996. *C. brevicollis* Hook.f., *FBI* 4: 74. 1883, p. p.; *FPM* 859. 1923. *C. stocksii* sensu Gamble, *FPM* 859. 1923.

Twining herbs, stem pubescent at nodes. Leaves to 15 x 5 cm, ovate or ovate-oblong, acute or acuminate, mucronate, base acute; petiole 2-3 cm long. Peduncle to 2 cm long, glabrous or hairy. Flowers few together; pedicels 2-2.5 cm long, stout; sepals 7 mm long, linear; corolla to 7.5 cm long, base inflated, funnel-shaped above, lobes 3.5 cm long, ovate-deltoid, dull pink with purple dots; outer corona 6 mm across, lobes deltoid, bifid, hairy; inner corona 2.5 mm long, glabrous. Follicle 23-28 cm long, 5 mm thick, terete, with a 5 cm long beak; seeds 10 x 3 mm, oblong; coma 15 mm long.

*Fl & Fr.* September-November

*Distr.* Endemic to Southern Western Ghats. Rare in evergreen forests; *NS 5729* Karimala Hills

**Ceropegia omissa** H.Hubber in Mem. Soc. Brot. 12:67.1957; Ansari, Fasc. Fl. Ind. 16: 27. 1984. *C. intermedia* Wight var. *wightii* Hook.f., FBI 4: 71. 1883; FPM 5: 858. 1923.

Twining. Leaves to 11 x 2 cm, lanceolate, acute, base obtuse, membranous; petiole 1.3 cm. Cymes axillary; peduncles 1.5 cm; pedicels 1.5 cm; flowers purplish; calyx 5-lobed, 3.5 mm, linear lanceolate; corolla curved, base bulbous, tube 2.3 cm, lobes fused at apex, lobes 8 mm, ciliate; outer corona cupular, 5-lobed, 1 mm, inner 2 mm, spathulate.

*Fl. & Fr.* September-December

*Distr.* Endemic to Peninsular India. Rare in semi-evergreen forests; *PS 30825* Parambikulam

#### COSMOSTIGMA R. Wight

**Cosmostigma racemosum** (Roxb.) Wight, Contrib. 42.1834 & Ic. t. 591.1842; FBI 4:46.1883; FPM 846.1923; FTSR 288. 1996. *Asclepias racemosa* Roxb., Fl. Ind. 2: 32. 1832. *Cosmostigma acuminatum* Wight, Ic. t. 1270. 1848.

Climbers; stem glabrous. Leaves to 10 x 5 cm, ovate, acute or acuminate, base rounded or subcordate, glabrous, with a few small black glandular papillae at base; lateral nerves 3 pairs, basally 5-nerved; petiole to 2.5 cm long. Racemes to 2.5 cm long. Flowers 8 mm across, many together; pedicels 1 cm long, slender, pubescent; sepals small, ovate to orbicular, ciliate; corolla greenish-yellow with brown dots, 4 mm long, lobes ovate; gynostegium 2 mm across, outer corona lobes orbicular, emarginate, membranous; inner corona similar to outer.

*Fl. & Fr.* July-August

*Distr.* India and Sri Lanka. Rare in evergreen forests; *PS 30805* Orukomban

#### CRYPTOLEPIS R. Brown

**Cryptolepis buchananii** Roem. & Schult., Syst. Veg. 4: 409. 1819; FBI 4: 5. 1883; FPM 826. 1923; FPL 288. 1990; FTSR 288. 1996. *Nerium reticulatum* Roxb., Fl. Ind. 2: 8. 1832.

Glabrous twining. Leaves 10-20 x 5-8 cm, elliptic or oblong-lanceolate, obtuse or apiculate, base acute, glabrous and glossy; lateral nerves many, parallel; petiole 1-3 cm long. Flowers in 3 cm broad axillary cymes, few together; peduncles to 2 cm long, glabrous; pedicels 3-5 mm long; sepals free, 2 mm long, ovate, obtuse, with a small scale at the base inside; corolla campanulate, greenish-yellow, tube 2 mm long, lobes linear-lanceolate, 8 x 2 mm, imbricate; coronal lobes 1-seriate, clavate, 2 mm long, connate with corolla tube. Follicle 9 x 1 cm, divaricate, lanceolate.

*Fl. & Fr.* March-August

*Distr.* Peninsular India and Sri Lanka. Common in degraded forest areas; *PS 19499* Thellikkal

#### CYNANCHUM Linnaeus

**Cynanchum callialatum** Ham. ex Wt., Contrib. Bot. India 56.1834 & Ic. t. 1274.1848; FBI 4:24.1883; FPM 836.1923; FTSR 288. 1996.

Glabrous twining herbs. Leaves elliptic-oblong or linear-oblong, acute, base cordate, glabrous, glaucous below, to 8 x 4.5 cm; lateral nerves 7-9 pairs, intercostae faint; petiole to 2 cm long. Peduncles 3-4 cm long. Corolla white, 0.5 cm long, divided nearly to the base, lobes oblong, acute; corona of 5 erect obtuse, bifid lobes, with shorter lobes between them.

*Fl. & Fr.* October-March

*Distr.* India and Myanmar. Rare in semi-evergreen forests; *PS 30783* Kariamchola

#### DECALEPIS R. Wight et Arnott

**Decalepis hamiltonii** Wight & Arn. in Wight, Contrib. 64. 1834; FBI 4: 11. 1883; FPM 828. 1923 [Figure 8].

Twining shrubs; branchlets jointed. Leaves to 6 x 4.5 cm, obovate-elliptic or orbicular, apex obtuse, base cuneate, membranous; petiole to 1.5 cm. Cymes trichotomously branched; calyx deeply 5 lobed, 2 mm, oblong; corolla tube 1 mm, lobes 3 x 2 mm, oblong, recurved, white

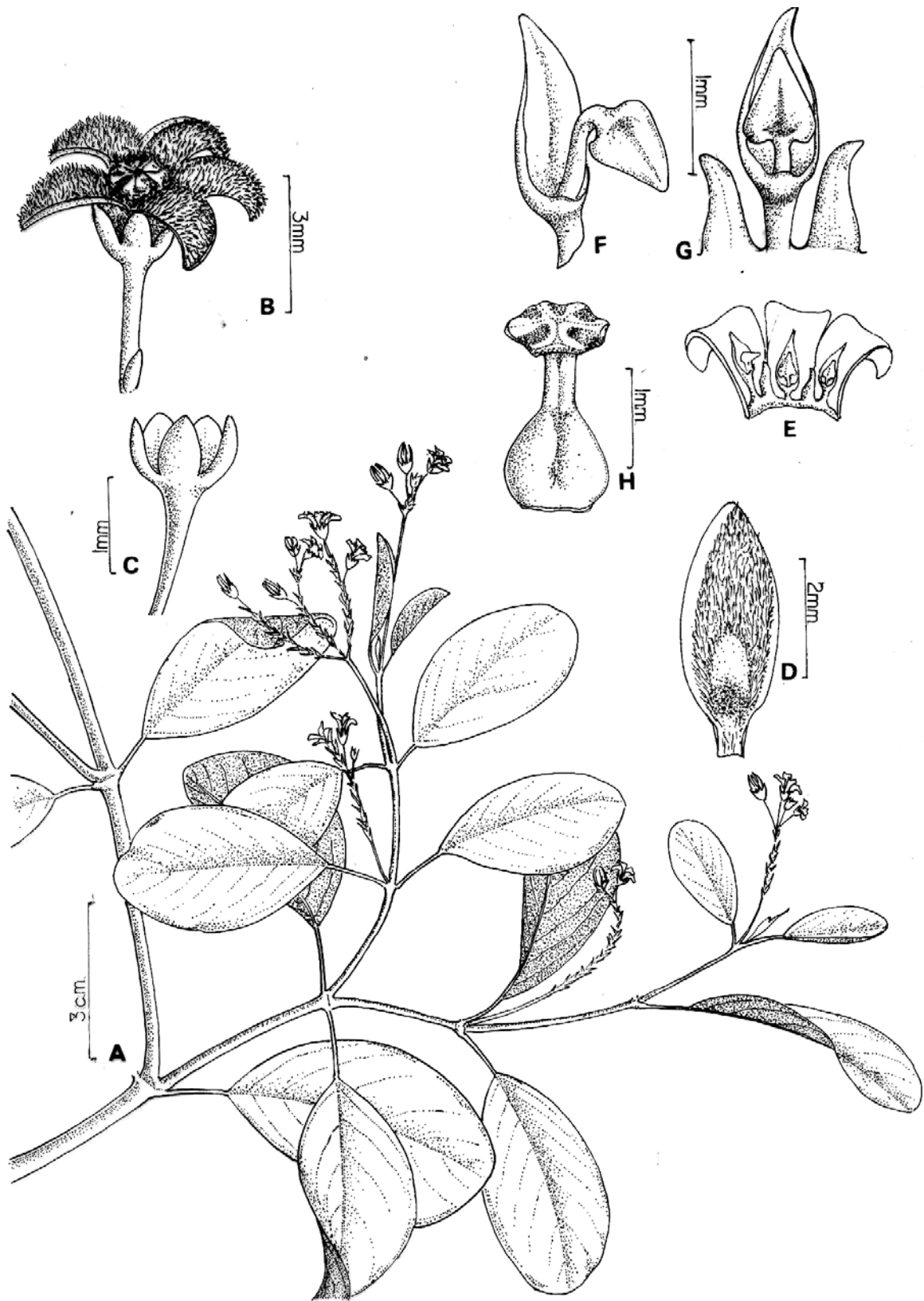


Figure 8. *Decalepis hamiltonii* Wight & Arn. **A** - flowering branch, **B** - flower, **C** - calyx, **D** - corolla lobe, **E** - a portion of corolla split open, **F** - stamen, **G** - stamen with staminal corona, **H** - pistil

pubescent inside; corona of 10 scales, alternately long hooked and short; filaments 1 mm, anthers attached to style apex; ovaries 1 mm.

*Fl. & Fr.* May-August

*Distr.* Endemic to Peninsular India. Rare in rocky areas of dry deciduous forests; *PS 30078* Kuchimudi

#### GYMNEMA R. Brown

**Gymnema sylvestre** (Retz.) R. Br. ex Schult. in Roem. & Schult., Syst. Veg. 6: 57. 1820; FBI 4: 29. 1883; FPM 839. 1923; FPL 289. 1990; FTSR 289. 1996. *Periploca sylvestris* Retz., Obs. Bot. 2: 15. 1781.

Climbers; branchlets fulvous-tomentose. Leaves to 7 x 5 cm, often much smaller, elliptic to ovate or obovate, obtusely acute, base truncate or obtuse, subcoriaceous, densely tomentose below; nerves 3 pairs; petiole 1-3 cm long. Flowers 4 mm across, umbellate, many together; peduncle to 1 cm long, hispid; pedicels 6 mm long, slender; sepals 2 mm long, ovate; corolla campanulate, yellow, 2.5 mm long, tube globose, lobes triangular; corolline corona 5 vertical pairs of pubescent ridges; gynostegium 1.5 x 1 mm, cylindrical. Follicle 7.5 x 0.8 cm, lanceolate, seeds 10 x 5 mm, much compressed.

*Fl. & Fr.* July-January

*Distr.* Indo-Malesia. Common in moist deciduous forests; *PS 30470* Vengoli

#### HEMIDESMUS R. Brown

**Hemidesmus indicus** (L.) R. Br. in Ait., Hort. Kew (ed. 2) 2: 75. 1811; FBI 4: 5. 1883; FPL 290. 1990; FTSR 289. 1996. *Periploca indica* L., Sp. Pl. 211. 1753.

Slender twining herbs, stem slender, usually brownish. Leaves very variable, 4-15 x 0.7-2 cm, elliptic-oblong to linear-lanceolate, acute to acuminate, pale below, young leaves often variegated; nerves 10-15 pairs. Flowers in axillary shortly peduncled cymes; pedicels short, bracteate; sepals 1 mm long, ovate, free; corolla mostly yellow, sometimes purple, 8 mm across, lobes ovate, acute, valvate; corona 5, scale-like, connate with corolla tube; stamens 5, filaments adnate at base; pollinia in pairs; gynostegium obovoid. Follicles 2, slender, terete.

*Fl. & Fr.* August-December

*Distr.* India and Sri Lanka. Very common in moist deciduous forests and degraded forest areas; *PS 19012* Thunakkadavu

#### HOLOSTEMMA R. Brown

**Holostemma ada-kodien** Schult. in Roem. & Schult., Syst. Veg. 6:95.1820; FPL 290. 1990; FTSR 291. 1996. *Sarcostemma annulare* Roth, Nov. Pl. Spec. 178.1821. *Holostemma rheedei* Spreng. ex Wall., Pl. As. Rar. 2:51.1831; FBI 4:21.1883. *H. annulare* (Roxb.) K. Schum. in Engl. & Prantl, Pflanzenf. 4(2):250.1895; FPM 834.1923. *Asclepias annularis* Roxb., Fl. Ind. 2:37.1832.

Glabrous twiners. Leaves to 12 x 8 cm, oblong or ovate, acute to cuspidate, base widely and deeply cordate; lateral nerves ca. 4-7 pairs, lower 2 pairs basal, base with few papillate glands; petiole to 4-5 cm long. Flowers few to many in axillary peduncled cymes; peduncles shorter than the petioles, stout; pedicels 1.5 cm long; calyx lobes ovate, 4 mm long; corolla 2.5 cm across, campanulate, pale purple, lobes 8 x 6 mm, ovate, obtuse; gynostegium 8 x 6 mm, outer corona short, truncate; inner corona 5, ovate, acute, glabrous.

*Fl.* September-November

*Distr.* India and Sri Lanka. Rare along the margins of evergreen forests; *PS 30818* Kottayali

#### HOYA R. Brown

1. Leaves narrow, linear ..... **H. pauciflora**
1. Leaves elliptic ..... **H. ovalifolia**

**Hoya ovalifolia** Wight & Arn. in Wight, Contrib. 37. 1834; FBI 4: 60. 1883; FPM 849. 1923; FPL 290. 1990; FTSR 293. 1996.

Climbing shrubs; stem pendulous, glabrous, terete, usually rooting from nodes. Leaves 6-8.5 x 2-3 cm, elliptic or rhomboid, acute or obtuse, base acute, margins undulate; nerves not clear; petiole *ca.* 0.8 cm long. Flowers 6-12, in axillary peduncled umbel; peduncles stout, to 3.5 cm long; pedicels slender, *ca.* 1.5 cm long; sepals 1.5 mm long, oblong; corolla 1 cm across, creamy-white, lobes ovate, acute; corona purplish, 4 x 4 mm, lobes acute. Follicles 9 x 1 cm, lanceolate.

*Fl. Fr.* November-December

*Distr.* Peninsular India and Sri Lanka. Rare in evergreen forests; *PS 30343* Vengoli

**Hoya pauciflora** Wight, Ic. t. 1269. 1848; FBI 4: 56. 1883; FPM 849. 1923; FTSR 293. 1996.

Slender epiphytic glabrous climbers; stem sometimes rooting from nodes. Leaves 4-6 x 0.7-0.9 cm, linear-lanceolate, obtuse, base truncate; petiole to 3 mm long. Flowers in few-flowered subsessile umbellate cymes, terminal on lateral smaller branches or axillary; pedicels 1.5-2 cm long, slender; sepals 1.5 mm long, ovate; corolla white, 1.2-2 cm across, campanulate, lobes shallow, triangular; corona 4 mm across, lobes rounded at apex.

*Fl.* November-December

*Distr.* South India and Sri Lanka. Rare in evergreen forests at higher altitudes; *PS 30003* Pooppara; *30381* Pandaravarai

#### SARCOSTEMMA R. Brown

**Sarcostemma brunonianum** Wight & Arn. in Wight, Contrib. 59. 1834; FBI 4: 27. 1883; FPM 838. 1923.

Leafless twiners, latex milky, dark green. Umbels lateral, 10-15 flowered, green; calyx lobes 1 mm, ovate; corolla deeply lobed, valvate, 5 x 2.5 mm, oblong, obtuse at apex, fleshy; pollinia pendulous; corona double, outer cupular, 10 lobed, wavy; inner staminal, lobes 5, fleshy; ovaries 1.5 mm, distinct, basally connate. Follicles 2, 13 cm long.

*Fl. & Fr.* March-June

*Distr.* Peninsula and Sri Lanka. Fairly common in dry deciduous forests; *PS 30838* Keerappdi

#### SECAMONE R. Brown

**Secamone emetica** (Retz.) R. Br. ex Schult. in Roem. & Schult., Syst. Veg. 6: 124. 1820; FBI 4: 13. 1883; FPM 829. 1923; Jens, Kew Bull. 47: 598. 1992. *Periploca emetica* Retz., Obs. Bot. 2: 14. 1781.

Scandent subshrubs. Leaves to 5.5 x 1 cm., linear-elliptic, apex acute, base decurrent, margins recurved, pubescent beneath, lateral nerves indistinct, subsessile. Cymes axillary, trichotomously branched; peduncles 0.5 cm; calyx lobes 0.5 mm, ovate, ciliate; corolla lobes twisted either to the left or right, 2 x 1 mm, oblong, ovate or acute at apex; corona staminal, of 5 scales; ovary 0.7 mm. Follicles paired, 7.5 x 0.8 cm, blunt at base and tapering at apex.

*Fl. & Fr.* May-August

*Distr.* Peninsular India and Sri Lanka. Common in dry deciduous forests; *PS 30481* Keerappadi

#### TYLOPHORA R. Brown

**Tylophora tetrapetala** (Dennst.) Suresh in Nicols, Suresh & Manilal, An Interpr. Hort. Malab. 64.1988. *Asclepias tetrapetala* Dennst., Schussel 14, 18, 35. 1818. *Tylophora tenuis* Blume, Bijdr. 1062. 1827; FBI 4: 42. 1883; FPM 843. 1923. *Tylophora carnosa* Wall. ex Wight, Contrib. 49. 1834.

Slender glabrous herbs. Leaves linear-oblong or oblong-lanceolate, acute, apiculate, base acute or rounded, to 6 x 1.5 cm; petiole *ca.* 5 mm long. Cymes umbellate, laxly dichasially branched. Calyx lobes ovate-acute, 5 mm long. Corolla 4 mm across, purplish-brown.

*Fl.* May-June

*Distr.* Indo-Malesia. Occasional in moist deciduous forests; *PS 30799* Padippara

### UTLERIA Beddome

**Utleria salicifolia** Bedd. ex Hook.f., FBI 4: 7. 1883; FPM 827. 1923; Sasidh. & Swarup., JETB 18: 636.1994.

Subshrubs. Leaves to 15-19 x 2-3 cm, linear-lanceolate, acuminate, base acute, crowded at the end of branches. Cymes dichotomous axillary, peduncle 4.5-6 cm; bracts linear-lanceolate, *ca* 3 mm; flowers *ca* 6 mm across; pedicel to 4 mm; calyx lobes *ca* 2 mm, glandular; corolla rotate, 2 mm, lobes ovate, corona scales 5, rounded; stamens basely in corolla tube, anthers ovate; ovary oblong. Mericarps divaricate, lanceolate, to 5 cm long.

*Fl.* June-July

*Distr.* Endemic to Southern Western Ghats. Rare in the rocky slopes of grasslands; *NS 5699* Thoothampara

### LOGANIACEAE

1. Herbs ..... **Mitrasacme**
1. Trees, lianas or shrubs ..... 2
2. Leaves 3-5 ribbed from base, coriaceous; berry globose ..... **Strychnos**
2. Leaves penninerved, thickly coriaceous; berry ellipsoid ..... **Fagraea**

### FAGRAEA Thunberg

**Fagraea ceylanica** Thumb., Vetensk. Acad. Handl. 3: 132. 1782; FBI 4: 83. 1883 "zeylanica"; FPM 865. 1923; FPL 294. 1990; FTSR 295. 1996. *F. obovata* Wall. in Roxb., Fl. Ind. 2: 33. 1824; FBI 4: 83. 1883; FPM 865. 1923. *F. coromandelica* Wight, Ic. t. 1316. 1848. *F. malabarica* Wight, Ic. t. 1317. 1848.

Small trees or shrubs, terrestrial or epiphytic. Leaves to 20 x 8 cm, obovate, obtuse, base cuneate, entire, fleshy, glossy above; petiole to 2.5 cm, united by stipular sheath at base. Flowers few to many, large, in terminal cymes, 5-merous; branches of cyme stout; calyx tube 5 mm long, lobes 8 mm long, obovate, obtuse, imbricate; corolla 4-7 cm long, creamy yellow, funnel shaped, lobes obovate, obtuse, twisted; stamens 5, exerted, filaments 2 cm long, inserted on the throat of corolla tube; ovary 2-celled, ovule numerous; style 4 cm long; stigma capitate. Berry 4 cm long, ellipsoid, obtuse, glabrous, glossy.

*Fl. & Fr.* June-December

*Distr.* Indo-Malesia. Common in evergreen forests; *PS 18959* Vengoli; *19327* Thenkudippara

### MITRASACME Labillardiere

**Mitrasacme indica** Wight, Ic. t. 1601. 1850; FTSR 295. 1996. *M. alsinoides* auct. non R. Br., 1810; Hook.f., FBI 4:80. 1883; FPM 864. 1923.

Leaves linear-lanceolate, to 5 x 1 mm, sessile, nerves indistinct. Flowers solitary or in fascicles of 2 or 3; pedicels filiform to 8 mm long. Calyx tube 1 mm long, lobes as long as the tube. Corolla white, 1.5 mm long, sparsely hairy at base. Capsule globose, 2 mm across.

*Fl. & Fr.* September-October

*Distr.* Indo-Malesia to Australia and China. Common in moist deciduous forests; *PS 30784* Thunakkadavu

### STRYCHNOS Linnaeus

1. Climbing shrubs, stigma entire ..... **S. colubrina**
1. Trees; stigma bifid ..... 2
2. Berry to 2 cm diameter; corolla tube and lobes equal in length ..... **S. potatorum**
2. Berry more than 4 cm diameter; corolla tube longer than the lobes ..... **S. nux-vomica**

**Strychnos colubrina** L., Sp. Pl. 189. 1753; FTSR 297. 1996. *S. wallichiana* Steud. ex DC., Prodr. 9: 13. 1845. *S. rheedei* Clarke in Hook.f., FBI 4: 87. 1883. *S. cinnamomifolia* Thw., Enum. Pl. Zeyl. 201. 1860, var. *wightii* Hill, Kew Bull. 1917: 194. 1917; FPM 869. 1923.

Tendrillate climbers. Leaves 5-8 x 3-5 cm, broadly elliptic, abruptly acuminate, shining, green or black when dry; nervules prominent, irregular. Cymes peduncled, 5-6 cm across. Flowers many; pedicels 2 mm long; calyx 1.5 mm long, lobes ovate, obtuse, ciliate; corolla greenish yellow, tube 10 mm long, hairy inside, lobes 4 x 2 mm, oblong, obtuse; anthers sessile; style 12 mm long, stigmas bilobed, globose. Berry 2 cm across, globose, glabrous, greenish.

*Fl. & Fr.* March-August

*Distr.* Indo-Malesia. Common in evergreen forests; *PS 18885* Orukomban

**Strychnos nux vomica** L., Sp. Pl. 189. 1753; FBI 4: 90. 1883; FPM 868. 1923; FPL 296. 1990; FTSR 297. 1996.

Small to medium trees. Leaves 8-15 x 5-9 cm, broadly ovate, obtuse at apex, acute at base, 5-ribbed, prominent beneath; nervules irregular; petiole 1 cm long. Cymes 2-3 cm across, terminal. Flowers sessile; calyx 1 mm long, lobes triangular, acute, pubescent; corolla greenish yellow, tube 10 mm long, hairy within; lobes 4 x 1.5 mm, oblong, acute; anthers sessile, inserted at the throat of corolla tube. Berry 3-4 cm across, red, glabrous; seeds 3 or 4, orbicular, flat.

*Fl. & Fr.* March-May

*Distr.* Indo-Malesia. Common in semi-evergreen forests; *PS 19214* Kariamchola

**Strychnos potatorum** L.f., Suppl. Pl. 148. 1781; FBI 4: 90. 1883; FPM 868. 1923; FPL 296. 1990.

Small to medium trees. Leaves opposite to 7 x 4 cm ovate, apex acute, base obtuse or rounded, membranous, 5 nerved, subsessile. Cymes from the axils of leafscars, 3 cm across, flowers white; calyx 5 lobed, 1.5 cm, ovate; corolla tubular, 3 mm, lobes 3 mm, oblong, pubescent inside; anthers oblong, 1.5 mm; ovary 1.5 mm, style 5 mm, stigma bifid. Berry *ca.* 1.5 cm across, blue when ripe.

*Fl. & Fr.* March-May

*Distr.* Peninsular India and Sri Lanka. Common in dry deciduous forests; *PS 30390* Kuchimudi

## GENTIANACEAE

- |   |                 |
|---|-----------------|
| 1. Flowers blue or lilac; ovary 2-locular .....   | <b>Exacum</b>   |
| 1. Flowers other than blue; ovary 1-locular ..... | 2               |
| 2. Flowers sessile, yellowish .....               | <b>Hoppea</b>   |
| 2. Flowers stalked, pink or white .....           | <b>Canscora</b> |

## CANSCORA Lamarck

- |   |                      |
|---|----------------------|
| 1. Bracts of the inflorescence perfoliate; calyx prominently winged ..... | <b>C. perfoliata</b> |
| 1. Bracts of the inflorescence not perfoliate; calyx not winged .....     | <b>C. diffusa</b>    |

**Canscora diffusa** (Vahl) R. Br. ex Roem. & Schult., Syst. Veg. 3: 301. 1820; FBI 4: 103. 1883; FPM 878. 1923; FPL 298. 1990; FTSR 298. 1996. *Gentiana diffusa* Vahl, Symb. Bot. 3: 47. 1794. *Canscora lawii* Wight, Ic.t. 1327. 1848.

Annual herbs; stem 4-angular. Lower leaves elliptic, petiolate; upper ones ovate, sessile, 3-ribbed, glabrous. Cymes terminal; bracts ovate. Flowers many; pedicel 1 cm long, filiform; calyx 6 mm long, wingless, 5-toothed, glabrous; corolla white, 9 mm long, tube cylindrical, lobes lanceolate, acute; two stamens fertile, two sterile; capsule 5 mm long, linear-oblong.

*Fl. & Fr.* November-December

*Distr.* Indo-Malesia, Australia and Africa. Common wet rocky areas and moist deciduous forests; *PS 19089* Amakkundu

**Canscora perfoliata** Lam., Encycl. 1: 601. 1785; FBI 4: 1094. 1884; FPM 879. 1923; FPL 298. 1990; FTSR 298. 1996. *C. grandiflora* Wight, Ic. t. 1326. 1848.

Branched annual herbs, 40-55 cm high. Leaves to 4 x 1.5 cm, ovate, acute, upper ones sessile, lower petiolate. Cymes terminal; bracts 10 mm across, membranous. Flowers many; pedicel 13 mm long, winged towards apex; calyx 15 mm long, 8-winged, lobes acuminate, wings strongly nerved; corolla 18-20 mm long, glabrous, lobes unequal. Capsule 8 x 2 mm, oblong; seeds irregular, brown, glassy.

*Fl. & Fr.* November-December

*Distr.* Endemic to Western Ghats. Common in wet rocky areas; *PS 19144, 19940* Karimala

#### EXACUM Linnaeus

1. Flowers 5-merous; leaves 5-8 cm long ..... **E. wightianum**
1. Flowers 4-merous; leaves to 3 cm long ..... 2
2. Calyx not winged; leaves to 1 cm long..... **E. sessile**
2. Calyx winged; leaves more than 1.5 cm long ..... 3
3. Leaves petiolate, rhomboid to elliptic..... **E. carinatum**
3. Leaves sessile, ovate-lanceolate..... **E. pumilum**

**Exacum carinatum** Roxb., Fl. Ind. 1: 415. 1820; FPL 299. 1990. *E. petiolare* Griseb. in DC., Prodr. 9: 46. 1845; FBI 4: 98. 1883; FPM 874. 1923.

Erect herbs, stem 4-angled. Leaves 3 x 2 cm, rhomboid to elliptic, acute to acuminate, narrowed in petiole at base; nerves 5, basal. Flowers few, 1 cm across, in terminal cymes; calyx 0.5 cm long, 5-winged; wings prominently nerved, lobes acuminate; corolla 10 mm long, lobes obovate; anthers 3.5 mm long, bottle shaped.

*Fl. & Fr.* August-December

*Distr.* India and Sri Lanka. Rare in wet rocks of evergreen forests; *PS 19969* Pandaravarai

**Exacum pumilum** Griseb. in DC., Prodr. 9: 46. 1845; FBI 4: 98. 1883; FPM 875. 1923; FPL 300. 1990; FTSR 299. 1996.

Slender herbs, stem 4-angled. Leaves sessile, ovate lanceolate, to 1.2 x 0.6 cm, lower much smaller, 1-nerved; upper 3-nerved from base. Flowers mostly solitary or in few flowered lax cymes; pedicel to 1.5 cm, enlarges in fruits. Calyx lobes 1 mm long, wings narrow. Corolla bluish-white, lobes oblong-obovate, 5 x 3.5 mm. Capsule 4 x 3 mm.

*Fl. & Fr.* September-October

*Distr.* Endemic to Western Ghats. Common on wet rocks in evergreen and moist deciduous forests; *PS 30005* Vengoli

**Exacum sessile** L., Sp. Pl. 112. 1753; FBI 4: 98. 1883; FPM 874. 1923; FPL 300. 1990; FTSR 299. 1996.

Erect herbs, to 20 cm high; stem narrowly winged. Leaves to 10 x 8 mm, broadly ovate, cordate at base, acute or obtuse at apex, 3-ribbed, sessile. Flowers few, in drooping terminal cymes, sessile and pedicelled, tetramerous; calyx 6 mm long, lobes oblong, acute; corolla violet or light blue, lobes deltoid; anthers 1.5 mm long.

*Fl. & Fr.* July-December

*Distr.* Peninsular India and Sri Lanka. Common on wet rocks; *PS 19744* Pezha

**Exacum wightianum** Arn., Ann. Sci. Nat Bot. 11: 176. 1839; FBI 4: 97. 1883; FPM 873. 1923. *E. atropurpureum* Bedd. var. *palghatense* Gamble, FPM 874. 1923.

Erect woody herbs; stem scarcely dichotomous or unbranched. Leaves 5-8 x 3-5 cm, ovate, acute, cordate at base, 5-ribbed. Cymes terminal, peduncled; bracts linear lanceolate. Flowers few; pedicels deflexed in fruit; calyx 14 mm long, lobes lanceolate, acuminate, wings 3 mm



broad, obtuse to subcordate at base, nerves not prominent; corolla tube 4 mm long, lobes obovate, glandular; anthers 4.5 mm long, black-glandular at apex.

*Fl. & Fr.* November-January

*Distr.* Endemic to Southern Western Ghats. Rare along the margins of grasslands; *PS 19935* Karimala

#### HOPPEA Willdenow

**Hoppea fastigiata** (Griseb.) Clarke in Hook.f., *FBI* 4: 100. 1883; *FPM* 877. 1923; *FPL* 300. 1990; *FTSR* 299. 1996. *Cicendia fastigiata* Griseb., *Gen. Sp. Gent.* 158. 1839.

Small branched herbs. Leaves opposite, 4-8 x 2-5 mm, ovate, subsessile. Cymes terminal and axillary; peduncles to 5 mm, calyx tube 4 mm, teeth 2 mm, lanceolate, acuminate; corolla tube 4 mm, lobes unequal, lanceolate; stamen 1 perfect, 3 sterile; ovary ellipsoid, one celled, many ovuled, stigma 2 lobed.

*Fl. & Fr.* April-June

*Distr.* Peninsular India, Sri Lanka and Myanmar. Occasional in moist deciduous forests; *PS 30755* Vengoli

### HYDROPHYLLACEAE

#### HYDROLEA Linnaeus

**Hydrolea zeylanica** (L.) Vahl, *Symb. Bot.* 2: 46. 1791; *FBI* 4: 133. 1883; *FPM* 884. 1923; *FPL* 301. 1990; *FTSR* 300. 1996. *Nama zeylanica* L., *Sp. Pl.* 226. 1753.

Annual herbs, rooting at nodes. Leaves alternate, to 7 x 1.5 cm, elliptic or lanceolate, apex acute, base cuneate, membranous, young parts partly hirsute. Racemes axillary and terminal, pedicels to 0.5 cm; calyx lobes 6 x 1.5 mm, lanceolate, glandular, acute; corolla lobes 6.5 mm, ovate, obtuse, deep blue; stamens 5, filaments basally dialated; ovary 2.5 mm, oblong, many ovuled, sparsely hispid, styles 2, 3 mm, stigma globose. Capsule 5 x 2 mm, ovoid.

*Fl. & Fr.* January-April

*Distr.* Pantropical. Common in marshy areas; *PS 19069* Thunakkadavu

### BORAGINACEAE

- |   |                     |
|---|---------------------|
| 1. Fruits covered with glochidiate bristles .....                   | <b>Cynoglossum</b>  |
| 1. Fruits without glochidiate bristles.....                         | 2                   |
| 2. Prostrate herbs; leaves crisped .....                            | <b>Coldenia</b>     |
| 2. Erect herbs, shrubs or trees; leaves not crisped .....           | 3                   |
| 3. Flowers in one sided spike or racemes .....                      | 4                   |
| 3. Flowers solitary or in cymes or panicles .....                   | 5                   |
| 4. Scandent shrubs; pyrenes 2 celled, cells 2-ovuled .....          | <b>Tournefortia</b> |
| 4. Herbs; pyrenes 4-celled, cells 1-ovuled .....                    | <b>Heliotropium</b> |
| 5. Scabrid herbs; anthers connate into a cone around the style..... | <b>Trichodesma</b>  |
| 5. Scandent or trailing shrubs or trees; anthers free .....         | 6                   |
| 6. Flowers solitary, axillary, pink .....                           | <b>Rotula</b>       |
| 6. Flowers in cymes or panicles, white or yellow .....              | 7                   |
| 7. Drupe more than 1.5 cm across; style 4 branched.....             | <b>Cordia</b>       |
| 7. Drupe less than 0.7 cm across; style 2 branched.....             | <b>Ehretia</b>      |

#### COLDENIA Linnaeus

**Coldenia procumbens** L., *Sp. Pl.* 125. 1753; *FBI* 4: 144. 1883; *FPM* 892. 1923; *FPL* 302. 1990; *FTSR* 351. 1996.

Prostrate herbs with radiating branches; stem hispid. Leaves 2-4 x 2 cm, oblong with wavy margins, obtuse, densely hispid, nerves deeply impressed; petiole to 1 cm long. Flowers axillary, solitary, sessile; sepals 5, 1 mm long, ovate, acute; corolla pale green, 2 mm long, 5-lobed, tube short; stamens 5, inserted inside the tube; ovary 4-lobed, 2-celled, 2-ovules in each cell; styles 2, free, stigmas capitate. Drupe 2 mm across, 4, 1-seeded pyrenes; seeds globose.

*Fl. & Fr.* May-June

*Distr.* Pantropical. Common in reservoir beds; *PS 18979* Thunakkadavu

#### CORDIA Linnaeus

1. Leaves scabrous; filaments glabrous at base ..... **C. monoica**
1. Leaves not scabrous; filaments villous at base ..... **C. wallichii**

**Cordia monoica** Roxb., Pl. Corom. t. 58. 1796; FBI 4: 137. 1883; FPM 888. 1923.

Small trees, branchlets lenticellate, tomentose. Leaves alternate, 8-10 x 5-7 cm, ovate-elliptic, nerves 4-5 pairs, basal pair opposite, upper surface scabrous, puberulus beneath; petiole to 2 cm. Corymbs terminal, pubescent; calyx tube 5 mm, tomentose, lobes 2 mm, hairy; corolla tube 8mm, lobes 5mm, white; filaments attached to the mouth of corolla tube, 3mm, anthers 1.5mm; ovary 4-celled, hairy, stigma clavate. Drupe 2.5 x 1.5 cm ovoid with mucronate tip.

*Fl. & Fr.* December-April

*Distr.* Peninsular India and Sri Lanka. Common in dry deciduous forests; *PS 30482* Kuchimudi; *30539* Pandaravarai

**Cordia wallichii** G. Don, Gen. Syst. 4: 379. 1837; FPM 887. 1923; FPL 302. 1990; FTSR 301. 1996. *C. tomentosa* Wall. in Roxb., Fl. Ind. 2: 339. 1824, non Roem. & Schult. 1819. *C. obliqua* Willd. var. *wallichii* (G. Don) Clarke in Hook.f., FBI 4: 137. 1883. *C. obliqua* Willd. var. *tomentosa* Kazmi, J. Arnold. Arbor. 51. 143. 1970.

Trees, to 15 m high; bark white corky; branchlets densely pubescent. Leaves to 14 x 8 cm, elliptic, acute at base and apex, densely pubescent below, scarcely above; nerves to 5 pairs, prominent; petiole 3 cm long. Cymes 8 x 8 cm, terminal, corymbose. Flowers creamy white; calyx 9 mm long, lobes 3, ovate, acute, hairy; corolla 15 mm long; lobes 6, oblong, acute; stamens 6, filaments villous at base. Drupe 2 x 2 cm, depressed-globose, yellow, shining.

*Fl. & Fr.* April-June

*Distr.* Endemic to South West India. Common in moist deciduous forests and plantations; *PS 19060* Thunakkadavu

#### CYNOGLOSSUM Linnaeus

**Cynoglossum zeylanicum** (Hornem.) Thumb. ex Lehm., Neue Schriften Naturf. Gen. Halle 3:20. 1817; FPL 303. 1990; FTSR 303. 1996. *Anchusa zeylanica* Vahl ex Hornem., Enum. Pl. Hort. Hafn. 3. 1807. *Cynoglossum denticulatum* A.DC. var. *zeylanicum* (Vahl ex Hornem.) Clarke in Hook.f., FBI 4: 157. 1883; FPM 900. 1923. *C. furcatum* Wall. in Roxb., Fl. Ind. 2: 6. 1824; FBI 4: 155. 1883; FPM 900. 1923.

Erect herbs, whole plant softly adpressed pubescent. Leaves alternate, 10-25 x 3-7 cm, oblong-lanceolate, acute at apex, cuneate at base; nerves to 5 pairs, prominent, arching, upper leaves smaller; petiole to 1 cm long, flat. Racemes 10-35 cm long, straight or arching. Flowers sessile, many; sepals 2 mm long, spreading; corolla 3-5 mm across, blue, campanulate; stamens inserted at the throat of the corolla tube; ovary 4-celled, style gynobasic. Fruit of 4 nutlets, 3-5 mm across, glochidiate.

*Fl. & Fr.* Throughout the year

*Distr.* Indo-Malesia and China. Common in degraded forest areas; *PS 19075* Peruvuripallam; *19489* Thelikkal; *19591* Karimalagapuram

## EHRETIA P. Browne

**Ehretia canarensis** (Clarke) Gamble, FPM 891. 1923. *E. laevis* Roxb. var. *canarensis* Clarke in Hook.f., FBI 4:142.1883. *E. indica* (Dennst. ex Kostel.) M.R. & S.M. Almeida, JBNHS 90. 424. 1993; FTSR 303.1996. *Bruxanella indica* Dennst. ex Kostel., Allig. Med. Pharm. Fl. 5:2002.1836.

Trees, to 8 m high; branchlets glabrous. Leaves alternate, to 13 x 5 cm, elliptic, acuminate at apex, base acute; lateral nerves 4-6 pairs; domatia glandular; petiole 1.5 cm long. Cymes terminal and axillary, 5-10 cm across. Flowers sessile; sepals 1 mm long, obtuse, ciliate; corolla white, 4 mm long, lobes oblong, obtuse; stamens 5, exserted; ovary ovoid, 2-celled, ovules 2 in each cell, style terminal, 3 mm long. Berry, 3-4 mm across, globose, reddish; seeds 4.

*Fl. & Fr.* August-December

*Distr.* Endemic to Peninsular India. Occasional in moist deciduous forests; *PS 19785* Kanthalppara; *30462* Vengoli

## HELIOTROPIUM Linnaeus

1. Leaves to 5 x 2 cm; nutlets free, obtuse.....**H. bracteatum**
1. Leaves more than 7 x 5 cm; nutlets connate in pairs, beaked..... 2
2. Flowers pale violet or pink ..... **H. indicum**
2. Flowers white ..... **H. keralense**

**Heliotropium bracteatum** R. Br., Prodr. 493. 1810; FBI 4: 151. 1883; FPM 897. 1923. *H. laxiflorum* Roth, Nov. Pl. Sp. 102. 1821.

Herbs, branchlets pubescent. Leaves to 4 x 0.5 cm, linear-lanceolate, acute, base cuneate, margin revolute; petiole to 4 mm; calyx lobes 5, 2.5 mm, ovate-obovate; corolla 2.5 mm across, salver form, lobes to 1.5 mm, broadly ovate; stamens 5; anthers to 1 mm, ovate-cordate; ovary globose. Drupe 2 mm across, 4-lobed, hirsute; seeds globose.

*Fl. & Fr.* March-July

*Distr.* India, Sri Lanka, Indonesia and Australia. Common in open rocky areas; *PS 30454* Vengoli

**Note:** Present collection is an addition to the flora of Kerala

**Heliotropium indicum** L., Sp. Pl. 130. 1753; FBI 4: 152. 1883; FPM 896. 1923; FPL 303. 1990. *Tiaridium indicum* (L.) Lehm., Pl. Asperif. Nucif. 14. 1818.

Erect herbs. Leaves 8-12 x 4-7 cm, ovate, obtuse at apex, rounded at base, entire, hispid. Calyx 1.5 mm long, lanceolate, hispid outside; corolla white, 3 mm long, bottle shaped, white; lobes 5, rounded; stamens 5, anthers sessile, inserted inside the corolla tube; ovary 4-celled; style terminal, stigma capitate. Drupe 4 x 3 mm, 4-lobed, glabrous; seeds subglobose.

*Fl. & Fr.* Throughout the year

*Distr.* Pantropical. Common in reservoir beds and marshy areas; *PS 30457* Parambikulam

**Heliotropium keralense** Sivari & Manilal, J. Indian Bot. Soc. 51: 348. 1972; FTSR 303. 1996.

Erect pubescent herbs. Leaves to 10 x 4 cm, ovate-obtuse, base cuneate, subentire, membranous, petiole to 8 cm long. Cymes 15 cm long. Calyx 2.5 mm long, white strigose. Corolla white, villous, 3 mm long; ovary 4-celled; style twisted; stigma capitate. Drupe 5 x 3 mm, 4-lobed; seeds 4, globose.

*Fl. & Fr.* March-May

*Distr.* Endemic to Southern Western Ghats (Kerala). Occasional in the banks of river and reservoir along with *H. indicum*; *PS 19472, 19492* Thellikkal

## ROTULA Loureiro

**Rotula aquatica** Lour., Fl. Cochinch. 121. 1790; FPM 893. 1923; FPL 304. 1990; FTSR 304. 1996. *Rhabdia lycioides* Mart. & Zucc. Nov. Gen. Sp. 2: 136. 1827; FBI 4: 145. 1883. *Ehretia cuneata* Wight, Ic. t. 1385. 1848.

Stout branching shrubs; branched virgate, usually pinkish, glabrous. Leaves alternate or fascicled, 1-2 x 0.5 cm, oblong-ob lanceolate, obtuse, sessile. Flowers solitary or in few flowered cymes axillary; calyx 3.5 mm long 5-partite, lobes lanceolate; corolla pink, 5 mm long, 7 mm across, campanulate, 5-lobed; stamens 5, anthers sagittate at base; ovary 4-celled, style filiform, stigma capitate. Drupe with 4, 1-seeded pyrenes, free, yellowish, smooth.

*Fl. & Fr.* Throughout the year

*Distr.* Pantropical. Occasional in rocky riverine areas; *PS 18803* Kannimara

#### TOURNEFORTIA Linnaeus

**Tournefortia heyneana** Wall. ex G. Don, Gen. Syst. 4: 369. 1837; FBI 4: 145. 1883; FPM 893. 1923; FTSR 304. 1996. *T. reticosa* Wight, Ic. t. 1386. 1848; FBI 4: 146. 1883; FPM 893. 1923.

Scandent shrubs, branches glabrous. Leaves alternate, to 15 x 4 cm elliptic, oblong, acuminate at apex, acute to rounded at base, entire; petiole 1.5 cm long. Flowers in dichotomous scorpioid cymes, terminal, pedicelled; calyx 5-lobed, 2 mm long, ovate, acute; corolla 7 mm long, bottle-shaped, tubular, lobes 5, very short; stamens 5, included; anthers sessile, oblong; ovary 4-celled. style terminal, bifid at apex. Drupe 4 x 3 mm, dehiscent into 2 pyrenes.

*Fl. & Fr.* January-March

*Distr.* Endemic to Southern Western Ghats. Fairly common along the margins of evergreen forests; *PS 30006* Pooppara

#### TRICHODESMA R. Brown

**Trichodesma zeylanicum** (Burm. f.) R. Br., Prodr. 496. 1810; FBI 4: 154. 1883; FPM 899. 1923; FPL 305. 1990; FTSR 305. 1996. *Borago zeylanica* Burm.f., Fl. Ind. 41. 1768.

Coarsely hispid erect herbs, to 50 cm high. Leaves 8-10 x 2 cm, lanceolate, acute at base and apex, tubercled hairy above, tomentose below; petiole 5 mm long. Flowers axillary or in terminal cymes, pedicelled; sepals 10 x 5 mm, enlarging in fruit; corolla blue, 8 mm long, campanulate, lobes 5, triangular with twisted narrow tip; stamens 5, anthers sessile, connivent, connective produced in twisted threads; ovary 4-lobbed and 4-celled; style terminal. Nutlets, rugose on the inner surface.

*Fl. & Fr.* Throughout the year

*Distr.* Indo-Malesia and Australia. Common in moist deciduous forests; *PS 19077* Amakkundu

### CONVOLVULACEAE

1. Corolla urceolate .....	<b>Lepistemon</b>
1. Corolla otherwise.....	2
2. Styles two or three .....	<b>Evolvulus</b>
2. Style one.....	3
3. Corolla deeply 5 lobed each with two lobules.....	<b>Erycibe</b>
3. Corolla entire .....	4
4. Outer two or three lobes of the sepals accrescent, foliosus.....	<b>Hewittia</b>
4. Lobes of the sepals equal or sub-equal not accrescent .....	5
5. Pollen grains smooth.....	<b>Merremia</b>
5. Pollen grains spinulose .....	6
6. Fruit dehiscent .....	<b>Ipomoea</b>
6. Fruit indehiscent .....	7
7. Stigma linear-oblong.....	<b>Rivea</b>
7. Stigma capitate or biglobose.....	8
8. Calyx accrescent larger than fruit .....	<b>Stictocardia</b>
8. Calyx not accrescent smaller than fruit .....	<b>Argyreia</b>

## ARGYREIA Loureiro

- |   |                     |
|---|---------------------|
| 1. Ovary 2-celled; fruits red .....           | 2                   |
| 1. Ovary 4-celled; fruits not red.....        | 3                   |
| 2. Leaves strigose villous above .....        | <b>A. imbricata</b> |
| 2. Leaves glabrous or glabrescent above ..... | <b>A. osyrensis</b> |
| 3. Leaves cordate at base.....                | <b>A. hirsuta</b>   |
| 3. Leaves acute at base .....                 | <b>A. elliptica</b> |

**Argyreia elliptica** (Roth) Choisy, Convolv. Orient. 35. 1834. *Ipomoea elliptica* Roth, Nov. Pl. Sp. 113.1821. *Lettsomia elliptica* (Roth) Wight, Ic. t. 1356.1848; FBI 4:192.1883; FPM 911. 1923.

Branchlets sparsely pubescent. Leaves 5-9 x 3-5 cm, elliptic-ovate to obovate, acute, base rounded to truncate. Cymes lax, corymbose, to 8 cm; bracts deciduous; calyx lobes 5, subequal, 4 x 3 mm, ovate, obtuse; corolla pink to rose, 3-4 cm across; stamens 5; anthers 3mm; ovary 1.5 mm, 2-locular; ovules 2 per cell, style 1.5 cm. Berry 0.7 cm across, orange.

*Fl. & Fr.* November-March

*Distr.* South India and Sri Lanka. Common in moist deciduous forests and bamboo brakes; *PS 19639* Vengoli; *18849* Kanthalppara

**Argyreia hirsuta** Wight & Arn., Nov. Acta Phys. Med. Acad. Caes. Leop. Carol. Nat. Cur. 18: 356. 1836; FBI 4: 189. 1883; FPM 909. 1923; FPL 306. 1990; FTSR 305. 1996. *Rivea hirsuta* (Wight & Arn.) Wight, Ic. t. 891. 1845.

Climbers; stem hirsute along one side. Leaves 18-20 cm across, broadly ovate, cordate at base, acute at apex, densely pubescent with adpressed hairs; nerves 8-13 pairs, prominent below; petiole 15-18 cm long. Peduncles axillary, to 10 cm long; bracts leafy, 3-4 cm long, elliptic, shortly petioled; sepals equal, ovate, obtuse, sparsely hairy; corolla 7 cm long, 6 cm broad, campanulate, hispid outside, pink. Berry 13 mm across, depressed-globose, yellow, glabrous.

*Fl. & Fr.* August-December

*Distr.* South India and Sri Lanka. Common in moist deciduous forests and bamboo areas; *PS 30464* Vengoli; *NS 19887* Velayudhankai

**Argyreia imbricata** (Roth.) Sant. & Patel, Trans. Bose-Res. Inst. Calcutta 22: 40. 1958. *Ipomoea imbricata* Roth, Nov. Pl. Sp. 112. 1821. *Lettsomia aggregata* Roxb., Fl. Ind. 2: 76. 1824; FBI 4: 191. 1883; FPM 910. 1923. *L. mysorensis* Clarke in Hook.f., FBI 4: 192. 1883.

Large climbers; stem white-woolly. Leaves 8-12 x 6 cm, ovate, obtusely acute, apiculate, rounded or subcordate at base, strigose above, white-tomentose beneath, nerves impressed above; petiole 3 cm long. Cymes terminal; peduncles 5 cm long; bracts and bracteoles small. Flowers few, shortly pedicelled; calyx lobe orbicular, 10 x 7 mm, densely hairy outside, reddish inside; corolla 2 cm long, pink. Berry 5 x 5 mm, reddish, densely hairy outside.

*Fl. & Fr.* August-December

*Distr.* Endemic to South India. Common in moist deciduous forests; *PS 30608* Anappadi

**Argyreia osyrensis** (Roth) Choisy, Mem. Soc. Phys. Geneve 6: 427. 1843 'orixensis'. *Ipomoea osyrensis* Roth, Nov. Pl. Sp. 117. 1821. *Lettsomia aggregata* Roxb., Fl. Ind. 2: 76. 1824; FBI 4: 191. 1883; FPM 910. 1923. *L. mysorensis* Clarke in Hook. f., FBI 4: 192. 1883.

Climbing shrubs, branchlets white, tomentose. Leaves 5-10 x 4-8 cm, broadly ovate, thinly pubescent above and tawny tomentose below, acute, base subcordate, petiole to 4 cm, tomentose. Cymes densely white tomentose, peduncle 5-8 cm, bracts sub-orbicular, calyx 5, unequal, ovate, to 8 x 5 mm, corolla 1 cm, pink, tube to 1.5 cm; stamens exerted; ovary 2-locular, ovules 2 per cell, style 2 cm. Berry ca 1 cm across, red, enclosed by ovate-orbicular bracts.

*Fl. & Fr.* December-May

*Distr.* Indo-Malesia. Occasional along the margins of grasslands; *PS 30681* Kuchimudi

**Note:** Present collection is the new record for the flora of Kerala.

### ERYCIBE Roxburgh

**Erycibe paniculata** Roxb., Pl. Corom. 2:31.t.159. 1798; FBI 4: 180. 1883; FPM 930. 1923; FPL 307. 1990; FTSR 306. 1996. *E. wightiana* Graham, Cat. Pl. Bomb. 137. 1839; FPM 930. 1923.

Woody climbers, bark covered with warty tubercles; branchlets brown tomentose. Leaves alternate, to 11 x 5 cm, elliptic, acute at base and apex, entire, coriaceous, glabrous, nerves 6-8 pairs; petiole 1 cm long, rusty tomentose. Flowers in axillary or terminal panicles; bracts and bracteoles minute; calyx 3 mm long, densely hairy; lobes obovate; corolla yellow, 7 mm long, tube campanulate, lobes obcordate, spreading, glabrous; stamens 5, filaments broaden below; ovary 1-celled, ovules 4, basal; stigma sessile, globose. Berry, 5-8 mm across, obovoid.

*Fl. & Fr.* May-December

*Distr.* India, Himalayas and Andaman Islands. Common in evergreen forests; *PS 19119* Kariamchola; *30192* Kottayali

### EVOLVULUS Linnaeus

1. Leaves sericeous on either side; corolla blue..... **E. alsinoides**  
1. Leaves glabrous; corolla white ..... **E. nummularis**

**Evolvulus alsinoides** (L.) L., Sp. Pl. (ed. 2) 1: 392. 1762; FBI 4: 220. 1883; FPM 922. 1923. *Convolvulus alsinoides* L., Sp. Pl. 157. 1753.

Diffuse herbs, stem villous. Leaves to 18 x 8 mm; elliptic oblong, acute, base rounded, densely villous, cuspidate. Flowers in axillary 1-3 flowered cymes, peduncles slender, 2 cm long; pedicels 1 cm long, bracts and bracteoles similar, lanceolate; sepals 5, 3 x 1 mm, lanceolate, hairy; corolla blue, campanulate, 8 mm across; lobes shallow; stamens 5, included; ovary 2-celled, ovules 4, styles 2, free, forked, stigmas linear. Capsule 3 mm across, globose, glabrous; seeds 4, ellipsoid, acute, black.

*Fl. & Fr.* Throughout the year

*Distr.* Pantropical. Occasional in dry deciduous forests; *PS 30069* Kuchimudi

**Evolvulus nummularis** (L.) L., Sp. Pl. (ed.2) 391. 1762; FPL 307. 1990; FTSR 307. 1996. *Convolvulus nummularis* L., Sp. Pl. 175. 1753. *Volvulopsis nummularis* (L.) Roberty, Candollea 14: 28. 1952.

Stem glabrescent. Leaves broadly ovate to orbicular, base cordate, to 1.2 x 1 cm; petiole 0.5 cm long. Flowers solitary or in pairs, axillary; pedicels to 3 mm long. Calyx lobes 5, acute, ciliate, 2.5 mm long. Corolla campanulate, 6 mm across. Capsule globose, 3-4 mm across.

*Fl. & Fr.* Throughout the year

*Distr.* Native of Tropical America. Common in degraded forest areas; *PS 30682* Parambikulam

### HEWITTIA R. Wight & Arnott

**Hewittia malabarica** (L.) Suresh in Nicols. *et al.*, *Interp. Hort. Malab.* 88. 1988; FTSR 307. 1996. *Convolvulus malabaricus* L., Sp. Pl. 155. 1753. *C. sublobatus* L. f., *Suppl. Pl.* 135. 1781. *C. bicolor* Vahl, *Symb. Bot.* 3: 25. 1794, non Desr. 1792. *Hewittia bicolor* (Vahl) Wight & Arn., *Madras J. Lit. Sci.* 1: 22. 1837; FBI 4: 216. 1883; FPM 924. 1923. *H. sublobata* (L. f.) O. Ktze., *Rev. Gen. Pl.* 2: 441. 1891.

Creepers; stem densely hispid. Leaves to 7 x 6 cm, ovate, truncate or cordate at base, entire, acute, hispid; petiole 4 cm long. Flowers axillary, 2-3 together, in peduncled cymes; bracts and bracteoles lanceolate, hairy; pedicels short, 2-3 mm long; sepals unequal, enlarging in fruit, to 15 x 5 mm, acute, hairy, inner smaller, lanceolate; corolla 25 mm long, lobed; yellow with brown eye; stamens equal; filaments glabrous; ovary and style tomentose; stigmas 2, clavate, papillose. Capsule 7 x 9 mm, depressed globose; hairy; seeds 4 x 3.5 mm, obovoid, dark brown.

*Fl. & Fr.* Throughout the year

*Distr.* Asia, Africa and South America. Common in moist deciduous forests and plantations; *PS 19037* Kanimara

**IPOMOEAE** Linnaeus

1. Corolla red, salver shaped .....	<b>I. hederifolia</b>
1. Corolla others than red, infundibular or campanulate .....	2
2. Leaf blade divided .....	3
2. Leaf blade entire .....	6
3. Leaves glabrous .....	<b>I. cairica</b>
3. Leaves variously tomentose .....	4
4. Leaves 7-9 lobed .....	<b>I. pes-tigridis</b>
4. Leaves 3-lobed .....	5
5. Inflorescence with one large bract .....	<b>I. pileata</b>
5. Inflorescence with two large bracts, overlapping at base .....	<b>I. deccana</b>
6. Leaves pubescent .....	<b>I. wightii</b>
6. Leaves glabrous .....	7
7. Corolla to 15 cm long, infundibular .....	<b>I. alba</b>
7. Corolla to 5 cm long, campanulate .....	<b>I. obscura</b>

**Ipomoea alba** L., Sp. Pl. 161. 1753; FPL 309. 1990; FTSR 308. 1996. *I. bona-nox* L., Sp. Pl. (2):228. 1762; FBI 4: 197. 1883. *Calonyction bona-nox* (L.) Boj., Hort. Maurit. 227. 1837; FPM 920. 1923. *C. speciosum* Choisy, Convolv. Orient. 58. t. 1. f. 4. 1834.

Perennial climbers; stem stout, glabrous. Leaves to 15 x 12 cm, ovate, acuminate at apex, cordate at base, 11-nerved from base; petiole to 9 cm long. Peduncles 12-16 cm long, stout. Flowers 1-3 together, but usually solitary; pedicels 2 cm long; sepals 1.5 cm long, lanceolate, strongly aristate, glabrous; corolla white, 8-10 cm broad, funnel shaped, lobes spreading, glabrous. Capsule 2.5 x 1.5 cm, glabrous; seeds glabrous.

*Fl. & Fr.* August-January

*Distr.* Native Tropical America; introduced and naturalised in many Asian countries. Occasional in moist deciduous forests and plantations; *PS 19896* Thellikkal

**Ipomoea cairica** (L.) Sweet, Hort. Brit. (ed. 1) 287. 1827; FPM 918. 1923. *Convolvulus cairicus* L., Syst. Nat. (ed.10) 922. 1759. *Ipomoea pulchella* sensu Wight, Ic. t. 156. 1839, non Roth 1821. *I. palmata* Forssk., Fl. Aeg.-Arab. 43. 1775; FBI 4: 214. 1883.

Glabrous climbers. Leaves divided below the middle, lobes elliptic, chartaceous, acute at apex; petiole to 4 cm long. Flowers solitary or in few flowered cymes; calyx lobes subequal, to 7 x 3.5 mm, apiculate; corolla pink, 5 cm across; capsule 7 mm across, globose; seeds pubescent.

*Fl. & Fr.* Throughout the year

*Distr.* Paleotropics. Common in openings and road cuttings; *PS 19373* Parambikulam; *30342* Vengoli

**Ipomoea deccana** Austin, Rev. Handb. Fl. Ceylon 1: 324. 1980; FPL 310. 1990; FTSR 308. 1996. *I. bracteata* Wight, Ic. t. 1374. 1848, non Cav. 1799; FBI 4: 203. 1883; FPM 918. 1923. *I. deccana* var. *lobata* (Clarke) Johri, JETB 5: 432. 1984.

Hispid creepers. Leaves to 4 x 4 cm, 5-lobed, cordate at base; lobes rhomboid, acute; petiole 4-5 cm long. Peduncle 2.5-5 cm long; bracts ovate, obtuse, 2-5 together, forming a capitate head; flowers 3 together; sessile; sepals unequal, to 9 x 3 mm, acute, hairy; inner smaller; corolla purple, 15 mm long, campanulate; filaments unequal, inserted near the base of corolla tube. Capsule 6 x 6 mm, globose, puberulus in vertical lines; seeds pubescent, black.

*Fl. & Fr.* November-January

*Distr.* India and Sri Lanka. Occasional in openings of moist deciduous forests; *PS 19232* Vengoli

**Ipomoea hederifolia** L., Syst. Nat. (ed. 10) 925. 1759; FPL 311. 1990; FTSR 309. 1996. *Quamoclit phoenicea* (Roxb.) Choisy, Mem. Soc. Phys. Geneve 6: 433. 1834; FPM 919. 1923.

*Ipomoea angulata* Lam., Tabl. Encycl. 1: 464. 1791. *I. phoenicea* Roxb., Fl. Ind. 2: 92. 1824. *I. coccinea* sensu Clarke in Hook.f., FBI 4: 199. 1883.

Slender climbers. Leaves to 10 x 8 cm, ovate, acuminate, cordate at base, entire or shallowly 3-lobed, membranous; petiole to 15 cm long. Peduncle to 16 cm long, slender, erect. Flowers 2-6 together; pedicels 5-7 mm long; sepals 7 mm long, ovate, long-cuspidate; corolla red, 4 cm long, tubular to funneliform, lobes acute; stamens equal, inserted inside the tube. Capsule 6 x 6 mm, globose, transparent; seeds 5 x 3 mm, trigonous, hairy.

*Fl. & Fr.* Throughout the year

*Distr.* Native of Tropical America; now naturalised in Tropical Asia. Fairly common in rocky areas of moist deciduous and evergreen forests; *PS 19109* Peruvaripallam; *19635* Vengoli

***Ipomoea obscura*** (L.) Ker-Gawl., Bot. Reg. 3. t.239. 1817; FBI 4: 207. 1883; FPM 916. 1923; FTSR 310. 1996. *Convolvulus obscurus* L., Sp. Pl. (ed. 2) 220. 1762.

Slender creepers; stem glabrous. Leaves to 5 x 3.5 cm, broadly ovate, acuminate, base cordate; petiole to 4 cm long. Peduncle axillary, 4-5 cm long, tomentose. Flowers 1 or 2 on each peduncle; sepals 5 mm long, ovate, acute, glandular, outer 2 smaller; corolla 25 mm long, 25 mm broad, white with pink eye; anthers sagittate at base. Capsule 10 x 8 mm, globose; seeds 6 x 4 mm, compressed, brown, thinly pubescent.

*Fl. & Fr.* Almost throughout the year

*Distr.* China, Tropical Asia and Tropical Africa. Common in dry deciduous forests; *PS 19983* Keerappadi

***Ipomoea pes-tigridis*** L., Sp. Pl. 162. 1753; FBI 4: 204. 1883; FPM 918. 1923; FPL 311. 1990; FTSR 310. 1996. *I. pes-tigridis* L. var. *hepaticifolia* (L.) Clarke in Hook.f., FBI 4: 204. 1883. *I. hepaticifolia* L., Sp. Pl. 161. 1753.

Slender twiners. Leaves to 10 x 12 cm, lobes obovate, acuminate; petiole to 7 cm long. Flowers 3-5 together, in bracteate heads; bracts densely bristly, foliaceous; sepals 10 mm long, pubescent; corolla 3 cm long, pink, funnel shaped/ Capsule globose; seeds black, grey pubescent.

*Fl. & Fr.* September-December

*Distr.* Pantropical. Common in dry deciduous forests; *PS 30080* Kuchimudi

***Ipomoea pileata*** Roxb., Fl. Ind. 2: 94. 1824; FBI 4: 203. 1883; FPM 918. 1923; FTSR 310. 1996.

Twining herbs, stem puberulus. Leaves ovate-acuminate, mucronate, base cordate, glabrescent above and pubescent below, to 8 x 9 cm; petiole to 7 cm long. Flowers enclosed in a boat-shaped, to 5 cm broad involucre; peduncle often longer than the petiole. Sepals ovate, obtuse, 1.2 cm long, tomentose. Corolla pinkish-white, narrowly, funnel-shaped, tube 2 cm long and 2 mm wide, limb 1.2 cm across. Capsule ovoid, 5 mm long; seeds ovoid, black.

*Fl. & Fr.* November-January

*Distr.* Tropical Africa and Indo-Malesia. Fairly common in opening of moist deciduous forests; *PS 19850* Vengoli

***Ipomoea wightii*** (Wall.) Choisy, Mem. Soc. Phys. Geneve 6: 470. 1834; FBI 4: 203. 1883; FPM 917. 1923; FPL 312. 1990. *Convolvulus wightii* Wall., Pl. Asiat. Rar. 2: 55. t. 171. 1831.

Small twiners; stem hirsute. Leaves to 10 x 9 cm, orbicular in outline, cordate at base, shallowly 3-lobed, lobes acute, distantly toothed, hirsute above, petiole 5 cm long. Peduncle 10 cm long; bracts many, linear-lanceolate, yellowish hispid. Flowers 3-5 together, sessile; sepals 20 x 5 mm, lanceolate, acuminate, densely hispid; corolla 3 cm long, campanulate, purple. Capsule 5 x 5 mm, globose, glabrous; seeds hairy on angles.

*Fl. & Fr.* December-January

*Distr.* Tropical Africa, Madagascar, Sri Lanka and India. Common in grasslands; *PS 30541* Pandaravarai

#### LEPISTEMON Blume



**Lepistemon verdcourtii** Mathew & Biju, Kew Bull. 46: 560. 1991; FTSR 311. 1996.

Herbaceous velutinous twiners. Leaves ovate-acuminate, mucronate, base cordate or hastate, tomentose on both sides, to 9 x 6 cm; lateral nerves 6-8; petiole to 7.5 cm long. Flowers in many-flowered dense, umbellate, peduncled cymes, peduncle ca. 3 cm long; pedicels 7 or 8 mm long. Sepals ovate, obtuse, subequal, outer 3 x 3 mm; inner two 3.5 x 3 mm. Corolla urceolate, pale yellow 1.5 cm long, shortly lobed, lobes plaited, glabrous; scales obovoid, concave, hirsute outside. Stamens attached to the base of scales. Ovary glabrous, conical; style short, stigma 2-lobed, papillose. Capsule dorsiventrally compressed, deeply 4-lobed, glabrous, 2-3.5 x 5-6 mm; seeds 4, ovoid, greyish-brown tomentose.

*Fl. & Fr.* January-April

*Distr.* Endemic to Southern Western Ghats (Kerala). Occasional in evergreen and reed brakes; *PS 19314* Kothala

#### MERREMIA Dennstedt ex Endlicher

- |  |                     |
|--|---------------------|
| 1. Leaves entire .....                                 | <b>M. umbellata</b> |
| 1. Leaves lobed or basely auricled.....                | 2                   |
| 2. Branchlets hairy; corolla more to 4 cm long.....    | <b>M. vitifolia</b> |
| 2. Branchlets glabrous; corolla to 2 cm long.....      | 3                   |
| 3. Leaf base auricled and toothed; seeds hairy .....   | <b>M tridentata</b> |
| 3. Leaf base auricled and toothed; seeds glabrous..... | <b>M. hederacea</b> |

**Merremia hederacea** (Burm. f.) Hall. f., Bot. Jahrb. 18: 118. 1893; FTSR 311. 1996. *Evolvulus hederaceus* Burm. f., Fl. Ind. 77. t.30. 1768. *Ipomoea chryseides* Ker-Gawl., Bot. Reg. 4: t. 270. 1818; FBI 4: 206. 1883. *Merremia chryseides* (Ker-Gawl.) Hall. f., Bot. Jahrb. 16: 552. 1893; FPM 929. 1923.

Creeping herbs, stem puberulus. Leaves 2.5 x 2.5 cm, shallowly 3-lobed, cordate at base, chartaceous, 5-7-nerved from base, glabrous, lobes sub-orbicular; petiole 1-4 cm long, hispid. Flowers many, on axillary dichasial cyme to 10 cm long; sepals unequal, to 5 x 4 mm, obovate, truncate at apex, cuspidate; corolla 10 mm long, 15 mm across, yellow, filaments glandular hairy below. Capsule 5 x 5 mm, glabrous; seeds hairy.

*Fl. & Fr.* November-January

*Distr.* Old World tropics. Fairly common in moist deciduous forests; *PS 19400* Padippara

**Merremia tridentata** (L.) Hall. f., Bot. Jahrb. 16: 552. 1893, ssp. **tridentata**; FPM 928. 1923; FPL 313. 1990. *Convolvulus tridentatus* L., Sp. Pl. 157. 1753. *Ipomoea tridentata* (L.) Roth in Roem. Arab. Bot. 1: 38. 1797; FBI 4: 205. 1883.

Trailing herbs. Leaves to 3 x 1 cm, lanceolate to oblong, hastate at base, acute at apex, mucronate, chartaceous, penninerved, glabrate; petiole 5 mm long, hairy. Flowers solitary, axillary; pedicels to 2.5 cm long, slender; sepals subequal, to 6 x 2 mm, ovate, acute, cuspidate, inner ones acuminate; corolla 12 mm long, 15 mm across, white or yellowish, throat usually pale purple. Capsule 6 x 6 mm, glabrous; seeds 3 x 3 mm, glabrous, black.

*Fl. & Fr.* November-February

*Distr.* Paleotropics. Common in rocky areas of moist deciduous forests; *PS 19223* Vengoli

**Merremia umbellata** (L.) Hall. f., Bot. Jahrb. 16: 552. 1893; FPM 928. 1923; FPL 313. 1990; FTSR 312. 1996. *Convolvulus umbellatus* L., Sp. Pl. 155. 1753. *Ipomoea cymosa* Roem. & Schult., Syst. Nat. 4: 241. 1819; FBI 4: 211. 1883.

Prostrate or twining herbs, stem sparsely hairy. Leaves to 8 x 5 cm, oblong, acuminate at apex, entire, membranous, glabrous above, sparsely hairy below; petiole 1 cm long, hairy. Peduncle 3 cm long, hispid. Flowers subumbellate; pedicels 1 cm long; sepals 8 x 6 mm,

suborbicular, obtuse; corolla 3.5 cm long, campanulate, white, lobes hairy at apex; filaments broadened and glandular below. Capsule 2 cm across, globose, seeds angular, black, pubescent  
*Fl. & Fr.* Throughout the year

*Distr.* Pantropical. Common in moist deciduous forests and plantations; *PS 18839* Kuriarkutty

**Merremia vitifolia** (Burm. f.) Hall. f., Bot. Jahrb. 16: 552. 1893; FPM 928. 1923; FPL 314. 1990; FTSR 312. 1996. *Convolvulus vitifolius* Burm. f., Fl. Ind. 45. t.18. 1768. *Ipomoea vitifolia* (Burm. f.) Blume, Bijdr. 709. 1826; FBI 4: 213. 1883.

Aggressive climbers; stem brownish, hirsute or glabrous. Leaves membranous, to 8 x 9 cm, 5-7-lobed, lobes acute, distantly dentate, petiole to 7 cm long. Peduncle 8 cm long, hirsute or glabrous. Flowers few, racemose; pedicels 1.5 cm long; sepals 1.5 cm long, ovate, obtuse, emarginate, sparsely bristled; corolla yellow, 5 cm broad, funnel-shaped; stamens 5, equal, filaments broadened and glandular at base. Capsule 1.5 x 1.5 cm, glabrous; seeds 8 x 6 mm, trigonous, dark brown; fruiting calyx lobes 2.5 x 1.5 cm.

*Fl. & Fr.* August-January

*Distr.* Indo-China and China. Common in degraded forest areas; *PS 18899* Muthalakkuzhi

#### RIVEA Choisy

**Rivea hypocrateriformis** (Desr.) Choisy, Mem. Soc. Phys. Geneve 6:408.1834; FBI 4:184.1883; FPM 908.1923; FPL 314. 1990. *Convolvulus hypocrateriformis* Desr. in Lam., Encycl. 3: 561. 1792.

Leaves 3-4 x 3-6 cm, cordiform, subcoriaceous, base cordate, apex obtuse; petiole to 6 cm. Flowers axillary, solitary or in cymes; bracts lanceolate; corolla white, 7 cm across, salver-form; stamens 5, unequal, to 1.8 cm; anthers oblong, 4 mm; ovary oblong, 4 mm, 4-locular, each 1-ovulate, style 3.5 cm. Capsule conical, indehiscent, 1.5 x 1 cm, 1-celled; seeds 4 or a few.

*Fl. & Fr.* December-February

*Distr.* India and Nepal. Common in dry deciduous forests; *PS 19970* Thekkady

#### STICTOCARDIA H.G. Hallier

**Stictocardia tiliifolia** (Desr.) Hallier f., Bot. Jahrb. Syst. 18: 159. 1894; FPM 904. 1923. *Convolvulus tiliifolius* Desr. in Lam., Encycl. 3: 544. 1792. *Argyreia tiliifolius* (Desr.) Wight, Ic. t. 1358. 1848; FBI 4: 184. 1883.

Leaves 5-9 x 6-9 cm, broadly ovate to cordiform, chartaceous, base cordate, margin entire; petiole to 8 cm. Flower axillary, solitary; bracts cauducous; corolla pink, 7 cm across, funnel-form; stamens 5, unequal, to 3.5 cm; ovary conical, 1.5 mm, 4-locular, each 1-ovuled; style 3.5 cm; stigma biglobose. Capsule indehiscent; accrescent calyx enlarged and fleshy.

*Fl. & Fr.* October-February

*Distr.* Endemic to Southern Western Ghats. Rare in the near by areas of reservoir; *PS 19107* Peruvaripallam

#### SOLANACEAE

1. Calyx accrescent, completely enclosing the fruit ..... **Physalis**
1. Calyx rarely accrescent not enclosing the fruit ..... 2
2. Fruit echinate ..... **Datura**
2. Fruit not echinate ..... 3
3. Flowers in extra-axillary racemes or cymes; stamens attached to throat of corolla tube ..... **Solanum**
3. Flowers in axillary fascicles; stamens attached to base of corolla tube ..... **Lycianthes**

#### DATURA Linnaeus

**Datura metel** L., Sp. Pl. 179. 1753; FPL 315. 1990. *D. fastuosa* L., Syst. Nat. (ed.10) 932. 1759; FBI 4: 242. 1883; FPM 941. 1923. *D. fastuosa* L. var. *alba* (Nees) Clarke in Hook.f., FBI 4: 243. 1883; FPM 941. 1924. *Datura alba* Nees, Trans. Linn. Soc. London 17: 73. 1834.

Shrubs, stem terete. Leaves alternate, 10-20 x 6-12 cm, ovate, acute at apex, unequal at base, glabrous, membranous; petiole to 10 cm long. Flowers erect, solitary, axillary, pedicellate; calyx green, to 6 cm long, tubular, lobes 5, erect, acute, glabrous; corolla to 15 cm long, white with violet shades, glabrous, lobes 5, erect, truncate with short linear appendage; stamens 5, included, filaments equal, hairy at base, anthers oblong; ovary 2-celled; style filiform; stigma 2-lobed. Capsule 3.5 cm across, globose, prickly; seeds compressed, glabrous.

*Fl. & Fr.* Throughout the year

*Distr.* Paleotropics. Fairly common in dry deciduous forests; *PS 30087* Kuchimudi

#### LYCIANTHES Hassler

1. Branches zig-zag; calyx cup without appendages ..... **L. laevis** ssp. **bigeminata**
1. Branches straight; calyx cup with vermiform appendages ..... **L. laevis** ssp. **laevis**

**Lycianthes laevis** (Dunal) Bitter, Abh. Nat. Ver. Bremen 24: 484. 1920, ssp. **laevis**; FPL 315. 1990; FTSR 315. 1996. *Solanum laeve* Dunal, Solan. Synop. 22. 1816; Clarke in Hook. f., FBI 4: 231. 1883; FPM 936. 1923.

Subshrubs; branches glabrous or scabrous. Leaves 8-18 x 2-5 cm, alternate or fascicled, elliptic, acuminate at either ends, entire, petiolate. Flowers solitary or fascicled; sepals a truncate cup-like rim with or without appendages; corolla spreading, tube very short, lobes oblong, glabrous white with violet shade; stamens 5, erect, anthers ovate, filaments very short; ovary conical; style glabrous, stigma terminal. Berry 6 x 6 mm, globose; seeds yellow, flat, concentricity reticulate.

*Fl. & Fr.* September-December

*Distr.* South India, Sri Lanka and Indonesia. Common along the grassland slopes; *PS 19420* Pooppara; *30433* Karimala

**Lycianthes laevis** (Dunal) Bitter ssp. **bigeminata** (Nees) Deb Bot. J. Linn. Soc. 76. 193. 1978; FTSR 315. 1996. *Solanum bigeminatum* Nees, Trans. Linn. Soc. London 17: 42. 1837; Clarke in Hook. f., FBI 4: 231. 1883.

Subshrubs, branchlets glabrous. Leaves 18-25 x 6-8 cm, alternate or fascicled, elliptic, acuminate. Flowers fascicled; sepals cupular; corolla spreading, lobes oblong; stamens 5; anthers ovate; ovary conical. Berry 6 x 6 mm, globose; seeds red.

*Fl. & Fr.* August-December

*Distr.* South India and Sri Lanka. Rare in reed areas; *PS 19742* Pezha

#### PHYSALIS Linnaeus

**Physalis angulata** L., Sp. Pl. 183. 1753; Hook.f., FBI 4:238. 1883; FPM 939. 1923; FTSR 316. 1996. *P. minima* L., Sp. Pl. 183. 1753; FPL 316. 1990.

Annual herbs, branches angular. Leaves ovate, acuminate, base cuneate, unequal sided, margins dentate or sinuate, sometimes entire, to 6 x 3 cm; petiole to 5 cm long. Flowers solitary, pedicels 1 cm long. Calyx 5-toothed, in fruit 2.5 cm across. Corolla pale-yellow, 0.8 cm across. Berry 0.7 mm across; seeds minutely rugose.

*Fl. & Fr.* July-December

*Distr.* Native of Tropical America; naturalized in many Asian countries. Fairly common in open forest lands; *PS 30785* Thunakkadavu

#### SOLANUM Linnaeus

1. Climbing shrubs ..... **S. seafortianum**

1. Erect herbs or shrubs.....	2
2. Plants unarmed.....	3
2. Plants armed with strong prickles.....	4
3. Herbs; leaves glabrous.....	<b>S. americanum</b>
3. Shrubs or small trees; leaves tomentose.....	<b>S. erianthum</b>
4. Leaves with prickles.....	5
4. Leaves without prickles.....	8
5. Berry less than 1 cm diameter, orange-red.....	6
5. Berry more than 1.5 cm diameter, yellow or white with greenish lines.....	7
6. Racemes lax; pedicels to 2 cm.....	<b>S. anguivi</b> var. <b>anguivi</b>
6. Racemes dense; pedicels to 0.7 cm.....	<b>S. anguivi</b> var. <b>multiflora</b>
7. Leaves covered with simple hairs; prickles to 2 cm long.....	<b>S. virginianum</b>
7. Leaves covered with stellate hairs; prickles to 1 cm long.....	<b>S. melongena</b> var. <b>insanum</b>
8. Flowers white; berry greenish-yellow.....	<b>S. torvum</b>
8. Flowers violet; berry red.....	<b>S. giganteum</b>

**Solanum americanum** Mill., Gard. Dict. (ed. 8) 5. 1768; FTSR 316. 1996. *Solanum nigrum* sensu Gamble, FPM 936. 1923, non L. 1753.

Herbs. Leaves 4-8 x 1.5-4 cm, ovate to broadly ovate, attenuate at base, entire or serrate, membranous. Peduncle 1 cm long. Flowers umbelled; pedicels 1 cm long, filiform, glabrous; calyx deeply 5-partite, corolla white with bluish shade, 5 mm across, lobes oblong. Berry 6 mm across, black, smooth, glossy; seeds 1 x 1 mm, orbicular, yellow, pitted.

*Fl. & Fr.* Throughout the year

*Distr.* Cosmopolitan. Common around the settlements; *PS 19038* Thunakkadavu; *30621* Pandaravarai

**Solanum anguivi** Lam., Encycl. 2: 23. 1794, var. **anguivi**. *S. indicum* Hook. f., FBI 4: 234. 1883, non L. 1753; FPM 938. 1923. *S. violaceum* Hepper in Dassan. & Fosb., Rev. Handb. Fl. Ceylon 6: 378. 1987.

Erect armed herbs; prickles 5 mm long, straight with a broaden base. Leaves to 9 x 5 cm, shallowly lobed, densely hairy below, sparsely above; petiole 3-5 cm long. Raceme axillary, 8-12-flowered, peduncled. Flowers blue; pedicels 1.5 cm long, straight, erect; corolla 20 mm across, densely stellate hairy outside; style hairy. Berry 7 x 7 mm, orange-yellow, smooth.

*Fl. & Fr.* October-December

*Distr.* Indo-Malesia. Occasional in moist deciduous forests and plantations; *PS 30819* Parambikulam

**Solanum anguivi** Lam. var. **multiflora** (Roth ex Roem. & Schult.) Chithra in Henry *et al.*, Fl. Tamil Nadu 2: 115. 1987. *S. multiflorum* Roth ex Roem. & Schult., Syst. Veg. 4: 669. 1819. *S. indicum* var. **multiflora** (Roth ex Roem. & Schult.) Clarke in Hook.f., Hook. f., FBI 4: 235. 1883; FPM 938. 1923. *S. ferox* L. var. *minus* Wight, Ic. t. 1400. 1848.

Erect woody herbs; stem prickled; prickles stout, broaden towards the base. Leaves to 15 x 12 cm, shallowly lobed, densely stellate hairy; petiole 3 cm long. Raceme 12-25-flowered, very shortly peduncled. Flowers blue, densely packed; pedicels 1.2 cm long, curved; corolla 22 mm across, glabrous or hairy. Berry 8 mm across, orange-red, smooth.

*Fl. & Fr.* November-January

*Distr.* Endemic to Peninsular India. Occasional in moist deciduous forests and plantations; *PS 30820* Parambikulam

**Solanum erianthum** D. Don, Prodr. Fl. Nepal 96. 1825; FPL 318. 1990. *S. verbascifolium* sensu Clarke in Hook.f., FBI 4: 230. 1883, non L. 1753. *S. pubescens* Roxb., Fl. Ind. 2: 244. 1824, non Willd. *S. verbascifolium* var. *adulterinum* (Buch.-Ham.) G. Don, Gen. Syst. 4: 415. 1838.

Large shrubs or small trees, unarmed. Leaves 15-25 x 5-10 cm, elliptic, entire, densely hairy below, sparsely above; nerves prominent; stellate hairs with equal arms; petioles 4 cm long. Cymes terminal or subterminal; peduncle 5 cm long, stout. Flowers many, erect, densely packed; pedicels 1 cm long; corolla white, densely pubescent outside. Berry 8 x 8 mm, orange-yellow, hairy when young.

*Fl. & Fr.* July-December

*Distr.* South East Asia and North Australia. Common in secondary forests; *PS 19221* Vengoli

**Solanum giganteum** Jacq., Coll. Bot. 4: 125. 1791; FBI 4: 233. 1883; FPM 937. 1923; FPL 318. 1990. *S. niveum* Vahl, Symb. 2: 41. 1791. *S. farinosum* Wall. in Roxb., Fl. Ind. 2: 255. 1824.

Large shrubs, stem and leaves covered with minute stellate hairs; prickles on stem, stout. Leaves 20-25 x 5-7 cm, elliptic, acute at either ends, entire, membranous; petiole to 5 cm long. Cymes terminal or subterminal; peduncle 4-5 cm long. Flowers densely packed; pedicel 1 cm long, densely white-stellate hairy; corolla blue, hairy outside. Berry 7 x 7 mm, red, glabrous; seeds smooth.

*Fl. & Fr.* Throughout the year

*Distr.* South India and Sri Lanka. Occasional in evergreen forests; *PS 19421* Poopara

**Solanum melongena** L., Sp. Pl. 186. 1753, var. **insanum** (L.) Prain, Bengal Pl. 746. 1903; FPM 937. 1923. *S. insanum* L., Mant. Pl. 46. 1767. *S. coagulans* Forssk., Fl. Aeg.-Arab. 47. 1775; FBI 4: 236. 1883.

Shrubs; stem usually bluish; prickles to 1 cm long, on stem, petiole and leaves, flattened with bluish base. Leaves to 7 x 5 cm, shallowly lobed; stellate hairs equally armed; petiole 3-6 cm long. Flowers solitary, axillary; pedicels 2.5 cm long, deflexed in flowers and fruits; calyx hairy or with scattered prickles; corolla blue, 1.5 cm across, hairy outside. Berry yellow, 2.5 cm across, globose, smooth.

*Fl. & Fr.* September-December

*Distr.* Paleotropics. Common in degraded forest areas; *PS 19006* Thunakkadavu

**Solanum seafortianum** Andr., Bot. Repos. 8: t.504. 1808.

Scandent shrubs. Leaves to 8 x 4 cm, petiolate. Peduncle 5 cm long. Flowers in corymbose cymes; pedicel 1 cm long, narrow; corolla 1.5 cm across, not spreading, blue. Berry globose, 7 x 7 mm, reddish.

*Fl. & Fr.* December-March

*Distr.* Native of Brazil; now widely naturalised. Fairly common in moist deciduous forests; *PS 19082* Padippara

**Solanum torvum** Sw., Prodr. 47. 1788; FBI 4: 234. 1883; FPM 937. 1923; FPL 320. 1990; FTSR 317. 1996. *S. stramonifolium* Roxb., Fl. Ind. 1: 572. 1832, non Jacq. *S. indicum* L., Sp. Pl. 187. 1753, p.p. *S. inclusum* Stahl, Eat. 6: 133. 1888.

Shrubs, to 2.5 m high, sparsely prickled; prickles stout, broaden at base. Leaves to 18 x 13 cm, entire or shallowly lobed; petiole to 4 cm long. Peduncle short; cymes congested, axillary. Flowers many; pedicel 1 cm long, narrow; corolla white, 1.5 cm across, stellate hairy outside, style glabrous. Berry 13 x 13 mm, globose, yellow; seeds pitted.

*Fl. & Fr.* Throughout the year

*Distr.* Throughout the tropics. Common in degraded forest areas; *PS 19155* Karimala

**Solanum virginianum** L., Sp. Pl. 187. 1753. *S. surattense* Burm. f., Fl. Ind. 57. 1768; FPL 320. 1990. *S. xanthocarpum* Schrad. & Wendl., sert. Hannov. 1: 8. t.2. 1795; FBI 4: 236. 1883; FPM 938. 1923. *S. jacquini* Willd., Sp. Pl. 1: 1041. 1798. *S. diffusum* Roxb., Fl. Ind. 1: 568. 1832.

Branched diffuse herbs, stem glandular hairy; prickles 2 cm long, spinescent, gradually or not broaden towards the base, present on all parts except berries. Leaves to 13 x 10 cm, lyrate, membranous; petioles to 8 cm long. Peduncle absent. Flowers 2-4 together, axillary; pedicel 2 cm long, stout; corolla 18 mm across, sparsely hispid. Berry 25 mm across, yellowish, smooth; seeds flat, not pitted.

*Fl. & Fr.* September-January

*Distr.* India, Himalaya, South East Asia, Malesia, Australia, Polynesia. Common in degraded forest areas and roadsides; *PS 19251* Thellikkal

## SCROPHULARIACEAE

1. Flowers regular .....	<b>Scoparia</b>
1. Flowers irregular .....	2
2. All leaves divided into linear lobes .....	<b>Sopubia</b>
2. Leaves entire or toothed, not all leaves divided into linear lobes .....	3
3. Upper leaves alternate, lower opposite .....	4
3. All leaves opposite or whorled .....	6
4. Calyx spathaceous, split on one side .....	<b>Centranthera</b>
4. Calyx not spathaceous .....	5
5. Leaves linear, to 0.5 cm broad .....	<b>Striga</b>
5. Leaves elliptic, to 3 cm broad .....	<b>Buchnera</b>
6. Filaments of lower stamens appendaged .....	7
6. Filaments of lower stamens not appendaged .....	8
7. Erect herbs; capsule depressed globose .....	<b>Artanema</b>
7. Prostrate herbs; capsule oblong .....	<b>Torenia</b>
8. Anthers stalked .....	9
8. Anthers sessile .....	<b>Lindernia</b>
9. Anthers confluent, one celled .....	<b>Microcarpa</b>
9. Anthers not confluent .....	10
10. Calyx lobes foliaceous .....	<b>Mecardonia</b>
10. Calyx lobes not foliaceous .....	11
11. Fertile stamens 4 .....	<b>Limnophila</b>
11. Fertile stamens 2 .....	<b>Dopatrium</b>

### ARTANEMA D. Don

**Artanema longifolium** (L.) Vatke, Linnaea 43: 207. 1881; FPL 321. 1990; FTSR 318. 1996. *Columnnea longifolia* L., Mant. Pl. 1: 90. 1767. *Achimenes sesamoides* Vahl, Symb. Bot. 2: 71. 1791. *Artanema sesamoides* (Vahl) Benth., Scroph. Ind. 39. 1835; FBI 4: 274. 1884; FPM 955. 1923.

Undershrubs. Leaves to 20 x 8 cm, elliptic, acuminate, serrate, attenuate at base, glabrous; nerves to 6 pairs, distinct below; petiole short or absent. Racemes terminal, to 20 cm long; bracts leafy. Calyx 12 mm long, campanulate, divided to the middle, lobes acuminate, glabrous; corolla 2.5 cm long, 2-lipped, deep violet, upper lip round or emarginate, lower lip 3-lobed; stamens 4, filaments of longer stamen curved or arched, with an orbicular basal appendage, anthers connate in pairs; ovary 2-furrowed; style long, slender, stigma spathulate. Capsule 7 x 8 mm, depressed globose; seeds cylindrical, puberulus, brown.

*Fl. & Fr.* August-January

*Distr.* Indo-Malesia. Common in grasslands; *PS 19265* Anakkalvayal

### BUCHNERA Linnaeus

**Buchnera hispida** Bunch.-Ham. ex D. Don, Prodr. Fl. Nepal 91. 1825; FBI 4: 298. 1884; FPM 966. 1923; FPL 322. 1990.

Rigid hispid erect herbs, to 60 cm high, usually not branched. Lower leaves opposite, 5 x 1 cm, elliptic, obtuse, serrate, attenuate at base; upper leaves alternate, narrower, densely hispid. Flowers in terminal lax spike to 20 cm long; bracts ovate, acute, hispid; sepals 5-6 mm long, tubular, acutely lobed; corolla tube 8 mm long, narrow, hairy inside; lobes equal, spreading, blue; stamens 4, filaments short; style stout, stigma terminal. Capsule 5 x 3 mm, oblong, loculicidal, opening by apical slits, glabrous; seeds 0.5 mm long, curved-obovoid, black, angled.

*Fl. & Fr.* October-January

*Distr.* India, Madagascar, Tropical Africa. Common in grasslands; *PS 19149* Karimala

### CENTRANTHERA R. Brown

**Centranthera indica** (L.) Gamble, FPM 971. 1924; FTSR 319. 1996. *Rhinanthus indica* L., Sp. Pl. 603. 1753. *Purshia ciliata* Dennst., Schluss. Hort. Malab. 11, 24, 35. 1818. *Centranthera procumbens* Benth. in DC., Prodr. 10: 525. 1846; FBI 4: 301. 1884. *C. hispida* R. Br., Prodr. 438. 1810; FBI 4: 301. 1885; FPM 971. 1924.

Coarsely scabrid erect herbs, 10-20 cm high, roots reddish; stem terete. Lower leaves opposite, 4 x 0.6 cm, linear oblong, obtuse, densely bulbous based hairy. Flowers axillary, solitary, sessile or some times in terminal raceme; calyx 13 mm long, spathaceous, split at one side, ribbed, lobes acute; corolla 25 mm long, pale yellow with brown lines, 2-lipped, tube ventricose, lobes equal, orbicular; stamens 4, filaments densely hairy; one anther lobe fertile, other sterile and tailed; ovary many-ovuled; style dilated above, stigma obovate. Capsule 8 x 5 mm, ovoid; seeds spirally reticulate.

*Fl. & Fr.* October-January

*Distr.* South India, Burma, Malesia and Sri Lanka. Common in moist deciduous forests and wet rocky areas; *PS 30786* Pooppara

### DOPATRIUM Buchanan-Hamilton ex Benth

**Dopatrium nudicaule** (Willd.) Benth., Scroph. Ind. 31.1835; Hook.f., FBI 4:274. 1884; FPM 954.1923. *Gratiola nudicaulis* Willd., Ges. Naturf. Fr. Neue Schr. 4:193. 1803.

Stem branched from the base. Leaves mostly basal, obovate, obtuse, subamplexicaule at base, to 7 x 3 mm; cauline leaves 2 or 3 pairs, linear, minute. Pedicels to 1 cm long, slender. Calyx lobes linear-lanceolate. Corolla pale blue, 6 mm long, throat shortly hairy. Capsule linear-oblong, 3 mm long; seeds rugose; fruiting pedicels deflexed.

*Fl. & Fr.* August-October

*Distr.* South India, Sri Lanka and Philippines. Fairly common in moist deciduous forests; *PS 30821* Parambikulam

### LIMNOPHILA R. Brown

**Limnophila repens** (Benth.) Benth. in DC., Prodr. 10. 387. 1846; FTSR 320. 1996. *Stemodia repens* Benth. in Edward's Bot. Reg. 17: sub t. 1470. 1832. *L. conferta* Benth. in DC., Prodr. 10: 386.1846; FBI 4:265.1884; FPM 952.1923. *L. sessilis* (Benth.) Fischer, Kew Bull. 1932: 62. 1932.

Procumbent hispid herbs, to 40 cm long. Leaves to 3 x 1 cm, oblanceolate, acute, serrate, sessile, gland-dotted. Flowers axillary, solitary or in terminal raceme, pedicelled; sepals 7 x 1 mm, oblong, acute, hirtus, basely connate; corolla 13 mm long, yellow, hairy, bilabiate, upper lip emarginate, lower lip 3-lobed, lobes equal, obtuse; anthers stalked; stigma with two small lateral projections. Capsule 5 x 2 mm, ovoid; seeds round, black.

*Fl. & Fr.* August-April

*Distr.* Tropical Asia. *PS 19722* Parambikulam; *30699* Pillakkalvayal

## LINDERNIA Allioni

1. Fertile stamens 4..... **L. crustacea**  
1. Fertile stamens 2..... 2  
2. Capsule much longer than the calyx ..... **L. ruellioides**  
2. Capsule equaling or shorter than the calyx..... **L. rotundifolia**

**Lindernia crustacea** (L.) F. Muell., Syst. Cens. Austral. Pl. 1:97.1882; FPL 324. 1990; FTSR 322. 1996. *Capraria crustacea* L., Mant. Pl. 87.1767. *Vandellia crustacea* (L.) Benth., Scroph. Ind. 35.1835; FBI 4:274.1884; FPM 959.1923.

Erect branched herbs, 5-15 cm high, rooting from lower nodes; stem bluish, glabrous. Leaves to 1.5 x 1 cm, broadly ovate, obtusely acute, serrate; nerves 4 pairs; petioles to 5 mm long. Racemes terminal or sometimes flowers axillary; pedicels to 1.5 cm long; calyx 3 mm long, 5-fid to below the middle, lobes acute, glabrous; corolla 5 mm long, purple; staminal filament of lower stamen appendaged at middle. Capsule 3.5 mm, globose, glabrous; seeds 0.5 mm long, obovoid, rugose, yellow.

*Fl. & Fr.* Throughout the year

*Distr.* Paleotropic. Common in degraded forest areas; *PS 30822* Parambikulam

**Lindernia rotundifolia** (L.) Mukerjee, J. Indian Bot. Soc. 24: 132. 1945; FTSR 323. 1996. *Gratiola rotundifolia* L., Mant. Pl. 1: 274. 1767. *Ilysanthes rotundifolia* (L.) Benth. in DC., Prodr. 10: 420. 1846; FBI 4: 254. 1885; FPM 962. 1923.

Prostrate branched herbs, rooting from nodes, glabrous. Leaves to 10 mm, orbicular, glabrous, sessile, serrate or entire, 3-ribbed from base. Flowers axillary; pedicels 1.6 cm long, slender, solitary; sepals 2.5 mm, elliptic, glandular-hairy; corolla 11 mm long; upper lip notched at apex, lower lip 3-lobed, hairy at the throat; staminodes 4 mm long, filiform, appendaged; stigmas hairy. Capsule 3 mm long, globose; seeds curved, striate, pale brown.

*Fl. & Fr.* Throughout the year

*Distr.* Paleotropics. Occasional in wet rocky areas; *PS 30700* Vengoli

**Lindernia ruellioides** (Colsm.) Pennell, Brittonia 2: 182. 1936. *Gratiola ruellioides* Colsm., Prodr. Desc. Grat. 12. 1793. *Bonnaya reptans* Spreng., Syst. 1: 41. 1824; FBI 4: 284. 1884. *Gratiola repens* Roxb., Fl. Ind. 1:140.1820. *Ilysanthes reptans* (Spreng.) Urban, Berl. Deutsch. Bot. Ges. 2: 436. 1884; FPM 962. 1923. *Bonnaya veronicaefolia* Wight, Ic. t. 1411. 1849, non Sprengl.

Creeping herbs with erect branches, lower nodes rooting. Leaves to 5 x 1.8 cm, elliptic-oblong, obtuse at apex, coarsely dentate-serrate; nerves 3-5 pairs; petiole 0.5-1 cm long. Raceme terminal. Flowers opposite; pedicels 1 cm long, slender, perpendicular to axis; sepals 6 mm long, lanceolate, basely connate, glabrous; corolla blue, 2-lipped, lobes round. Capsule 1.7 cm long, linear, acuminate; seeds trigonous, 0.5 mm long, rugose, brown.

*Fl. & Fr.* October-January

*Distr.* Tropical and Subtropical Asia. Rare in the openings of evergreen forests; *PS 19905* Kariamchola

## MECARDONIA Ruiz & Pavon

**Mecardonia procumbens** (Mill.) Small, Fl. Southeast. U.S. 1065 & 1338. 1903; FTSR 324. 1996. *Erinus procumbens* Mill., Prodr. Veg. Ind. Occ. 92. 1788. *Bacopa procumbens* (Mill.) Green, Publ. Field. Columb. Mus. Bot. ser. 2: 261. 1907. *Mecardonia dianthera* (Swartz) Pennell, Proc. Acad. Nat. Sci. Philadelphia 98: 87. 1940.

Diffuse herbs, stem 4-angled. Leaves opposite, sessile, to 1.5 x 0.6 cm, ovate-lanceolate, base acute, crenate-serrate, penninerved. Flowers axillary, solitary; pedicels 1 cm long; bracteoles



oblong, 0.5 cm long; calyx deeply 5-partiate, inner 2 lobes much narrower, 4 x 0.5 cm; outer ovate-lanceolate; corolla yellow, 7 mm long, slightly 2-lipped with subequal lobes; stamens 4, didynamous, anthers stalked, ovary oblong with short style; stigma lamellate. Capsule 2-valved; seeds reticulate.

*Fl. & Fr.* October-December

*Distr.* Native of Tropical America; Introduced and naturalised in India. Common in disturbed areas and vayals; *PS 19340* Thenkudippara; *30418* Parambikulam

#### MICROCARPAEA R. Brown

**Microcarpaea minima** (Koenig ex Retz.) Merr., Philipp. J. Sci. 7: 100. 1912. *Paederota minima* Koenig ex Retz., Obs. Bot. 5: 10. 1788. *Microcarpaea muscosa* R. Br., Prodr. 436. 1810; FBI 4: 286. 1884; FPM 963. 1924.

Herbs. Leaves 2-4 x 0.5-1 mm, narrowly oblong, apex obtuse. Flower axillary, solitary; corolla purplish, 1.2 mm across, cauducous; stamens 2, exerted, filaments filiform, 1 mm; anthers 1-celled, confluent, 0.2 mm; ovary oblong-cylindric, 1 mm; style 1 mm; stigma capitate, papillose, deflexed. Capsule oblong-globose, enclosed by calyx-base, 2 mm; seeds ellipsoid.

*Fl. & Fr.* December-February

*Distr.* Paleotropics. Occasional in wet rocky areas; *PS 19335* Thenkudippara

#### SCOPARIA Linnaeus

**Scoparia dulcis** L., Sp. Pl. 116. 1753; FBI 4: 289. 1884; FPM 964. 1924; FPL 326. 1990; FTSR 324. 1996.

Erect herbs; stem ridged. Leaves whorled, 3.5 x 1.5 cm, elliptic to obovate, acute, serrate; petiole 7 mm long. Flowers axillary, solitary; pedicels erect, slender; calyx 3 mm long, deeply 4-lobed, lobes ovate, obtuse; corolla rotate, 4-lobed, white, throat densely hairy, lobes 3 mm long; stamens 4, subequal. Capsule globose, longer than the calyx, 2-valved; seeds many, pitted.

*Fl. & Fr.* Throughout the year

*Distr.* Native of Tropical America; now Pantropical. Very common along the roadsides, moist deciduous forests and plantations; *PS 19045* Thunakkadavu

#### SOPUBIA F. Hamilton ex D. Don

1. Corolla pink; anthers not beared ..... **S. delphiniifolia**
1. Corolla yellow with purple centre; anthers beared ..... **S. trifida**

**Sopubia delphiniifolia** (L.) G. Don, Gen., Syst. 4: 560. 1837 "delphinifolia"; FBI 4: 302. 1885; FPM 970. 1924; FPL 326. 1990; FTSR 325. 1996. *Gerardia delphiniifolia* L., Cent. Pl. 2: 21. 1756.

Annuals or perennials; stem hispid. Leaves 2-3.5 cm long, lobes narrow, filiform, hirtus. Flowers axillary; pedicels 2-3 cm long, slender; calyx 9 mm long, tube ribbed, lobes acuminate, scabrid; corolla 2.5 cm long, tube ventricose, lobes subequal, obovate, obtuse; stamens 4, one anther lobe sterile, spurred. Capsule 5 x 3.5 mm, truncate at apex; seeds oblong, pitted.

*Fl. & Fr.* October-January

*Distr.* India and Sri Lanka. Common in grasslands and wet rocky areas; *PS 19647* Vengoli

**Sopubia trifida** Bunch.-Ham. ex D. Don, Prodr. Fl. Nepal 88. 1825; FBI 4: 302. 1884; FPM 970. 1924; FPL 326. 1990; FTSR 325. 1996.

Stout rigid herbs; stem hispid. Leaves 3-fid or upper ones entire; lobes 1-2 cm long, linear-oblong, coriaceous, covered with tubercle based hairs. Flowers axillary or in terminal racemes; pedicels 7 mm long; calyx 3.5 mm long, campanulate, lobes triangular, glandular; corolla 12 mm across, lobes rotate, subequal; anthers bearded at base. Capsule 3 x 2.5 mm, emarginate at apex; seeds brown.

*Fl. & Fr.* July-December

*Distr.* Indo-Malesia and China. Common in grasslands; *PS 18934* Karimalagapuram; 19931 Karimala

#### STRIGA Loureiro

1. Flowers yellow; calyx tube 10-ribbed.....**S. asiatica**

1. Flowers white; calyx tube 15-ribbed.....**S. angustifolia**

**Striga angustifolia** (D. Don) Sald., Bull. Bot. Surv. India 5: 70. 1963; FPL 327. 1990; FTSR 325. 1996. *Buchnera angustifolia* D. Don, Prodr. Fl. Nepal 91. 1825. *Striga euphrasioides* auct. non Vahl, 1794: Roxb., Fl. Ind. 3: 32. 1832.

Erect, little or not branched scabrid herbs. Leaves 2-4 x 0.4 cm, linear-lanceolate. Flowers in terminal spikes; bracts lanceolate; sepals 10 mm long; corolla 14 mm long, 2-lipped, upper lip orbicular, lower lip 3-lobed. Capsule 4 x 3 mm, obovoid, cuspidate; seeds cylindrical, brown.

*Fl. & Fr.* October-December

*Distr.* Indo-Malesia. Common in grasslands; *PS 18927* Karimalagapuram

**Striga asiatica** (L.) O. Ktze., Rev. Gen. Pl. 2: 466. 1981; FTSR 326. 1996. *Buchnera asiatica* L., Sp. Pl. 1630. 1753. *Striga lutea* Lour., Fl. Cochinch. 22. 1790; FBI 4: 299. 1884; FPM 968. 1924.

Herbs, stem tubercled hairy. Leaves to 4 x 0.5 cm, lanceolate to oblanceolate, thickly scabrid. Flowers sessile in terminal spike; bracts and bracteoles lanceolate; sepals 1 cm long, oblong, glabrous, united to near the tip, tubercled hairy; corolla 14 mm long, tube slender; upper lip orbicular, entire. Capsule 4 x 3 mm, oblong; seeds angular, pitted

*Fl. & Fr.* August-December

*Distr.* South East Asia and Africa. Occasional in grasslands; *PS 30469* Vengoli

#### TORENIA Linnaeus

**Torenia bicolor** Dalz. in Hook.'s J. Bot. Kew Gard. Misc.3: 38. 1851; FBI 4: 278. 1884; FPM 957. 1923; FPL 327. 1990; FTSR 326. 1996.

Prostrate herbs. Leaves to 3 x 2 cm, ovate, acute, serrate, base truncate to subcordate, thinly hairy; nerves to 4 pairs; petiole to 2 cm long. Flowers axillary, solitary; pedicels 4-5 cm long, slender; calyx 1.5 cm long, ribbed with brown line, narrowly winged, glabrous, wing decurrent at base into the pedicel; lobes acuminate; corolla 2.5 cm long, deep-violet, with pale lower lip, lobes obtuse, glabrous; appendages of lower filament shortly subulate.

*Fl. & Fr.* August-December

*Distr.* Endemic to Western Ghats. Occasional in the openings of evergreen forests; *PS 19210* Kariamchola

#### OROBANCHACEAE

1. Calyx tubular, 5 lobed.....**Christisonia**

1. Calyx spathaceous, split on one side.....**Aeginetia**

#### AEGINETIA Linnaeus

1. Scape unbranched, one flowered; corolla tube deep purple..... **A. indica**

1. Scape branched, many flowered; corolla tube yellow.....**A. pedunculata**

**Aeginetia indica** L., Sp. Pl. 632. 1753; FBI 4: 320. 1884; FPM 974. 1924; FPL 328. 1990; FTSR 327. 1996.

Root stock short, horizontal; scapes many, erect, unbranched, glabrous, deep pink or brown, 15-30 cm long. Flowers solitary; bracts and bracteoles absent; calyx 2 cm long, glabrous, reddish; corolla 3 cm long, dark purple, tube broad, lobes equal, rounded, glabrous; upper

stamens with one anther lobe; lower stamen with one sterile and one fertile lobes. Capsule 2 cm long, dehisce apically; seeds many, white, rugose

*Fl. & Fr.* August-October

*Distr.* Indo-Malesia and Japan. Fairly common in semi-evergreen forests; *PS 19878* Velayudhankai

**Aeginetia pedunculata** Wall., Pl. Asiat. Rar. 2: t.219. 1831; FBI 4: 320. 1884; FPM 974. 1924; FPL 329. 1990; FTSR 327. 1996. *Orobanche pedunculata* Roxb., Fl. Ind. 3: 29. 1832.

Rootstock erect, glabrous or scabrid. Scapes branched, 10-20 cm long, glabrous, pink or brownish yellow. Flowers many; calyx 4 cm long, split along one side, puberulus, acute. pale orange; corolla 6 cm long, 4 cm across; tube widening above, yellowish pink; lobes rounded, purple to blue; sterile anthers with fleshy acute horn; stigma peltate, prominent, glabrous, white.

*Fl. & Fr.* August-December

*Distr.* Indo-Malesia. Rare in the rocky grasslands and openings in the evergreen forests; *PS 19673* Karimala

#### CHRISTISONIA Gardner

1. Stem glandular hairy; bracteoles two, large.....**C. bicolor**
1. Stem not glandular hairy; bracteoles absent..... **C. tubulosa**

**Christisonia bicolor** Gard., Calcutta J. Nat. Hist. 8: 159. 1847; FBI 4: 322. 1884; FPM 976. 1924; FTSR 327. 1996. *Christisonia aurantiaca* Wight, Ic. t. 1486. 1849.

Stem 8-12 cm long, pubescent; scales few, distant. Flowers peduncled and pedicellate; bracteoles 2, 8 x 3 mm, lanceolate, acute, pubescent; calyx 18 mm long, brick-red, lobes short, triangular, acuminate, glandular pubescent; corolla 6 cm long, tube narrow below, widening above, lobes yellow, orbicular, glandular hairy; filaments 25 mm long, sterile, anther lobes 3 mm long, spur-like, acuminate; placenta lobed; style to 4.5 cm long, stigma with a large pit at centre.

*Fl. & Fr.* June-October

*Distr.* South India and Sri Lanka. Occasional in reed areas; *NS 5624* Karimala Hills

**Christisonia tubulosa** (Wight) Benth. ex Hook.f., FBI 4: 321. 1884; FPM 975. 1924. *Oligopholis tubulosa* Wight, Ic. t. 1422. 1849.

Stem reddish, to 40 cm high, glabrous. Peduncle 3 cm long, stout; bracts 8 mm long, ovate, acute; calyx 2 cm long, orange coloured, glabrous, lobes unequal, acute; corolla to 5 cm long; tube slightly curved, 1.5-2 cm broad, yellowish white, lobes equal, 1.5 cm across, thinly tomentose, pink; stamens equal, filaments hairy; sterile anther lobe hooked; stigma papillose.

*Fl. & Fr.* August-December

*Distr.* Endemic to Southern Western Ghats. Common in reed areas and evergreen forests at higher elevations; *PS 18925* Karimalagapuram

#### LENTIBULARIACEAE

#### UTRICULARIA Linnaeus

1. Flowers rose pink; lower lip 5 lobed.....**U. striatula**
1. Flowers blue, violet or yellow; lower lip entire or 3-lobed..... 2
2. Bracts and scales medifixed..... **U. caerulea**
2. Bracts and scales basifixed..... 3
3. Pedicels recurved in fruit; spur strait.....**U. polygaloides**
3. Pedicels not recurved in fruit; spur curved upwards ..... 4

4. Capsule wall uniformly thickened; testa cells isodiametric ..... **U. uliginosa**  
 4. Capsule wall thickened along dehiscent margins; testa cells elongated ..... **U. graminifolia**

**Utricularia caerulea** L., Sp. Pl. 18. 1753; FPM 983. 1924; JBI 43. 1992; FPL 330. 1990; FTSR 328. 1996. *U. nivea* Vahl, Enum. Pl. 1: 203. 1804. *U. racemosa* Wall. ex Walp. in Meyen, Obs. Bot. 19: 401. 1843.

Foliar organs spatulate, revolute, up to 8 mm long, traps ovoid, mouth terminal. Racemes up to 40 cm long, erect; bracts medifixed, rhomboid. Flowers bluish purple; calyx lobes subequal, broadly ovate, obtuse; upper lip of corolla oblong, lower lip broadly ovate, larger than lower lip. Capsule subglobose; seeds ovoid, reticulate, cells elongate.

*Fl. & Fr.* August-December

*Distr.* Paletropics. Common in the moist areas of grasslands; *NS 5756* Karimala Hills

**Utricularia graminifolia** Vahl, Enum. Pl. 1: 195. 1804; FPM 981. 1924; JBI 57. 1992; FPL 330. 1990. *U. smithiana* Wight in Hook.'s J. Bot. Kew Gard. Misc. 1: 373. 1849; FPM 982. 1924. *U. squamosa* Wight in Hook.'s J. Bot. Kew Gard. Misc. 1: 373. 1849; FPM 982. 1924. *U. uliginoides* Wight in Hook.'s J. Bot. Kew Gard. Misc. 1: 372. 1849 & Ic. t. 1575. 1850. *U. conferta* Wight, Ic. t. 1575. 1850. *U. pedicellata* Wight in Hook.'s J. Bot. Kew Gard. Misc. 1: 373. 1849 & Ic. t. 1578. f. 2. 1850. *U. caerulea* sensu Clarke in Hook.f., FBI 4: 331. 1884, non L. 1753.

Foliar organs, linear, obtuse, 3-nerved, up to 2 cm long. Traps subglobose, mouth basal, appendages 2, subulate, simple. Racemes to 30 cm long; bracts basifixed, ovate, lanceolate. Flowers blue to purple; calyx lobes unequal, ovate, acute, upper lip 4 x 2.5 mm, lower lip 3 x 2 mm; upper lip of corolla linear, oblong, lower lip obovate. Capsules ovoid, thickened along dehiscent margins; seeds subglobose, reticulate.

*Fl. & Fr.* Throughout the year

*Distr.* India and Sri Lanka. Common in wet areas of grasslands with *Drosera* and *Eriocaulon*; *PS 19276* Karimala

**Utricularia polygaloides** Edgew., Proc. Linn. Soc. London 1: 351. 1848; JBI 79. 1992. *U. reticulata* Smith var. *uliginosa* sensu Clarke in Hook.f., FBI 4: 331. 1884 p.p. *U. stricticaulis* (Kon. ex Oliver) Stapf ex Gamble, FPM 981. 1924. *U. reticulata* Smith var. *stricticaulis* Koen. ex Oliver, J. Proc. Linn. Soc. Bot. 3: 180. 1859.

Rhizoids glandular, branches papillose. Foliar organs to 1 x 0.4 cm, linear acute, Trap *ca* 1 mm, globose, glandular hairy. Racemes to 25 cm, scale 1 mm, ovate-lanceolate, basifixed; bracts *ca* 3 mm, ovate, acute; bracteoles 2 mm, subulate, basifixed; calyx, upper to 7 x 4 mm, ovate, acute, lower tridentate; corolla violet, upper lip *ca* 4 x 3 mm, oblong, obtuse, lower lip *ca* 6 x 4 mm, obovate, rounded; spur equal to calyx, conical; stamens *ca* 2 mm; pistil 2 mm, ovary ovoid. Capsule to 6 x 3.5 mm, ovoid.

*Fl. & Fr.* November-January

*Distr.* India and Sri Lanka. Common the wet rocky areas; *PS 30011* Karimala

**Utricularia striatula** Smith, Res. Cyclop. 37: n.17. 1819; FPM 983. 1924; JBI 106. 1992; FPL 331. 1990; FTSR 328. 1996. *U. pusilla* Graham, Cat. Pl. Bombay 165. 1839, non Vahl 1804. *U. orbiculata* Wall. ex A. DC. in DC., Prodr. 8: 18. 1844; FBI 4: 334. 1884. *U. glochidiata* Wight in Hook.'s J. Bot. Kew Gard. Misc. 1: 373. 1849 & Ic. t. 1581. 1850.

Foliar organs to 4 x 3 mm, orbicular, rostrate at base; scape scattered on stolen, filiform. Traps globose, mouth lateral; scape 8 cm long, erect, 3-5-flowered; bracts medifixed. Flowers rose pink; calyx unequal, papillose, upper lip 2 x 2 mm, orbicular, lower lip 1 x 0.9 mm, ovate, rounded; corolla bluish violet with yellow throat; upper lip suborbicular, lower lip 5-lobed, throat hairy, spur cylindrical, acute. Capsule ovoid; seeds oblong, clavate, glochidiate.

*Fl. & Fr.* July-December

*Distr.* Paleotropics. Rare on wet rocks; *PS 19728* Parambikulam

**Utricularia uliginosa** Vahl, Enum. Pl. 1: 203. 1804; FPM 981. 1924; JBI 113. 1992; FPL 331. 1990; FTSR 328. 1996. *U. affinis* Wight in Hook.'s J. Bot. Kew Gard. Misc. 1: 373. 1849; FBI 4: 330. 1884.

Foliar organs linear, rounded, up to 5 cm. Traps subglobose, glandular, mouth basal appendages 2, subulate. Racemes up to 30 cm long, erect; bracts basifixed. Flowers 3-6 in a raceme; calyx lobes unequal, upper lip blue, ovate, acute; calyx elliptic, acuminate or bidentate; corolla bluish purple, 8 mm long, upper lip oblong, emarginate, lower lip obovate or elliptic. Capsule ovoid; seeds subglobose, testa reticulate, cells isodiametric.

*Fl. & Fr.* Throughout the year

*Distr.* Indo-Malesia, China and Australia. Common in moist localities in grasslands; *PS 19681* Karimala

## GESNERIACEAE

1. Epiphytic subshrubs; fruit to 15 cm ..... **Aeschynanthus**
1. Terrestrial herbs or shrubs; fruit to 8 cm..... 2
2. Fruit a linear capsule; leaves radical..... **Didymocarpus**
2. Fruits ovoid or ellipsoid; leaves cauline..... 3
3. Leaves unequal at base; flowers blue ..... **Rhynchoglossum**
3. Leaves equal to base; flowers white or pale blue..... 4
4. Leaves oblanceolate; flowers white; staminodes absent..... **Rhynchotechum**
4. Leaves ovate-orbicular; flowers pale blue, small; staminodes 2..... **Epithema**

## AESCHYNANTHUS Jack

**Aeschynanthus perrottetii** A.DC. in DC., Prodr. 9: 261. 1845; FBI 4: 339. 1884; FPM 985. 1924; FPL 332. 1990; FTSR 329. 1996. *A. ceylanica* sensu Wight, Ic. t.1347. 1846. *A. perrottetii* A. DC. var. *planiculmis* Clarke in Hook.f., FBI 4: 340. 1884, 'platyculmis'. *A. planiculmis* (Clarke) Gamble, FPM 985. 1924.

Epiphytic subshrubs; stem terete, scandent. Leaves to 8 x 1.5 cm, elliptic, succulent, acute, pale below; petiole 5 mm long. Flowers axillary, solitary or rarely paired; pedicels 1 cm long; sepals 8 x 1 mm, free, lanceolate; corolla pink, 4.5 cm long, tubular, curved, oblique at mouth, lobes 5, subequal, glandular-ciliate; stamens 4, all perfect, inserted at the middle of the corolla tube; upper stamens with smaller anthers, confluent in pairs; ovary long-stipitate; linear, 1-celled, ovules many; style slender, stigma terminal. Capsule to 15 cm long, linear; seeds linear.

*Fl. & Fr.* October-January

*Distr.* Endemic to Western Ghats. Common in evergreen forests; *PS 19761* Pooppara

## DIDYMOCARPUS Wallich

1. Leaves spatulate; scape slender ..... **D. innominatus**
1. Leaves ovate or orbicular; scape stout..... **D. tomentosus**

**Didymocarpus innominatus** Burt, Notes Roy. Bot. Gard. Edinb. 21: 201. 1954; FTSR 329. 1996. *D. rottleriana* sensu Clarke in DC., Monogr. Phan. 5: 101. 1883; FBI 4: 353. 1884; FPM 989. 1924.

Scapigerous herbs. Leaves spatulate, acute, base attenuate and shortly decurrent on the petiole, thickly coriaceous, margin irregularly shallowly lobed, densely white strigose above and villous below, to 9 x 6.5 cm; petiole of basal leaves to 3 cm long. Scapes several, dichotomously branched, many flowered; pedicels 1.2-1.5 cm long. Sepals tomentose. Corolla 1 cm long, pale blue. Capsule 2 cm long; seeds boat-shaped, reticulate-pitted.

*Fl. & Fr.* September-May

*Distr.* Endemic to Southern Western Ghats. Common on rocks in grasslands; *NS 5633* Karimala

**Didymocarpus tomentosus** Wight, Ic. t. 1349. 1848; FBI 4: 353. 1884; FPM 989. 1924; FPL 332. 1990. *D. rottleriana* var. *tomentosa* (Wight) Clarke in A. & C. DC., Monogr. Phan. 5: 101. 1883.

Scapigerous herbs. Leaves 6-7 x 4 cm, ovate or orbicular, acute, irregularly crenate-serrate, densely bullate above, fulvous tomentose below, prominently reticulate below; petiole 1-3 cm long, 5 mm broad; central leaves sessile. Scapes few, to 12 cm long. Cymes glandular-hairy; pedicels 1 cm long. Flowers blue, subumbellate; sepals 2.5 x 1 mm, oblanceolate, obtuse, long-hairy; corolla 11 mm long, glandular-hairy, lobes obovate to orbicular; staminodes straight, bristle-like; ovary densely glandular, hairy. Capsule 2 x 0.2 cm, linear, densely glandular hairy  
*Fl. & Fr.* August-December

*Distr.* Endemic to Peninsula India. Occasional in grasslands; *PS 18904* Karimalagopuram

#### EPITHEMA Blume

**Epithema carnosum** (G. Don) Benth. var. **hispida** Clarke in DC., Monogr. Phan. 5: 178. 1883 & Hook.f., FBI 4: 369. 1884; FPM 992. 1924; FPL 333. 1990; FTSR 330. 1996. *E. ceylanicum* Wight, Ic. t. 1354. 1848, non Gard. 1846.

Erect leafy herbs; stem succulent, pilose. Leaves opposite and alternate, 7-14 x 6-10 cm, ovate, rounded or cordate at base, obtuse at apex, upper ones sessile, hairy above and below; nerves 6-8 pairs. Flowers small, in terminal or axillary scorpioid cymes; pedicels 6 mm long, hairy; calyx 5 mm long, campanulate, lobes 5, acuminate, united above the middle; corolla 7 mm long, 2-lipped, lobes 5, subequal, white; stamens 2, free; staminodes 3 or 4; ovary ovoid, 1-celled, ovules many, placenta parietal; style 1, stigma minute. Capsule 5 x 3 mm, ovoid, circumscissile; seeds twisted, brown, ridged.

*Fl. & Fr.* August-December

*Distr.* Endemic to Western Ghats. Common in moist shades of evergreen forests; *PS 19522* Orukomban; *19714* Karimala

#### RHYNCHOGLOSSUM Blume

**Rhynchoglossum notonianum** (Wall.) Burt, Notes Roy. Bot. Gard. Edinb. 24: 170. 1962 & Rev. Handb. Fl. Ceylon 3: 99. 1981; FPL 333. 1990; FTSR 330. 1996. *Wulfenia notoniana* Wall., Tent. Fl. Nepal 46. 1826. *Klugia notoniana* (Wall.) A. DC. in DC., Prodr. 9: 276. 1845; FBI 4: 366. 1889; FPM 990. 1924.

Fleshy herbs. Leaves alternate and opposite, to 17 x 11 cm, ovate, acute at apex, cordate at base, inequilateral, acute on one side; nerves 17-20 pairs, prominent below. Flowers in terminal racemes; bracts ovate, acute; pedicels to 5 mm long; sepals 8 mm long, lanceolate; corolla blue, 1-2.5 cm long, bilabiate; stamens 4, anthers connate in pairs; ovary 1-celled, ovules many, on 2-parietal placentae; stigma oblique. Capsule 6 x 4 mm, ovoid, loculicidal; seeds reticulate.

*Fl. & Fr.* August-December

*Distr.* South West India and Sri Lanka. Occasional in moist localities in all types of forests; *PS 19595* Karimala

#### RHYNCHOTECHUM Blume

**Rhynchotechum permolle** (Nees) Burt, Notes Roy. Bot. Gard. Edinb. 24: 39. 1962; FPL 333. 1990; FTSR 331. 1996. *Isanthera permollis* Nees, Trans. Linn. Soc. London 17: 82. 1834; FBI 4: 372. 1884; FPM 992. 1924.

Young stem tawny, woolly-tomentose. Leaves oblanceolate, base attenuate, serrate at apex, woolly-tomentose when young, becoming glabrescent on maturity, to 18 x 8 cm; lateral nerves 15-20 pairs; petiole to 2.5 cm long. Peduncle to 1 cm long. Calyx lobes lanceolate 5 mm long, woolly-tomentose. Corolla white, 5 mm long, lobes ovate, subequal.

*Fl. & Fr.* August-March

*Distr.* Peninsular India and Sri Lanka. Occasional in evergreen forests; *PS 30240* Pezha

## BIGNONIACEAE

1. Leaves simple pinnate ..... 2
1. Leaves multi-pinnate ..... 5
2. Fruit linear angled or terete..... **Stereospermum**
2. Fruit broadly flat ..... 3
3. Calyx spathaceous; flowers red ..... **Spathodea**
3. Calyx not spathaceous; flowers rose or pinkish white ..... 4
4. Leaflets to 20 x 12 cm, clearly oblique; capsule winged ..... **Pajanelia**
4. Leaflets to 7 x 3 cm, slightly oblique or not; capsule not winged ..... **Heterophragma**
5. Fruit with warty tubercles; 4 stamens fertile ..... **Radermachera**
5. Fruit compressed smooth; 5 stamens fertile ..... **Oroxylum**

### HETEROPHRAGMA A. P. de Candolle

**Heterophragma roxburghii** DC., Prodr. 9: 210. 1845; FBI 4: 381. 1884; FPM 997. 1924. *Bignonia quadricularis* Roxb., Pl. Corom. t. 145. 1798.

Medium trees. Leaves imparipinnate; leaflets 7-11, opposite or sub-opposite, 4-5 x 1.8-2.3 cm, elliptic, obtuse, margin crenate; petiole *ca* 4 mm. Panicle woolly, corymbose terminal; pedicel to 5 mm, stout; calyx to 2 cm, tubular, irregularly 5-lobed; corolla to 3.5 cm, floccose, bilipped, lobes crisped, pale rose; stamens 4, didymous, included; anthers elliptic, divaricate; ovary ovate, style to 3 cm, stigma 2-lobed. Capsule 25-28 x 5-6.5 cm, elongate-oblong compressed, 2-valved, dissepiments spongy; seeds on the central suture, *ca* 2 x 6 cm, winged.

*Fl. & Fr.* December-February

*Distr.* Endemic to Peninsular India. Rare in dry deciduous forests; *PS 30598* Kuchimudi

**Note:** This species hitherto not reported from Tamil Nadu and Kerala has been collected from the sanctuary.

### OROXYLUM Ventenat

**Oroxylum indicum** (L.) Benth. ex Kurz, For. Fl. Burma 2: 238. 1877; FBI 4: 378. 1884; FPM 994. 1924; FPL 335. 1990; FTSR 331. 1996. *Bignonia indica* L., Sp. Pl. 625. 1753. *Spathodea indica* (L.) Pers., Syn. Pl. 2: 173. 1806.

Small to medium deciduous trees; bark grey, smooth, dull yellow inside. Leaves to 1 m long, pinnae opposite, leaflets 2-4 pairs per pinnae, to 12 x 9 cm, ovate or elliptic, acuminate, base rounded or cordate. Racemes 30-50 cm long; pedicels 1-2 cm long. Calyx 2.5 cm long, coriaceous, glabrous. Corolla *ca.* 10 cm long, lobes 3 cm long, pale-purple streaked. Four stamens exerted, filaments hairy at base. Capsule 40-75 x 5-8 cm, tapering at both ends; seeds 5-6 cm long, winged all around except at the base.

*Fl. & Fr.* July-December

*Distr.* South India and Sri Lanka. Rare in moist deciduous forests; *PS 19272* Karimala

### PAJANELIA A. P. de Candolle

**Pajanelia longifolia** (Willd.) K. Schum. in Engl. & Prantl, Pflanzenf. 4: 244. 1895; FPL 335. 1990; FTSR 332. 1996. *Bignonia longifolia* Willd., Sp. Pl. 3: 306. 1800. *Pajanelia rheedii* Wight, Ic. tt. 1343, 1344. 1848; FBI 4: 384. 1884; FPM 1000. 1924.

Medium trees, usually unbranched. Leaves to 1 m long, leaflets 8-10 pairs, to 20 x 12 cm, ovate, inequilateral, oblique at base, subsessile, acute to acuminate at apex. Flowers in terminal racemose panicles; calyx 4.5 cm long, campanulate, rusty tomentose; corolla 9 cm long and 8 cm broad, tube broadly ventricose, lobes subequal, hispid, pinkish white; stamens 4, free, filaments

arching, anthers equal, oblong; ovary oblong, ovules many; placenta thin at centre; style 6 cm long, stigma spoon shaped. Capsule to 30 x 6 cm; winged; seeds flat, papery, winged.

*Fl. & Fr.* January-May

*Distr.* India and Myanmar. Rare in moist deciduous forests; *PS 30754* Thunakkadavu

#### RADERMACHERA Zollinger & Moritzi

**Radermachera xylocarpa** (Roxb.) K. Schum. in Engl. & Prantl, *Pflanzenf.* 4: 243. 1895; FPM 999. 1924; FPL 335. 1990; FTSR 332. 1996. *Bignonia xylocarpa* Roxb., *Fl. Ind.* 3: 108. 1832. *Stereospermum xylocarpum* (Roxb.) Benth. in Benth. & Hook.f., *Gen. Pl.* 2: 1047. 1876; FBI 4: 383. 1884.

Medium trees, bark grey-corky. Leaves to 60 cm long, bipinnate; leaflets opposite, to 8 x 5 cm, ovate, acute to acuminate, glabrous; nerves 5-7 pairs. Flowers in terminal paniced cymes, pedicelled, 5-8 together; calyx 1 cm long, campanulate, irregularly 5-lobed, corolla 4.5 cm long and 4 cm across, white, campanulate, bilabiate, lobes equal, obtuse, crisped; stamens 4, included, anthers divaricate; staminodes filiform; ovary oblong, glabrous; ovules multiseriate, style slender; stigma spoon-shaped. Capsule 40 x 2 cm, woody, warty tubercled, bivalved; seeds winged, 1.5 cm long.

*Fl. & Fr.* February-April

*Distr.* Endemic to Peninsular India. Common in moist deciduous forests; *PS 19376* Karimala

#### SPATHODEA Palisot de Beauvois

**Spathodea campanulata** Beauv., *Fl. Owar.* 1: 47. tt. 27-28. 1805; FTSR 333. 1996.

Trees; twigs tomentose. Leaves 1-pinnate, to 40 cm long; leaflets many, opposite, to 12 x 7 cm, oblong-obovate, obtuse. Flowers large, few to many, in terminal cyme; calyx spathaceous, brown-tomentose; corolla scarlet to red, 5-8 cm across, campanulate, ventricose; stamens 4, anthers divaricate; ovary glabrous; stigma spoon-shaped. Capsule to 20 cm long, erect, compressed, woody; seeds flat, winged 1-1.5 cm across, white.

*Fl. & Fr.* November-May.

*Distr.* Native in Tropical Africa. Planted in gardens; *PS 19665* Parambikulam

#### STEREOSPERMUM Chamisso

**Stereospermum colais** (Buch.-Ham. ex Dillw.) Mabb., *Taxon* 27: 553. 1979; FPL 336. 1990; FTSR 332. 1996. *Bignonia colais* Buch.-Ham. ex Dillw., *Rev. Hort. Malab.* 28. 1839. *Stereospermum tetragonum* DC., *Prodr.* 9: 210. 1845; FPM 998. 1924. *S. chelonoides* sensu Wight, *lc. t.* 1341. 1845, non (L. f.) DC. 1838; FBI 4: 383. 1884. *S. personatum* (Hassk.) Chatter., *Bull. Bot. Soc. Bengal* 2: 70. 1948. *Dipterosperma personatum* Hassk., *Flora* 25: Biebl. 28. 1842.

Large trees, bark transversally rugose, grey. Leaves to 35 cm long, 1-pinnate; leaflets to 12 x 4.5 cm, 4-6 pairs, ovate, entire or serrate, caudate-acuminate, obtuse at base, slightly unequal-sided, petiolulate; nerves 8-10 pairs. Flowers in terminal panicles; calyx 6 mm long, campanulate, shallowly lobed, lobes obtuse; corolla yellow, 2 cm long, 1.5 cm broad, bilabiate, lobes subequal, crisped; stamens 5, included, filaments pubescent at base; ovary sessile, oblong, 2-celled, ovules many, 1-seriate, style slender, stigmas 2, spoon shaped. Capsule to 35 x 0.7 cm, subtetragonous, spirally splitting; seeds 8 mm long, with membranous wings on both sides.

*Fl. & Fr.* April-October

*Distr.* Indo-China and Malesia. Common in moist deciduous forests; *PS 18969* Vengoli

### PEDALIACEAE

#### SESAMUM Linnaeus



**Sesamum orientale** L., Sp. Pl. 634. 1753; FPL 337. 1990; FTSR 333. 1996. *S indicum* L., Sp. Pl. 634. 1753; FBI 4: 387. 1884; FPM 1002. 1924.

Erect herbs, young shoots 4-angled, puberulus. Leaves opposite below, alternate above, basal leaves often 3-foliolate, elliptic-lanceolate, variable in size, pubescent on both sides. Flowers solitary, axillary, terminating into a leafy raceme above; calyx 5-lobed; lobes unequal; corolla purple, 3.5 x 2 cm, tube ventricose, 2-lipped above, lobes 5; stamens 4, included. Capsule to 1.8 x 0.5 cm, oblong, beaked, compressed, medianly grooved, pubescent; seeds compressed, black.

*Fl. & Fr.* July-December

*Distr.* Tropical Africa and Asia. Fairly common in the marshy areas; *PS 30766* Anakkalvayal

#### ACANTHACEAE

1. Climbers; calyx reduced .....	2
1. Erect or prostrate herbs or stragglers; calyx well developed .....	3
2. Leaves petiolate; anthers glabrous or basally beard .....	<b>Thunbergia</b>
2. Leaves sub-sessile; anthers apically beard .....	<b>Meyenia</b>
3. Flowers in axillary clusters or sub-capitate peduncled clusters .....	4
3. Flowers in spike, racemes or panicles .....	6
4. Flowers in axillary whorls, armed with sharp thorns at nodes .....	<b>Hygrophila</b>
4. Flowers in few flowered clusters or capitate peduncled clusters, unarmed .....	5
5. Prostrate herbs; leaves sessile; fertile anther cell 1 .....	<b>Blepharis</b>
5. Erect herbs; leaves petiolate; fertile anther cells 2 .....	<b>Dicliptera</b>
6. Corolla lobes twisted to left in bud .....	7
6. Corolla lobes imbricate in bud .....	9
7. Placentas separating elastically from the base of the ripe capsule .....	<b>Phaulopsis</b>
7. Placentas not separating elastically from the base of the ripe capsule .....	8
8. Corolla tube short, ventricose .....	<b>Strobilanthes</b>
8. Corolla tube slender, not ventricose .....	<b>Eranthemum</b>
9. Ovules more than 3 in each cell; capsule more than 6 seeded .....	10
9. Ovules 1 or 2 in each cell; capsule to 4 seeded .....	12
10. Capsule sub-terete .....	<b>Gymnostachyum</b>
10. Capsule compressed at right angles to the septum .....	11
11. Flowers in whorls among axillary cladodes .....	<b>Haplanthodes</b>
11. Flowers in spikes, racemes or panicles .....	<b>Andrographis</b>
12. Corolla lobes 5, equal or sub-equal .....	13
12. Corolla distinctly two lipped .....	16
13. Spike 4 angled; anthers one celled .....	<b>Crossandra</b>
13. Spike terete or lax; anthers two celled .....	14
14. Calyx 4-partite .....	<b>Barleria</b>
14. Calyx 5-partite .....	15
15. Stamens 4; corolla tube cylindric below .....	<b>Asystasia</b>
15. Stamens 2; corolla tube long and slender .....	<b>Pseuderanthemum</b>
16. Bracts spinosus; stamens 4 .....	<b>Lepidagathis</b>
16. Bracts not spinosus; stamens 2 .....	17
17. Bracteoles linear, setaceous; anthers 1-celled .....	<b>Monothecium</b>
17. Bracteoles otherwise; anthers 2-celled .....	18
18. Spike one-sided; placenta separating elastically from the valve .....	<b>Rungia</b>
18. Spike otherwise; placentas not separating elastically from the valve .....	19
19. Bracts large, on dense spikes; anther cells sub-equal .....	<b>Ecboilium</b>
19. Bracts smaller, absent on lax spike or panicles; anther cells one higher .....	20
20. Corolla tube broad; anther cells with white appendage .....	<b>Justicia</b>
20. Corolla tube slender; anther cells without white appendage .....	21
21. Corolla white; bracts and bracteoles similar .....	<b>Rhinacanthus</b>
21. Corolla pink; bracteoles smaller than the bracts .....	<b>Peristrophe</b>

### ANDROGRAPHIS Wallich ex C.G.D. Nees

1. Panicle congested; staminal filaments glabrous.....**A. neesiana**
1. Panicle lax; staminal filaments hairy.....**A. macrobotrys**

**Andrographis macrobotrys** Nees in DC., Prodr. 11: 516. 1847; FBI 4: 503. 1884; FPM 1048. 1924; FPL 342. 1990; FTSR 335. 1996.

Erect or scandent undershrubs; stem stout, glabrous. Leaves to 13 x 3 cm, elliptic, lanceolate, coriaceous, glabrous; nerves to 10 pairs; petiole 6 mm long. Racemes to 19 cm long, upper axillary; calyx lobes 3 mm long, glandular hairy; corolla 20 mm long, tube ventricose; upper lip entire, midlobe of the lower lip broader than laterals, hairy; filaments bulged at base. Capsule 25 mm long, linear oblong, glandular hairy, retinacula acute; seeds 8, glabrous.

*Fl. & Fr.* September-February

*Distr.* South India and Sri Lanka. Common in semi-evergreen and openings of evergreen forests; *PS 19648* Vengoli

**Andrographis neesiana** Wight, Ic. t. 1561. 1850; FBI 4: 504. 1884; FPM 1049. 1924; FTSR 335. 1996.

Unbranched herbs, 30-45 cm high; branches strigose. Leaves 2-4 x 2 cm, ovate-elliptic, acute at both ends, glabrous, ciliate, nearly sessile; nerves 5 pairs. Panicle 2-5 x 4 cm, congested, terminal, strigose. Flowers densely arranged; calyx lobes 6 mm long, acuminate, glandular hairy, connate at base; corolla 14 mm long, tube not ventricose, upper lip emarginate; lobes of lower lip obtuse, hairy; filaments broaden below, anthers attenuate at base; style hairy. Capsule 16 x 3 mm, oblong, acute, hairy; seeds 6, glabrous.

*Fl. & Fr.* September-October

*Distr.* Endemic to Western Ghats. Fairly common in grasslands; *PS 19938* Karimala

### ASYSTASIA Blume

**Asystasia gangetica** (L.) Anders. in Thw., Enum. Pl. Zeyl. 235. 1860; FBI 4: 493. 1884; FPM 1063. 1924. *Justicia gangetica* L., Cent. Pl. 2: 3. 1756. *Asystasia coromandeliana* Wight ex Nees in Wall., Pl. Asiat. Rar. 3: 89. 1832; FPM 1063. 1924.

Erect or diffuse herbs, 20-35 cm high. Leaves to 5 x 3 cm, obovate, acuminate at apex, base rounded, pubescent; petiole 1 cm long, densely tomentose. Racemes terminal. Flowers distant; pedicels 3 mm long; calyx lobes 7 mm long, linear, acuminate, glandular hairy, free to the base; corolla 25 mm long, yellow; tube ventricose, lobes orbicular; anthers cuspidate at base. Capsule 25 mm long, puberulus; seeds 4, compressed, rugose.

*Fl. & Fr.* November-December

*Distr.* Peninsular India, Sri Lanka, Arabia and Africa. Common in moist deciduous forests; *PS 19539* Thekkady

### BARLERIA Linnaeus

1. Plants armed .....**B. mysorensis**
1. Plants unarmed..... 2
2. Branchlets tawny pubescent; corolla salver form..... 3
2. Branchlets glabrescent; corolla infundibular..... 4
3. Corolla white; leaf base truncate to rounded.....**B. acuminata**
3. Corolla pink; leaf base acuminate..... **B. tomentosa**
4. Inflorescence a terminal spike; stamens 4.....**B. courtallica**
4. Inflorescence an axillary or terminal helicoids cyme; stamens 5..... **B. involucrata**

**Barleria acuminata** Nees in Wall., Pl. Asiat. Rar. 3: 93. 1832; FBI 4: 484. 1884; FPM 1059. 1924; FTSR 336. 1996. *B. tomentosa* Roth var. *acuminata* (Nees) Clarke in Hook.f., FBI 4: 485. 1884.

Tawny pubescent shrubs. Leaves to 4.5 x 2.5-3 cm, ovate, orbicular, apex acute, apiculate, base rounded, tomentose; petiole to 3.5 cm, pubescent. Racemes axillary and terminal; bracts 1.3 cm long, lanceolate, glandular, pubescent, acute; outer calyx lobes larger, 1.3 x 2 mm; inner smaller to 6 x 2 mm, lanceolate, pubescent; corolla tube to 3 cm, lobes 1 cm, obovate, obtuse, imbricate; filaments 7 mm; ovary 3 mm, ovoid, style 3.5 cm long, hairy at the base.

*Fl. & Fr.* December-March

*Distr.* Endemic to South India. Occasional in dry deciduous forests; *PS* 30086, 30494 Kuchimudi

**Barleria courtallica** Nees in DC., Prodr. 11: 226. 1847; FPL 344. 1990; FTSR 336. 1996.

Shrubs to 1 m high; branchlets glabrous. Leaves 15-20 x 6-8 cm, elliptic, acuminate at apex, base attenuate, glabrous; nerves 7-9 pairs; petiole 1-4 cm long. Spike 3-10 cm long; bracts and bracteoles similar, 5 mm long, lanceolate. Flowers closely packed; outer sepals 18-20 x 6.5 mm, elliptic, acuminate, pubescent; inner sepals 15 mm long, linear, acuminate, hairy; corolla 4-5 cm long, tube and throat yellow or white; lobes 1.5 cm long, obovate, blue; filaments villous at base. Capsule 2.3 x 0.9 cm, elliptic, glabrous; seeds 4, 5 x 5 mm, orbicular, hairy, brown.

*Fl. & Fr.* January-April

*Distr.* Endemic to Western Ghats. Fairly common in evergreen forests; *PS* 30037 Meenkara; 30531 Pandaravarai

**Barleria involucrata** Nees in Wall., Pl. Asiat. Rar. 3: 92. 1832, var. *elata* (Dalz.) Hook. f., FBI 4: 486. 1884; FPM 1060. 1924; FPL 345. 1990. *B. elata* Dalz. in Hook.'s J. Bot. Kew. Gard. Misc. 3: 227. 1851.

Shrubs, 2-4 m high; branchlets quadrangular, tawny pubescent. Leaves 10-15 x 4-6 cm, elliptic, acuminate at both ends, thinly pubescent above; nerves 7 pairs, prominent; petiole 1-1.5 cm long. Cymes densely pubescent; bracts linear to oblanceolate. Flowers many, outer sepals 3-3.5 x 1-1.3 cm, oblong-lanceolate, acute, densely tawny pubescent, one shortly bifid at apex, inner sepals 15 x 3 mm, lanceolate, pubescent; corolla 7-8 cm long, tube 4-6 cm long, cylindrical, thinly hairy out, lobes spreading, blue; filaments villous at base.

*Fl. & Fr.* November-January

*Distr.* Endemic to Southern Western Ghats. Fairly common in evergreen forests; *PS* 30038 Meenkara; 30520 Koorankuzhi

**Barleria mysorensis** Heyne ex Roth, Nov. Pl. Sp. 313. 1821; FBI 4: 484. 1884.

Spinescent silky pubescent shrubs. Leaves to 2.5 x 1.8 cm, obovate, elliptic, apex obtuse, mucronate, base cuneate, ca. 5 nerved; petiole 0.5 cm. Flowers solitary, axillary, subsessile, blue; outer two calyx lobes 1.2 x 0.8 cm, ovate, silky pubescent, inner 0.5 cm, lanceolate; corolla tube to 2 cm, lobes 1 cm, obovate; filaments 1 cm; ovary ovoid, acute at apex.

*Fl. & Fr.* November-February

*Distr.* Pantropical. Fairly common in dry deciduous forests; *PS* 19548 Thekkady

**Barleria tomentosa** Roth, Nov. Pl. Sp. 314. 1821; FBI 4: 485. 1884; FPM 1059. 1924.

Shrubs, branchlets pubescent. Leaves to 6 x 3 cm, ovate, acuminate, base acute, tomentose below; petiole to 3 cm. Flowers subsessile in short axillary racemes; bracts spatulate; calyx lobes 4, to 1.5 x 0.7 cm, subequal, obovate; corolla 3 mm across, salviform, pink, tube to 7 cm; stamens 2. Capsule 4-seeded; seed hairy.

*Fl. & Fr.* December-March

*Distr.* Endemic to Peninsular India. Occasional in moist deciduous forests; *PS* 19873 Vengoli

#### BLEPHARIS Jussieu

**Blepharis maderaspatensis** (L.) Roth, Nov. Pl. Sp. 320. 1821; FBI 4: 478. 1884; FPM 1013. 1924; FPL 346. 1990. *Acanthus maderaspatensis* L., Sp. Pl. 639. 1753. *Blepharis boerhaviifolia* Pers., Syn. Pl. 2: 180. 1806.

Prostrate herbs. Leaves ternate, unequal, to 5 x 2.2 cm, obovate, apiculate, puberulus, margins distantly serrate; petiole to 3 cm. Flowers axillary; bracts 4 pairs, obovate, margins dentate with stiff elongated hairs, bracteoles 1.5 cm, spatulate; outer calyx lobes 1.3 cm and 1.8 cm, oblong, 2 and 3 veined, inner 8 mm; corolla tube urceolate, 5 mm, lower lip reduced, upper lip 3 lobed, 18 x 12 mm, white with pink nerves; filaments 4 and 5 mm, anthers 1-celled, apiculate, bearded; ovary 2.5 mm, oblong, style 1 cm, with a basal ring.

*Fl. & Fr.* November-January

*Distr.* Tropical Africa to India. Common in dry deciduous forests; *PS 19972* Keerappadi

#### CROSSANDRA R. A. Salisbury

**Crossandra infundibuliformis** (L.) Nees in Wall., Pl. Asiat. Rar. 3: 98. 1832. *Justicia infundibuliformis* L., Sp. Pl. 21. 1753. *Crossandra undulaefolia* Salisb., Parad. Lond. t. 12. 1805; FBI 4: 492. 1884; FPM 1055. 1924. *C. axillaris* Nees in Wall., Pl. Asiat. Rar. 3: 98. 1832.

Subshrubs, 1-2 m high. Leaves 6-9 x 2-4 cm, elliptic, acute at either ends, usually crowded towards the apex; petiole to 4 cm long. Spike terminal or rarely axillary, dense, to 7 cm long; peduncle 5-10 cm long; bracts in 4 rows, 15 x 5 mm, lanceolate; bracteoles 15 x 3 mm, linear, acuminate, pubescent. Flowers many, densely packed; calyx lobes 5, unequal, to 9 mm long, glandular-hairy, outer one sometimes 2-fid at apex; corolla bluish green, tube 2.5 cm long, narrow, lobes 5, subequal, 1 cm long, oblong, spreading; stamens 4, inserted at the middle of corolla tube, included, filaments unequal, anthers bearded; ovary oblong, 4-ovuled; style narrow, stigma fimbriate. Capsule 10 x 5 mm, oblong; seeds 4, orbicular.

*Fl. & Fr.* December-March

*Distr.* India and Sri Lanka. Planted in settlements; *PS 19072* Thunakkadavu

#### DICLIPTERA A. L. Jussieu

**Dicliptera cuneata** Nees in Wall., Pl. Asiat. Rar. 3:111.1832; FBI 4:552.1884; FPM 1073.1924.

Subshrubs. Leaves to 7 x 5 cm, elliptic, acuminate, base rounded or cuneate, hispid; petiole 2-3 cm long. Cymes sessile or shortly peduncled, subcapitate; bracts 18 x 12 mm, obovate, obtuse, mucronate, hispid; bracteoles 5 mm long, lanceolate, subulate. Flowers to 13 together; sepals 7 mm long, lanceolate, hispid; corolla pink, 8 mm long, tube slender; filaments hairy.

*Fl. & Fr.* November-February

*Distr.* Endemic to Peninsular India. Occasional in semi-evergreen forests; *PS 19956* Karimala

#### ECBOLIUM S. Kurz

**Ecbolium ligustrinum** (Vahl) Vollesen, Kew Bull. 44: 651. 1989; FTSR 338. 1996. *Justicia ligustrina* Vahl, Enum. Pl. Zeyl. 1: 118. 1804. *Ecbolium linneanum* Kurz, J. Asiat. Soc. Bengal 40: 75. 1871; FBI 4: 544. 1885, p. p.; FPM 1074. 1924. *E. linneanum* var. *dentatum* (Klein ex Link) Clarke in Hook.f., FBI 4: 545. 1885. *E. linneanum* var. *laetevirens* (Vahl) Clarke in Hook.f., FBI 4: 545. 1885; FPL 348. 1990. *E. viride* (Forssk.) Alston var. *laetevirens* (Vahl) Raizada, Indian For. Rec. 84: 482. 1958; FPL 348. 1990.

Glabrous shrubs; stem terete. Leaves to 22 x 6 cm, elliptic-lanceolate, acuminate on both ends; lateral nerves 7 pairs; petiole 3.5 cm long. Spikes terminal, to 12 cm long; bracts 23 x 12 mm, elliptic, glabrous; bracteoles filiform. Flowers many; sepals 5 mm long, linear, acuminate, hirtus, united at base, corolla bluish-green, bilabiate, tube 27 mm long, narrow, upper lip linear-oblong, shortly bifid; lower lip deeply 3-lobed; tube 25 mm long, narrow, hairy; stamens 2; style slender; stigma 2-lobed, clavate. Capsule 23 x 10 mm, clavate, thinly hairy; seeds one in each chamber, 8 x 8 mm, orbicular, compressed, white, rugulose.

*Fl. & Fr.* January-May

*Distr.* Indo-Malesia and Africa. Common in evergreen forests; *PS 18814* Parambikulam; *19234* Vengoli

#### ERANTHEMUM Linnaeus

***Eranthemum capense*** L., Sp. Pl. 9. 1753; FBI 4: 525. 1885; FPM 1078. 1924; FPL 348. 1990; FTSR 338. 1996. *E. montanum* Roxb., Fl. Ind. 1: 100. 1820; FPM 1025. 1924. *Justicia montana* Roxb., Pl. Corom. t. 176. 1798. *Daedalacanthus montanus* (Roxb.) Anders. in Thw., Enum. Pl. Zeyl. 229. 1860.

Subshrubs; branchlets glandular-pubescent. Leaves to 15 x 5 cm, elliptic, acuminate at both ends, entire, glabrous; nerves 5-7 pairs; petioles to 3 cm long. Spikes 3-7 cm long, terminal; bracts 20 x 5 mm, lanceolate, acuminate, glandular hairy; bracteoles linear; sepals 5, united at the base, lanceolate, acuminate, hairy; corolla blue, tube 3 cm long, slender, glabrous, blue, lobes equal, 12 mm long, obovate, obtuse; stamens 2, anther cells subequal, parallel; staminodes 2, basely united; ovary 2-4-ovuled. Capsule oblong; seeds 2, orbicular, densely hairy.

*Fl. & Fr.* January-March

*Distr.* Peninsular India and Sri Lanka. Common in moist deciduous forests; *PS 19051* Thunakkadavu; *PS 19604* Kothala

#### GYMNOSTACHYUM C. G. D. Nees

***Gymnostachyum canescens*** (Nees) Anders., J. Linn. Soc. Bot. 9: 505. 1867; FBI 4: 509. 1884; FPM 1053. 1924; FPL 349. 1990; FTSR 339. 1996. *Cryptophragmium canescens* Nees in Wall., Pl. Asiat. Rar. 3: 100. 1832.

Subshrubs, stem hirsute. Leaves 15-20 x 10-12 cm, broadly elliptic, acute to acuminate at either ends. Cymes axillary, paniced, hirsute; bracts and bracteoles similar, 2 mm long, ovate. Flowers many, densely packed; sepals 5 mm long, glandular hairy; corolla greenish white, 15 mm long, tube 10 mm long, narrow, lobes obtuse, hispid; anthers unequal, glabrous. Capsule 16 x 2 mm, oblong, acute, hirsute; seeds many, orbicular, golden brown.

*Fl. & Fr.* October-January

*Distr.* Endemic to South West India. Common in moist areas of evergreen forests; *PS 30044* Kamamudi

#### HAPLANTHODES O. Kuntze

***Haplanthodes neilgherryensis*** (Wight) Majumdar, Bull. Bot. Soc. Bengal 25: 76. 1971; FPL 349. 1990; FTSR 339. 1996. *Haplanthus neilgherryensis* Wight, Ic. t. 1556. 1850; FBI 4: 507. 1884; FPM 1052. 1924. *H. tentaculatus* Nees. var. *neilgherryensis* (Wight) Clarke in Hook.f., FBI 4: 507. 1884.

Profusely branched herbs, branches quadrangular, glabrous. Leaves to 7 x 3 cm, elliptic, acuminate at both ends, glabrous, attenuate and decurrent at base into a petiole of 4-9 cm long. Spikes terminal, to 5 cm long, cylindrical, densely covered with hairy cladodes; bracts and bracteoles minute. Flowers in whorls; calyx 2 mm long, lobes filiform, hairy; corolla 10 mm long; upper lip 2-lobed and lower lip 3-lobed, hairy; stamens 2, free, anthers unequal, appendaged; ovary oblong, ovule 4-6 in each cell, style slender, stigma linear. Capsule 7 mm long, oblong; seeds 6-12, thinly hairy.

*Fl. & Fr.* January-March

*Distr.* Endemic to Western Ghats. Fairly common in evergreen forests; *PS 19215* Kariamchola

#### HYGROPHILA R. Brown

***Hygrophila schulli*** (Ham.) M. R. & S. M. Almeida, JBNHS 83(Suppl.): 221. 1986; FTSR 340. 1996. *Bahell schulli* Ham., Trans. Linn. Soc. London 14: 289. 1825. *Barleria auriculata* K. Schum. in Schum. & Thonn., Besker Guin. Pl. 285. 1827. *Asteracantha longifolia* (L.) Nees in Wall., Pl. Asiat. Rar. 3: 90. 1832; FBI 4: 408. 1884; FPM 1015. 1924. *Hygrophila auriculata* (K. Schum.) Heine, Kew Bull. 16: 172. 1962; FPL 350. 1990.

Subshrubs, strigose-hispid, with sharp thorns. Leaves in whorls of 8, unequal, linear-lanceolate, base cuneate, margins dentate and wavy, larger pair to 10 x 2 cm, sessile. Thorns 2-3 cm long. Bracts and bracteoles leafy, 1.2 cm long. Calyx lobes 4, larger lobe 1 cm long. Corolla pink, 1.5 cm long, lobes obtuse, ciliate. Capsule 1 cm long; seeds orbicular, 3 mm across.

*Fl. & Fr.* September-April

*Distr.* India, Myanmar and Indo-China. Common in marshy areas; *PS 19253* Thellikkal

### JUSTICIA Linnaeus

1. Shrubs.....	2
1. Herbs.....	5
2. Bracts white with green nerves.....	<b>J. betonica</b>
2. Bracts green.....	3
3. Branchlets dark purple; capsule glabrous.....	<b>J. gendarussa</b>
3. Branchlets otherwise.....	4
4. Branchlets obtusely 4 angled; corolla 2 cm long.....	<b>J. santapau</b>
4. Branchlets terete; corolla to 15 mm long.....	<b>J. wynaadensis</b>
5. Inflorescence cymose; flowers pedicelled.....	<b>J. glabra</b>
5. Inflorescence spicate.....	6
6. Bracts longer than the calyx.....	<b>J. tranquebariensis</b>
6. Bracts as long as or shorter than the calyx.....	7
7. Bracteoles similar; fruiting spike intact.....	8
7. Bracteoles dissimilar; fruiting spikes not intact.....	10
8. Petiole to 2 cm; bracteoles with bulbous based hairs.....	<b>J. neesii</b>
8. Petiole to 0.5 cm; bracteoles with simple hairs.....	9
9. Spike to 2.5 cm long; bracts obovate.....	<b>J. procumbens</b>
9. Spike more than 4 cm long; bracts ovate.....	<b>J. japonica</b>
10. Bracts ovate; calyx lobes glabrescent.....	<b>J. diffusa</b>
10. Bracts lanceolate; calyx lobes ciliate.....	<b>J. prostrata</b>

**Justicia betonica** L., Sp. Pl. 15. 1753; FBI 4: 525. 1885; FPM 1078. 1924; FPL 351. 1990; FTSR 341. 1996. *Adhatoda betonica* (L.) Nees in Wall., Pl. Asiat. Rar. 3: 103. 1832.

Shrubs, 1-3 m high; stem terete, glabrous. Leaves 5-15 x 4 cm, elliptic, acuminate at either ends, glabrous; nerves 10-12 pairs; petiole 4 cm long. Spike to 10 cm long, terminal and upper axillary; bracts 13-15 x 5 mm, ovate, acuminate. Flowers bluish-white; calyx 5 mm long, lobes oblong, hairy, 3-ribbed; corolla white with bluish streaks, 12 mm long, hairy; style hairy. Capsule 14 x 5 mm, hairy; seeds 3 x 2 mm, orbicular.

*Fl. & Fr.* November-January

*Distr.* Old World Tropics. Common along the margins of evergreen forests; *PS 30206* Karimala

**Justicia diffusa** Willd., Sp. Pl. 1: 87. 1797; FBI 4: 538. 1885; FPM 1081. 1924; FPL 352. 1990. *Rostellularia diffusa* (Willd.) Nees in Wall., Pl. Asiat. Rar. 3: 100. 1832.

Herbs. Leaves to 5 x 3 cm, elliptic-ovate, subacute, base rounded; petiole to 1 cm. Spike axillary, to 6 cm; bracts and bracteoles to 2 cm, ovate, acute, calyx lobes to 4 mm, lanceolate, acute, subequal, margin ciliate; corolla ca 5 x 2 mm across; stamen 2; ovary 1 mm, style 3 mm, hairy. Capsule to 5 mm, hairy above; seeds ovate, papillose.

*Fl. & Fr.* August-October

*Distr.* South and South East Asia. Common in moist deciduous forests and plantations; *PS 19013* Thunakkadavu

**Justicia gendarussa** Burm. f., Fl. Ind. 10. 1768; FBI 4: 532. 1885; FPM 1079. 1924; FTSR 341. 1996. *Gendarussa vulgaris* Nees in Wall., Pl. Asiat. Rar. 3: 104. 1832.

Shrubs, branches dark purple, terete, smooth. Leaves linear or oblong-lanceolate, acute or obtuse, base acute, chartaceous, glabrous, to 10 x 1.8 cm; lateral nerves 5-7 pairs, bluish; petiole 2-3 mm long. Spikes terminal, to 8 cm long, narrow; bracts linear, 4 mm long. Flowers white; calyx lobes linear-lanceolate, 5 mm long; corolla white with purple streaks, 1.5 cm long. Ovary and style puberulus. Capsule 12 mm long, glabrous

*Fl. & Fr.* January-April

*Distr.* Tropical Africa and Asia. Planted in gardens; *PS 30288* Parambikulam

**Justicia glabra** Koen. ex Roxb., *Fl. Ind.* 1: 132. 1820; *FBI* 4: 535. 1885; *FPM* 1079. 1924. *Rhaphidospora glabra* (Koen. ex Roxb.) Nees in *Wall., Pl. Asiat. Rar.* 3: 115. 1832.

Large herbs. Leaves to 10 x 6.5 cm, broadly ovate, apex acute, base rounded or cuneate, upper sessile; petiole 3 cm. Panicles axillary and terminal, to 15 cm long, glandular pubescent; bracts and bracteoles 1.5 mm, linear; calyx lobes 4 mm, lanceolate, puberulus; corolla tube to 4 mm, pubescent, bilabiate, upper 5 mm, lower 8 mm, white with reddish blotches; filaments 4 mm; ovary 1.5 mm, style 6 mm, hairy.

*Fl. & Fr.* December-February

*Distr.* India and Tropical Africa. Occasional in dry deciduous forests; *PS 30085* Kuchimudi

**Justicia japonica** Thunb., *Fl. Jap.* 20.1784; *FTSR* 342. 1996. *Rostellularia japonica* (Thunb.) Ellis in *Bull. Bot. Surv.* 22:196.1980 (1982). *Justicia simplex* D. Don., *Prodr. Fl. Nepal* 118.1825; *FBI* 4:539.1855; *FPM* 1080.1924. *Rostellularia mollissima* (Nees) Nees in *DC., Prodr.* 11:373.1847.

Erect or decumbent herbs, branchlets strigose-hispid. Leaves ovate or linear, acute, to 2 x 1.5 cm, sparsely scabrous above and strigose below; lateral nerves 5-7 pairs; petiole to 2 mm long. Bracts and bracteoles ovate, scarious-margined, softly hairy, 4 mm long. Calyx lobes linear, margins scarious, ciliate, 4 mm long. Corolla 4 mm long, pink. Capsule pubescent, 4 mm long.

*Fl. & Fr.* August-January

*Distr.* Indo-Malesia, East Asia and Tropical Africa. Common in moist deciduous forests and plantations; *PS 30787* Parambikulam

**Justicia neesii** Ramam. in *Sald. & Nicols., Fl. Hassan Dist.* 551. 1976; *FPL* 352. 1990. *Rostellularia crinita* Nees *Wall., Pl. Asiat. Rar.* 3: 101. 1832, non *Justicia crinita* Thunb. 1784. *Justicia micrantha* *Wall. ex Clarke in Hook.f., FBI* 4: 536. 1885; *FPM* 1080. 1924.

Subshrubs, 40-80 cm high; stem hispid. Leaves to 3.5 x 2 cm, ovate, acute at apex, round or acute at base, glabrous; nerves 4 pairs; petiole 7 mm long. Spikes 5 x 0.6 cm, terminal; bracts 4 mm long, lanceolate, acuminate. Flowers densely packed; calyx lobes 5 mm long, linear, acuminate; corolla 6 mm long, lilac with pink spots. Capsule 6 mm long, oblong, acute, glabrous; seeds orbicular, rugose, brown.

*Fl. & Fr.* November-January

*Distr.* Endemic to Peninsular India. Common in degraded forest areas; *PS 19190* Rockpoint

**Justicia procumbens** L., *Sp. Pl.* 15. 1753; *FBI* 4: 539. 1885; *FPM* 1080. 1924; *FTSR* 342. 1996. *Rostellularia procumbens* (L.) Nees in *DC., Prodr.* 11: 371. 1847.

Diffuse herbs, profusely branched. Leaves 4-6 x 2-3 cm, ovate, acute at either ends, hispid; nerves 5 pairs; petioles 1 cm long, hirtus. Spikes 1-2.5 x 1 cm, terminal, oblong; bracts 5 x 1.5 mm, oblanceolate, cuspidate, ciliate, with green midrib; bracteoles linear. Flowers many; calyx lobes 3.5 mm long, lanceolate, ciliate; corolla 7 mm long, hairy with pink lines, upper lip 2-lobed. Capsule 5 x 2 mm, glabrous; seeds 1 x 1 mm. orbicular, brown, striately rugose.

*Fl. & Fr.* June-November

*Distr.* Indo-Malesia and Australia. Common in moist deciduous forests and plantations; *PS 19086* Padippara

**Justicia prostrata** (Roxb. ex Clarke) Gamble, FPM 1081. 1924. *J. diffusa* Willd., Sp. Pl. 1: 87. 1800, var. *prostrata* Roxb. ex Clarke in Hook.f., FBI 4: 538. 1885. *Rostellularia prostrata* (Roxb. ex Clarke) Majumdar, Bull. Bot. Soc. Bengal 25: 75. 1971.

Erect or prostrate herbs; stem puberulus. Leaves to 1.7 x 1 cm, ovate, obtuse or acute, base rounded; nerves 4 pairs; petioles 7 mm long. Spikes 1.5 cm long, terminal, cylindrical to ovoid; bracts and bracteoles similar, 2 mm long. Flowers lax; calyx lobes 3 mm long, lanceolate, glabrous; corolla 4 mm long, white, glabrous; ovary glabrous. Capsule 3 mm long, glabrous; seeds triangular, rugose, puberulus, reddish brown.

*Fl. & Fr.* September-January

*Distr.* Peninsular India and Sri Lanka. Occasional in moist and dry deciduous forests; *PS 30098* Thekkady

**Justicia santapau** Bennet, JBNHS 67: 358. 1970; FPL 352. 1990; FTSR 342. 1996. *J. montana* (Nees) Wall. ex Anders., J. Linn. Soc. Bot. 9: 509. 1867; FPM 1078. 1924. *Hemichoriste montana* Nees in Wall., Pl. Asiat. Rar. 3: 102. 1832. *Justicia andersonii* Ramam. in Sald. & Nicols., Fl. Hassan Dist. 551. 1976.

Shrubs, 1-2.5 m high; branches terete or obtusely 4-angled, glabrous. Leaves 25-40 x 7-10 cm, oblanceolate, acute at apex, base attenuate, glabrous; nerves 8 pairs, prominent; petioles 5-6 cm long. Spike 20 cm long, axillary, peduncled, simple or branched; bracts and bracteoles similar, 5 x 1.5 mm, oblong, pubescent. Flowers lax; calyx lobes 9 mm long, lanceolate, puberulus; corolla white with pink spots, villous at the base between the filaments; ovary densely hairy. Capsule 25 mm long, clavate, glabrous

*Fl. & Fr.* January-March

*Distr.* Endemic to Southern Western Ghats. Occasional in evergreen forests; *PS 30040* Meenkara; *30567* Kariamchola

**Justicia tranquebariensis** L. f., Suppl. Pl. 85. 1781; FBI 4: 530. 1885; FPM 1079. 1924. *Gendarussa tranquebariensis* (L. f.) Nees in Wall., Pl. Asiat. Rar. 3: 105. 1832.

Subshrubs. Leaves 2.5-3 x 2 cm, obovate, orbicular, apex obtuse, base cuneate, membranous, pubescent; petiole 1.5 cm. Spikes terminal and axillary, to 10 cm; bracts 1 x 0.7 cm, broadly ovate; calyx teeth 5 mm, lanceolate, 3-nerved; corolla bilabiate, tube 5 mm, villous inside, upper lobe 7 x 5 mm, lower narrow, white with pink blotches; filaments dilated, 2 mm; ovary 1.5 mm, ciliate along the margins, style ciliate. Capsule 8 mm, widened above the middle, puberulus.

*Fl. & Fr.* November-January

*Distr.* Peninsular India and Sri Lanka. Common in dry deciduous forests; *PS 30066* Kuchimudi

**Justicia wynaadensis** (Nees) Heyne ex Anders., J. Linn. Soc. Bot. 9: 515. 1867; FBI 4: 533. 1885; FPM 1079. 1924; FPL 353. 1990; FTSR 342. 1996. *Gendarussa wynaadensis* Nees in Wall., Pl. Asiat. Rar. 3: 105. 1832. *Adhatoda wynaadensis* (Nees) Nees in DC., Prodr. 11: 406. 1847.

Erect subshrubs; stem terete, smooth. Leaves to 18 x 6 cm, lanceolate, acuminate at either ends, glabrous; lateral nerves 7 pairs; petioles 1-3.5 cm long. Spike 10 cm long, axillary and terminal, slender; rachis pubescent, sometimes branched. Flowers in distant pairs; bracts 3 x 1 mm, hairy; corolla 12 mm long, throat hairy; ovary glabrous. Capsule 17 mm long, pubescent; seeds obovoid, oblique, minutely rugulose, dark brown.

*Fl. & Fr.* November-March

*Distr.* Endemic to Southern Western Ghats. Occasional along the margins of evergreen forests; *PS 30207* Parambikulam; *30019* Karappara

#### LEPIDAGATHIS Willdenow



**Lepidagathis incurva** Buch.-Ham. ex D. Don, Prodr. Fl. Nepal 119. 1825; FTSR 343. 1996. *L. hyalina* Nees in Wall., Pl. Asiat. Rar. 3: 95. 1832; FBI 4: 521. 1884; FPM 1068. 1924.

Prostrate herbs; stem angular, strigose. Leaves 6-8 x 3 cm, ovate, acute at apex, cuneate at base, hispid; nerves to 7 pairs. Spikes terminal and axillary, clustered; bracts and bracteoles similar, 3.5 x 2 mm, lanceolate, ciliate, hyaline. Flowers densely packed; sepals 5, 5 mm long, linear-lanceolate, ciliate, glandular-hairy at apex; corolla 6 mm long, bilabiate, tube short, slender, upper lip entire, lower lip 3-lobed, hairy outside; stamens 4, didynamous, anthers softly hairy; ovary ovoid, thinly hairy, style curved, stigma capitate. Capsule 4 mm long, ellipsoid, hairy at apex; seeds 4, compressed, rugose, brown.

*Fl. & Fr.* February-April

*Distr.* India, Myanmar and China. Common in moist deciduous forests and plantations; *PS 19947* Karimala

#### MEYENIA C. G. D. Nees

**Meyenia hawtayneana** (Wall.) Nees in Wall., Pl. As. Rar. 3: 78. 1832; FPM 1009. 1924. *Thunbergia hawtayneana* Wall., Tent. Fl. Nap. 49. 1826 & Pl. As. Rar. 2: 52. t. 164. 1831; FBI 4: 391. 1884

Climbers, branchlets tetragonous. Leaves to 9 x 4.5 cm, ovate acuminate, base 3-5 nerved, cordate, pedicles to 1.5 cm. Flowers solitary, axillary; bracteoles *ca* 1.5 x 0.5 cm, calyx to 2.5 cm, obscurely 5-lobed; corolla 5 x 4 cm across, violet, lobes ovate, to 1 cm, villous below the stamen; stamens 4, in pairs, included; filaments to 1.8 cm. Ovary *ca* 3 x 2 mm, conical; ovules 2 in each cell; style to 3 cm; stigma bilamellate, incurved. Capsule to 3 x 1.5 cm, globose, beaked; seeds 4, *ca* 4 mm across, orbicular.

*Fl. & Fr.* February-April

*Distr.* India and Sri Lanka. Rare in rocky areas of dry deciduous forests; *PS 18950* Vengoli

**Note:** Present collection is an addition to the flora of Kerala

#### MONOTHECIUM Hochst

**Monothecium aristatum** (Wall. ex Nees) T. Anders. in Thw., Enum. Pl. Zeyl. 234. 1860; FBI 4:524.1885; FPM 1068.1924. *Justicia aristata* Wall. ex Nees in Wall., Pl. Asiat. Rar. 3:115.1832.

Herbs; branchlets puberulus. Leaves 5-6 x 2.3 cm, elliptic-oblong, acuminate, base acute; petiole to 2 mm. Spike to 4 cm, lax, terminal or on upper axils; bracts linear setaceous *ca* 1 cm; sepals 5, to 8 mm, linear, setaceous; corolla to 1.5 cm, white, brown spotted. Capsule *ca* 6 mm, oblong 4-seeded; seeds orbicular.

*Fl. & Fr.* December-March

*Distr.* Peninsular India and Sri Lanka. Occasional in dry deciduous forests; *PS 19996* Kuchimudi

**Note:** Present collection is an addition to the flora of Kerala

#### PERISTROPHE C. G. D. Nees

1. Branchlets terete, glabrous: ..... **P. montana**
1. Branchlets angled; hispid ..... **P. paniculata**

**Peristrophe montana** Nees in Wall., Pl. Asiat. Rar. 3: 113. 1832; FBI 4: 556. 1885; FPM 1084. 1924; FPL 357. 1990; FTSR 344. 1996.

Erect shrubs; stem quadrangular. Leaves to 17 x 6 cm, ovate, acuminate, glabrous; nerves 7 pairs; petiole to 6 cm long. Cymes axillary and terminal, trichotomous; bracts 2, opposite, 2.5 x 1.5 cm, ovate, obtuse; bracteoles 6 mm long, linear. Flowers pink; calyx lobes 5, 4 mm long, linear, united below the middle; corolla tube 30 mm long, slender, 2-lipped above; lower lip 3-lobed, upper 15 mm long, orbicular, emarginate; stamens 2, filaments hairy, attached at the

throat of corolla tube; anthers linear, curved, ovary glabrous, style filiform, stigma 2-lobed. Capsule 13 mm long, stipitate, tomentose.

*Fl. & Fr.* September-March

*Distr.* Indo-Malesia. Occasional in moist deciduous forests; *PS 19181* Karimala; *19662* Vengoli; *19832* Vengoli

**Peristrophe paniculata** (Forssk.) Brummitt, Kew Bull. 38: 451. 1984; FTSR 344. 1996. *Dianthera paniculata* Forssk., Fl. Aeg.-Arab. 7. 1775. *Peristrophe bicalyculata* (Retz.) Nees in Wall., Pl. Asiat. Rar. 3: 113. 1832; FBI 4: 554. 1885; FPM 1084. 1924. *Dianthera bicalyculata* Retz., Acta Holm. 1775: 297, t. 9. 1776.

Erect branched herbs. Leaves 4.5-2 x 0.5-1 cm, ovate, apex acute, hirsute. Panicles axillary; pedicels to 2 cm; bracts 2, unequal, 11 and 8 mm, bracteoles 4, 6 mm, linear, hirsute; calyx lobes 4 mm, linear; corolla tube 5 mm, hairy, lobes 7 mm; filaments 5 mm, hairy, cells muticous; ovary 1 mm, oblong. Capsule ellipsoid.

*Fl. & Fr.* December-February

*Distr.* India, Myanmar and Tropical Africa. Common in moist deciduous forests; *PS 19024* Thunakkadavu

#### PHAULOPSIS Willdenow

**Phaulopsis imbricata** (Forssk.) Sweet., Hort. Brit. (ed. 1) 327. 1827; FTSR 345. 1996. *Ruellia imbricata* Forssk., Fl. Aeg.-Arab. 113. 1775. *Micranthus oppositifolius* Wendl., Bot. Beobacht 39. 1798. *Phaulopsis parviflora* Willd., Sp. Pl. 3: 342. 1800. *P. dorsiflora* (Retz.) Sant., Kew Bull. 2: 276. 1948; FPL 358. 1990.

Diffuse herbs, branches glandular hairy. Leaves in unequal pairs, up to 5 x 2 cm, elliptic, acuminate at both ends; nerves 4 pairs; petiole 2.5 cm long. Spikes axillary, 2 x 1 cm, 1-sided; bracts paired, 6 x 7 mm, orbicular, hairy and long ciliate along the margins; bracteoles absent. Flowers small, scarcely seen above the bracts; calyx lobes 5, unequal; corolla 8 mm long, bilabiate, tube slender, lobes obtuse, white with pink spots; stamens 4, filaments united into an adnate sheath below. Capsule 3 mm long, glabrous; seeds 4, compressed.

*Fl. & Fr.* November-March

*Distr.* Indo-Malesia, China and Africa. Common in degraded forest areas; *PS 19043* Thunakkadavu

#### PSEUDERANTHEMUM Radlkfer

**Pseuderanthemum malabaricum** (Clarke) Gamble, FPM 1064. 1924; FPL 359. 1990; FTSR 345. 1996. *Eranthemum malabaricum* Clarke in Hook.f., FBI 4: 497. 1884.

Shrubs; stem terete, white, smooth. Leaves to 10 x 4 cm, elliptic, acuminate to base and apex, glabrous, glaucous below; nerves 5 pairs; petiole to 2 cm long. Spike 3-8 cm long, terminal, slender; bracts and bracteoles similar, 3 mm long, linear. Flowers in small interrupted clusters; calyx 6 mm long, lobes united at base, acuminate; corolla tube 30 mm long, slender; lobes 10 mm long, obovate, equal; stamens 2, free, anthers oblong; stigma bilobed. Capsule 18 x 5 mm, clavate, basal portion solid; seeds 5 x 3 mm, compressed, reticulate.

*Fl. & Fr.* December-March

*Distr.* Peninsular India and Sri Lanka. Occasional in evergreen forests; *PS 19739* Pezha

#### RHINACANTHUS C.G.D. Nees

**Rhinacanthus nasutus** (L.) Kurz, J. Asiat. Soc. Bengal 39: 79. 1870; FPL 359. 1990; FTSR 346. 1996. *Justicia nasuta* L., Sp. Pl. 16. 1753. *Rhinacanthus communis* Nees in Wall., Pl. Asiat. Rar. 3: 109. 1832; FBI 4: 541. 1885; FPM 1083. 1924.

Erect shrubs; stem terete, tomentose. Leaves to 12 x 8 cm, elliptic, acute at either ends, crenulate, minutely pubescent; nerves 7-10 pairs. Cymes terminal, paniced; flowers sessile;

bracts and bracteoles similar, 2 mm long, hispid; sepals 5, 5 mm long, linear-lanceolate, hispid; corolla white, tube 25 mm long, slender, hispid; upper lip entire, oblong, acuminate; lower lip broad, 3-lobed, obtuse; stamens 2, inserted near the throat of the tube, equal; one anther lobe lower than other, glabrous; ovules paired in each cell of the ovary, style slender. Capsule 2 cm long, clavate, with a lower solid slender stalk, glabrous; seeds 1 or 2 in each cell, rugose.

*Fl. & Fr.* November-February

*Distr.* India, Sri Lanka, Java and Madagascar. Common in moist deciduous forests and road cuttings; *PS 19188* Rockpoint

#### RUNGIA C.G.D. Nees

- |  |                     |
|--|---------------------|
| 1. Barren bracts and flowering bracts similar; stem zigzag .....       | <b>R. repens</b>    |
| 1. Barren bracts and flowering bracts dissimilar; stem not zigzag..... | 2                   |
| 2. Bracts prominently white scarious margined; glabrous.....           | <b>R. wightiana</b> |
| 2. Bracts narrowly hyaline on the margins; ciliate .....               | 3                   |
| 3. Subshrubs; corolla more than 1.5 cm long .....                      | <b>R. laetas</b>    |
| 3. Herbs; corolla to 0.5 cm long .....                                 | 4                   |
| 4. Floral bracts villous; leaves to 6 x 2.5 cm.....                    | <b>R. pectinata</b> |
| 4. Floral bracts glabrous or glabrescent; leaves to 3 x 1.5 cm .....   | <b>R. muralis</b>   |

**Rungia laeta** Clarke in Hook.f., *FBI* 4:546.1885; *FPM* 1071.1924.

Stem terete, glabrous. Leaves 6-8 x 3-5 cm, ovate-lanceolate, acute, glabrous; nerves 6-8 pairs; petiole 2 cm long. Spikes 3-6 x 2 cm, oblong, peduncled, floral bracts white, 16 x 7 mm, lateral ones empty, elliptic to obovate, acute, ciliate; bracteoles 10 x 2 mm, linear. Flowers white; sepals 7 x 1.5 mm, lanceolate, aristate; corolla 18 mm long, white with brown spots, thinly hairy, upper lip emarginate; filaments glabrous. Capsule 9 mm long, pubescent; seeds 4, rugose, brown.

*Fl. & Fr.* July-January

*Distr.* Endemic to Peninsular India. Common along the margins of evergreen forests; *PS 30788* Keerappadi

**Rungia muralis** Nees in DC., *Prodr.* 11: 470. 1847. *Rungia parviflora* Nees var. *muralis* (Nees) Clarke in Hook.f., *FBI* 4: 550. 1885; *FPM* 1072. 1924.

Herbs. Leaves to 5 x 2 cm, ovate-elliptic, acute, membranous. Spike to 2 cm, dense, terminal and axillary, barren bract 4-5 x 2.5 mm, ovate, acute, fertile 3.5-4.5 x 2 mm, ovate, emarginate, mucronate, margin ciliate; bracteoles 2 mm, elliptic, acute; calyx 2 mm, lobes 5, linear, ciliate; corolla bluish-white, 5 mm; stamens 2, lower cell spurred. Capsule *ca* 2.5 mm, ovoid; seeds 4.

*Fl. & Fr.* April-January

*Distr.* India and Myanmar. Common in moist deciduous and degraded forest areas; *PS 30217* Karimala

**Rungia pectinata** (L.) Nees in DC., *Prodr.* 11: 469. 1847; *FPL* 360. 1990; *FTSR* 346. 1996. *Justicia pectinata* L., *Amoen. Acad.* 4: 299. 1759. *Rungia parviflora* Nees var. *pectinata* (L.) Clarke in Hook.f., *FBI* 4: 550. 1885; *FPM* 1071. 1924.

Profusely branched herbs; stem hairy. Leaves to 6 x 2 cm, ovate to linear-oblong or obovate. Spikes 2 x 0.7 cm, 2-5 together, axillary, sessile; sterile bracts 4 x 2 mm, elliptic, narrowly winged on one side; fertile bracts 3 x 2 mm, obovate, broadly winged on either sides, emarginate, pubescent; bracteoles similar to bracts. Flowers small, densely packed; sepals linear, acuminate, hyaline, hairy; corolla 4 mm long, upper lip entire, white; upper anthers hairy. Capsule 2.5 mm long, glabrous; seeds orbicular, rugose, brown.

*Fl. & Fr.* November-February

*Distr.* India, Sri Lanka and Myanmar. Common in moist deciduous forests and plantations; *PS 19893* Thellikkal

**Rungia repens** (L.) Nees in Wall., Pl. Asiat. Rar. 3: 110. 1832; FBI 4: 549. 1885; FPM 1070. 1924. *Justicia repens* L., Sp. Pl. 15. 1753.

Decumbent herbs. Leaves to 5 x 1.5 cm, elliptic-lanceolate, acute at both ends, puberulus; petiole to 0.5 mm. Spike to 6 mm, terminal; bracts 4-farious, 2 rows barren, similar to 7 x 3 mm, elliptic-lanceolate, thinly pubescent, margin scarious; bracteoles *ca* 4 x 0.7 mm, lanceolate, acuminate, ciliate; calyx 3.5 x 5 mm, lobes 5, subequal, lanceolate; corolla to 5 x 2 mm, pinkish with white striations; stamens 2, on the throat of the corolla tube; filaments puberulus; anthers cells unequal, appendaged; ovary globose, 1 mm, puberulus; style hairy; stigma hispid. Capsule to 5 mm, elliptic-oblong, pubescent; seeds suborbicular.

*Fl. & Fr.* June-July

*Distr.* India and Sri Lanka. Common in moist deciduous forests and marshy areas; *PS 19495* Thellikkal

**Rungia wightiana** Nees in Wall., Pl. Asiat. Rar. 3: 110. 1832; FBI 4: 546. 1885; FPM 1071. 1924; FTSR 346. 1996.

Herbs, stem glabrous. Leaves to 15 x 7 cm, elliptic, acute, glabrous; lateral nerves 6-7 pairs; petiole 3-4 cm long. Spikes 6-9 x 0.8 cm, terminal, 3-8 together, shortly peduncled or sessile, basal bracts lanceolate, acute; sterile bracts 7 x 5 mm, obovate, emarginate, cuspidate; fertile bracts 5 x 2 mm, acute, aristate; bracteoles linear, acuminate. Flowers pale blue; sepals 5 mm long, glabrous; corolla 11 mm long, upper lip bifid at apex, lower lip with brown transverse lines. Capsule 8-10 mm long, hairy; seeds brown with white tuberculations.

*Fl. & Fr.* December-January

*Distr.* Endemic to Southern Western Ghats. Common along the margins of evergreen forests at higher altitudes; *PS 19924, 19156, 30120* Karimala

#### STROBILANTHES Blume

1. Fertile stamens 2 .....	<b>S. lawsonii</b>
1. Fertile stamens 4 .....	2
2. Stamens equal .....	<b>S. luridus</b>
2. Stamens unequal .....	3
3. Seeds hairy when wetted .....	4
3. Seeds glabrous .....	6
4. Spikes sub-tetragonus, terminal and on old wood .....	<b>S. dupenii</b>
4. Spike not sub-tetragonus, terminal or axillary .....	5
5. Flowers in deflexed heads with two pairs of large involucral bracts .....	<b>S. tristis</b>
5. Flowers in spikes without distinct involucral bracts .....	<b>S. asper</b>
6. Bracts and bracteoles glabrous .....	7
6. Bracts and bracteoles variously hairy .....	10
7. Spike solitary or paired .....	8
7. Spike 3-6 together .....	9
8. Spike closed, strobilate; stamens exerted .....	<b>S. ciliatus</b>
8. Spike spreading; stamens included .....	<b>S. adenophorus</b>
9. Leaves glabrous .....	<b>S. heyneanus</b>
9. Leaves covered with bulbous based hairs .....	<b>S. asperrimus</b>
10. Leaves coriaceous with bulbous based hairs .....	<b>S. neilgherrensis</b>
10. Leaves membranous; glandular hairy .....	<b>S. anceps</b>

**Strobilanthes adenophorus** Bedd., Ic. t. 225. 1868-1874; FBI 4: 440. 1884; FPM 1040. 1924; FTSR 348. 1996. *Didyplosandra lanceolata* (Hook. ex Nees) Bremek., Verh. Acad. Wet. afd.

Natuurk. Sect 2, 41: 178. 1944. *Nilgirianthus beddomei* Bremek., Verh. Acad. Wet. afd. Natuurk. Sect. 2, 41: 172. 1944; FPL 356. 1990.

Shrubs, to 2 m tall, branchlets slender. Leaves linear or oblanceolate, caudate-acuminate, base cuneate, chartaceous, subentire or serrulate, to 10 x 2.5 cm; lateral nerves ca. 6 pairs; petiole to 3.5 cm long. Spikes axillary, to 3 cm; peduncle to 2 cm; bracts obovate, acute, to 1 cm long; bracteoles narrow. Corolla 2 cm long, funnel-shaped, pale lavender.

*Fl. & Fr.* April-May

*Distr.* Endemic to Southern Western Ghats. Common in evergreen forests at higher altitudes; *PS 30050* Kamamudi

***Strobilanthes anceps*** Nees in DC., Prodr. 11: 189. 1847; FTSR 348. 1996. *Nilgirianthus punctatus* (Nees) Bremek., Verh. Acad. Wet. afd. Natuurk. Sect 2, 41: 174. 1944.

Shrubs, 1.5-2 m high; branches obscurely 4-angled; hairy along the angles. Leaves to 14 x 5 cm, elliptic, caudate-acuminate; nerves 6-7 pairs, glandular-pubescent; petiole 3-4 cm long. Spikes globose, 2-2.5 cm across, peduncled; involucre bracts 6 x 6 mm, orbicular, ciliate; floral bracts 10 x 8 mm, orbicular, glandular-ciliate along margins; bracteoles 7 x 2 mm, oblanceolate. Flowers several, densely packed; sepals 5, 4 mm long, lanceolate; corolla white or blue, 18-20 mm long, hairy outside, tube narrow below, ventricose above; staminal sheath glabrous.

*Fl. & Fr.* November-December

*Distr.* India and Sri Lanka. Common in evergreen forests; *PS 30604* Parambikulam

***Strobilanthes asper*** Wight, Ic. t. 1518. 1850; FBI 4: 452. 1884; FPM 1041. 1924. *Nilgirianthus asper* (Wight) Sant., Bot. Mem. Univ. Bombay 2: 42. 1951; FPL 355. 1990.

Shrubs, branchlets softly hairy. Leaves ovate, acute or shortly acuminate, base cuneate, crenate, to 10 x 4.5 cm. Spikes axillary, oblong, to 3 cm; bracts obovate, to 1 cm long; bracteoles linear. Corolla pale blue, 2 cm long.

*Fl. & Fr.* January-April

*Distr.* Endemic to Southern Western Ghats. Common in evergreen forests and reed areas; *PS 30316* Pooppara

***Strobilanthes asperrimus*** Nees in DC., Prodr. 11:183.1847; FBI 4:443.1884; FPM 730.1924.

Stout bushy shrubs; branches hirtus. Leaves to 10 x 7 cm, broadly elliptic, bluntly acuminate at apex, attenuate to base, crenate, covered with bulbous based hairs; lateral nerves 8-9 pairs; petiole 3-4.5 cm long. Spikes 3-4 together, 2 x 1.5 cm, axillary, on trichotomous peduncles, ovoid; involucre bracts 8 x 6 mm, broadly ovate, obtuse; floral bracts 13 x 10 mm, ovate, concave, obtuse, glabrous; bracteoles absent. Flowers few to many; sepals 6 x 2.5 mm, oblong, emarginate, connate a little above the base; corolla blue, 25 mm long; tube stout, with a patch of hairs inside above the stamens; staminal filaments and sheath hairy; style bulged below the stigma, hairy. Capsule 9 x 4 mm, glabrous; seeds winged.

*Fl. & Fr.* November-February

*Distr.* India and Sri Lanka. Common in evergreen forests at higher altitudes; *PS 19925* Karimala

***Strobilanthes ciliatus*** Nees in Wall., Pl. Asiat. Rar. 3: 85. 1832; FBI 4: 439. 1884; FPM 1039. 1924; FTSR 348. 1996. *Nilgirianthus ciliatus* (Nees) Bremek., Verh. Acad. Wet. afd. Natuurk. Sect 2, 41: 172. 1944.

Shrubs, 1-2 m high; branches terete, glabrous. Leaves to 15 x 5 cm, acuminate at either ends, glabrous; nerves 5 pairs, raised above, scabrid; petiole 2 cm long. Spikes 1.5 cm long, axillary, solitary, peduncled; bracts 6 x 4 mm, obovate; bracteoles 5 x 1 mm, linear-oblong. Flowers 5-15; calyx 5 mm long, lobes oblong, connate below the middle; corolla 15 mm long, white with pink patches on lower lobes; staminal sheath hairy.

*Fl. & Fr.* December-May

*Distr.* Endemic to Peninsular India. Common in evergreen forests; *PS 30704* Karimala

***Strobilanthes dupenii*** Bedd. ex C.B. Clarke in Hook. f., *FBI* 4: 453. 1884; *FPM* 1043. 1924.

Shrubs. Leaves 10-12 x 3.5-5.5 cm, ovate, acuminate, base truncate or subcordate, crenate, pubescent, coriaceous; petiole to 4 cm. Spikes to 7.5 cm, sub-tetragonous, oblong, terminal and lateral on peduncle to 2 cm; bracts to 2.3 x 1.7 cm, ovate, obtuse, closely imbricate, decurrent at base, viscous, reddish; bracts lanceolate; calyx to 1.5 cm, 5-lobed, linear, acuminate, green; corolla 3-2 cm, blue; stamens 4, connate, margin free. Capsule to 1 cm, ellipsoid, beaked, sessile; seeds 4, ca 3 mm diameter, hairy.

*Fl. & Fr.* December-February

*Distr.* Endemic to Southern Western Ghats. Rare in the rocky openings of evergreen forests; *PS 30045* Kamamudi

***Strobilanthes heyneanus*** Nees in Wall., *Pl. Asiat. Rar.* 3: 85. 1832; *FBI* 4: 443. 1884; *FPM* 1041. 1924; *FTSR* 348. 1996. *Nilgirianthus heyneanus* (Nees) Bremek., *Verh. Acad. Wet. afd. Natuurk. Sect. 2*, 41: 173. 1944; *FPL* 357. 1990. *Strobilanthes rugosus* Wight,  *Ic. t.* 1619. 1850.

Shrubs; branches glabrous. Leaves 8-13 x 6 cm, elliptic, acuminate, attenuate to the base, glabrous. Spikes 2 x 1.5 cm, axillary, 2-3 together on trichotomous peduncle, ovoid or globose; bracts 14 x 11 mm, orbicular or obovate, concave, glabrous. Flowers 4-10 in each spike; sepals 6 x 2 mm, united to the middle, glabrous; corolla 2.5 cm long, white; staminal sheath ciliate. Capsule 10 x 5 mm, glabrous; seeds 3 mm, biconvex, hairy along the margins.

*Fl. & Fr.* November-January

*Distr.* Endemic to South West India. Rare in evergreen forests; *PS 30101* Pooppara

***Strobilanthes lawsonii*** Gamble, *Kew Bull.* 1923: 374. 1923 & *FPM* 1037. 1924; *FTSR* 348. 1996. *Phlebophyllum lawsonii* (Gamble) Bremek., *Verh. Acad. Wet. afd. Natuurk. Sect. 2*, 41: 169. 1944.

Shrubs; branches tawny-pubescent. Leaves to 11 x 6 cm, broadly elliptic, acuminate at either ends; lateral nerves 12 pairs. Spikes 8-10 cm long, slender, tawny villous, interrupted, axillary, solitary or paniced; bracts lanceolate, glabrous within. Flowers scattered; calyx tubular below the middle, lobes acuminate, villous; corolla 2 cm long, blue, glabrous; staminal filaments hairy.

*Fl. & Fr.* October-December

*Distr.* Endemic to Southern Western Ghats. Rare in evergreen forests at higher altitudes; *PS 19926* Karimala

***Strobilanthes luridus*** Wight,  *Ic. t.* 1515, 1516. 1850; *FBI* 4: 450. 1884; *FPM* 1042. 1924. *Didyplosandra lurida* (Wight) Bremek., *Verh. Acad. Wet. afd. Natuurk. Sect. 2*, 41: 178. 1944.

Large shrubs; branchlets terete, grey-puberulus. Leaves to 25 x 15 cm, broadly elliptic, acute at both ends, hispid, serrulate; lateral nerves 8-9 pairs. Spikes 8-15 x 2-5 cm oblong, 2-3 together, axillary on old branches; peduncle deflexed; bracts 2.5 x 3 cm, orbicular, reddish brown; bracteoles 2 x 0.4 cm, linear. Flowers densely packed; calyx 23 mm long, lobes elliptic, ciliate along margins, white; corolla 35 mm long, campanulate, dark blue; lobes deflexed, orbicular; staminal filaments glabrous. Capsule 20 x 6 mm, glabrous; seeds 4 mm, orbicular, yellowish.

*Fl. & Fr.* December-April

*Distr.* Endemic to Southern Western Ghats. Common in evergreen forests; *PS 30703* Karimala

***Strobilanthes neilgherrensis*** Bedd.,  *Ic. t.* 196. 1868-1874; *FBI* 4: 438. 1884; *FPM* 1038. 1924. *Nilgirianthus neilgherrensis* (Bedd.) Bremek., *Verh. Acad. Wet. afd. Natuurk. Sect. 2*, 41: 174. 1944; *FPL* 357. 1990.

Shrubs. Leaves to 11 x 7 cm, ovate, acuminate, base rounded, crenate, hispid above, sparsely pubescent below. Head to 3 cm, ovoid; bract to 2 cm, oblong; bracteoles 1.2 cm, linear, setaceous; calyx to 1 cm, lanceolate, scarious; corolla to 3 cm, cylindrical, pale violet; stamens 4, subequal, filaments pilose; style to 2.5 cm, hairy. Capsule to 1 cm, ellipsoid; seed 4 obovate.

*Fl. & Fr.* May-November

*Distr.* Endemic to Southern Western Ghats. Rare in evergreen forests at higher altitudes; *PS 30555* Karimala

**Strobilanthes tristis** (Wight) Anders., J. Linn. Soc. Bot. 9: 470. 1867; FBI 4: 441. 1885; FPM 1040. 1924; FPL 361. 1990. *Goldfussia tristis* Wight, Ic. t. 1508. 1850.

Shrubs; branchlets glabrous. Leaves 15-25 x 4-10 cm, acuminate at either ends, glabrous; petiole 4-8 cm long. Spikes 2.5-4 cm long, lanceolate, acuminate, 1-2-flowered, deflexed, in axillary clusters, glabrous; bracts 2.5 x 0.5 cm, lanceolate, acuminate, ciliate along the margins. Sepals 17 x 2.5 mm, acuminate, hairy; corolla 30 mm long, narrowed to the base, glabrous, white; staminal sheath glabrous. Capsule 11 x 3 mm; seeds orbicular.

*Fl. & Fr.* December-April

*Distr.* Endemic to Southern Western Ghats. Common in evergreen forests; *PS 19700* Karimala

#### THUNBERGIA Retzius

1. Flowers in pendent racemes; corolla yellow..... **T. mysorensis**  
 1. Flowers solitary; corolla white ..... **T. fragrans**

**Thunbergia fragrans** Roxb., Pl. Corm. t. 67. 1795; FPL 362. 1990; FTSR 350. 1996. *T. fragrans* Roxb. var. *laevis* (Nees) Clarke in Hook.f., FBI 4: 391. 1884; FPM 1007. 1924. *T. laevis* Nees in Wall., Pl. Asiat. Rar. 3: 77. 1832.

Scabrous climber. Leaves to 8 x 6 cm, ovate, entire, acute, base truncate to subcordate, scabrid, 5-nerved from base; petiole 4 cm long. Flowers solitary; pedicels 3 cm long; bracteoles 1.5 cm long, ovate-oblong, obtuse, mucronate; sepals of 8-16 fibrils; corolla white, 4 cm across, tube 3 cm long, lobes 3.5 cm; filaments glandular hispid at base. Capsule 1 cm across, glabrous, beak 1.5 cm long, acute.

*Fl. & Fr.* September-January

*Distr.* Indo-Malesia and Australia. Common in moist deciduous forests and plantations; *PS 19108* Peruvaripallam

**Thunbergia mysorensis** (Wight) Anders., J. Linn. Soc. Bot. 9: 448. 1967; FBI 4: 393. 1884; FPM 1008. 1924; FPL 362. 1990; FTSR 350. 1996. *Hexacentris mysorensis* Wight, Ic. t. 871. 1844.

Climbers. Leaves to 14 x 8 cm, ovate-lanceolate or oblong, acute to acuminate, base truncate or hastate, scabrid, coarsely nerved, dentate; petiole 1-5 cm long. Racemes axillary, to 50 cm long, drooping. Flowers many; bracteoles 15-25 x 5-12 mm, ovate-oblong-lanceolate, pedicels 2-3 cm long, opposite; calyx obscure; corolla yellow, to 4 cm long, 6 cm across, tube ventricose, lobes obovate, glabrous; filaments ciliate, anthers spurred. Capsule 3 cm long.

*Fl. & Fr.* December-March

*Distr.* Endemic to Western Ghats. Common in evergreen forests at higher altitudes; *PS 19153* Karimala

#### VERBENACEAE

1. Woody climbers; bracts forming an involucre ..... **Symphorema**  
 1. Herbs, shrubs or trees; bracts not forming involucre ..... 2  
 2. Leaves palmately 3-5 foliolate ..... **Vitex**  
 2. Leaves simple..... 3

2. Inflorescence a spike.....	4
3. Inflorescence a raceme, cyme or panicle.....	7
4. Spikes capitate, axillary.....	5
4. Spikes elongate, terminal.....	6
5. Prostrate herbs; fruit dry.....	<b>Phyla</b>
5. Strangling shrubs; fruit fleshy.....	<b>Lantana</b>
6. Flowers embedded in excavations of dense spike; stamens 2.....	<b>Stachytarpheta</b>
6. Flowers free, spike lax; stamens 4.....	<b>Priva</b>
7. Corolla regular; young parts stellate hairy.....	8
7. Corolla irregular; young parts not stellate hairy.....	9
8. Inflorescence terminal panicle; flowers 6-merous.....	<b>Tectona</b>
8. Inflorescence an axillary corymbose cyme; flowers 4-merous.....	<b>Callicarpa</b>
9. Flowers in corymbose cymes; corolla less than 8 mm across.....	<b>Premna</b>
9. Flowers in condensed paniculate racemes.....	10
10. Calyx with glands; fruits with one pyrene.....	<b>Gmelina</b>
10. Calyx without glands; fruits with four pyrenes.....	<b>Clerodendrum</b>

**CALLICARPA** Linnaeus

**Callicarpa tomentosa** (L.) Murr., Syst. Veg. (ed. 13) 130. 1774; FPL 364. 1990; FTSR 351. 1996. *Tomex tomentosa* L., Sp. Pl. 118. 1753. *Callicarpa arborea* Miq. ex Clarke in Hook.f., FBI 4: 507. 1885, non Roxb. 1832. *C. lanata* L., Mant. Pl. 2: 331. 1771; FPM 1092. 1924.

Small trees, branchlets densely grey-pubescent. Leaves to 25 x 15 cm, broadly ovate, acuminate at apex, rounded at base, entire, densely covered with stellate hairs below; nerves 7 pairs; petiole to 5 cm long. Flowers in axillary corymbose cymes, branched, densely tomentose; pedicels absent; calyx 2 mm long, campanulate, lobes 5, obtuse; corolla 4 mm long, tube short; lobes 4, spreading; stamens 4; filaments glandular, anthers sagittate; ovary pubescent; style slender, stigma capitate. Berry 3 mm across, globose, glabrous.

*Fl. & Fr.* February-May

*Distr.* Peninsular India and Sri Lanka. Very common in secondary forests; *PS 19289* Karimala

**CLERODENDRUM** Burman ex Linnaeus

1. Leaves whorled; base acute.....	<b>C. serratum</b>
1. Leaves opposite; base cordate or rounded.....	2
2. Corolla double; calyx red.....	<b>C. philippinum</b>
2. Corolla single; calyx green.....	<b>C. viscosum</b>

**Clerodendrum philippinum** Schauer in DC., Prodr. 11: 667. 1847; Sivar. & Manilal, JETB 3: 815. 1982; FPL 365. 1990. *Volkameria fragrans* Vent., Jard. Malm. t. 70. 1804. *Clerodendrum fragrans* Hort. ex Vent., Jard. Mal. 2: t. 70. 1804 pro syn; FPM 1100. 1924. *C. japonicum* (Thunb.) Sweet var. *planiflorum* Schauer in DC., Prodr. 11: 666. 1847.

Shrubs, branchlets angled, hirsute. Leaves 10-30 x 8-20 cm, broadly ovate, acute, base cordate, margins serrate; petiole to 20 cm. Inflorescence terminal, congested cymes; flowers double, fragrant; calyx campanulate, pinkish; corolla to 2 cm wide, white; stamens 4; filaments flattened; style 1 cm.

*Fl. & Fr.* February-May

*Distr.* Native of China. Common in wastelands around the settlements; *PS 30291* Parambikulam

**Clerodendrum serratum** (L.) Moon, Cat. Pl. Ceylon 46. n.382. 1824; FBI 4: 592. 1885; FPM 1100. 1924; FPL 365. 1990; FTSR 351. 1996. *Volkameria serrata* L., Mant. Pl. 1: 90. 1767.

Shrubs; branchlets 4-angled. Leaves to 35 x 25 cm, obovate, acuminate at both ends, serrate, scabrous, nerves 8-10 pairs; petiole 1-3 cm long. Panicles terminal, to 30 x 10 cm, pubescent.



Flowers blue, shortly pedicelled; calyx 4 mm long, lobes obtuse, hairy; corolla 15-20 mm long, hairy below, lobes round. Berry 1 cm across, 2-4-lobed, depressed globose; seeds 2-4, rugose, black.

*Fl. & Fr.* December-May

*Distr.* India, Nepal, Myanmar and Sri Lanka. Occasional in grasslands; *PS 18924* Karimalagopuram

**Clerodendrum viscosum** Vent., *Jard. Mal.* 1: t.25. 1803; FPL 365. 1990; FTSR 351. 1996. *C. infortunatum* Wight,  *Ic. t.* 1471. 1849, "*infortunata*", non L.; FBI 4: 594. 1885; FPM 1100. 1924. *C. petasites* auct. non. (Lour.) S. Moore. *Meeuse, Blumea* 5: 77. 1942.

Large shrubs; stem sub-tetragonous, pubescent. Leaves to 20 x 20 cm, orbicular, cordate at base, acute at apex, densely glandular-pubescent, nerves 4-6 pairs; lower pairs basal; petiole to 8 cm long, pubescent. Flowers white, in large paniced cymes; calyx 12 mm long, lobes acuminate; corolla tube 2 cm long, slender, lobes 1 x 0.5 cm, obovate, pubescent; filaments hairy at base. Berry 0.8-1 cm across, 1-3-lobed, black, glabrous.

*Fl. & Fr.* September-February

*Distr.* Indo-Malesia. Common in secondary forests; *PS 19170* Karimala

#### GMELINA Linnaeus

**Gmelina arborea** Roxb., *Pl. Corom. t.* 246. 1815; FBI 4: 581. 1885; FPM 1097. 1924; FPL 365. 1990; FTSR 352. 1996.

Trees; bark white, branchlets stout, tomentose. Leaves to 20 x 18 cm, broadly ovate, cordate or truncate at base, acute at apex, densely fulvous tomentose beneath, glabrous above; nerves 3-4 pairs, lowest pair from base; petiole 5-10 cm long, tomentose. Flowers in terminal racemes, subsessile; calyx 6 mm long, campanulate, 5-toothed, tomentose; corolla brownish-yellow, 3 cm across, bilabiate, tube ventricose, lobes subequal, obovate, obtuse, densely hairy; stamens 4, didynamous, anthers divaricate; ovary glabrous, globose, style 1, slender, glabrous. Berry 2 x 1.5 cm, ovoid, yellow, smooth.

*Fl. & Fr.* January-May

*Distr.* Indo-Malesia. Common in moist deciduous forests; *PS 30230* Karimala

#### LANTANA Linnaeus

1. Armed shrubs; bracts lanceolate..... **L. camara**  
1. Unarmed shrubs; bracts ovate..... **L. indica**

**Lantana camara** L., *Sp. Pl.* 627. 1753; FBI 4: 562. 1885. *L. aculeata* L., *Sp. Pl.* 627. 1753; FPM 1087. 1924. *L. camara* L. var. *aculeata* (L) Moldenke, *Torreyia* 34: 9. 1934; FBI 4: 562. 1885; FPL 366. 1990; FTSR 353. 1996.

Rambling shrubs; stem with retrorse prickles especially along the angles. Leaves to 6 x 3.5 cm, ovate, acute at apex, rounded or cordate at base, scabrous, rugose, crenate; petiole 1-2.5 cm long. Spikes 1.5 cm across, globose, axillary, solitary, peduncled; bracts 8 x 3 mm, ovate, obtuse, floral bracts smaller. Flowers densely packed; calyx 1 mm long truncate, ciliate; corolla reddish, 4 mm broad, tube 8 mm long, curved, slender. Berry 4 x 4 mm, dark blue, smooth.

*Fl. & Fr.* Throughout the year

*Distr.* Native of Tropical America, widely naturalised in the tropics and subtropics. Very common in moist deciduous forests and degraded forests areas; *PS 19057* Thunakkadavu

**Lantana indica** Roxb., *Fl. India* 3:89.1832; FBI 4:562.1885; FPM 1087.1924.

Shrubs. Leaves to 5.5 x 3.5 cm, broadly ovate, acute, base truncate, crenate, puberulus above, tomentose below; petiole to 1.5 cm. Spikes axillary, to 2.5 cm; peduncles to 5 cm; bracts to 1 cm, broadly ovate, pubescent; calyx tube 1.5 mm, entire, ciliate; corolla tube to 7 mm, curved, lobes to 2.5 mm, violet. Berry 5 mm long, ovoid, enclosed by the bracts.

*Fl. & Fr.* December-February

*Distr.* India, Nepal and Thailand. Rare in the rocky areas; *PS 18951* Vengoli

#### PHYLA Loureiro

**Phyla nodiflora** (L.) Greene, *Pittonia* 4: 46. 1899; FPL 367. 1990. *Verbena nodiflora* L., Sp. Pl. 20. 1753. *Lippia nodiflora* (L.) A.Rich. in Michx., Fl. Bor. Amer. 2: 15. 1803; FBI 4: 563. 1885; FPM 1088. 1924.

Prostrate herbs. Leaves 0.7-1.5 x 0.6-0.8 cm, orbicular to obovate-spathulate, base cuneate, apex obtuse. Flowers 5-merous, sessile; bracts broadly ovate, thick, concave; corolla purplish white, 2.5 mm across, salver-form; stamens 4, attached in 2 pairs at the throat of tube; filaments curved, 0.4 mm; anthers ovate, 0.2 mm; ovary globose, 0.5 mm; style 0.5 mm; stigma oblique. Drupe subglobose, 1 mm, endocarp hard, enclosing 2, 1-celled pyrenes; seeds minute.

*Fl. & Fr.* November-March

*Distr.* Tropics and subtropics. Common in moist deciduous forests; *PS 19085* Padippara

#### PREMNA Linnaeus

1. Climbing shrubs; leaves coriaceous ..... **P. coriacea**
1. Erect shrubs or trees; leaves membranous ..... 2
2. Leaves densely stellately-tomentose; drupe subglobose ..... **P. tomentosa**
2. Leaves glabrous or softly pubescent; drupe globose ..... 3
3. Corolla greenish-yellow, lobes elliptic-oblong or oblanceolate ..... **P. glaberrima**
3. Corolla white, lobes broadly ovate to suborbicular ..... **P. latifolia**

**Premna coriacea** Clarke in Hook.f., FBI 4: 573. 1885; FPM 1095. 1923; FPL 367. 1990; FTSR 353. 1996.

Large climbing shrubs; branchlets pilose, lenticellate. Leaves to 18 x 10 cm, ovate-oblong, abruptly acuminate at apex, cordate at base, entire, glabrous; nerves 4-5 pairs, very prominent beneath. Cymes to 15 cm across, corymbose, terminal; branches pilose; peduncles to 12 cm long, erect; bracts 3 mm long, ovate. Flowers many, creamy white; pedicels 1 mm long hispid; calyx 1 mm long, truncate, pinkish brown, puberulus; corolla 3.5 mm long, hairy.

*Fl. & Fr.* October-January

*Distr.* Endemic to South India. Occasional in dry deciduous forests; *PS 30410* Kuchimudi

**Premna glaberrima** Wight, Ic. t. 1484. 1849; FBI 4: 577. 1885; FPM 1096. 1923; FPL 368. 1990; Pandurangan, & Nair, JETB 17: 180. 1993; FTSR 353. 1996.

Erect shrubs; branchlets scandent, puberulus. Leaves to 15 x 6 cm, elliptic-oblong, abruptly acuminate, rounded at base, entire or distantly serrulate, glabrous; nerves 6-7 pairs; petiole 1.5 cm long. Cymes 5 x 5 cm, terminal, corymbose; pedicels 2 mm long, hairy; calyx 2 mm long, shortly bilipped, hispid; corolla greenish white or cream, 5 mm long, throat hairy. Drupes 3 x 3 mm, hispid; seed 1, rugose, brown.

*Fl. & Fr.* October-March

*Distr.* Endemic to Southern Western Ghats. Occasional in secondary forests; *PS 30188* Kottayali; 30248 Pezha

**Premna latifolia** Roxb., Fl. Ind. 3: 76. 1832; FBI 4: 577. 1885; FPM 1096. 1924.

Trees. Leaves to 8 x 5 cm, ovate, apex abruptly acuminate, base rounded or cordate, entire or serrate; petiole 3-3.5 cm long. Corymbs terminal, to 7 cm long; calyx obscurely 2-lipped, 1.5 mm; corolla tube 2 mm, densely villous inside; stamens exerted. Pyrenes 4 mm across.

*Fl. & Fr.* November-February

*Distr.* India and Bangladesh. Occasional in dry deciduous forests; *PS 30623* Thekkady; 30397 Kuchimudi

**Premna tomentosa** Willd., Sp. Pl. 3: 314. 1800; FBI 4: 576. 1885; FPM 1095. 1924; FPL 368. 1990. *Cornutia corymbosa* Lam., Encycl. 1: 54. 1783, non Burm.f. 1768.

Trees; young branchlets tomentose. Leaves 6-18 x 5-15 cm, ovate cordate, acuminate, thick, densely tomentose below. Corymbs axillary and terminal, to 7 cm long; flowers yellow; calyx 2 mm long, pubescent; corolla 4 mm long, hairy at throat, bilabiate; stamens 2 mm long; ovary hairy at apex, style 3 mm. Fruit 4 mm across, pubescent.

*Fl. & Fr.* February-April

*Distr.* Peninsular India and Sri Lanka. Occasional in dry and moist deciduous forests; *PS 19974* Keerappadi

#### PRIVA Adans

**Priva cordifolia** (L.f.) Druce, Bot. Exch. Club. Soc. Brit. Isles 4: 641. 1917; FPL 368. 1990. *Buchnera cordifolia* L.f., Suppl. Pl. 287. 1781. *Priva leptostachya* A.Juss., Ann. Mus. Natl. Hist. Nat. 7: 70. 1806; FBI 4: 565. 1883; FPM 1091. 1924. *Streptium asperum* Roxb., Pl. Corom. t. 146. 1800.

Erect herbs; stem quadrangular. Leaves to 5 x 4 cm, broadly ovate, apex acute, base truncate, crenate, membranous, pilose; petiole to 4 cm. Racemes terminal, to 15 cm; bracts 2 mm, lanceolate; flowers white; calyx 6 mm, 5-ribbed, pubescent; corolla tube obscurely 2-lipped, 8 mm, curved, lobes 4 mm, orbicular; filaments subequal; ovary oblong,. Fruit enclosed in calyx tube, sticky, pubescent.

*Fl. & Fr.* October-January

*Distr.* India, Pakistan and Nepal. Fairly common in dry deciduous forests; *PS 30084* Kuchimudi

#### STACHYTARPHETA Vahl

**Stachytarpheta jamaicensis** (L.) Vahl, Enum. Pl. 1:206.1804; FPL 369. 1990. *Verbena jamaicensis* L., Sp. Pl. 19.1753. *Stachytarpheta indica* (L.) Vahl var. *jamaicensis* (L.) Moon, Cat. Pl. Ceylon 68.1885 & Handb. Fl. Ceylon 3:348.1895; FPM 1090.1924. *S. indica* sensu Clarke in Hook. f., FBI 4:564.1885,p.p.; non (L.) Vahl 1804.

Erect glabrous shrubs. Leaves opposite, to 10 x 6 cm, ovate, acute, crenate, serrate, base cuneate; lateral nerves 5 or 6 pairs, reticulate, nervules impressed above; petiole 1-3 cm long. Spikes terminal, to 20 cm long, linear; bracts 6 mm long, linear-ovate; calyx tubular, 6 mm long, ridged; lobes acuminate; corolla blue, 7 mm long; tube cylindrical, lobes 5, obtuse, spreading, stamens 2, included; ovary glabrous, 2-celled; style slender, stigma globose. Fruit separating into 2, 1-seeded pyrenes; seeds oblong.

*Fl. & Fr.* Throughout the year

*Distr.* Pantropical. Common in degraded forest areas; *PS 19374* Parambikulam

#### SYMPHOREMA Roxburgh

**Symphorema involucreatum** Roxb., Pl. Corom. t.186. 1798; FBI 4: 559. 1885; FPM 1104. 1924; FTSR 357. 1996.

Woody climbers, stem with warty tubercles; branchlets yellow-tomentose. Leaves to 10 x 6 cm, elliptic or oblong, acute to acuminate, rounded at base, inequilateral, entire or serrate; lateral nerves 5-7 pairs, reticulate. Flowers 6 or 7, in peduncled capitate cymes; peduncle 2.5 cm long; involucre bracts 6, 7 x 2 mm, elliptic-oblong, enlarged in fruit; calyx 6 mm long, campanulate, 4-8-lobed, tomentose; corolla 6 mm long, white, campanulate, 6-8-lobed, sparsely hairy; stamens 6-8; ovary 2 or imperfectly 4-celled. Fruit 1-seeded. enclosed by the calyx.

*Fl. & Fr.* March-May

*Distr.* Indo-Malesia. Occasional in moist deciduous forests; *PS 30597* Kuchimudi

#### TECTONA Linnaeus f.

**Tectona grandis** L. f., Suppl. Pl. 151. 1781; FBI 4: 570. 1885; FPM 1092. 1924; FPL 369. 1990; FTSR 354. 1996.

Large trees; branchlets 4-angled, puberulus. Leaves to 45 x 35 cm, obovate, obtuse at apex; attenuate to the base, pubescent with minute red glands below; nerves 8-10 pairs, prominent; nervules parallel or scalariform; petiole 1-2 cm long. Cymes paniced, terminal, to 50 x 40 cm, puberulus. Flowers to 7 mm across, white; calyx 5 mm long, lobes 6, ovate, white, tomentose; corolla 6 mm long, lobes 6, oblong, spreading; stamens 6, equal, erect; ovary densely hairy, 4-celled; style slender, bifid at apex. Drupes 1.5-2 cm across; globose, densely floccose hairy, covered by the inflated calyx.

*Fl. & Fr.* December-April

*Distr.* South and South East Asia. Very common in plantations and moist deciduous forests; *PS 30789* Anappadi

**Note:** This species is spread over 90 km<sup>2</sup> plantation area in the sanctuary.

#### VITEX Linnaeus

1. Leaves 3-foliolate, petiole winged ..... **V. altissima**

1. Leaves 5-7 foliolate, petiole not winged..... **V. leucoxydon**

**Vitex altissima** L. f., Suppl. Pl. 294. 1781; FBI 4: 584. 1885; FPM 1102. 1924; FPL 370. 1990; FTSR 355. 1996. *V. alata* Heyne ex Roth, Nov. Pl. Sp. 316. 1821; FBI 4: 584. 1885.

Large trees; bark grey, branchlets lenticellate, minutely tomentose. Leaflets sessile, to 15 x 5 cm, elliptic, acuminate, entire; lateral nerves 12 pairs; petiole to 10 cm long, winged. Panicles to 25 x 15 cm, branches tomentose. Flowers 3-10 together; calyx 3 mm long, campanulate, lobes ovate, white, tomentose; corolla 5 mm long, blue, throat villous, lobes obtuse; filaments hairy at base; ovary densely hairy. Drupes 5 x 5 mm, glabrous, blue.

*Fl. & Fr.* May-July

*Distr.* India, Indo-China, Malesia and Sri Lanka; cultivated in Europe and U.S.A. Common in all forest types; *PS 18965* Vengoli; *NS 18994* Orukomban

**Vitex leucoxydon** L. f., Suppl. Pl. 293. 1781; FBI 3: 587. 1885; FPM 1103. 1923; FTSR 355. 1996. *Wallrothia leucoxydon* (L. f.) Roth, Nov. Pl. Sp. 391. 1821.

Shrubs, branchlets glabrous. Leaflets to 14 x 4 cm, elliptic, acute at both ends, glabrous, lateral nerves 12-14 pairs; petiolule 2 cm long; petiole to 8 cm long. Cymes axillary, dichotomous, long-peduncled, hispid; peduncle to 8 cm long. Flowers few to many; pedicels 5 mm long, calyx 5 mm long, sub-bilabiate, tomentose, lobes acute; corolla 14 mm long, lobes, oblong to orbicular, curved, white, throat hairy; filaments unequal, hairy at base.

*Fl. & Fr.* November-March

*Distr.* Peninsular India and Sri Lanka. Common along the riverine areas; *PS 19341* Thenkudippara; *NS 30155* Muthuvarachal

#### LAMIACEAE

1. Calyx lobes equal or subequal ..... 2

1. Calyx lobes distinctly bilipped ..... 8

2. Plants stellately pubescent; flowers yellow ..... **Gomphostemma**

2. Plants not stellately pubescent; flowers otherwise ..... 3

3. Leaves in whorls of three; calyx tube much shorter than the lobes ..... **Colebrookea**

3. Leaves opposite; calyx tube longer than lobes..... 4

4. Flowers in axillary clusters, cymes or globose heads..... 5

4. Flowers in elongated spikes, racemes or panicles..... 7

5. Calyx 5-toothed; corolla blue..... **Hyptis**

- 5. Calyx 8-10 toothed; corolla white or orange ..... 6
- 6. Calyx teeth spinescent; corolla orange..... **Leonotis**
- 6. Calyx teeth not spinescent; corolla white ..... **Leucas**
- 7. Corolla 4-lobed; stamens equal or subequal ..... **Pogostemon**
- 7. Corolla 5-lobed; stamens didynamous ..... **Anisomeles**
- 8. Flowers in dense uninterrupted spike forming oblong or ovoid heads ..... 9
- 8. Flowers in interrupted whorls forming lax spike or thyrus ..... 10
- 9. Disc entire; upper lip of corolla longer than the lower lip ..... **Acrocephalus**
- 9. Disc lobed; upper lip of corolla shorter than the lower lip..... **Anisochilus**
- 10. Ovary 4-lobed; corolla 1-lipped ..... **Teucrium**
- 10. Ovary 4 partite; corolla 2-lipped..... 11
- 11. Upper lip of the corolla equal to or longer than the lower lip ..... 12
- 11. Upper lip of the corolla shorter than the lower lip..... 13
- 12. Stigma entire; corolla tube narrow..... **Orthosiphon**
- 12. Stigma bifid; corolla tube broad..... **Ocimum**
- 13. Lips of calyx deeply saccate at base; flowers paired at nodes of racemes ..... **Scutellaria**
- 13. Lips of calyx not saccate; flowers not paired at nodes ..... **Plectranthus**

**ACROCEPHALUS** Benth

**Acrocephalus hispidus** (L.) Nicols. & Sivad., Taxon 29: 324. 1980; FPL 372. 1990; FTSR 358. 1996. *Gomphrena hispida* L., Sp. Pl. 1: 326. 1762. *Prunella indica* Burm.f., Fl. Ind. 130. 1768. *Acrocephalus indicus* (Burm.f.) O. Ktze., Rev. Gen. Pl. 511. 1891; FPM 1115. 1924. *A. capitatus* (Roth) Benth., Edward's Bot. Reg. 15. sub t. 1282. 1829; FBI 4: 611. 1885. *Ocimum capitatum* Roth, Nov. Pl. Sp. 276. 1871.

Erect or diffuse branched herbs. Leaves 2-3 x 1 cm, elliptic, acute at either ends, crenate, glabrous. Inflorescence an ovoid head, 1.5 x 0.8 cm; basal bracts 2, foliar; floral bracts 3 mm across, deltoid. Flowers densely packed; calyx 5-6 mm long, bilabiate; upper lip entire, obovate; lower lip 4-toothed, scabrous; corolla white, 2.5 mm long, bilabiate; upper lip entire, lower lip 4-toothed, glabrous; stamens 4, didynamous; ovary 4-partite, glabrous; style slender, stigma 2-lobed. Nutlets 1 mm long, oblong, smooth; seeds yellowish white, smooth.

*Fl. & Fr.* August-January

*Distr.* Indo-Malesia. Common in moist deciduous forests; *PS 30708* Vengoli

**ANISOCHILUS** Wallich ex Benth

- 1. Leaf base cordate; corolla pale purple ..... **A. carnosus**
- 1. Leaf base acute or attenuate; corolla yellow or white ..... 2
- 2. Leaf margins crenulate; lower lip of fruiting calyx obscurely toothed..... **A. scaber**
- 2. Leaf margin entire; lower tip of fruiting calyx truncate ..... **A. argenteus**

**Anisochilus argenteus** Gamble, Kew Bull. 1924: 265. 1924 & FPM 1127. 1924.

Stout herbs; stem silvery white tomentose. Leaves to 1.5 x 1 cm, obovate, acute at apex, entire, densely hairy, closely packed on stem, sessile. Spikes to 8 cm long, 0.5-1 cm broad, cylindrical to tetragonous; bracts and calyx densely villous; corolla small, yellowish.

*Fl. & Fr.* January-February

*Distr.* Endemic to South India. Occasional in grasslands; *PS 19937* Karimala

**Anisochilus carnosus** (L.f.) Wall. ex Benth. in Wall., Pl. Asiat. Rar. 2: 18. 1830; FBI 4: 627. 1885; FPM 1127. 1924; FPL 372. 1990; FTSR 358. 1996. *Lavandula carnosus* L. f., Suppl. Pl. 273. 1781.

Fleshy herbs; stem quadrangular, puberulus. Leaves to 5 x 4.5 cm, broadly ovate, obtuse, cordate at base, crenate scabrous; petiole 5 cm long. Spikes 2-4 x 1 cm, cylindrical, oblong, paniced; peduncle 5-7 cm long. Flowers densely packed; bracts minute; calyx 5 mm long, red

glandular, upper lip entire, declined, lower lip orbicular; corolla 5 mm long, blue, upper lip oblanceolate, lower lip obtusely 4-lobed; filaments glabrous. Nutlets triangular, smooth, brown.

*Fl. & Fr.* November-January

*Distr.* South India, Sri Lanka and Myanmar. Common in moist deciduous forests and wet rocky areas; *PS 19866* Vengoli

**Anisochilus scaber** Benth. in DC., Prodr. 12: 81. 1848; FBI 4: 629. 1885; FPM 1127. 1924; FPL 373. 1990.

Herbs. Leaves to 6 x 4 cm, ovate, acute, base attenuate, margin crenate, puberulus; petiole to 2 mm. Spikes terminal to 2 cm; calyx tube *ca* 2 mm, bilipped, pubescent, lobes acute, lower lip reduced; corolla 5 mm, white-pinkish, bilipped, pubescent; stamens 4, filaments *ca* 3 mm in pair; ovary globose, style *ca* 6 mm.

*Fl. & Fr.* September-December

*Distr.* India and Myanmar. Occasional in grasslands; *PS 30074* Kuchimudi

#### ANISOMELES R. Brown

**Anisomeles indica** (L.) O. Ktze., Rev. Gen. Pl. 512. 1891; FPM 1140. 1924. *Nepeta indica* L., Sp. Pl. 571. 1753; FPL 373. 1990; FTSR 359. 1996. *Anisomeles ovata* R. Br. in Ait., Hort. Kew. (ed. 2) 3: 364. 1811; FBI 4: 672. 1885.

Shrubs; stem densely woolly. Leaves to 13 x 7 cm, broadly ovate, acuminate at apex, densely woolly, unequally crenate; petiole 2-3 cm long. Racemes 5-12 x 3 cm, terminal; bracts foliar, 2 x 1 cm. Flowers closely packed in globose thyrse; calyx 10 mm long, lobes equal, acuminate, hispid; corolla violet or purple, 1.4 cm long, upper lip entire, acute, lower lip 4-lobed, white or lilac, covered with purple hairs, lobes obtuse; stamens 4, filaments erect, hairy; stigma 2-lobed; nutlets 2 x 1.5 mm, plano-convex, light brown.

*Fl & Fr.*: June-September

*Distr.* Indo-Malesia and China. Occasional in grasslands; *PS 19686* Karimala

#### COLEBROOKEA J. J. Smith

**Colebrookea oppositifolia** Smith, Exot. Bot. 2: 111, t.115. 1805; FBI 4: 642. 1885; FPM 1138. 1924; FPL 374. 1990; FTSR 359. 1996. *C. tenuifolia* Roxb., Pl. Corom. t. 245. 1815.

Large shrubs; stem and leaves densely tomentose. Leaves to 20 x 6 cm, elliptic, acuminate, crenulate, base acute to acuminate, nerves *ca.* 10 pairs, oblique. Spikes to 10 x 0.5 cm, paniced, terminal, densely hairy. Flowers in close whorls; calyx 1.5 mm long; tube very short, densely white-hairy, lobes subulate; corolla 2 mm long, equally 4-lobed; stamens 4, exerted in male flowers, included in female flowers, filaments glabrous; style 2-fid at tip. Nutlets hairy at apex; fruiting calyx larger.

*Fl. & Fr.* October-February

*Distr.* South and South East Asia. Occasional in evergreen forests; *PS 19167* Karimala

#### GOMPHOSTEMMA Wallich

1. Flowers in terminal cylindrical spikes; filaments glabrous..... **G. heyneanum**
1. Flowers in axillary whorls; filaments hairy ..... **G. keralensis**

**Gomphostemma heyneanum** Benth. in Wall., Pl. Asiat. Rar. 2: 12. 1830; FPM 1167. 1924; FTSR 360. 1996. *G. strobilinum* Wall. ex Benth var. *heyneanum* (Benth.) Hook.f., FBI 4: 696. 1885.

Subshrubs; stem obtusely 4-angular, stellate tomentose. Leaves to 25 x 15 cm, broadly elliptic, acute at both ends, stellate tomentose below, sparsely hairy above, crenate, nerves 5-7 pairs; petiole 4-6 cm long. Racemes 18 x 2.5 cm. Flowers 10 to 20 together; bracts elliptic, acute. Calyx 12 mm long, lobes lanceolate; corolla 15 mm long, tube 7 mm broad, cylindrical, midlobe of lower lip obtuse, emarginate; filaments unequal, glabrous. Nutlets glabrous.

*Fl. & Fr.* September-January

*Distr.* Endemic to Southern Western Ghats. very common in moist deciduous forests and plantations; *PS 19053* Thunakkadavu

**Gomphostemma keralensis** Vivek. *et al.*, Kew Bull. 38: 189. 1984.

Subshrubs; stem quadrangular, stellately tomentose. Leaves 26 x 10 cm, elliptic-oblongate, dentate, acuminate; petiole to 10.6 cm long. Flowers 10-15, sessile, axillary; bracts elliptic, acute; calyx 12 mm long, lobed to the middle; lobes ovate, subulate; corolla 8 mm long; upper lip ovate, rounded; lower lip 3-lobed, lobes oblong, rounded, midlobe smaller than the lateral lobes, filaments hairy. Nutlets oblong-ellipsoid, pubescent.

*Fl. & Fr.* October-November

*Distr.* Endemic to Southern Western Ghats (Kerala). Rare in evergreen forests; *PS 19769* Pooppara

#### HYPTIS N. J. Jacquin

**Hyptis suaveolens** (L.) Poit., Ann. Mus. Hist. Nat. 7: 472. t.27. f.2. 1806; FBI 4: 630. 1885; FPM 1129. 1924; FPL 376. 1990; FTSR 360. 1996. *Ballota suaveolens* L., Syst. Nat. (ed. 10) 1100. 1759.

Shrubs; stem obtusely 4-angular, thinly hairy. Leaves ovate, acute, hispid below, glabrate above; petiole to 5 cm long. Flowers in clusters of 1-12; calyx tube 8 mm long, tubular, 10-ribbed, glandular hairy, teeth spinulose, 4 mm long; corolla 5 mm long, lobes short, glabrous inside, blue. Nutlets 4 x 2.5 mm, compressed, with a ridge on dorsal surface, pubescent, deep brown, mucilaginous when wet.

*Fl. & Fr.* August-February

*Distr.* Originally from America now Pantropical. Common in degraded areas; *PS 19618* Vengoli

#### LEONOTIS (Persoon) R. Brown

**Leonotis nepetiifolia** (L.) R. Br., Prodr. 504. 1810; FBI 4: 691. 1885; FPM 1155. 1924; FPL 376. 1990. *Phlomis nepetiifolia* L., Sp. Pl. 586. 1753.

Shrubs, pilose. Leaves to 11 x 8 cm, ovate, apex acute, base truncate, deeply crenate, minutely punctuate, pubescent, basally tri-nerved; petiole to 9 cm. Thyrsus axillary and terminal, 5 cm across; flowers red; bracts 1.5 cm, linear, spinescent, pubescent; calyx oblique, tube 1.3 cm long, 7-toothed, spinescent; corolla tube 1 cm long, lower lip 1.5 cm, concave, densely villous; filaments 3 and 4 mm, flattened; ovary 1 mm, style 2 cm.

*Fl.* November-March

*Distr.* Native of Tropical Africa; naturalised in many parts of the tropics. Occasional in dry deciduous forests and roadsides; *PS 19083* Padippara

#### LEUCAS R. Brown

1. Flowers to 4; not aggregated in verticals ..... **L. biflora**
1. Flowers 6 to many, aggregated in verticals ..... 2
2. Mouth of the calyx oblique; leaves to 1 cm broad ..... **L. aspera**
2. Mouth of calyx not oblique; leaves more than 1.5 cm broad ..... 3
3. Verticils axillary; calyx throat naked ..... **L. chinensis**
3. Verticils terminal, calyx throat villous ..... 4
4. Leaves ovate; bracts glabrous ..... **L. ciliata**
4. Leaves oblong; bracts pubescent ..... **L. hirta**

**Leucas aspera** (Willd.) Spreng., Syst. 2: 743. 1825; FBI 4: 690. 1885; FPM 1150. 1924; FPL 377. 1990. *Phlomis aspera* Willd. in Link, Enum. Pl. Hort. Berol. 2: 621. 1822. *Leucas plukenetii*

(Roth) Spreng., Linn. Syst. Veg. (ed.16) 2: 743. 1825. *Phlomis plukenetii* Roth, Nov. Pl. Sp. 261. 1821.

Herbs, pubescent. Leaves to 5.5 x 0.8 cm, elliptic, apex obtuse, base cuneate, distantly serrate, membranous, pubescent. Whorls axillary and terminal, 2 cm across; flowers white; bracts 8 mm long, linear, ciliate, acute; calyx mouth oblique, 5 mm, 10-toothed, ciliate with bulbous based hairs at apex; corolla tube 8 mm, upper lobe 4 mm, lower 8 mm; filaments 4 and 5 mm, pubescent; ovary 1 mm, style 8 mm.

*Fl. & Fr.* December-February

*Distr.* Indo-Malesia. Occasional in wet rocky areas; *PS 19640* Vengoli

**Leucas biflora** (Vahl) R. Br., Prodr. 504. 1810; FBI 4: 683. 1885; FPM 1150. 1924; FPL 377. 1990; FTSR 361. 1996. *Phlomis biflora* Vahl, Symb. Bot. 3: 42. 1794.

Diffuse or scandent herbs; branches finely pubescent. Leaves broadly ovate, acute, base obtuse, membranous, crenate, to 3.5 x 2 cm; petiole 0.5 cm long. Flowers solitary; calyx tubular, 7 mm long, finely strigose; corolla white, 1.4 cm long, annulate-villous inside at middle. Nutlets oblong, truncate.

*Fl. & Fr.* October-February

*Distr.* Peninsular India and Sri Lanka. Fairly common in wet areas of moist deciduous forests; *PS 19533* Thekkady

**Leucas chinensis** (Retz.) R. Br., Prodr. 504. 1810; FBI 4: 681. 1885; FPM 1151. 1924; FTSR 361. 1996. *Phlomis chinensis* Retz., Obs. Bot. 2: 19. 1781.

Erect or scandent herbs, branches sericeous. Leaves ovate, obtuse, base truncate or obtuse, crenate, to 3.5 x 2.5 cm; petiole to 0.5 cm long. Calyx funnel-shaped, sericeous, 1 cm long. Corolla 1 cm long, obliquely annulate-villous inside; lower lip glabrous.

*Fl. & Fr.* December-February

*Distr.* Peninsular India and China. Very common in moist deciduous forests and plantations; *PS 19022* Thunakkadavu

**Leucas ciliata** Benth. in Wall., Pl. Asiat. Rar. 1: 61. 1830; FBI 4: 687. 1885; FPM 1153. 1924; FPL 378. 1990.

Subscandent herbs with few hispid branches. Leaves to 8 x 3 cm, ovate, acute at both ends, densely hispid; petiole 1 cm long. Heads terminal, 3 cm across, globose; bracts 15 x 1 mm, strongly ciliate. Flowers 30-40 in a head; calyx tube 12 mm long, not ribbed, teeth 5 mm long, ciliate; corolla tube 10 mm long, upper lip obovate, concave, brown hairy, lower lip white, 10 x 8 mm, 3-lobed, midlobe orbicular, glabrous. Nutlets 3 x 1.5 mm, 3-angled brown, smooth.

*Fl. & Fr.* August-January

*Distr.* India and Himalayas. Occasional in grasslands; *PS 19600* Karimalagapuram

**Leucas hirta** (Heyne ex Roth) Spreng., Syst. Veg. 2: 743. 1825; FBI 4: 687. 1885; FPM 1153. 1924; FPL 378. 1990; FTSR 361. 1996. *Phlomis hirta* Heyne ex Roth, Nov. Pl. Sp. 264. 1821.

Erect herbs; branches covered with reflexed hairs. Leaves 5-6 x 1.5 cm, elliptic, obtuse, acute at base, distantly crenate, hirsute above, densely tomentose beneath; petiole 8 mm long. Heads terminal; bracts 10 x 1 mm, linear, bristly. Flowers 15-30 in a head; calyx tube 7 mm long, white, densely hairy outside; corolla tube 5 mm long, upper lip emarginate, white, hairy, midlobe of lower lip emarginate.

*Fl. & Fr.* November-March

*Distr.* Endemic to Peninsular India. Occasional in grasslands; *PS 19592, 19466* Karimalagapuram

#### OCIMUM Linnaeus

1. Leaves to 10 x 5 cm; wet seed not mucilaginous ..... **O. gratissimum**



1. Leaves to 5 x 2 cm; wet seed heavily mucilaginous..... **O. americanum**

**Ocimum americanum** L., Cent. Pl. 1: 15. 1755; FPL 380. 1990; FTSR 352. 1996. *O. canum* Sims, Bot. Mag. 51: t.2452. 1824; FBI 4: 607. 1885; FPM 1111. 1924.

Herbs, stem hirtus. Leaves elliptic, acute to acuminate, base truncate or obtuse, subentire, sparsely hairy or glabrous. Racemes 13 cm long, densely pubescent. Flowers 5-7 in each whorl; calyx 3 x 5 mm, upper lip 3 x 3 mm, orbicular, densely hairy, corolla white, 5 mm long, glabrous; filaments glabrous. Nutlets 1.5 mm long, sub-trigonal, minutely pitted, dark brown  
*Fl. & Fr.* Throughout the year

*Distr.* Paleotropics. Common in wet rocky areas of moist deciduous forests; *PS 30607* Anappadi

**Ocimum gratissimum** L., Sp. Pl. 1197. 1753; FBI 4: 608. 1885; FPM 1111. 1924; FPL 380. 1990; FTSR 362. 1996.

Shrubs, glandular-scabrid. Leaves elliptic to obovate, base attenuate serrate, acuminate at apex; nerves 6-pairs; thinly tomentose below; petiole to 6 cm long. Racemes terminal, paniced; bracts oblanceolate. Flowers 4-6 at each node; pedicel 4 mm long; calyx 5 mm long, glabrous; upper lip ovate, obtuse, lobes of lower lip acuminate, glandular; corolla white, tube 2-3 mm long, lobes obtuse; filaments glabrous or villous at base. Nutlets 1.5 x 1 mm, pitted, brown.

*Fl. & Fr.* Throughout the year

*Distr.* Pantropical. Fairly common in moist deciduous forests; *PS 19063* Thunakkadavu

#### ORTHOSIPHON Benth

1. Leaves glabrous; stamen much longer than the corolla..... **O. aristatus**

1. Leaves puberulus along the nerves; stamen as long as the corolla ..... **O. thymiflorus**

**Orthosiphon aristatus** (Blume) Miq., Fl. Ind. Bat. 2: 943. 1858; FTSR 363. 1996. *Ocimum aristatum* Blume, Bijdr. 833. 1826. *Orthosiphon stamineus* Benth. in Wall., Pl. Asiat. Rar. 2: 15. 1830; FBI 4: 615. 1885; FPM 1115. 1924.

Diffusely branched glabrous herbs. Leaves to 7 x 4 cm, broadly elliptic, obtusely acute or acuminate, base acute, serrate, glabrous, glaucous below; lateral nerves ca. 5 pairs; petiole to 3 cm long. Racemes to 8 cm long. Calyx tube 4 mm long, puberulus, lower lobes aristate. Corolla 1.8 cm long, linear, sparsely strigose, pale-lilac. Filaments 4 cm long. Nutlets oblong-orbicular or subtrigonal, smooth or tuberculate.

*Fl. & Fr.* September-December

*Distr.* Indo-Malesia. Rare along the margins of evergreen forests; *PS 19904* Kariamchola

**Orthosiphon thymiflorus** (Roth) Sleensen, Reinwardtia 5: 42. 1959; FPL 380. 1990; FTSR 363. 1996. *Ocimum thymiflorum* Roth, Nov. Pl. Sp. 269. 1821. *O. tomentosus* Benth. in Wall., Pl. Asiat. Rar. 2: 14. 1830; FBI 4: 613. 1885. *O. glabratus* Benth. in Wall., Pl. Asiat. Rar. 2: 14. 1830; FPM 1114. 1924. *O. viscosus* Benth. in Wall., Pl. Asiat. Rar. 2: 41. 1830; FPM 1114. 1924. *O. diffusus* (Benth.) Benth. in DC., Prodr. 12: 50. 1848; FBI 4: 613. 1885; FPM 1113. 1924.

Erect herbs; stem hirtus. Leaves 5 x 3 cm, ovate, base rounded or cordate, acute at apex, thinly tomentose below; nerves 6-8 pairs. Racemes 15-20 cm long, terminal, with distant whorls of flowers. Flowers 5-6 in a whorl; pedicels 2-3 mm long; calyx 6-7 mm long, deflexed, 2-lipped; upper lip broad, entire, lower lip 4-lobed, lobes subulate, hairy; corolla 13 mm long, 2-lipped, tube 9 mm long, cylindric, upper lip 4-lobed, lower lip cup-shaped; stamens 4, included, declinate, style slender, stigma terminal, capitate. Nutlets 2-4, orbicular, pitted.

*Fl. & Fr.* Throughout the year

*Distr.* Indo-Malesia. Occasional in wet areas of moist deciduous forests; *PS 30715* Vengoli

#### PLECTRANTHUS L' Heritier

1. Filaments connate into a sheath around the style..... 2

1. Filaments free..... 3

2. Leaves glabrous; flowers pedicellate..... **P. malabaricus**  
 2. Leaves densely villous; flowers sessile ..... **P. barbatus**  
 3. Fruiting calyx densely woolly; wet nutlets mucilaginous ..... **P. nilgherricus**  
 3. Fruity calyx minutely scabrous; wet nutlets not mucilaginous ..... **P. wightii**

**Plectranthus barbatus** Andr., Bot. Repos. t. 594. 1809. *Coleus barbatus* (Andr.) Benth. in Wall., Pl. Asiat. Rar. 2: 15. 1830; FBI 4: 625. 1885; FPM 1124. 1924. *C. forskohlii* (Willd.) Briq., Pflanzenf. 4:359. 1897; FPL 374. 1990. *Plectranthus forskohlii* Willd., Sp. Pl. 3: 169. 1800.

Stout herbs; stem densely villous. Leaves ovate, acute or obtuse, densely long-villous, usually folded. Spike 15-25 cm long, terminal with distant whorls of flowers; bracts 10 x 8 mm, broadly ovate, acuminate. Flowers 8-12 in each whorl, sessile; calyx 5 mm long; upper lip entire; lower lip narrowly 4-lobed; corolla tube 6 mm long, exserted, lower lobe blue, boat-shaped, upper 4-lobed. Nutlets globose, black, smooth.

*Fl. & Fr.* September-December

*Distr.* India, Sri Lanka and Tropical East Africa. Occasional in grasslands and evergreen forests; *PS 19746* Pezha

**Plectranthus malabaricus** (Benth.) Willemse, Blumea 25: 509. 1979. *Coleus malabaricus* Benth. in Wall., Pl. Asiat. Rar. 2: 16. 1830; FBI 4: 626. 1885; FPM 1124. 1924; FPL 375. 1990; FTSR 359. 1996.

Herbs. Leaves broadly ovate, acute, base truncate or subcordate, crenate, puberulus, nerves 4 pairs; petiole to 10 cm long. Racemes in terminal to 30 cm long panicles, with distant whorls of flowers; bracts 5 x 3 mm, ovate. Flowers 5-10 in each whorl; calyx 8 mm long, striate, upper lip obtuse; lower lip unequally toothed, glabrous; corolla 1.5 cm long, pink; filaments glabrous.

*Fl. & Fr.* August-February

*Distr.* South India and Sri Lanka. Occasional in grasslands; *PS 19766* Pooppara; *19706, 30135* Karimala; *NS 30543* Pandaravarai

**Plectranthus nilgherricus** Benth. in DC., Prodr. 12: 57. 1848; FBI 4: 619. 1885; FPM 1121. 1924; FTSR 363. 1996. *Rabdosia nilgherrica* (Benth.) Hara, J. Jap. Bot. 47: 198. 1972.

Shrubs; whole plant glandular hirtus. Leaves 5-10 x 3-6 cm, rounded or cordate at base, serrate; upper ones sessile, acuminate, densely hairy below; nerves 4 pairs; petioles 3-5 cm long. Panicle 20-30 cm long. Flowers 3-5 together, pedicelled; calyx 3.5-4 mm long, strongly ribbed, subequally 5-lobed, hirtus; corolla 7 mm long, white with red spot, glandular, lobes ciliate, midlobe larger than sidelobes; filaments glabrous.

*Fl. & Fr.* December-February

*Distr.* Endemic to Southern Western Ghats. Occasional in grasslands; *PS 19687* Karimala

**Plectranthus wightii** Benth., Labiat. Gen. Sp. 41. 1832; FBI 4: 619. 1855; FPM 1120. 1924; FTSR 364. 1996. *P. pulneyensis* Hook.f., FBI 4: 617. 1855. *P. nepetaefolius* Benth. in DC., Prodr. 12: 57. 1848; FBI 4: 619. 1855. *Rabdosia wightii* (Benth.) Hara, J. Jap. Bot. 47: 203. 1972; FPL 383. 1990.

Subshrubs, branchlets glabrescent. Leaves ovate, acute, base cordate, deeply serrate, membranous, sparsely hispid, to 7.5 x 6 cm; lateral nerves ca. 5 pairs; petiole to 7 cm long. Thyrsus to 20 cm long. Calyx hirtellous, prominently red gland-dotted. Corolla lobes glabrous. Stamens exserted.

*Fl. & Fr.* September-December

*Distr.* Endemic to Peninsular India. Fairly common in moist deciduous forests; *PS 19830* Vengoli

#### POGOSTEMON Desfontaines

- |   |                        |
|---|------------------------|
| 1. Inflorescence branched .....                               | 2                      |
| 1. Inflorescence unbranched.....                              | 3                      |
| 2. Inflorescence 1-sided; leaves glabrous or glabrescent..... | <b>P. paniculatus</b>  |
| 2. Inflorescence otherwise; leaves tomentose.....             | <b>P. benghalensis</b> |
| 3. Leaves orbicular; corolla lobes unequal.....               | <b>P. rotundatus</b>   |
| 3. Leaves ovate; corolla lobes equal .....                    | <b>P auricularius</b>  |

**Pogostemon auricularius** (L.) Hassk., Tijdschr. Natuurl. Gesch. Physiol. 10: 127. 1843. *Mentha auricularia* L., Mant. Pl. 81. 1767. *Dysophylla auricularia* (L.) Blume, Bijdr. 826. 1826; FBI 4: 638. 1885; FPM 1136. 1924.

Herbs. Leaves 2-8 x 1-3 cm, elliptic-lanceolate, chartaceous, base truncate to attenuate, margin irregularly crenate-serrate, apex acute; petiole to 0.5 cm. Racemes dense, terminal; corolla violet, 2 mm across; stamens 4, subequal; filaments 5 mm; anthers 0.4 mm; ovary 0.2 mm; style 5 mm.

*Fl. & Fr.* July-September

*Distr.* South East Asia. Fairly common in marshy areas; *PS 30521* Pillackalvayal

**Pogostemon benghalensis** (Burm. f.) O. Ktze., Rev. Gen. Pl. 2: 517. 1891; FPL 381. 1990; FTSR 364. 1996. *Origanum benghalense* Burm. f., Fl. Ind. 128,t.38, f. 3. 1768. *Pogostemon plectranthoides* Desf., Ann Mus. Hist. Nat. 2: 156. t. 6. 1808; FBI 4: 632. 1885; FPM 1133. 1924.

Shrubs, to 2 cm high; stem hoary pubescent, subterete, reddish. Leaves 12-15 x 6 cm, ovate to lanceolate, acute, base attenuate, nerves 3-5 pairs. Panicle large, 15-25 cm long, with many congested and 1-sided cymes; bracteoles ovate, acute, hairy. Flowers many, densely packed; calyx 4 mm long, pubescent outside, glabrous inside; lobes acuminate; corolla pink, 7 mm long, lobes acute, hairy, pink; staminal filaments unequal. purple, bearded with moniliform hairs.

*Fl. & Fr.* August-January

*Distr.* Endemic to India; Common along the margins of evergreen forests; *PS 19146* Karimala

**Pogostemon paniculatus** (Willd.) Benth. in Wall., Pl. Asiat. Rar. 1: 30. 1830; FBI 4: 631. 1885; FPM 1132. 1924; FPL 382. 1990; FTSR 364. 1996. *Elsholtzia paniculata* Willd., Sp. Pl. 3: 59. 1800.

Subshrubs. Leaves to 8 x 4 cm, ovate, acuminate at either ends, irregularly dentate, hirtus-tomentose; lateral nerves 3-4 pairs; petiole 2 cm long, tomentose. Panicle large, branches 5-10-flowered, 1-sided; bracteoles 5 x 3 mm, oblique, falcate, imbricating. Flowers densely packed; calyx 4 mm long, 5-ribbed; lobes acuminate, hirtus; corolla purplish, 6 mm long; pubescent outside; filaments bearded.

*Fl. & Fr.* November-January

*Distr.* Peninsular India and Myanmar. Common in moist deciduous forests and plantations; *PS 19039* Thunakkadavu

**Pogostemon rotundatus** Benth. in Wall., Pl. Asiat. Rar. 1: 31. 1830; FBI 4: 636. 1885; FPM 1134. 1924; FTSR 365. 1996.

Profusely branched herbs; stem villous. Leaves 3 x 2.5 cm, villous above and below, crenate along the margins; nerves 3 pairs; petiole to 1 cm long. Spike 6-12 x 1 cm, terminal solitary, cylindrical, continuous; bracts and bracteoles minute. Flowers densely packed; calyx 4 mm long, densely hairy, lobes acuminate; corolla white or yellow, 6.5 mm long; lobes obtuse; filaments bearded. Nutlets biconvex, obovoid, minutely reticulate, brown.

*Fl. & Fr.* November-January

*Distr.* Endemic to Peninsular India. Occasional in grasslands; *PS 19151, NS 19306* Karimala

## SCUTELLARIA Linnaeus

1. Leaf base cordate; nutlets spinulose..... **S. violacea**  
 1. Leaf base cuneate; nutlets tuberculate ..... **S. colebrookeana**

**Scutellaria colebrookeana** Benth. in Wall., Pl. Asiat. Rar. 1: 67. 1830; FPM 1142. 1924. *S. violacea* Heyne ex Benth. var. *colebrookeana* (Benth.) Hook.f., FBI 4: 668. 1885, '*colebrookiana*'.

Puberulus herbs. Leaves to 3 x 3 cm, deltoid, acute, base truncate, dentate, nerves 4 pairs; petioles 2.5 cm long. Racemes 12 cm long, bracts 3 x 1 mm, ovate, acute. Flowers paired, calyx 5 x 5 mm, upper lip and lower lip equal, white, glabrous; corolla 12 mm long, pale purple, lower lip broader; filaments glabrous.

*Fl. & Fr.* October-December

*Distr.* Endemic to Western Ghats. Fairly common in evergreen forests; *PS 30323* Pezha

**Scutellaria violacea** Heyne ex Benth. in Wall., Pl. Asiat. Rar. 1: 66. 1830; FBI 4: 668. 1885; FPM 1142. 1924; FTSR 365. 1996. *S. violacea* var. *sikkimensis* Hook.f., FBI 4: 668. 1885.

Erect herbs; stem hispid. Leaves to 7 x 5 cm, ovate, acute, crenate, base cordate, hispid; petiole 4-5 cm long. Racemes 15 cm long, glandular hispid; bracts ovate, 3 mm long. Flowers paired, long-pedicelled; calyx glabrous, upper lobe saccate; corolla pale blue, 15 mm long, lateral lobes of lower lip shorter, glabrous; filaments fimbriate at base; anthers bearded, confluent.

*Fl. & Fr.* October-December

*Distr.* South India and Sri Lanka. Fairly common in moist deciduous forests; *PS 19843* Vengoli; *NS 19427* Pooppara

#### TEUCRIUM Linnaeus

**Teucrium tomentosum** Heyne ex Benth. in Wall., Pl. Asiat. Rar. 1: 58. 1830; FBI 4: 700. 1885; FPM 1158. 1924; FTSR 365. 1996.

Erect shrubs; branchlets tomentose. Leaves 11 x 6 cm, ovate, acute at apex, rounded at base, crenate, hairy along nerves; petiole 1-3 cm long. Racemes paniced, terminal and axillary; bracts 3 mm long, ovate, small. Flowers pedicellate; calyx 6 mm long, lobed near the apex, lobes acute, hairy; corolla yellow to white, 11 mm long, upper lip absent, lower lip 3-lobed, lateral lobes smaller; stamens didynamous, filaments glabrous; anthers reniform; stigma bifid. Nutlets 4, basely united, globular, reticulately pitted, glandular.

*Fl. & Fr.* November-January

*Distr.* Peninsular India and Sri Lanka. Occasional in grasslands; *PS 19708* Karimala

#### NYCTAGINACEAE

1. Diffuse herbs; flowers bisexual ..... **Boerhavia**  
 1. Scandent shrubs; flowers unisexual ..... **Pisonia**

#### BOERHAVIA Linnaeus

1. Flowers pedicelled; branchlets slender..... **B. chinensis**  
 1. Flowers sessile; branchlets stout ..... **B. diffusa**

**Boerhavia chinensis** (L.) Asch. & Schweinf. in Schweinf., Beitr. Fl. Aethiop. 1: 167. 1867, "Boerhaavia". *Valeriana chinensis* L., Sp. Pl. 33. 1753. *B. repanda* Willd., Sp. Pl. 1: 22. 1797; FBI 4: 709. 1885; FPM 1163. 1925.

Diffuse herbs with divaricate scandent glabrous branches. Leaves equal, ovate, acute, shallowly lobed, cordate at base, lineolate; petiole to 2.5 cm long. Flowers 1 cm long, 3-6 together in paniced umbel; pedicels 13 mm long, capillary; bracts 3 mm long, glandular; perianth 8 mm long, pink. Capsule 8 x 1.5 mm, oblanceolate, densely lineolate, glandular.

*Fl. & Fr.* October-February

*Distr.* West Asia, India and Myanmar. Occasional in moist deciduous forests; *PS 19988* Keerappadi

**Boerhavia diffusa** L., Sp. Pl. 3. 1753; FPM 1162. 1925; FPL 383. 1990; FTSR 366. 1996. *B. repens* L., Sp. Pl. 3. 1753; FBI 4: 709. 1885. *B. procumbens* Banks ex Roxb., Fl. Ind. 1: 148. 1820.

Herbs with long trailing branches; stem reddish, tomentose. Leaves unequal, ovate, obtuse, undulate along margins, truncate to subcordate at base, tomentose; petiole to 1 cm long. Flowers 4 mm long, 4-10 together, in axillary or terminal, peduncled umbels; bracts 5, ovate, glandular, perianth pink, stamens 3, capsule 3 x 1 mm, clavate, 5-ribbed, glandular.

*Fl. & Fr.* October-February

*Distr.* Pantropical. Common in degraded forest areas; *PS 19206* Rockpoint; *19541* Thekkady

#### PISONIA Linnaeus

**Pisonia aculeata** L., Sp. Pl. 1026. 1753; FBI 4: 711. 1885; FPM 1163. 1925; FTSR 366. 1996.

Spines axillary, recurved, branchlets adpressed, pubescent. Leaves opposite and alternate, to 8 x 4 cm, ovate, obtuse, base cuneate, chartaceous; petiole to 2 cm. Umbels axillary; peduncles to 2 cm, pubescent; bracteoles 1 mm, ovate, pubescent; perianth 4 mm across, funnel shaped, 10-lobed, alternately long and short; stamens 4-5-8, filaments 5 mm; ovary 0.5 mm, seated on a disc, 1-celled, one ovuled.

*Fl. & Fr.* January-April

*Distr.* Pantropical. Rare along the riverine areas; *PS 30571* Keerappadi

#### AMARANTHACEAE

1. Leaves opposite .....	2
1. Leaves alternate .....	7
2. Inflorescence an elongated, slender spike .....	3
2. Inflorescence otherwise .....	5
3. Flowers all fertile, solitary; bracteole spinescent .....	<b>Achyranthes</b>
3. Flowers fertile and sterile, in groups; bracteoles not spinescent .....	4
4. Sterile flowers with hooked hairs .....	<b>Pupalia</b>
4. Sterile flowers without hooked hairs .....	<b>Cyathula</b>
5. Prostrate or decumbent herbs; anthers 1-celled .....	<b>Alternanthera</b>
5. Erect herbs; anthers 2-celled .....	6
6. Leaves lanceolate, obovate or spatulate; style bifid at middle .....	<b>Gomphrena</b>
6. Leaves ovate or deltoid; style not forked .....	<b>Psilotrichum</b>
7. Flowers in globose heads .....	<b>Allmania</b>
7. Flowers in simple or paniculate spikes .....	8
8. Spike simple, lax, glabrous .....	<b>Celosia</b>
8. Spike paniculate or in axillary clusters .....	9
9. Spike in axillary clusters, white tomentose .....	<b>Aerva</b>
9. Spike paniculate; glabrous .....	10
10. Spike dense; flowers unisexual .....	<b>Amaranthus</b>
10. Spike lax; flowers bisexual .....	<b>Indobanalia</b>

#### ACHYRANTHES Linnaeus

- |   |                     |
|---|---------------------|
| 1. Leaves linear-lanceolate to 16 cm, membranous; staminal tube truncate .....  | <b>A. bidentata</b> |
| 1. Leaves ovate-elliptic to 10 cm, coriaceous; staminal tube semicircular ..... | <b>A. aspera</b>    |

**Achyranthes aspera** L., Sp. Pl. 204.1753; FBI 4: 730. 1885; FPM 1176. 1925; FTSR 367. 1996.

Erect herbs; stem tomentose. Leaves to 10 x 6 cm, broadly elliptic to obovate, abruptly

acuminate, tomentose, nerves 6 pairs; petiole 5 mm long. Spike to 20 cm long, hispid; bracts 6 mm long, lanceolate, aristate; bracteoles entire, aristate. Flowers deflexed; tepals 7.5 x 2 mm, elliptic, acute, glabrous, equal; ovary truncate at apex. Achenes 3 mm long, ovoid, brown.

*Fl. & Fr.* December-January

*Distr.* Pantropical. Common in moist deciduous forests and plantations; *PS 19005* Thunakkadavu

**Achyranthes bidentata** Blume, Bijdr. 545. 1826; FPM 1176. 1925; FPL 385. 1990; FTSR 367. 1996.

Erect herbs; stem glabrous. Leaves lanceolate, to linear-lanceolate, acuminate, thinly pubescent, nerves 7-9 pairs; petiole 5 mm long. Spike axillary and terminal, 15-30 cm long, narrow, glabrous; bracts 4 x 1.5 mm, lanceolate, long-aristate; bracteoles 3 mm long, entire, aristate. Flowers distant; tepals equal, 7 x 1.5 mm, lanceolate, acuminate, glabrous. Achenes 3 x 1.5 mm, cylindrical, longitudinally striate, reddish-brown.

*Fl. & Fr.* January-April

*Distr.* Indo-Malesia to Australia and East Asia. Fairly common in evergreen forests; *PS 19787* Kanthalppara

#### AERVA Forsskal

**Aerva lanata** (L.) Juss. ex Schult., Ann. Mus. Natl. Hist. Nat. 11: 131. 1808; FBI 4: 728. 1885; FPM 1178. 1925; FPL 385. 1990; FTSR 368. 1996. *Achyranthes lanata* L., Sp. Pl. 204. 1753. *Aerva floribunda* Wight, Ic. t. 723. 1840.

Woolly herbs. Leaves to 3 x 2.5 cm, orbicular, ovate, apex obtuse, mucronate, pubescent above, densely woolly below, membranous; petiole 1 cm. Spikes axillary, to 1 cm, densely tomentose; bracts and bracteoles 1 mm, ovate; tepals 1.5 mm, oblong, woolly mucronate; filaments basally connate, 0.5 mm, staminodes subulate; ovary 0.4 mm, stigma 2 fid.

*Fl.* November-March

*Distr.* Widespread in tropic and subtropics. Common in degraded forest areas; *PS 18877* Parambikulam

#### ALLMANIA R. Brown ex Wight

**Allmania nodiflora** (L.) R. Br. ex Wight in Hook. J. Bot. 1: 226, t. 128. 1834; FBI 4: 716. 1885; FPM 1167. 1925; FTSR 368. 1996.

Diffuse herbs, stem puberulus. Leaves alternate, 2-6 x 1-1.5 cm, elliptic-oblong, acute, entire, glabrous. Flowers in terminal and axillary globose congested cymes, pedicelled; bracts and bracteoles 4 mm long, lanceolate, acuminate with filiform tips; tepals 5, equal, 5 x 1 mm, lanceolate, acute, free to the base, 1-nerved, glabrous; stamens 5, filaments united below into a membranous cup, glabrous; ovary obovoid, 1-celled, 1-ovuled; style 1, slender; stigma 2-toothed. Achenes 3 x 2 mm, ellipsoid with a long beak, biconvex, black.

*Fl. & Fr.* Almost throughout the year

*Distr.* Tropical Asia. Common in moist deciduous forests; *PS 30335* Pezha

#### ALTERNANTHERA Forsskal

1. Bracts and bracteoles glabrous ..... 2
1. Bracts and bracteoles hairy ..... 3
2. Leaves reddish; pseudo-staminodes as long as the filaments ..... **A. sessilis**
2. Leaves greenish; pseudo-staminodes shorter than the filaments ..... **A. pungens**
3. Outer tepals mucronate; pseudo-staminodes shorter than the filaments ..... **A. paronychioides**
3. Outers tepals spinescent; pseudo-staminodes longer than the filaments ..... **A. tenella**

**Alternanthera paronychioides** A. St. Hill, Voy. Bres. 2: 439. 1833; FTSR 369. 1996. *A. polygonoides* sensu Standley, N. Amer. Fl. 21: 136. 1917, non L. 1753.

Prostrate herbs; stem sparsely covered with long crisped hairs. Leaves to 3 x 0.7 cm, oblanceolate to spatulate, acute, glabrous. Spike 5 x 3 mm, solitary, axillary, few-flowered, sessile; bracts and bracteoles similar, 1.5 mm long, hyaline, apiculate. Flowers densely packed; tepals 5, outer three larger, 2.5 x 1 mm, ovate, acute, inner smaller, all hairy; stamens 3-5; ovary obovoid, compressed, stigma bilobed.

*Fl. & Fr.* January-March

*Distr.* Native of Tropical America, getting established in Tropical Asia. Common in moist deciduous forests and plantations; *PS 30423* Parambikulam

**Alternanthera pungens** Kunth in HBK, Nov. Gen. Sp. 2: 206. 1817. *A. echinata* J. E. Smith in Rees, Cyclop. 39: 10. 1819.

Prostrate herbs. Leaves to 1.5 x 1 cm, deltoid to obovate, obtuse, base narrowed, short, glabrous. Spikes to 10 x 6 mm, 2-3 together, axillary, sessile; bracts and bracteoles equal, 5 mm long, scarious, aristate. Flowers densely packed; tepals 5, outer three larger, 5 mm long, lanceolate, aristate, one oblong, obtuse, inner smaller, boat shaped, keeled, aristate, all 3-ribbed, barbed at base; stamens 5, filaments united at base; ovary obovoid; stigma capitate.

*Fl. & Fr.* Throughout the year

*Distr.* Native of American continent; now wide spread as a weed in the tropics and subtropics of the Old World. Occasional in dry deciduous forests; *PS 19993* Kuchimudi

**Alternanthera sessilis** (L.) R. Br. ex. DC., Cat. Hort. 4: 77. 1813; FPL 386. 1990. *Gomphrena sessilis* L., Sp. Pl. 225. 1753. *Alternanthera triandra* Lam., Encycl. 1: 95. 1785; FPM 1179. 1925.

Erect or prostrate herbs; stem glabrous. Leaves to 4 x 1 cm, elliptic-oblong to oblanceolate, obtuse, crenate, attenuate at base into a petiole, glabrous. Spike 7-12 x 5 mm, sessile, solitary or 2-3 together; bracts and bracteoles similar, 1 mm long, broadly ovate, acute, glabrous. Flowers yellowish red; tepals equal, 2.5 x 1.5 mm, ovate, acute, glabrous, 3-nerved at base; stamens 3. Achenes 2 x 2 mm, obovoid, emarginate at apex; seed orbicular, compressed, brown.

*Fl. & Fr.* Throughout the year

*Distr.* Pantropical. Common in marshy areas; *PS 19490* Thellikkal

**Alternanthera tenella** Moq. in DC., Prodr. 13: 355. 1849.

Prostrate herbs, stem white villous. Leaves to 4.5 x 2 cm, elliptic-oblong, sub-acute, hairy above, subsessile, ovoid. Head axillary, to 4, ovoid, sessile; bracts and bracteoles *ca* 2.5 mm, elliptic-lanceolate, spinescent; Tepals outer 3 *ca* 4 mm, lanceolate, spinescent, inner two smaller. Fertile stamens 5; filaments 1.5 mm; anthers oblong, pseudostaminodes strap shaped, longer than the filaments; ovary ovoid; style short. Seeds brownish, discoid.

*Fl. & Fr.* June-December

*Distr.* Tropics and subtropics. Common in moist deciduous forests and plantations; *PS 19004* Thunakkadavu

#### AMARANTHUS Linnaeus

1. Plants with axillary spines.....**A. spinosus**
1. Plants unarmed.....**A. viridis**

**Amaranthus spinosus** L., Sp. Pl. 991. 1753; FBI 4: 718. 1885; FPM 1170. 1925; FPL 387. 1990; FTSR 369. 1996.

Armed subshrubs, spines axillary, to 1.5 cm. Leaves to 7 x 3 cm, ovate, oblong, obtuse, base cuneate, mucronate, membranous; petiole to 7 cm. Spikes axillary and terminal, dense, to 15 cm; bracts and bracteoles 1.5 mm, curved; male flowers-tepals 1.5 and 2 mm, lanceolate; stamens 5, female flowers-tepals 1.5 mm, oblong, subequal; ovary 0.6 mm, styles 2.

*Fl. & Fr.* June-December

*Distr.* Originally from America; now found throughout the warmer regions of the world. Common in degraded forest areas and roadsides; *PS 18809* Thellikkal

**Amaranthus viridis** L., Sp. Pl. ed. 2: 1405. 1763; FBI 4: 720. 1885; FPM 1171. 1925; FPL 387. 1990; FTSR 369. 1996. *Chenopodium caudatum* Jacq., Coll. Bot. 2: 235. 1788, non *Amaranthus caudatus* L. 1753. *Amaranthus gracilis* Desf., Tabl. Ecole Bot. 43. 1804.

Glabrous herbs, stem green or sometimes reddish. Leaves 5-10 x 2-5 cm, alternate, ovate, acute, truncate at base; nerves 3-6 pairs. Spikes terminal and axillary, interrupted. Flowers unisexual, mixed, densely arranged; bracts and bracteoles similar, ovate, acuminate; tepals 3, 1.5 mm long, obovate, obtuse; stamens 3, free; ovary obovoid, styles 2, free. Achenes 2 x 1 mm, ovoid, acute, membranous; seeds biconvex, dark brown, shining with hexagonal epidermal cells.

*Fl. & Fr.* Throughout the year

*Distr.* Pantropical. Common in degraded forest areas and roadsides; *PS 30642* Anappadi

#### CELOSIA Linnaeus

**Celosia pulchella** Moq. in DC., Prodr. 13: 238. 1849; FBI 4: 715. 1885; FPM 1166. 1925.

Erect glabrous herbs. Leaves to 9 x 5 cm, alternate, ovate, acuminate, base truncate and shortly cuneate; nerves 5 pairs; petioles 2-4 cm long. Spike terminal, 5-15 cm long, slender. Flowers clustered, all fertile; bracts and bracteoles similar, 1 mm long, ovate, acute, hyaline; tepals 5, 2.5 x 1 mm, ovate, acute, hyaline; stamens 5, filaments united at base; ovary globose, style absent; stigmas 2, curved, pilose. Utricles 4 x 3 mm, ovoid; circumscissile; seeds many, reniform, black, muricate.

*Fl. & Fr.* August-January

*Distr.* India and Sri Lanka. Fairly common in bamboo areas; *PS 30545* Pandaravarai

#### CYATHULA Blume

**Cyathula prostrata** (L.) Blume, Bijdr. 549. 1826; FBI 4: 722. 1885; FPM 1172. 1925; FTSR 370. 1996. *Achyranthes prostrata* L., Sp. Pl. ed. 2. 1: 296. 1761. *Desmochaeta prostrata* (L.) DC., Cat. Hort. Monsp. 102. 1813.

Decumbent herbs. Leaves opposite, 7 x 3.5 cm, rhomboid, acute at either ends, thinly pubescent; petiole 5-15 mm long. Spike terminal, to 18 cm long, slender, solitary. Flowers in groups of 3-5 of which one perfect and others neuter flowers; bracts and bracteoles similar, 1.5 mm long, lanceolate, acuminate, pubescent; sepals 5, free, 3 x 1 mm, elliptic, acute, hooked awn like in neuter flowers; stamens 5, filaments united into a membranous truncate cup; staminodes membranous, alternate with stamens, fimbriate; ovary ovoid, style simple, stigma capitellate. Achenes 2 x 1 mm, obovoid, compressed, golden brown.

*Fl. & Fr.* September-August

*Distr.* Pantropical. Common in moist deciduous forests and plantations; *PS 19020* Thunakkadavu

#### GOMPHRENA Linnaeus

**Gomphrena celosioides** Mart., Beitr. Amar. 93. 1825; FPL 388. 1990. *G. decumbens* sensu Gamble, FPM 1179. 1925, non Jacq. 1805.

Prostrate herbs, younger parts woolly. Leaves to 3 x 1 cm, elliptic, obovate, apex acute, mucronate, spatulate, woolly beneath. Spikes terminal and sometimes axillary, to 8 cm long; bracts 3 mm, scarious, mucronate, ciliate at apex; bracteoles 2, 2.5 mm, ovate, mucronate; tepals 5, 4.5 mm, lanceolate, acute at apex, woolly at the back of the inner 3 tepals; stamens 5, tube to 2.5 mm; ovary 1 mm, 1-ovuled, style 0.4 mm, stigma 2-fid.

*Fl.* December-February

*Distr.* Originally from South America; now widespread in the tropics. Occasional in wet rocky areas; *PS 19663* Vengoli



## INDOBANALIA A. N. Henry et R. Roy

**Indobanalia thyrsiflora** (Moq.) Henry & Roy, Bull. Bot. Surv. India 10: 274. 1968; FPL 388. 1990; FTSR 370. 1996. *Banalia thyrsiflora* Moq. in DC., Prodr. 13: 278. 1849; FPM 1167. 1925.

Erect herbs; stem glabrous, ribbed. Leaves alternate, to 10 x 5 cm, ovate, acuminate, cuneate at base, hairy below; lateral nerves 8 pairs; petiole 2 cm long. Spikes thyrseoid, paniced, narrow, terminal and axillary; bracts and bracteoles similar, broadly ovate. Flowers 2-3 together; sepals free, equal, 3 x 1 mm, 3-nerved, glabrous; stamens 5, filaments jointed into a tube; ovary ellipsoid, compressed, 1-ovuled, style-1, slender; stigmas 2, linear, papillose. Achenes globose; seed orbicular, black.

*Fl. & Fr.* December-March

*Distr.* Endemic to Southern Western Ghats. Fairly common in moist deciduous forests; *PS 30215* Kothala

## PSILOTRICHUM Blume

**Psilotrichum elliotii** Baker & Clarke in Dyer, Fl. Trop. Africa 6: 58. 1909. *P. calceolatum* Moq. ex Hook.f., FBI 4: 725. 1885. *P. nudum* sensu Wight, Ic. t. 1775. 1852, non (Heyne ex Wall.) Moq. 1849.

Herbs. Leaves to 4 x 2 cm, ovate, acute at apex, obtuse at base, pubescent; petiole 3 mm. Spikes axillary, to 2 cm; bracts 1.5 mm, ovate, acute, pubescent; bracteoles 2, 1.5 x 1.2 mm, broadly ovate, acute, pubescent; tepals 5, 5 and 4 mm, prominently nerved, silky pubescent lanceolate, acute; stamens 5, connate at base, filaments 1.5 mm; ovary 0.5 mm, globose, 1-ovuled, style 0.5 mm, stigma capitellate. Utricle 2 mm long.

*Fl. & Fr.* December-February

*Distr.* South India and Tropical Africa. Occasional in dry deciduous forests; *PS 19544* Thekkady

## PUPALIA A. L. Jussieu

**Pupalia lappacea** (L.) Juss., Ann. Mus. Nat. Hist. Nat. 2: 132. 1803; FBI 4: 724. 1885; FPM 1173. 1925. *Achyranthes lappacea* L., Sp. Pl. 204. 1753. *A. atropurpurea* Lam., Encycl. 1: 546. 1785. *Pupalia atropurpurea* (Lam.) Moq. in DC., Prodr. 13: 331. 1849.

Straggling herbs; stem densely hispid. Leaves 2-5 x 2-3 cm, obovate, obtuse, fulvous tomentose; petiole to 1 cm long. Spike 15-25 cm long, terminal, usually unbranched. Flowers sterile and fertile together in distant clusters; bracts 3 mm across, orbicular; bracteoles smaller; sepals 5, 5 x 2 mm, elliptic, acute, densely covered with hooked bristles, woody; stamens 5, filaments united into short tube at base; ovary obovoid, compressed; style simple; stigma capitate. Achenes 2 x 2 mm, biconvex, brown, smooth.

*Fl. & Fr.* September-November

*Distr.* India, Sri Lanka and East Africa. Common in dry deciduous forests; *PS 19975* Keerappadi

## CHENOPODIACEAE

### CHENOPODIUM Linnaeus

**Chenopodium ambrosioides** L., Sp. Pl. 219.1753; FBI 5:4.1886; FPM 1181.1925; FPL 389.1990.

Erect pungent smelling herbs, profusely branching. Leaves alternate, to 8 x 3 cm, elliptic to lanceolate, entire to deeply lobed, base attenuate, glabrous, membranous; upper leaves smaller. Flowers bisexual, minute, sessile, clustered in terminal and axillary cymes; perianth 5-lobed, herbaceous, green; stamens 5, free; ovary 1-celled, with solitary ovule; styles 3; stigmas 3. Fruit a utricle enclosed by the persistent perianth.

*Fl. & Fr.* Throughout the year

*Distr.* Native of Tropical America; widely introduced, Europe, Asia, Africa, Australia and Malesia. Common in degraded forest areas; *PS 19337* Thenkudippara

## BASELLACEAE

### BASELLA Linnaeus

**Basella alba** L., Sp. Pl. 272.1753. *B. rubra* L., Sp. Pl. 272.1753; FBI 5:20.1886; FPM 1185.1925.

Twining fleshy herbs; stem terete, glabrous. Leaves to 5 x 4 cm, ovate, acute or obtuse, rounded at base, thick, fleshy, glabrous; petiole 1 cm long. Flowers in axillary, stout, erect, 3-10 cm long spikes; bracts ovate, bracteoles orbicular; perianth calycine, lobes 5, 4 mm long, united at base; stamens 5, antitepalous, free; ovary glabrous, 1-celled; ovule 1, styles 3, stigma linear. Utricle globose, 5 mm across, fleshy, white, glabrous.

*Fl. & Fr.* October-December

*Distr.* Native of Tropical Asia and Africa, often cultivated. Common in dry deciduous forests; *PS 19985* Keerappadi

## POLYGONACEAE

1. Prostrate herbs; flowers in axillary clusters ..... **Polygonum**
1. Erect or scandent herbs; flowers in heads, racemes or spikes ..... **Persicaria**

### PERSICARIA P. Miller

1. Scandent herbs; flowers in heads..... **P. chinensis**
1. Erect herbs; flowers in elongated spikes or racemes..... 2
2. Ochrea truncate, glabrous at mouth ..... **P. glabra**
2. Ochrea obliquely clefted, long ciliate at mouth..... **P. barbata**

**Persicaria barbata** (L.) Hara, Fl. E. Himal. 1: 70. 1966. *Polygonum barbatum* L., Sp. Pl. 362. 1753; FBI 5: 37. 1886; FPM 1189. 1925; FPL 390. 1990; FTSR 371. 1996.

Erect stout herbs. Leaves 6-12 x 2-3 cm, elliptic-lanceolate, acuminate at either ends, glabrate or pubescent, subsessile; nerves many, slender; ochrea 15 mm long, strigose, mouth oblique, shortly bristled, pubescent. Spike 2-4 cm long, shortly peduncled, stout, in 15-20 cm long panicles; bracts obovate, obtuse, long-ciliate. Flowers white, 4-10 in each bracts, long-pedicelled; pedicels persistent; tepals 5, free, 2.5 mm long, oblong, obtuse, glandular; stamens 8; styles 3. Nut trigonous, acute, glabrous.

*Fl. & Fr.* September-January

*Distr.* Paletropics. Common in marshy areas; *PS 30764* Vengoli

**Persicaria chinensis** (L.) Gross., Bot. Jahrb. Syst. 49: 269,277,315. 1913. *Polygonum chinense* L., Sp. Pl. 363. 1753; FBI 5: 44. 1886; FPM 1190. 1925; FPL 390. 1990; FTSR 371. 1996.

Trailing or scandent shrubs; stem glabrous. Leaves ovate, cordate at base, oblique, abruptly acuminate, punctuate, glabrous except the midrib below; nerves many; petiole 1.5 cm long; ochrea 2-3 cm long, membranous, ribbed, oblique at mouth, glabrous. Spike 7 x 7 mm, paniced, globose; peduncles glandular-hairy; bracts ovate, obtuse, 1-flowered. Flowers pedicelled; tepals 4, white, 5 x 2.5 mm, oblong, obtuse, glabrous; stamens 8, styles 3. Nut 5 x 2.5 mm, trigonous, glabrous, acute, brown.

*Fl. & Fr.* July-January

*Distr.* Indo-Malesia and China. Common in secondary forests; *PS 19160* Karimala

**Persicaria glabra** (Willd.) Gomez, Ann. Inst. Segunda Ensef. Habana 2: 278. 1896. *Polygonum glabrum* Willd., Sp. Pl. 2: 447. 1799; FBI 5: 34. 1886; FPM 1189. 1925; FPL 391. 1990.

Stout erect herbs, glabrous, to 100 cm high. Leaves to 16 x 3 cm, linear-lanceolate, acuminate at both ends, punctuate.; petiole 2 cm long; ochrea tubular, mouth truncate, glabrous. Racemes stout, long peduncled; bracts obovate, obtuse, glabrous. Flowers few-several

in each bract; tepals 4, oblong, obtuse, eglandular; stamens 8; style 2-fid. Nuts 2 x 1.5 mm, biconvex, acute, brown.

*Fl. & Fr.* October-January

*Distr.* India, Africa, Eastward to Malesia. Occasional in marshy areas; *PS 19016* Thunakkadavu

### POLYGONUM Linnaeus

**Polygonum plebeium** R. Br., Prodr. 420. 1810. "plebejum; FBI 5: 27. 1886; FPM 1188. 1925; FPL 391. 1990; FTSR 371. 1996. *P. indicum* Heyne ex Roth, Nov. Pl. Sp. 208. 1821.

Prostrate woody herbs with radiate branches; stem glabrous. Leaves to 10 x 4 mm, oblong, sessile, acute, glabrous; ochrea chartaceous, white, ciliate. Flowers 3-7 together, sessile, axillary; tepals 5, ovate, acute, glabrous; stamens 5. Nut 1.5 mm long, trigonous, acute, glabrous, brown.

*Fl. & Fr.* February-May

*Distr.* Pantropical. Common in reservoir beds; *PS 30452* Vengoli

### PODOSTEMACEAE

1. Secondary shoots thread like, free floating ..... **Indotristicha**
1. Secondary shoots otherwise, appressed, erect or free floating ..... 2
2. Secondary shoots erect with 4 ranked leaves ..... **Willisia**
2. Secondary shoots not erect, without 4 ranked leaves ..... 3
3. Secondary shoots appressed, crustaceous; capsule anisolobous..... **Zeylanidium**
3. Secondary shoots free floating, ribbon like or filiform; capsule isolobous ..... **Polypleurum**

#### INDOTRISTICHA van Royen

**Indotristicha ramosissima** (Wight) van Royen, Acta Bot. Neerl., 8: 474. 1959; FTSR 372. 1996. *Dalzellia ramosissima* Wight, Ic. t.1920. f.1. 1852. *Terniola ramosissima* (Wight) Willis, Ann. Roy. Bot. Gard. (Peradeniya) 1: 208, 293, 306 tt. 5-9, f.29. 1902; FPM 1194. 1925. *Tristicha ramosissima* (Wight) Willis, Ann. Roy. Bot. Gard. (Peradeniya) 1: 208. 1902 & 1:293-306. ff. 5-9. 1902; FPM 1194. 1925.

Stem free floating, branched, to 60 cm long, attached to rock by base, stem with 1.5-2.5 cm long ramuli and scale leaves. Flowers 1-6 mm long, axillary along the stem; pedicels 1-2.5 cm long, slender, erect; perianth 3, free, 2 mm long, ovate; stamens 3; ovary 2.5 mm long, ellipsoid, stigma 3-lobed.

*Fl. & Fr.* January-March

*Distr.* Endemic to Southern Western Ghats. Common along the riverine areas; *PS 30059* Kanthalppara

#### POLYPLEURUM Warming

1. Secondary shoots filiform ..... **P. filifolium**
1. Secondary shoots ribbon like, branched or unbranched ..... 2
2. Thallus narrow; pedicels to 2 cm long ..... **P. dichotomum**
2. Thallus broad; pedicels to 4 cm long..... **P. stylosum**

**Polypleurum dichotomum** (Gard.) Hall, Kew Bull. 26: 131. 1972; FPL 392. 1990. *Podostemon dichotomum* Gard., Calcutta J. Nat. Hist. 7: 185. 1846; FBI 5: 64. 1886. *Dicraea dichotoma* (Gard.) Tul., Ann. Sci. Nat. Bot. ser. 3. 2: 101. 1849; FPM 1196. 1925.

Thallus to 20 x 0.5 cm, branched, ribbon like, free floating, base attached on rocks; secondary shoots marginal. Leaves to 3 x 0.5 mm, 2, unequal; floral bracts 6, distichous, keeled; flowers solitary on secondary shoot; stamens 2, monadelphous, staminodes ca. 3 mm long, 2, linear; style ca 1 mm long, lanceolate. Fruit ca 3 mm, ellipsoid, 8-ribbed, isolobous.

*Fl. & Fr.* November-February

*Distr.* Endemic to Southern Western Ghats. Fairly common in streams of evergreen forests; *PS 30311* Karappara

**Polypleurum filifolium** (Ramam. & Joseph) Nagendran *et al.*, Pl. Syst. Evol. 128: 217. 1977; FPL 392. 1990. *Dicraea filifolia* Ramam. & Joseph, Bull. Bot. Surv. India 6: 333. 1964.

Thallus crustaceous, reddish or green; secondary shoots filiform to 1.5-2 cm, 3 pairs. Leaves decussate, spatulate, upper most leaves with filaments. Flowers terminal, subsessile; stamens 2, *ca* 1.5 mm, subequal with pistil, staminodes *ca* 1.5 mm, filiform; ovary 1.5 mm, ellipsoid, style absent, stigma two papillate. Fruit to 2.5 x 1 mm, ellipsoid, 8-ribbed, isolobous.

*Fl. & Fr.* November-February

*Distr.* Endemic to Southern Western Ghats (Kerala). Common in Parambikulam river; *PS 30010* Orukomban

**Polypleurum stylosum** (Wight) Hall, Kew Bull. 26: 131. 1971; FPL 393. 1990; FTSR 373. 1996. *Dicraea stylosa* Wight, Ic. t. 1917. f.2. 1852; FPM 1196. 1925. *Podostemon stylosus* (Wight) Benth. ex Hook.f., FBI 5: 64. 1886. *P. algaeformis* (Bedd.) Benth. ex Hook.f., FBI 5: 65. 1886. *Dicraea algaeformis* Bedd., Trans. Linn. Soc. London 25: 223. t. 24. 1865.

Thallus ribbon like, branched, 15-20 cm long; attached at base; bracts 4-6, alternate, distichous. Spathella splitting into 4 or 5 lobes; pedicel 10 mm long. Tepals 2 mm long; stamens and andropodium 4 mm long; ovary 3 x 1 mm, 6-ribbed, stigma lobes subequal. Capsule 3 x 1.5 mm, ovoid, 6-ribbed, pedicel 1.2-1.5 cm long; seeds many.

*Fl. & Fr.* November-January

*Distr.* India and Sri Lanka. Fairly common in streams of evergreen forests; *PS 30140* Karappara; *NS 19778* Pooppara

#### WILLISIA Warming

**Willisia selaginoides** (Bedd.) Warming ex Willis, Ann. Roy. Bot. Gard. (Peradeniya) 1: 235. 1902; FPM 1198.1925; FPL 393.1990. *Mniopsis selaginoides* Bedd., Madras J. Lit. Sci. ser.3, 54. 1864. *Podostemon selaginoides* Benth. in Benth. & Hook.f., Gen. Pl. 3:113.1880; FBI 5: 68. 1886.

Thallus crustaceous, secondary shoot erect 5-10 cm, covered with 4 rows of triquetrous scales, crowded on the dorsal surface. Flowers sessile, solitary on a secondary shoot; stamens 2, *ca* 5.5 mm, equal or longer than ovary; ovary *ca* 4 mm, ellipsoid, style absent, stigma 2. Capsule 4-5 x 2.5 mm, smooth, sessile, anisolobous.

*Fl. & Fr.* December-March

*Distr.* Endemic to Southern Western Ghats. Rare in streams of evergreen forests; *PS 30031* Karappara

#### ZEYLANIDIUM Engler

**Zeylanidium lichenoides** (Kurz) Engl. in Engl. & Prantl., Nat. Pflanzenf. (ed. 2) 18a:62. 1928. *Podostemon acuminatus* Wedd. in DC., Prodr. 17: 75. 1873; FBI 65: 66. 1884. *P. microcarpus* Wedd. in DC., Prodr. 17: 76. 1873; FBI 5: 66. 1886. *Hydrobryum lichenoides* Kurz, J. Asiat. Soc. Bengal 42:103. 1873; FPM 1199. 1925.

Thallus ribbon like, lower smaller; upper larger. Spathella 2 x 1 mm, prostrate. Flowers 2.5 x 1 mm, zygomorphic; tepals 2, 1 mm long, scarious, subulate; stamens 2, monadelphous, andropodium 1.2 x 0.3 mm; anthers bilobed, lobes unequal; ovary 1.5 x 0.9 mm, ellipsoid, smooth; stigma bilobed, lobes unequal, smooth. Capsule 2 x 1 mm, anisolobous, ellipsoid, ribs 8; one lobe persistent, stalk 2 mm, long.

*Fl. & Fr.* November-January

*Distr.* India and Sri Lanka. Very common in streams; *PS 30646* Karappara

#### ARISTOLOCHIACEAE

1. Erect shrubs; flowers actinomorphic ..... **Thottea**  
 1. Climbers; flowers zygomorphic ..... **Aristolochia**

**ARISTOLOCHIA** Linnaeus

1. Leaves deeply cordate at base, to 18 x 10 cm..... **A. tagala**  
 1. Leaves subcordate or truncate at base, to 13 x 6 cm..... **A. indica**

**Aristolochia indica** L., Sp. Pl. 960. 1753; FBI 5: 75. 1886; FPM 1202. 1925; FPL 394. 1990; FTSR 373. 1996. *A. lanceolata* Wight, Ic. t. 1858. 1852.

Twiners; stem glabrous. Leaves to 13 x 6 cm, ovate-oblong, acuminate at apex, 5-ribbed from the flat or subcordate base, midrib with 3 or 4 pairs of lateral nerves; petiole 2 cm long. Flowers to 4.5 cm long, 3-5 together in axillary cymes, greenish-brown; pedicels 1.5 cm long, perianth tube 1.5 cm long, globose at base, hairy inside, glabrous outside, limbs obovate, brown, glabrous; stamens 6, filaments short, anthers adnate to the columnar style; ovary 6-celled. Capsule obovoid, glabrous; seeds to 10 x 7 mm, brown, samaroid.

*Fl. & Fr.* July-October

*Distr.* Indo-Malesia. Common in deciduous forests; *PS 30064* Kuchimudi

**Aristolochia tagala** Cham., Linnaea 7: 207. t. 5. f. 3. 1832; FPM 1202. 1925; FPL 394. 1990; FTSR 374. 1996. *A. roxburghiana* Klotzsch, Monatsber Koenigl. Preuss. Akad. Wiss. Berlin 596. 1859; FBI 5: 75. 1886. *A. acuminata* Roxb., Fl. Ind. 3: 489. 1832, non Lam. 1783.

Twiners; stem glabrous. Leaves to 18 x 10 cm, ovate, acuminate at apex, glabrous, 5-7-nerved from deeply cordate base; petiole 4-5 cm long. Flowers 6.5 cm long, in axillary raceme; bracts 5 mm long, ovate; perianth tube 1 cm long, hairy inside, glabrous outside; limb 4.5 cm long, 1 cm broad, brown, tomentose; stamens 12, biseriate; connective broad, anthers oblong; style 6-7-fid, short. Capsule obovoid, stalked, 6-celled.

*Fl. & Fr.* February-June

*Distr.* Indo-Malesia and China. Fairly common in evergreen forests; *PS 30644* Kanthalppara

**THOTTEA** Rottboell

**Thottea siliquosa** (Lam.) Ding Hou., Blumea 27: 327. 1981; FPL 395. 1990; FTSR 374. 1996. *Apama siliquosa* Lam., Encycl. 1: 91. 1783; FPM 1200. 1925. *Bragantia wallichii* R. Br. ex Wight & Arn., Edinb. New Phil. J. 15: 181. 1833; FBI 5: 73. 1886.

Shrubs; branchlets angled. Leaves to 25 x 8 cm, elliptic-oblong, inequilateral, acuminate at apex, tomentose below; nerves 5-8 pairs, basal pair rib-like, extending above the middle, nervules parallel; petiole 5 mm long. Flowers in axillary fascicles, 1-5 together, 1.5 cm across; perianth lobed, united into a cup, acute, yellow or brown, lined inside; stamens 12, united in 3 groups; stigma peltate, many-lobed. Capsule to 12 cm long, 5 mm broad, cylindrical; seeds 2 mm long, trigonous, rugose.

*Fl. & Fr.* Throughout the year

*Distr.* Peninsular India and Sri Lanka. Very common in evergreen and semi-evergreen forests; *PS 18856* Kanthalppara

**PIPERACEAE**

1. Climbers with nodal roots; spike leaf opposed..... **Piper**  
 1. Erect herbs or shrubs without nodal roots; spike terminal or axillary..... **2**  
 2. Spikes in axillary umbels ..... **Lepianthes**  
 2. Spikes terminal, solitary or paniced..... **Peperomia**

**LEPIANTHES** Rafinesque

**Lepianthes umbellata** (L.) Raf., *Sylva Tellur.* 85. 1838; FPL 395. 1990; FTSR 374. 1996. *Piper umbellatum* L., *Sp. Pl.* 30. 1753. *P. subpeltatum* Willd., *Sp. Pl.* 1: 166. 1797; FBI 5: 95. 1886. *Hackeria subpeltata* (Willd.) Kunth, *Linnaea* 13: 571. 1839; FPM 1208. 1925. *Pothomorphe subpeltata* (Willd.) Miq., *Comm. Phyt.* 37. 1840.

Erect herbs, to 1.5 m high; stem ridged. Leaves 20-40 cm, orbicular, rounded at apex, cordate at base, entire, pubescent above and below; nerves palmately radiating from base; petiole sheathing at base, to 20 cm long. Spikes 8-15 x 0.3 cm, cylindric, 3-7 together, umbellate, peduncled, axillary, bracts peltate, triangular, ciliate. Flowers densely packed; stamens 3, filaments short; ovary obovoid, truncate, stigmas 3, sessile, curved out. Berry trigonous, minute.  
*Fl. & Fr.* Throughout the year

*Distr.* Paleotropics. Common in secondary forests; *PS 19288* Karimala

#### PEPEROMIA Ruiz & Pavon

- |  |                         |
|--|-------------------------|
| 1. All leaves in whorls of 4; spike pubescent.....             | <b>P. tetraphylla</b>   |
| 1. Leaves otherwise; spikes glabrous.....                      | 2                       |
| 2. Spikes to 10 cm long; nutlets black punctate.....           | <b>P. thomsonii</b>     |
| 2. Spikes to 5 cm long;; nutlets not black punctate .....      | 3                       |
| 3. Leaves cordate at base, 5-7 ribbed, membranous.....         | <b>P. pellucida</b>     |
| 3. Leaves cuneate or rounded at base, thickly coriaceous ..... | 4                       |
| 4. Leaves rounded at base; nutlets rugose and scurfy .....     | <b>P. heyneana</b>      |
| 4. Leaves cuneate at base; nutlets minutely scaly .....        | <b>P. portulacoides</b> |

**Peperomia heyneana** Miq., *Syst. Piperac.* 123. 1843. *P. wightiana* Miq. in Hook.'s London J. Bot. 5: 548. 1846; FBI 5: 98. 1886; FPM 1210. 1925.

Terrestrial or sometimes epiphytic herbs, to 20 cm high. Leaves to 2 x 1.75 cm, orbicular, obtuse or shortly acute at apex, rounded at base, 5-ribbed, usually alternate; petiole 3 mm long. Spike 5 cm long, terminal or upper axillary, slender, glabrous, usually 2 or 3 together; bracts ovate, peltate. Nutlets 1 x 0.5 mm, ellipsoid, rugose, dark brown.

*Fl. & Fr.* July-December

*Distr.* South India and Sri Lanka. Common in rocky areas of evergreen forests; *PS 30506* Orukomban

**Peperomia pellucida** (L.) Kunth, *Nov. Gen. Sp.* 1: 64. 1815; FPM 1210. 1925; FPL 396. 1990. *Piper pellucidum* L., *Sp. Pl.* 30. 1753. *Peperomia exigua* (Blume) Miq., *Syst. Piperac.* 77. 1843; FBI 5: 97. 1886.

Fleshy herbs, to 20 cm high. Leaves alternate, to 3 x 2 cm, ovate, cordate at base, acute, glabrous, 5-ribbed, fleshy, shortly petioled. Spikes axillary, solitary, to 3 cm long, slender.

*Fl. & Fr.* Throughout the year except the dry seasons

*Distr.* Native of Tropical America; now Pantropical. Common in openings of moist deciduous forests; *PS 19021* Thunakkadavu

**Peperomia portulacoides** (Lam.) Dietr., *Sp. Pl. (ed. 6)* 1: 172.1831; FBI 5:98.1886; FPM 1210. 1925; FPL 396. 1990; FTSR 375. 1996. *Piper portulacoides* Lam., *Tabl. Encycl.* 1: 82. 1791.

Glabrous terrestrial herbs, 15-20 cm high. Leaves to 3.5 x 2.5 cm, obovate-rhomboid, obtuse at apex, cuneate at base, glabrous, upper opposite; lower alternate, smaller, 3-nerved from base. Spike terminal and axillary, 5 cm long, slender, glabrous; peduncle 2 cm long; bracts orbicular, sessile, margins white. Nut partially embedded in the rachis.

*Fl. & Fr.* September-December

*Distr.* Madagascar and South West India. Common in wet rocky areas of evergreen forests; *PS 19511* Orukomban

**Peperomia tetraphylla** (Forst.) Hook. & Arn., Bot. Beech Voy. 97. 1841; FPL 397. 1990. *Piper tetraphylla* Forst., Prod. 5. 1759. *Peperomia reflexa* (L. f.) Dietr., Sp. Pl. 1: 180. 1839; FBI 5: 99. 1886; FPM 1209. 1925. *Piper reflexum* L.f., Suppl. Pl. 91. 1781.

Epiphytic herbs; branches diffuse to procumbent; stem and leaves thinly pubescent. Leaves 7-10 x 5-7 mm, orbicular, obtuse. Spike 1.5 cm long, erect, stout; peduncle 0.8 cm long; bracts peltate, sessile, with white margins. Flowers densely arranged; stamens 2; stigmas 3-toothed. Nutlets 0.8 x 0.4 mm, ovoid, beaked, brown, glabrous.

*Fl. & Fr.* November-January

*Distr.* Africa, India, Sri Lanka, China, Indo-China, Malesia and America. Common in evergreen forests at higher altitudes; *PS 19270* Karimala

**Peperomia thomsonii** Hook.f., FBI 5: 97. 1886; FPM 1210. 1925.

Epiphytes on rock or tree crevices to 25 cm high. Leaves to 5 x 2 cm, elliptic, acute, base cuneate, petiole to 1.5 cm, 5 nerved from base. Spike terminal, to 6 cm, slender, flowers lax. Nutlets *ca* 1 x 1.5 mm, globose, scurfy.

*Fl. & Fr.* November-January

*Distr.* South India and Sri Lanka. Rare in the wet shades of evergreen forests; *PS 19216* Kariamchola

#### PIPER Linnaeus

- |  |                          |
|--|--------------------------|
| 1. Spike erect .....   | 2                        |
| 1. Spike pendulous .....   | 3                        |
| 2. Leaves obliquely cordate at base; female spike to 3 cm long .....     | <b>P. longum</b>         |
| 2. Leaves acute at base; female spike to 1 cm long .....                 | <b>P. mullesua</b>       |
| 3. Leaves penninerved; peduncles more than 7 cm long .....               | <b>P. barberi</b>        |
| 3. Leaves 3-7 nerved from base; peduncles to 5 cm long .....             | 4                        |
| 4. Branchlets and leaves pubescent; berries ovoid .....                  | <b>P. hymenophyllum</b>  |
| 4. Branchlets and leaves glabrous; berries otherwise .....               | 5                        |
| 5. Spikes more than 15 cm long .....                                     | <b>P. argyrophyllum</b>  |
| 5. Spikes less than 12 cm long .....                                     | 6                        |
| 6. Bracts cupular .....  | 7                        |
| 6. Bracts otherwise .....  | 8                        |
| 7. Receptacle distant; spikes glabrous .....                             | <b>P. galeatum</b>       |
| 7. Receptacle close; spikes minutely pubescent .....                     | <b>P. trichostachyon</b> |
| 8. Cupular bract hooded on one side; berry more than 0.5 cm across ..... | <b>P. wightii</b>        |
| 8. Cupular bract not hooded; berry less than 0.5 cm across .....         | <b>P. nigrum</b>         |

**Piper argyrophyllum** Miq., Syst. Piperac. 330. 1844; FBI 5: 93. 1886; FPM 1207. 1925; FTSR 375. 1996.

Climbing shrubs. Leaves 8-13 x 5-6 cm, ovate or elliptic, acuminate at apex, acute or rounded at base, oblique, lower side usually covered with white scales, glabrous, basely 7 nerved; petiole 1 cm long; stipule to 1.5 cm long, lanceolate. Spikes slender, leaf-opposed, drooping; peduncle 2-3 cm long; bracts oblong, adnate to the rachis with free margins, ciliate; stamens 2. Berry 3 x 3 mm, globose, stigma 4, curved.

*Fl. & Fr.* August-December

*Distr.* Sri Lanka and Western Ghats. Common in semi-evergreen forests; *PS 30701* Orukomban

**Piper barberi** Gamble, Kew Bull. 387. 1924 & FPM 1206. 1925; FTSR 375. 1996.

Slender climbing shrubs. Leaves 10-15 x 2-6 cm, oblong-lanceolate, abruptly acuminate at apex, acute or obtuse at base; lateral nerves 6-pairs, looped below the margins, glabrous and

glossy above; petiole 1 cm long; stipule 1.5 cm long, lanceolate. Spike to 15 cm long, glabrous, slender, pendulous; peduncles puberulous; bracts peltate, orbicular, entire. Flowers densely arranged; stamen 1. Berry 3.5 x 3.5 mm, globose; stigma 3-lobed.

*Fl. & Fr.* August-December

*Distr.* Endemic to Southern Western Ghats. Rare in evergreen forests; *PS 30254* Pezha

**Note:** This endangered species was considered restricted to the evergreen forests of Kannikatty in Tamil Nadu. It has been recently reported from Shenduruny, Achencoil, Thekkady and Thrissur. The present collection from the sanctuary demonstrates the continuous distribution up to the Palghat gap of Western Ghats.

**Piper galeatum** Cas. in DC., Prodr. 16: 242. 1869; FBI 5: 80. 1886; FPM 1205. 1925; FPL 397. 1990.

Stout climbing shrubs, glabrous. Leaves 10-16 x 3-6 cm, elliptic, acuminate, acute at base, 5-ribbed; petiole 1-1.5 cm long. Spike to 9 cm long, leaf-opposed, drooping, slender, male spike longer and slender; peduncle 1 cm long, reddish, glabrous; bracts formed into a fleshy globose cup. Flowers distant; stamens 2. Berry 8 x 8 mm, globose, smooth, yellow.

*Fl. & Fr.* October-January

*Distr.* Endemic to Southern Western Ghats. Rare in evergreen forests; *PS 18851* Kanthalppara; *NS 30548* Kariamchola; *PS 30563* Karimala

**Piper hymenophyllum** Miq. in Hook.'s. Lond. J. Bot. 5: 554. 1846; FBI 5: 93. 1886; FPM 1207. 1925; FPL 398. 1990. *Piper nilghirianum* C. DC. in DC., Prodr. 16: 364. 1869.

Slender climbers. Leaves to 13 x 6 cm, ovate, rounded to subcordate at base, often unequal sided, acuminate at apex, 7-ribbed, membranous; petiole 1 cm long. Spike 20 cm long, slender, drooping; male spike shorter; bracts oblong, adnate to the rachis with free margins, hairy; stamens 2 or 3. Berry 5 mm long, ovoid, beaked; stigma 3-lobed.

*Fl. & Fr.* Throughout the year

*Distr.* Endemic to Peninsular India. Common in semi-evergreen forests; *PS 30278* Pooppara

**Piper longum** L., Sp. Pl. 29. 1753; FBI 5: 83. 1886; FPM 1205. 1925; FTSR 376. 1996. *Chavica roxburghii* Miq. Syst. Piperac. 239. 1843.

Scandent or straggling shrubs, sometimes ascending and climbing. Leaves to 8 x 4 cm, ovate, acute at apex, cordate and strongly oblique at base, 7-nerved, membranous, shining above; nerves impressed; petiole 1-3 cm long. Female spike stout, erect; peduncle 1.5 cm long; bracts peltate, orbicular. Male spike to 7 cm long, erect, slender; stamens 2. Berry 2 mm across, glabrous, black or deep red.

*Fl. & Fr.* August-January

*Distr.* Indo-Malesia. Common in moist deciduous and semi-evergreen forests; *PS 18892* Muthalakkuzhi

**Piper mullesua** Buch.-Ham. ex D. Don, Prodr. Fl. Nep. 20. 1825. *P. brachystachyum* Wall. ex Hook.f., FBI 5: 87. 1886; FPM 1206. 1925. *Chavica sphaerostachya* Miq., Syst. Piperac. 239. 1843.

Slender climbers. Leaves to 9 x 4 cm, elliptic, acuminate at apex, acute at base, 3-5 ribbed from base, secondary nerves prominent, glabrous. Female spike to 7 x 4 mm, erect, oblong; peduncle 3 mm long; male spike to 4 cm long, erect, slender; bracts peltate, orbicular; stamens 3. Berry 1.5 mm across, red; stigmas 3, spreading.

*Fl. & Fr.* October-January

*Distr.* Endemic to Peninsular India. Rare in evergreen forests at higher altitudes; *PS 30273, 30274* Pooppara



**Piper nigrum** L., Sp. Pl. 28. 1753; FBI 5: 90. 1886; FPM 1206. 1925; FPL 398. 1990; FTSR 376. 1996.

Glabrous climbers. Leaves to 16 x 10 cm, ovate, acuminate at apex, acute, rounded or truncate at base, 7-nerved, nervules subparallel; petiole to 2.5 cm long. Spikes to 12 cm long, slender; peduncles to 2.5 cm long; bracts united forming a cup below the flower. Flowers closely placed; stamens 2. Drupes 5 mm across, globose, smooth, deep red; stigmas 3-5, recurved.

*Fl. & Fr.* August-January

*Distr.* Peninsular India and Sri Lanka. Common in moist deciduous and semi-evergreen forests; *PS 30319* Pooppara

**Piper trichostachyon** (Miq.) C. DC. in DC., Prodr. 16:242. 1869; FBI 5: 80. 1886; FPM 1205. 1925; FPL 399. 1990. *Muldera trichostachyon* Miq. in Hook.'s London J. Bot. 5: 556. 1846.

Stout climbers. Leaves 8-12 x 3-6 cm, elliptic-ovate, acuminate at apex, oblique and acute at base, 3-5-ribbed; petiole 1-2 cm long. Spikes to 10 cm long, stout, drooping; bracts pubescent, formed into a fleshy cup; stamens 2. Berry 6 x 6, globose, yellowish red; stigmatic lobes 3.

*Fl. & Fr.* March-December

*Distr.* Endemic to Peninsular India. Fairly common in evergreen forests; *PS 30702* Karimala

**Piper wightii** Miq. in Hook.'s London J. Bot. 5: 552. 1846; FBI 5: 94. 1886; FPM 1207. 1925; FTSR 376. 1996.

Stout glabrous climbers. Leaves 14-17 x 6-8 cm, ovate, acuminate at apex, round to subcordate at base, 3-5-ribbed, coriaceous, midrib with 2-3 lateral nerves similar to ribs, nervules reticulate; petiole 2 cm long. Spike 8 cm long stout, drooping; peduncle 2 cm long; bracts curved and hooded at one side. Flowers distantly arranged; stamens 2. Berry reddish, to 7 mm across, globose, smooth; stigmatic lobes 3 or 4.

*Fl. & Fr.* July-December

*Distr.* Endemic to Southern Western Ghats. Fairly common in evergreen forests; *PS 19164* Karimala

## CHLORANTHACEAE

### SARCANDRA Gardner

**Sarcandra chloranthoides** Gard., Calcutta J. Nat. Hist. 6: 348. 1846; FPL 399. 1990; FTSR 376. 1996. *Chloranthus brachystachya* sensu Hook.f., FBI 5: 100. 1886, p.p., non Blume 1829; FPM 1211. 1925. *Sarcandra grandifolia* (Miq.) Subram. & Henry, Bull. Bot. Surv. India 12: 5. 1972. *Chloranthus grandifolius* Miq., Fl. Ind. Bat. 1: 802. 1856.

Evergreen shrubs; branchlets glabrous, terete. Leaves opposite, to 17 x 6.5 cm, elliptic, acute at base and apex, serrate, glabrous; nerves 7 or 8 pairs. Flowers in terminal, trichotomous to 10 cm long spike, unisexual, clustered; bracts yellow, petaloid, 6 mm long, perianth absent; stamen 1, filaments and connectives broad, thick; ovary 1-ovuled; stigma sessile, truncate. Berry 8 x 4 mm, ovoid, purplish-black, smooth.

*Fl. & Fr.* October-February

*Distr.* India and Sri Lanka. Common in evergreen forests at higher altitudes; *PS 19415* Pooppara

## MYRISTICACEAE

1. Staminal column peltate, reddish..... **Knema**

1. Staminal column not peltate, yellowish ..... **Myristica**

**KNEMA** Loureiro

**Knema attenuata** (Hook. f. & Thoms.) Warb., Monogr. Myris. 590. 1897; FPM 1215. 1925; FPL 400. 1990; FTSR 377. 1996. *Myristica attenuata* Wall. ex Hook. f. & Thoms. in Hook.f., FBI 5: 110. 1886. *M. corticosa* Bedd., Fl. Sylv. t. 278. 1872.

Trees with radiating branches and reddish exudation; bark greyish black; branchlets rusty tomentose. Leaves to 20 x 7.5 cm, elliptic-oblong, acuminate at apex, rounded at base; fulvous tomentose below; nerves to 18 pairs, parallel; petiole to 1 cm long. Cymes axillary, peduncled, densely fulvous-tomentose; pedicels 7-8 mm long. Male flowers 7 mm across; perianth 3-lobed to the base; lobes triangular; spreading; stamens 12-14, arranged along the rim of the stipitate disc, anthers vertical; ovary 1-celled; style short; stigmas 2, lacinate. Capsule 4 x 2 cm, ellipsoid, cuspidate at apex, 2-valved; seed 1, ellipsoidal.

*Fl. & Fr.* February-August

*Distr.* Endemic to Western Ghats. Common in evergreen forests; *PS 18823* Parambikulam; *NS 30091* Kottayali; *PS 18984* Orukomban

**MYRISTICA** Gronovius

**Myristica dactyloides** Gaertn., Fruct. 1: 195, t. 41. f.202. 1788; FPL 400. 1990; FTSR 378. 1996. *M. laurifolia* Hook. f. & Thoms., Fl. Ind. 163. 1855; FBI 5: 103. 1886. *M. laurifolia* var. *lanceolata* Hook.f., FBI 5: 103. 1866. *M. beddomei* King, Ann. Roy. Bot. Gard. (Calcutta) 3: 291, t. 118. f.1-8,1891; FPM 1214. 1915. *M. contorta* Warb., Monogr. Myris. 5-7. 1897; FPM 1214. 1925.

Medium trees; bark brownish black, often with grey blotches, smooth with linear pustular lenticels, reddish inside, exudation red, scanty. Branches nearly horizontal. Leaves oblong, acute, base acute, coriaceous, glabrous above and glaucous below, to 25 x 7 cm; lateral nerves 15-20 pairs; petiole to 2 cm long. Perianth 6 mm long, yellow, tomentose outside. Anthers 10-15. Female flowers usually solitary. Capsule ovoid or subglobose,

*Fl. & Fr.* December-May

*Distr.* South India and Sri Lanka. Common in evergreen forests; *PS 19318* Kothala

**LAURACEAE**

- 1. Leaves 3-ribbed at base or little above from the base ..... 2
- 1. Leaves penninerved ..... 3
- 2. Leaves alternate; flowers in axillary or extra-axillary umbellules ..... **Neolitsea**
- 2. Leaves opposite or sub-opposite; flower in cymes or panicles ..... **Cinnamomum**
- 3. Leaves in whorls or pseudo-whorls..... **Actinodaphne**
- 3. Leaves alternate sometime crowded at apex ..... 4
- 4. Flowers in axillary or extra-axillary simple or compound racemose umbels..... **Litsea**
- 4. Flowers in racemes or panicles ..... 5
- 5. Anthers 2 celled ..... 6
- 5. Anthers 4 celled ..... 7
- 6. Drupe with persisting perianth tube; branchlets rusty puberulus..... **Cryptocarya**
- 6. Drupe without perianth tube; branchlets glabrous..... **Beilschmiedia**
- 7. Leaves alternate, equidistant; panicles many flowered..... **Persea**
- 7. Leaves alternate fascicled at apex of branchlets; panicles few flowered ..... 8
- 8. Staminal glands stipitate ..... **Phoebe**
- 8. Staminal glands sessile ..... **Alseodaphne**

### ACTINODAPHNE Nees

1. Flowers in sessile clusters nervules of leaves prominent ..... **A. tadulingamii**
1. Flowers in racemes; nervules of leaves obscure ..... **A. malabarica**

**Actinodaphne malabarica** Balakr., JBNHS 63: 329. 1967; FPL 402. 1990; FTSR 379. 1996. *A. hirsuta* Hook.f., FBI 5: 152. 1886, non Blume 1851; FPM 1231. 1925. *A. hookeri* sensu Bedd., Fl. Sylv. t. 296. 1873 p.p., non Meisner 1864.

Medium trees; branchlets densely dark hispid. Leaves to 18 x 6 cm, elliptic, acuminate, base acute; nerves 12-14 pairs, obscure towards margins; nervules parallel, obscure, densely hispid below, glabrous above; petiole 2 cm long. Racemes 2.5 cm long, densely tomentose; bracts 10 x 7 mm, orbicular. Flowers pedicelled; tepals 4 mm long, oblong, obtuse, densely hispid; filaments 2-glandular at base. Female flowers in short racemes; pedicels 12 mm long, slender. Berry 1 cm across, globose; fruiting calyx entire.

*Fl. & Fr.* August-February

*Distr.* Endemic to Southern Western Ghats. Common evergreen forests and riverine areas; *PS 19479* Thellikkal; *19163* Karimala

**Actinodaphne tadulingamii** Gamble, Kew Bull. 1925: 130. 1925 & FPM 1231. 1925; FPL 402. 1990; Pandurangan, & Nair, JETB 17: 173. 1993.

Medium trees; branchlets rusty tomentose. Leaves to 20 x 5 cm, elliptic-lanceolate, acuminate, base acute; nerves to 15 pairs, nervules parallel, prominent, densely hispid below, glabrate above; petiole to 1.5 cm long. Female flowers 3-5 together on lateral tubercles, sessile.

*Fl.* December-February

*Distr.* Endemic to Western Ghats. Fairly common in evergreen forests; *PS 30149* Kariamchola; *NS 30094* Kottayali

### ALSEODAPHNE Nees

**Alseodaphne semecarpifolia** Nees var. **parvifolia** Hook.f., FBI 5: 144. 1886; FPM 1226. 1925; FTSR 379. 1996. *A. semecarpifolia* sensu Wight, Ic. t. 1827. 1852, non Nees 1831.

Small trees, branchlets stout. Leaves 7-15 x 3-7 cm, obovate, obtuse, attenuate to base, glabrous; nerves 7 pairs. Panicle 5 x 3 cm, axillary; peduncle to 5 cm long, slender. Flowers 3-4 mm across, bisexual, pedicellate; tepals 6, obovate, glabrous without, densely rusty tomentose inside; stamens 9, in 3 rows; anthers of inner most row extrorse; filaments rusty tomentose; staminodes cordate, stalked; ovary ovoid, glabrous. Drupes 23 x 18 mm, ellipsoid to globose.

*Fl. & Fr.* April-February

*Distr.* Endemic to Southern Western Ghats. Fairly common in evergreen forests; *PS 30351* Vengoli; *NS 30175* Kottayali

### BEILSCHMIEDIA Nees

1. Leaves alternate; panicle to 3 cm long ..... **B. bourdillonii**
1. Leaves opposite or subopposite panicle more than 10 cm ..... **B. wightii**

**Beilschmiedia bourdillonii** Brandis, Indian Trees 528. 1906; FPM 1221. 1925; FTSR 380. 1996. *B. fagifolia* Bedd., Fl. Sylv. t. 263. 1872, non Nees 1831.

Large trees; branchlets glabrous. Leaves to 15 x 5 cm, elliptic, acute at base and apex, glabrous; nerves 8-10 pairs, irregular, nervules reticulate; petiole 1.5 cm long. Panicles to 3 cm across, axillary, tomentose; bracts many, ovate, pubescent. Flowers bisexual, 3 mm across, shortly pedicelled; perianth lobes 6, equal, 2 x 1 mm, ovate, tomentose outside; stamens 9, in 3 rows; outer filaments with 2 glands at the base; anthers of innermost row extrorse, staminodes 3, inner to stamens; ovary tomentose.

*Fl. & Fr.* January

*Distr.* Endemic to Peninsular India. Occasional in evergreen forests: *PS 30565* Kariamchola

**Beilschmiedia wightii** (Nees) Benth. ex Hook.f., *FBI* 5: 124. 1886; *FPM* 1221. 1925; *FTSR* 380. 1996. *Haasia wightii* Nees, *Syst. Laurin.* 676. 1836.

Medium trees; branchlets rough, glabrous. Leaves to 10 x 6 cm, broadly ovate, obtusely acuminate at apex, acute at base, coriaceous; nerves to 8 pairs, nervules, coarsely reticulate, glabrous; petiole to 1 cm long; panicles axillary and terminal, branches slender. Berry 3 x 2 cm, ovoid, smooth.

*Fl. & Fr.* January-February

*Distr.* Endemic to Southern Western Ghats. Occasional in evergreen forests at higher altitudes; *PS 30616* Pandaravarai

#### CINNAMOMUM Schaeffer

1. Leaves yellowish brown tomentose below..... **C. sulphuratum**
1. Leaves glabrous..... 2
2. Leaves more the 15 cm long, ribs reaching to apex..... **C. malabatum**
2. Leaves to 12 cm long, ribs not reaching to apex ..... 3
3. Panicles glabrous or glabrescent; petiole to 2.5 cm long..... **C. keralaense**
3. Panicles fulvous tomentose; petiole to 1.5 cm long..... **C. wightii**

**Cinnamomum keralaense** Kosterm., *Bull. Bot. Surv. India* 25: 98. 1983. *C. litseaefolium* sensu Hook.f., *FBI* 5: 133. 1886.

Medium trees. Leaves to 11 x 5 cm, ovate, acute-acuminate at apex, cuneate at base, ribs from 1 cm above the base; nervules not prominent, subparallel; petiole 2.5 cm long. Panicle 5-10 cm long, axillary; peduncle 7 cm long, slender. Flowers 6 mm across; pedicels 4 mm long, slender, pubescent; tepals 5, ovate, obtuse, densely tomentose; fertile stamens in second and fourth whorls, filaments sparsely tomentose; staminodes in first and third whorls, hairy.

*Fl. & Fr.* December-January

*Distr.* Endemic to Southern Western Ghats. Rare in evergreen and semi-evergreen forests; *PS 30535* Pandaravarai

**Cinnamomum malabatum** (Burm. f.) Blume, *Bijdr.* 568. 1826; *FPL* 403. 1990; *FTSR* 380. 1996. *Laurus malabatum* Burm. f., *Fl. Ind.* 92. 1768. *Cinnamomum iners* sensu Gamble, *FPM* 1224. 1925.

Small to medium trees; branchlets glabrous. Leaves to 22 x 8 cm, oblong, acute at base and apex, ribbed from or 1.5 cm above the base; petiole 2 cm long. Panicle 10-20 x 3-5 cm, upper axillary, densely yellow-tomentose. Flowers 3-4 mm across; pedicels 3 mm long; tepals ovate, acute; stamens in first and forth whorls; filaments tomentose; staminodes in second and third whorls; ovary glabrous.

*Fl. & Fr.* February-June

*Distr.* Endemic to Southern Western Ghats. Common in moist deciduous and evergreen forests; *PS 18864* Karimthalappara; *19992* Anakalvayal

**Cinnamomum sulphuratum** Nees in Wall., *Pl. Asiat. Rar.* 2: 74. 1830; *FBI* 5: 132. 1886; *FPM* 1225. 1925; *FPL* 403. 1990; *FTSR* 381. 1996.

Medium trees; branchlets tomentose. Leaves 8-15 x 2-5 cm, elliptic to linear-elliptic, acute at either ends, yellowish-tomentose below; ribs from the base reaching the apex; nervules regular, sub-parallel; petiole 7-15 mm long. Panicle 3 x 3 cm, axillary, tomentose; peduncle *ca.* 7 cm long. Flowers 5 mm long; pedicels hairy; sepals 5, oblong, densely hairy; stamens in 3 whorls; glands globose; staminodes triangular.

*Fl. & Fr.* March-June

*Distr.* Endemic to Western Ghats. Rare in evergreen forests at higher altitudes; *PS* 30224 Karimala; 30526 Pandaravarai

**Cinnamomum wightii** Meisner in DC., Prodr. 15: 11. 1864; FBI 5: 132. 1886; FPM 1224. 1925; FPL 403. 1990.

Small trees; branchlets glabrous. Leaves to 9 x 4 cm, elliptic, acute at either ends, glabrous, glaucous below; ribs 1 cm above the base, nervules parallel, regular, distinct; petiole 12 mm long, stout, glabrous. Cymes to 3 cm long, to 10-flowered. Flowers 6 mm long, closely packed; pedicels 5 mm long; tepals oblong, obtuse.

*Fl. & Fr.* May-June

*Distr.* Endemic to Southern Western Ghats. Rare in evergreen forests at higher altitudes; *PS* 30680 Pandaravarai

#### CRYPTOCARYA R. Brown

1. Leaves to 10 cm long; drupe oblong, puberulus..... **C. beddomei**

1. Leaves more than 10 cm long; drupe globose, glabrous..... **C. bourdillonii**

**Cryptocarya beddomei** Gamble, Kew Bull. 1925: 127. 1925 & FPM 1218. 1925.

Medium trees; branchlets rusty puberulus. Leaves to 12 x 6.5 cm, ovate-oblong, shortly acuminate at apex, rounded at base, glabrous; nerves 9 pairs, nervules sub-parallel, pinkish brown beneath; petiole 1 cm long, stout. Panicle to 12 x 4 cm, axillary, rusty puberulus; peduncles short. Drupes 10 x 6 mm, puberulus.

*Fl. & Fr.* September-January

*Distr.* Endemic to Southern Western Ghats. Rare in evergreen forests at higher altitudes; *PS* 30055 Thelliyalimattukkal

**Cryptocarya bourdillonii** Gamble, Kew Bull. 1925: 125. 1925 & FPM 1218. 1925; FTSR 381. 1996. *C. wightiana* sensu Hook.f., FBI 5: 120. 1886.

Large trees; branchlets rusty puberulus. Leaves to 16 x 7 cm, abruptly acute to acuminate, glabrous; nerves 9 or 10 pairs; nervules sub-parallel, prominent beneath; petiole 2 cm long, tomentose. Panicle 5-7 cm across, axillary, rusty tomentose. Flowers 3-4 mm across, shortly pedicelled; perianth lobes 6, 3 mm long, ovate, tomentose; stamens 12, filaments pubescent, outer ones with glands; ovary glabrous. Drupes globose with an obtuse beak, glabrous.

*Fl. & Fr.* February-August

*Distr.* Endemic to Western Ghats. Fairly common in evergreen forests at higher altitudes; *PS* 30008, 30434, 19666 Karimala

#### LITSEA Lamarck

1. Branchlets and leaves glabrous ..... 2

1. Branchlets and leaves hairy ..... 6

2. Umbellules solitary or fascicled ..... 3

2. Umbellules in racemes..... 4

3. Leaves pseudoverticillate; umbellules peduncled ..... **L. quinqueflora**

3. Leaves equidistant; umbellules sessile..... **L. coriacea**

4. Berry depressed globose, to 2.5 cm across, deep red ..... **L. oleoides**

4. Berry ellipsoid or ovoid, to 1.5 cm long, reddish-brown or green ..... 5

5. Leaves white-glaucous beneath; perianth tube cup shaped ..... **L. stocksii** var. **glabrescens**

5. Leaves not as above; perianth tube obscure ..... **L. glabrata**

6. Umbellules solitary ..... **L. deccanensis**

6. Umbellules in fascicles, cymes, spikes or racemes ..... 7

7. Umbellules sessile..... **L. bourdillonii**

7. Umbellules peduncled..... 8

8. Leaves to 10 cm long, margins recurved.....**L. wightiana**  
 8. Leaves to 20 cm long, margins not recurved..... **L. floribunda**

**Litsea bourdillonii** Gamble in Kew Bull. 1925:131.1925 & FPM 1237.1925; FTSR 382. 1996.

Medium trees; branchlets dark brown-tomentose. Leaves to 20 x 9 cm, obovate, abruptly acute at apex, cuneate at base; nerves to 15 pairs, parallel, pale white beneath, punctate below; petiole 1.5 cm long, stout, tomentose. Umbellules 2-5 together, axillary, fascicled; bracts orbicular, densely white-tomentose. Flowers 4-6 in an umbellule, densely hairy; stamens 12, filaments glabrous, outer ones with short glands at base.

*Fl.* December

*Distr.* Endemic to Southern Western Ghats. Fairly common in evergreen forests at higher altitudes; *PS 30790* Pezha

**Litsea coriacea** (Heyne ex Meisner) Hook.f., FBI 5: 166. 1886; FPM 1236. 1925; FPL 404. 1990; FTSR 382. 1996. *Tetranthera coriacea* Heyne ex Meisner in DC., Prodr. 15: 186. 1864.

Small to medium trees; branchlets glabrous. Leaves to 16 x 5 cm, elliptic to obovate, acute at base, acuminate at apex, coriaceous; nerves 4-6 pairs; intercostae faint; petiole 1 cm long. Umbellules 3-6 together, sessile, axillary on leafscars. Flowers 8-10 in an umbellule; perianth lobes oblong, finely hirsute; stamens 12.

*Fl.* February-May

*Distr.* Endemic to Peninsular India. Common in evergreen and occasional in moist deciduous forests; *PS 19916* Karimala; *19805* Thellikkal; *19664* Kuriarkutty

**Litsea deccanensis** Gamble, FPM 1235. 1925. *L. tomentosa* Heyne ex Nees in Wall., Pl. Asiat. Rar. 2: 65. 1830, non Blume 1826; FBI 5: 157. 1886. *Tetranthera tomentosa* Roxb. ex Wight, Ic. t. 1834. 1852.

Small trees; young branchlets and leaves fulvous tomentose. Leaves to 20 x 9 cm, ovate, elliptic, apex acute, base cuneate; petiole to 4 cm. Umbellules solitary, axillary; peduncles to 1.5 cm; involucre bracts 4, concave, tomentose outside; female flowers 6-8 per umbellule; pedicels 3 mm, pubescent, perianth absent, staminodes many, linear; ovary 1 mm, 1-ovuled, style 3 mm.

*Fl. & Fr.* November-February

*Distr.* South India and Sri Lanka. Rare in evergreen forests; *PS 18913* Karimala

**Litsea floribunda** (Blume) Gamble, Hook. f., FBI 1238. 1925; FPL 405. 1990; FTSR 382. 1996. *Cylicodaphne floribunda* Blume, Mus. Bot. Lugd.-Bat. 1: 387. 1851. *Tetranthera wightiana* sensu Bedd., Fl. Sylv. t. 293. 1873, non Nees 1836. *Litsea wightiana* Hook.f., FBI 5: 177. 1886.

Tall trees; branchlets tomentose. Leaves to 18 x 9 cm, obovate, obtuse, acute at base, fulvous-tomentose below; nerves to 13 pairs, prominent below, nervules subparallel; petiole 1 cm long. Racemes to 4 cm long, axillary. Umbellules few, peduncle 8 mm long; bracts orbicular, densely tomentose. Flowers 6-8 in an umbellule; perianth lobes silky tomentose; stamens 12. Female umbellules paniced. Drupes 1 cm across, obovoid; fruiting calyx 1 cm across, cupular.

*Fl. & Fr.* December-February

*Distr.* Endemic to Western Ghats. Common in evergreen forests; *PS 30092* Kottayali; *30267* Pooppara

**Litsea glabrata** (Wall. ex Nees) Hook.f., FBI 5: 174. 1886; FPM 1237. 1925; FPL 405. 1990. *Tetranthera glabrata* Wall. ex Nees in Wall., Pl. Asiat. Rar. 2: 67. 1830.

Medium trees; branchlets glabrous. Leaves to 18 x 5 cm, elliptic to linear oblong, acute at base and apex, coriaceous; nerves 7 pairs; petiole 1.5 cm long. Racemes 2-6 cm long, axillary. Flowers 3-6 together; tepals ovate, hispid outside, filaments glandular hairy. Berry ovoid; fruiting perianth obconic.

*Fl. & Fr.* January-June

*Distr.* Endemic to Southern Western Ghats. Fairly common in evergreen forests; *PS 30439* Karimala

**Litsea oleoides** (Meisner) Hook.f., *FBI 5: 175. 1886; FPM 1236. 1925; FPL 405. 1990; FTSR 383. 1996. Tetranchera oleoides Meisner in DC., *Prodr. 15: 195. 1864.**

Large trees; branchlets angled, glabrous. Leaves to 18 x 6 cm, oblong, acute at both ends, pale beneath; nerves ca. 12 pairs, not prominent; petiole 2.5 cm long. Umbellule 6 mm across, in long axillary raceme, peduncles 6 mm long; bracts orbicular, pubescent. Flowers 3-6 in an umbellule, pedicelled; stamens 9, all filaments with sessile glands at base, filaments hairy. Staminodes in female flowers 3-seriate, glandular at base. Berry glabrous, 2-2.5 cm across, red with white spots.

*Fl. & Fr.* August-April

*Distr.* Endemic to Southern Western Ghats. Fairly common in evergreen forests; *PS 30320* Orukomban

**Litsea quinqueflora** (Dennst.) Suresh in Nicols. *et al.*, *Interpr. Hort. Malab. 158. 1988. Darwinia quinqueflora* Dennst., *Schluss. Hort. Malab. 12, 20, 31. 1818. Tetranchera ligustrina* Nees in Wall., *Pl. Asiat. Rar. 2: 65. 1830. Litsea ligustrina* (Nees) Hook.f., *FBI 5: 158. 1886; FPM 1235. 1925.*

Small trees; branchlets densely tomentose. Leaves to 20 x 9 cm, obovate, obtuse at apex, acute to the base; nerves 9-11 pairs, reticulate; petiole 2.5 cm long. Peduncle 1.5-2 cm long. Umbellules 10-20 mm across; bracts orbicular, densely tomentose outside. Flowers to 25 in an umbellule, pedicels 4 mm long; perianth lobes 3-5 or absent, 2 mm long, densely hairy; stamens 25-30, filaments bearded.

*Fl. & Fr.* August-October

*Distr.* Endemic to Southern Western Ghats. Rare in stream sides of evergreen forests; *PS 30330* Pezha

**Litsea stocksii** (Meisner) Hook. f. var. **glabrescens** (Meisner) Hook. f., *FBI 5: 176. 1886; FPM 1236. 1925. Cylicodaphne wightiana* Nees var. *glabrescens* Meisner in DC., *Prodr. 15:201. 1864.*

Medium trees. Leaves to 13 x 5 cm, elliptic-oblong, acute, lateral nerves obscure, white glaucous below; petiole to 1 cm. Racemes to 5 cm, umbellule to 5 mm; flowers pedicelled; fruiting calyx ca 10 mm across, crenate. Drupe 10 x 6 cm, ellipsoid, reddish-brown.

*Fl.* December-February

*Distr.* Endemic to Peninsular India. Rare in evergreen forests at higher altitudes; *PS 19697* Karimala

**Litsea wightiana** (Nees) Hook. f. in Benth. & Hook. f., *Gen. Pl. 3: 162. 1880; FPM 1238. 1925. Cylicodaphne wightiana* Nees in Wall., *Pl. Asiat. Rar. 2: 68. 1830.*

Large trees. Leaves to 11 x 4 cm, elliptic-lanceolate, acute, cuneate at base, coriaceous, reddish brown beneath, tomentose, later becomes glabrous; nerves ca. 8 pairs, transverse nervules faint, margins thick; petiole to 2 cm. Racemes axillary, to 7 cm; umbellules 8 mm across, globose, ferrugineous, tomentose.

*Fl. & Fr.* March-July

*Distr.* Endemic to Southern Western Ghats. Fairly common in evergreen forests; *PS 19580* Karimalagopuram; *NS 19918, PS 30437* Karimala

#### NEOLITSEA (Bentham) Merrill

1. Leaves elliptic-lanceolate; fruiting calyx to 3 mm across..... **N. cassia**
1. Leaves ovate; fruiting calyx to 7 mm across ..... **N. scrobiculata**

**Neolitsea cassia** (L.) Kosterm., J. Sci. Res.(Jakarta) 1: 85. 1952; FTSR 383. 1996. *Laurus cassia* L., Sp. Pl. 369. 1753. *Neolitsea zeylanica* (Nees) Merr., Philipp. J. Sci. Suppl. 1: 57. 1906; FPM 1239. 1925; FPL 406. 1990. *Litsea zeylanica* Nees, Amoen. Bot. Benn. Fasc. 1: 58. t.5. 1823; FBI 5: 178. 1886.

Large shrubs to small trees; branchlets slender, glabrous. Leaves to 9 x 3 cm, elliptic-lanceolate, acuminate at apex, attenuate to the base, glaucous beneath, thin, subcoriaceous; ribs from above the base, nervules indistinct; petiole 8 mm long. Umbellule 6-8 mm across, sessile, in fascicles of 3-5; bracts 4 mm long, oblong, obtuse, glabrous. Berry 1.5 x 1 cm, ellipsoid, smooth, black; calyx cup toothed.

*Fl. & Fr.* March-December

*Distr.* Indo-Malesia. Common in evergreen forests; *PS 19429* Pooppara; *30142* Kariamchola

**Neolitsea scrobiculata** (Meisner) Gamble, FPM 1240. 1925; FPL 406. 1990. *Litsea scrobiculata* Meisner in DC., Prodr. 15: 223. 1864. *L. zeylanica* sensu Hook.f., FBI 5: 178. 1886, p.p., non Nees 1823.

Medium trees; branchlets glabrous, black. Leaves to 9 x 6 cm, ovate, abruptly obtusely acute or acuminate, attenuate at base, densely scrobiculate, 3-ribbed from the base, midribs with 1-3 pairs of lateral nerves. Peduncle 8 mm long. Berry 12 x 10 mm, obovoid to globose; calyx cup obconic, entire.

*Fl. & Fr.* December-March

*Distr.* Endemic to Western Ghats. Fairly common in evergreen forests; *PS 30116, 30438, 30441, 30200* Karimala; *NS 30362* Kariamchola; *PS 30377* Pandaravarai

#### PERSEA P. Miller

**Persea macrantha** (Nees) Kosterm., Reinwardtia 6: 193. 1962; FPL 407. 1990; FTSR 383. 1996. *Machilus macrantha* Nees in Wall., Pl. Asiat. Rar. 2: 70. 1830; FBI 5: 140. 1886; FPM 1227. 1925. *M. glaucescens* Wight, Ic. t. 1825.

Large trees; bark granular, smelling; branchlets glabrous. Leaves to 20 x 10 cm, ovate-oblong, obtuse or obtusely acute, glaucous beneath; nerves 10-12 pairs; petiole 3-4 cm long. Panicle to 20 x 10 cm, axillary or terminal; branches white, thinly pubescent. Flowers 8-10 mm across, shortly pedicelled; perianth lobes 6, greenish white, 6 mm long, ovate; stamens 9, 3-seriate, innermost row with extrorse anthers, filaments pubescent; ovary conical, 1-celled, pubescent. Drupes 1.2 cm across, globose, black, glabrous.

*Fl. & Fr.* March-December

*Distr.* Peninsular India and Sri Lanka. Common in evergreen and semi-evergreen forests; *PS 19951* Karimala

#### PHOEBE Nees

1. Branchlets densely rusty tomentose..... **P. wightii**  
 1. Branchlets glabrous ..... **P. lanceolata**

**Phoebe lanceolata** Nees, Syst. Laurin. 109. 1836; FBI 5: 141. 1886; FPM 1228. 1925.

Small trees; branchlets slender. Leaves to 18 x 6 cm, oblanceolate, long-acuminate, attenuate to the base; nerves 9-11 pairs; nervules subparallel; petiole 1.5 cm long. Peduncle 6-8 cm long, slender, axillary; pedicels 5-10 mm long, glabrous. Flowers 5 mm across; perianth lobes 2.5 mm long, ovate, glabrous, connate at base; stamens 9; filaments 1.5 mm long, pubescent with two reniform appendages at base. Berry 15 x 8 mm, ellipsoid, glabrous, black. Fruiting perianth lobes 5 x 3 mm.

*Fl. & Fr.* October-December



*Distr.* India and Myanmar. Common in evergreen forests; *PS 19154* Karimala; *19315* Kothala; *NS 19758* Pooppara

**Phoebe wightii** Meisner in DC., Prodr. 15: 38. 1864; FPM 1228. 1925. *P. paniculata* Hook.f., FBI 5: 142. 1886, non Nees 1836.

Small to medium trees; branchlets stout. Leaves to 15 x 6 cm, obovate, shortly acuminate, acute at base, glabrous above, tomentose below; nerves 9-11 pairs, prominent beneath, nervules subparallel; petiole 1 cm long, stout. Peduncle 5 cm long, axillary, slender, pubescent, 6-12-flowered. Flowers 6 mm across; perianth lobes 3 mm long, ovate, densely hairy; ovary thinly pubescent; stamens 12, outer filaments 2-glandular at base; ovary thinly hairy.

*Fl. & Fr.* April-May

*Distr.* India and Myanmar. Common in evergreen forests; *PS 30371* Kariamchola

## HERNANDIACEAE

### GYROCARPUS N.J. Jacquin

**Gyrocarpus asiaticus** Willd., Sp. Pl. 4: 982. 1806. *G. jacquinii* Roxb., Pl. Corom. t. 1. 1795 p.p.; FBI 5: 461. 1878. *G. americanus* sensu Gamble, FPM 1242. 1925, non Jacq. 1763.

Deciduous trees, bark silver coloured, shining. Leaves mostly crowded at apex of branches, sometimes lobed, to 15 x 15 cm, broadly ovate, apex acuminate, base subcordate or truncate; petiole to 15 cm. Panicles of cymes subterminal, to 4 cm, tomentose; flowers polygamous, greenish-yellow; tepals 7, to 1.5 mm, ovate, concave, pubescent; stamens 4, filaments 2 mm; staminodes glandular, obtuse, fleshy; ovary inferior. Fruit 1 x 0.8 cm, ovoid, pubescent, wings 2, spathulate, to 5 cm.

*Fl. & Fr.* December-April

*Distr.* Tropical West and East Africa, Tropical Asia and Polynesia. Common in dry deciduous forests; *PS 30486* Kuchimudi; *NS 30071* Pandaravarai

## THYMELEACEAE

### GNIDIA Linnaeus

**Gnidia glauca** (Fresen.) Gilg, Bot. Jahrb. 19: 265. 1894. *Lasiosiphon glaucus* Fresen., Flora 21: 603. 1838. *Gnidia eriocephala* Meisner in Denkschr., Koenigl.-Baier. Bot. Ges. Regensburg 3: 292. 1841. *Lasiosiphon eriocephalus* (Meisner) Decne. in Jacq., Voy. 148. 1844; FBI 5: 197. 1886; FPM 1244. 1925

Small trees or large shrubs; branchlets glabrous. Leaves spiral, to 9 x 1.5 cm, oblong, acute at apex, rounded at base, entire, glabrous, penninerved; petiole 2-3 mm long. Flowers many, in terminal heads surrounded by leafy bracts; pedicels 3 mm long; perianth 15 mm long, tubular, silky hairy at the middle, lobes 5, short; stamens 10, biseriate, free, filaments attached to the perianth tube; ovary 1-celled, ovule solitary; stigma capitate. Capsule 4 x 1 mm, ellipsoid, thinly hairy, covered by the persisting base of the perianth tube.

*Fl. & Fr.* January-June

*Distr.* India, Sri Lanka and Africa. Common in rocky areas at higher altitudes; *PS 19237* Vengoli

## ELAEAGNACEAE

### ELAEAGNUS Linnaeus

**Elaeagnus indica** Serv., Bull. Herb. Boiss. (Ser.2) 8: 393. 1908; FPM 1246. 1925.

Thorny climbers, densely covered with silvery scales; thorns axillary, straight, 1-2 cm long. Leaves to 14 x 7.5 cm, ovate, acute, glabrous above, silvery-white below; nerves 5-7 pairs,

indistinct. Flowers bisexual, 3-6 in axillary fascicles, pedicelled; perianth greenish white, 1 cm long, urceolate, gamotepalous, lobes 4, ovate; stamens 4, filaments free, broadened below; anthers transverse; ovary 1-celled; inferior; ovules solitary; style filiform, stigma lateral. Fruit a nut covered with thickened perianth base, 2.6 x 1.2 cm, reddish, fleshy.

*Fl. & Fr.* November-April

*Distr.* Indo-Malesia. Common along the margins of evergreen forests; *PS 19110* Erumappara

## LORANTHACEAE

- |   |                     |
|---|---------------------|
| 1. Leaves alternate.....                                    | <b>Taxillus</b>     |
| 1. Leaves opposite or sub-opposite.....                     | 2                   |
| 2. Petals 4.....  | 3                   |
| 2. Petals 5 or 6.....                                       | 4                   |
| 3. Flowers in cymes or fascicles; corolla gamopetalous..... | <b>Scurrula</b>     |
| 3. Flowers in spikes or racemes; corolla polypetalous.....  | <b>Helixanthera</b> |
| 4. Flowers bracteate and bracteolate.....                   | <b>Macrosolen</b>   |
| 4. Flowers ebracteolate.....                                | 5                   |
| 5. Flowers sessile; leaves 3-5 ribbed from base.....        | <b>Helicanthes</b>  |
| 5. Flowers pedicelled; leaves penninerved.....              | <b>Dendrophthoe</b> |

### DENDROPTHOE C. F. P. Martius

- |   |   |
|---|---|
| 1. Branchlets trigonous; leaves fleshy.....                         | <b>D. trigona</b>                       |
| 1. Branchlets terete; leaves coriaceous.....                        | 2                                       |
| 2. Bracts and calyx pubescent; leaves acute at base.....            | <b>D. falcata</b> var. <b>pubescens</b> |
| 2. Bracts and calyx glabrous; leaves obliquely cordate at base..... | <b>D. falcata</b> var. <b>falcata</b>   |

**Dendrophthoe falcata** (L. f.) Etting., Denkschr. Kaiserl. Akad. Wiss., Math.-Naturwiss. Kl. 32: 52,53,58. t.13. 1872, var. **falcata**; FPL 409. 1990; FTSR 385. 1996. *Loranthus falcatus* L. f., Suppl. Pl. 211. 1781. *L. longiflorus* Desr. in Lam., Encycl. 3: 598. 1792; FBI 5: 214. 1886; FPM 1253. 1925. *L. longiflorus* Desr. var. *falcata* (L. f.) Kurz, For. Fl. Burma 2: 321. 1877; FBI 5: 215. 1886; FPM 1253. 1925. *L. longiflorus* Desr. var. *amplexifolia* (DC.) Thw., Enum. Pl. Zeyl. 134. 1859; FBI 5: 215. 1886; FPM 1253. 1925.

Branches stout, smooth. Leaves to 20 x 10 cm, ovate-falcate, acute or obtuse at apex or orbicular, cordate at base, glabrous, coriaceous. Racemes to 8 cm long, axillary, drooping, glabrous. Flowers many, closely packed; pedicel 3 mm long; calyx cupular; corolla 5 cm long, pink with greenish lobes; style glabrous, stigma slightly wider than style. Berry 10 mm across, ovoid, crimson, smooth.

*Fl. & Fr.* October-January

*Distr.* Indo-Malesia to Australia. Common parasite on deciduous trees; *PS 19609* Vengoli

**Dendrophthoe falcata** (L. f.) Etting. var. **pubescens** (Hook. f.) Chandrab. in Henry *et al.*, Fl. Tamil Nadu 2: 215. 1987. *Loranthus longiflorus* Desr. in Lam., Encycl. 3: 598. 1792, var. *pubescens* Hook.f., FBI 5: 215. 1886; FPM 1253. 1925.

Branches stout, smooth. Leaves 6-15 x 2-4 cm, elliptic-oblong, obtusely acute, base truncate to sub-cordate, glabrous; nerves 3-5 pairs, sub-prominent; petiole 2-3 mm long, flattened. Racemes 2-3 cm long, pubescent; pedicel 3 mm long. Flowers many; corolla pink, 3 cm long, pubescent outside, lobes 7 mm long, curved; tube inflated above the middle, white below, pink middle and green above.

*Fl. & Fr.* January-June

*Distr.* Endemic to Peninsular India. Common parasite on deciduous trees; *PS 19081* Padippara; *30090* Orukomban; *30609* Anappadi

**Dendrophthoe trigona** (Wight & Arn.) Danser ex Sant., Rec. Bot. Surv. India 16: 163. 1953. *Loranthus trigonus* Wight & Arn., Prodr. 386. 1834; FBI 5: 219. 1886; FPM 1253. 1925.

Parasitic shrubs; branches to 15 mm thick, rugose, glabrous. Leaves to 20 x 13 cm, ovate, obtuse, acute at base, coriaceous; petiole 1.5 cm long, flattened or winged. Racemes to 3 cm long; bracts cup shaped. Flowers pink; calyx cupular, truncate, glabrous; corolla 15-20 mm long, split to the middle. Berry 1 x 0.5 cm, obovoid.

*Fl. & Fr.* December-March

*Distr.* Endemic to Western Ghats. Common parasite on deciduous trees; *PS 19653* Vengoli

#### HELICANTHES Danser

**Helicanthes elastica** (Desr.) Danser, Verh. Akad. Wet. afd. Natuurk. Sect. 2. 29: 55. 1933; FPL 410. 1990; FTSR 385. 1996. *Loranthus elasticus* Desr. in Lam., Encycl. 3: 599. 1792; FBI 5: 216. 1886; FPM 1254. 1925. *L. euphorbiae* Wight, Calcutta J. Nat. Hist. 6: 363. 1846 & Ic. t. 1063. 1846. *Dendrophthoe elasticus* (Desr.) Danser, Bull. Jard. Bot. Buitenz. ser. 3, 10: 308. 1929.

Branches woody, thickened at nodes, glabrous. Leaves to 10 x 5 cm, opposite, ovate, obtuse, ribbed from base; base obtuse or truncate, glabrous. Flowers axillary, fascicled, 1-3 together, sessile; bracts minute; calyx tube cupular, truncate; corolla 2.5 cm long, lobes 5, spirally twisted, pale pink, tube lined with vertical pubescence inside; stamens 5; filaments and style slender, crimson; stigma globose. Berry 5 mm across, globose, red.

*Fl. & Fr.* March-April

*Distr.* Endemic to Western Ghats. Fairly common in deciduous forests; *PS 19260* Thellikkal

#### HELIXANTHERA Loureiro

1. Leaves to 12 cm long; petals to 7 mm long.....**H. wallichiana**

1. Leaves to 7 cm long; petals to 18 mm long.....**H. intermedia**

**Helixanthera intermedia** (Wight) Danser, Bull. Jard. Bot. Buitenz. ser. 3, 10: 317. 1929; FPL 410. 1990. *Loranthus intermedius* Wight, Calcutta J. Nat. Hist. 6: 361. 1846; FBI 5: 205. 1886; FPM 1251. 1925.

Glabrous shrubs. Leaves ovate, obtuse, coriaceous, base obtuse, truncate, or sub-cordate; petiole 1 cm long. Racemes 7 cm long, axillary, many-flowered; pedicel 7 mm long, slender, glabrous. Flower buds 4-angled and curved; corolla lobes 4, straight, purplish pink, free to the base; stamens 4; filaments attached below the middle of the corolla; stigma globose.

*Fl. & Fr.* March-May

*Distr.* Endemic to Southern Western Ghats. Common parasites on evergreen trees; *PS 19494* Thellikkal; *NS 19432* Shekkalmudi

**Helixanthera wallichiana** (Schult.) Danser, Bull. Jard. Bot. Buitenz. ser. 3, 10: 319. 1929; FPL 410. 1990; FTSR 386. 1996. *Loranthus wallichianus* Schult. in Roem. & Schult., Syst. Veg. 7: 100. 1829; FBI 5: 205. 1886; FPM 1251. 1925.

Branchlets rugose or lenticellate. Leaves ovate, obtuse, base acute or rounded glabrous; nerves 2 or 3 pairs; petiole 5 mm long. Racemes 3 cm long, slender, glabrous; pedicel 3 mm long, corolla reddish, terete in bud, lobes 4, glabrous.

*Fl. & Fr.* April-August

*Distr.* Endemic to Western Ghats. Common parasite on evergreen trees; *PS 19258* Thellikkal; *NS 19412* Pooppara; *PS 19536* Thekkady

#### MACROSOLEN (Blume) Blume

**Macrosolen capitellatus** (Wight & Arn.) Danser, Blumea 2: 36. 1936; FPL 411. 1990. *Loranthus capitellatus* Wight & Arn., Prodr. 382. 1834; FBI 5: 221. 1886. *Elytranthe capitellata* (Wight & Arn.) Engl. in Engl. & Prantl, Pflanzenf. 3:189. 1889; FPM 1255. 1925.

Branches 2-angulr, glabrous. Leaves 5-8 x 2-3 cm, elliptic-lanceolate, acute, cuneate at base, coriaceous; nerves 2 or 3 pairs, obscure; petiole to 7 mm long. Peduncle to 10 mm long; bracts and bracteoles similar, ovate to orbicular, keeled. Flowers few together; calyx tube 4 mm long, truncate with short rounded lobes; corolla yellow to white or pale scarlet with base and apex green, split below the middle. Berry 6 x 5 mm, beaked with persistent calyx tube.

*Fl. & Fr.* April-June

*Distr.* South West India and Sri Lanka. Fairly common parasite on evergreen trees; *PS 18956* Vengoli

#### SCURRULA Linnaeus

**Scurrula parasitica** L., Sp. Pl. 110. 1753; FPL 412. 1990; FTSR 386. 1996. *Loranthus buddleioides* Desr. in Lam., Encycl. 3: 660. 1792; FPM 1251. 1925. *L. scurrula* L., Sp. Pl. (ed. 2) 1: 472. 1762; FBI 5: 208. 1886.

Parasitic shrubs; branches erect, tomentose. Leaves 5-9 x 3-5 cm, ovate, rounded at base and apex; golden tomentose below; petiole to 1 cm long. Flowers in axillary fascicles or shortly peduncled cymes, 16-20 together; bract ovate, densely tomentose; calyx cupular; corolla 15 mm long, slender, densely tomentose; lobes 4, ovate, acute; stamens 4, filaments glabrous; stigma clavate. Berry obovoid, densely hairy.

*Fl. & Fr.* June-December

*Distr.* South and South East Asia. Common parasite on evergreen trees; *PS 18840* Kuriarkutty; *NS 19282* Karimala

#### TAXILLUS van Tieghem

1. Branchlets, corolla and young leaves reddish-brown tomentose ..... **T. tomentosus**  
1. Branchlets, corolla and young leaves glabrous.....**T. cuneatus**

**Taxillus cuneatus** (Heyne ex Roth) Danser, Bull. Jard. Bot. Buitenz. ser. 3, 10: 354. 1929; FTSR 387. 1996. *Loranthus cuneatus* Heyne ex Roth, Nov. Pl. Sp. 193. 1821; FBI 5: 214. 1886; FPM 1253. 1925.

Branches slender, rugulose, glabrous. Leaves to 3 x 1.5 cm, obovate, rounded or retuse at apex; nerves obscure; petiole 2-4 mm long. Racemes axillary, shortly peduncled; bracts 1 mm long, obovate. Flowers few; calyx 1.5 mm long, irregularly toothed, pubescent; corolla 2 cm long, tube inflated at middle, curved, greenish-white. Berry 8 mm long, ovoid, crimson.

*Fl. & Fr.* Almost throughout the year

*Distr.* Peninsular India and Sri Lanka. Fairly common parasite on deciduous trees; *PS 30485* Kuchimudi; *30626* Thekkady

**Taxillus tomentosus** (Heyne ex Roth) Tieghem, Bull. Soc. Bot. France 42: 256. 1895; FPL 412. 1990; FTSR 387. 1996. *Loranthus tomentosus* Heyne ex Roth, Nov. Pl. Sp. 191. 1821; FBI 5: 212. 1886; FPM 1252. 1925.

Branches lenticellate, young shoots fulvous tomentose. Leaves to 5 x 2.5 cm, obovate to oblong, obtuse, glabrous above; nerves 4-5 pairs. Flowers 3-8, fascicled; pedicels 2 mm long; calyx 2 mm long, lobes triangular; corolla greenish white, pink at base, to 16 mm long, densely hairy, tube gibbous, lobes spreading; stigma hemispheric. Berry sub-globose, tomentose.

*Fl. & Fr.* June-December

*Distr.* South West India and Sri Lanka. Common parasite on evergreen trees; *PS 19171* Karimala

## VISCACEAE

### VISCUM Linnaeus

1. Stem leafy ..... 2
1. Stem leafless ..... 3
2. Flowers sessile; leaves obovate ..... **V. orientale**
2. Flowers pedicelled; leaves elliptic ..... **V. heyneanum**
3. Branchlets quadrangular, internodes uniform ..... **V. angulatum**
3. Branchlets flattered, internodes broad above ..... **V. articulatum** var. **dichotomum**

**Viscum angulatum** Heyne ex DC., Prodr. 4: 283. 1830; FBI 5: 225. 1886; FPM 1259. 1925; FPL 413. 1990; FTSR 388. 1996.

Branches 4-angled, drooping, slightly broadened near the apex of the internode, smooth. Flowers solitary or 3-together, axillary, all female, all male or middle one female and laterals male; perianth lobes in male flowers 4, triangular, connate below; stamens 4, epiphyllous; anthers sessile; ovary obovoid, style short or absent. Berry 5 x 5 mm, globose, yellowish.

*Fl. & Fr.* March-May

*Distr.* Indo-Malesia. Fairly common parasite on deciduous trees; *PS 30694* Pandaravarai

**Viscum articulatum** Burm. f. var. **dichotomum** Kurz, Forest. Fl. Burma 2: 325. 1877; FBI 5: 226. 1886; FPM 1259. 1925.

Subshrubs, internodes to 4.5 cm, flattened upwards. Flowers in axillary clusters, tepals 4, 1.5 mm ovate; stamens 4, filaments 1 mm; female flowers-tepals 4, 1 mm, ovate. Berry 0.4 mm across, ovoid, glossy.

*Fl. & Fr.* December-April

*Distr.* Indo-Malesia. Rare in dry deciduous forests; *PS 19995* Kuchimudi

**Viscum heyneanum** DC., Prodr. 4: 278. 1830. *V. verruculosum* Wight & Arn., Prodr. 379. 1834; FBI 5: 224. 1886; FPM 1258. 1925. *V. orbiculatum* Wight, Ic. t. 1016. 1845; FBI 5: 224. 1886; FPM 1258. 1925. *V. heyneanum* DC. var. *liocarpum* Danser, Blumea 4: 305. 1941.

Branchlets terete, suberect. Leaves 4 x 1-2 cm, ovate-lanceolate, acute or obtuse, tip rounded, 3-5-nerved from base, glandular, narrowing into a small petiole. Flowers in peduncled cymes. Peduncles 5 mm long, 3-flowered, 3-8 in the axils, slender. Flowers in each triad all male, all female, or middle one female and laterals male, sessile. Berry 5 x 2 mm, ellipsoid, acute.

*Fl. & Fr.* June-September

*Distr.* India and Sri Lanka. Fairly common on deciduous trees; *PS 30024* Puliyala

**Viscum orientale** Willd., Sp. Pl. 4: 737. 1805; FBI 5: 224. 1886; FPM 1258. 1925; FTSR 388. 1996.

Branchlets erect or drooping; internodes terete, angled towards apex. Leaves to 4 x 2.5 cm, obovate, acute at base, 3-5-ribbed, shortly petioled. Flowers sessile or sub-sessile, axillary, 3-together, middle one female, laterals male; bracts cupular. Berry obovoid, truncate, smooth.

*Fl. & Fr.* April-May

*Distr.* Indo-Malesia and Australia. Fairly common on deciduous trees; *PS 30757* Vengoli

## SANTALACEAE

### SANTALUM Linnaeus

**Santalum album** L., Sp. Pl. 349. 1753; FBI 5: 231. 1886; FPM 1261. 1925; FPL 414. 1990; FTSR 388. 1996.

Small trees. Leaves opposite, to 7 x 4 cm, elliptic, acute at apex, rounded at base; nerves 10-12 pairs; petiole to 1.5 cm long. Inflorescence of paniced cymes, 5 cm across, terminal and axillary. Flowers bisexual, 5-merous, 6 mm across, perianth lobes equal, connate into a campanulate tube; mouth with 5 fleshy appendages, pink; stamens free, inserted on the mouth of perianth tube; ovary half inferior, 1-celled; ovules 2 or 3 pendulous; stigma 3-lobed. Drupe 1 x 0.8 cm, obovoid, smooth, black.

*Fl. & Fr.* February-May

*Distr.* Peninsular India and Malesia. *PS 18869* Karimthalappara

## BALANOPHORACEAE

### BALANOPHORA J.R. Forster et J.G.A. Forster

**Balanophora fungosa** J. R. & G. Forst., Char. Gen. Pl. 100. t. 50. 1776, ssp. **indica** (Arn.) Hansen in Dansk., Bot. Ark 28: 100. ff. 20 & 21. 1972; FPL 414. 1990. *B. indica* (Arn.) ex Griff., Trans. Linn. Soc. London 20: 95. 1846; FBI 5: 237. 1886; FPM 1263. 1925. *Langsdorffia indica* Arn., Ann. Nat. Hist. 2: 37. 1838.

Herbs; root parasite, fleshy; root stock globular; peduncle stout, to 15 cm long, 2 cm thick, yellowish inside; covered by imbricating sheathing leaves. Flowers dioecious, densely packed in globose or oblong, heads; male and female flowers dissimilar. Male perianth lobes 5, valvate, erect, yellowish; stamens 5, filaments united into a column; anthers horse-shoe-shaped. Female perianth absent; ovary 1-celled; style long, slender, ovules solitary. Fruit a 1-seeded capsule.

*Fl. & Fr.* February-March

*Distr.* Indo-Malesia and Australia. Common in evergreen forests; *PS 18854* Kanthalppara

## EUPHORBIACEAE

- |   |                     |
|---|---------------------|
| 1. Herbaceous climbers.....                                   | 2                   |
| 1. Herbs, shrubs, trees or lianas.....                        | 3                   |
| 2. Leaves entire; flowers in spikes.....                      | <b>Tragia</b>       |
| 2. Leaves 3 or 5-lobed; flowers in involucre clusters.....    | <b>Dalechampia</b>  |
| 3. Leaves 3-foliolate.....                                    | <b>Bischofia</b>    |
| 3. Leaves simple.....   | 4                   |
| 4. Flowers in cyathea; stamen 1.....                          | <b>Euphorbia</b>    |
| 4. Flowers not in cyathea; stamens 2 or more.....             | 5                   |
| 5. Racemes densely clustered on trunk.....                    | <b>Baccaurea</b>    |
| 5. Inflorescence axillary or terminal.....                    | 6                   |
| 6. Leaves apposite.....                                       | <b>Excoecaria</b>   |
| 6. Leaves alternate.....                                      | 7                   |
| 7. Leaves distichous.....                                     | 8                   |
| 7. Leaves spirally alternating, rarely sub-distichous.....    | 13                  |
| 8. Leaves with white patches; tepals gland dotted.....        | <b>Sauropus</b>     |
| 8. Leaves without white patches; tepals not gland dotted..... | 9                   |
| 9. Filaments and anthers free.....                            | 10                  |
| 9. Filaments and anthers connate.....                         | 11                  |
| 10. Trees; monoecious.....                                    | <b>Cleistanthus</b> |
| 10. Shrubs; dioecious.....                                    | <b>Securinea</b>    |
| 11. Branchlets zigzag.....                                    | <b>Glochidion</b>   |
| 11. Branchlets phyllanthoid.....                              | 12                  |
| 12. Fruiting perianth accrescent; disc absent.....            | <b>Breynia</b>      |
| 12. Fruiting perianth not accrescent; disc present.....       | <b>Phyllanthus</b>  |
| 13. Cells of ovary 2-ovuled.....                              | 14                  |

13. Cells of ovary 1-ovuled.....	19
14. Perianth biseriata .....	<b>Bridelia</b>
14. Perianth uniseriate.....	15
15. Branchlets phyllanthoid.....	<b>Meineckia</b>
15. Branchlets otherwise.....	16
16. Flowers solitary or in fascicles.....	17
16. Flowers in elongated racemes, spikes or cymes.....	18
17. Fruits dry dehiscent .....	<b>Margaritaria</b>
17. Fruits fleshy indehiscent.....	<b>Drypetes</b>
18. Fruit dehiscent; ovary 1-celled .....	<b>Antidesma</b>
18. Fruit capsular; ovary 2-4-celled.....	<b>Aporusa</b>
19. Plant with milky latex; petiole glandular.....	<b>Sapium</b>
19. Plant without milky latex; petiole eglandular.....	20
20. Perianth in male flowers uniseriate.....	21
20. Perianth in male flowers biseriata .....	25
21. Leaves with sessile or stalked glands at base of the lamina.....	<b>Croton</b>
21. Leaves without glands at the base .....	22
22. Male flowers in umbels .....	<b>Blachia</b>
22. Male flowers not in umbels .....	23
23. Female sepals enlarged in fruit.....	<b>Dimorphocalyx</b>
23. Female sepals not enlarged in fruit .....	24
24. Leaves sessile or subsessile.....	<b>Agrostistachys</b>
24. Petioles to 7 cm long .....	<b>Paracroton</b>
25. Plants monoecious .....	26
25. Plants dioecious .....	31
26. Stamens to 5.....	27
26. Stamens 8 or more.....	29
27. Capsule cocci with two rows of echinate processes .....	<b>Sebastiania</b>
27. Capsule without echinate process .....	28
28. Shrubs; raceme to 12 cm long.....	<b>Claoxylon</b>
28. Herbs; raceme to 7 cm long.....	<b>Micrococca</b>
29. Trees .....	<b>Epiprinus</b>
29. Herbs or sub shrubs.....	30
30. Disc absent .....	<b>Acalypha</b>
30. Disc present.....	<b>Baliospermum</b>
31. Capsule wall echinate or glandular hairy .....	32
31. Capsule wall without appendages or hairy .....	35
32. Shrubs.....	<b>Ricinus</b>
32. Trees .....	33
33. Leaves sub-orbicular; ovary 1-locular .....	<b>Macaranga</b>
33. Leaves otherwise; ovary 3-locular .....	34
34. Drupe fulvous tomentose; perianth biseriata .....	<b>Givotia</b>
34. Drupe echinate or red glandular; perianth uniseriate .....	<b>Mallotus</b>
35. Trees .....	36
35. Shrubs.....	37
36. Fruit fleshy, unlobed .....	<b>Trewia</b>
36. Fruit capsule, bilobed .....	<b>Cleidion</b>
37. Leaves penninerved, cordiform or peltate .....	<b>Jatropha</b>
37. Leaves penninerved, linear-lanceolate .....	<b>Homonoia</b>

ACALYPHA Linnaeus

- |   |                         |
|---|-------------------------|
| 1. Racemes unisexual.....                                       | 2                       |
| 1. Racemes bisexual.....  | 3                       |
| 2. Female spike branched; bracts smaller than the flower.....   | <b>A. racemosa</b>      |
| 2. Female spikes unbranched; bracts larger than the flower..... | <b>A. alnifolia</b>     |
| 3. Petiole shorter than the lamina.....                         | <b>A. fruticosa</b>     |
| 3. Petiole longer than the lamina.....                          | 4                       |
| 4. Bracts 3-5 fid.....  | <b>A. brachystachya</b> |
| 4. Bracts entire.....   | 5                       |
| 5. Bracts aciculate; capsule glabrous.....                      | <b>A. ciliata</b>       |
| 5. Bracts dentate; capsule hispid.....                          | <b>A. indica</b>        |

**Acalypha alnifolia** Klein ex Willd., Sp. Pl. 4: 525. 1805; FBI 5: 415. 1887; FPM 1330. 1925; FPL 418. 1990.

Shrubs, branchlets densely hispid. Leaves 2-2.5 x 1.5-2 cm, ovate, acute, base cuneate, margin crenate to serrate. Male flowers in axillary cylindrical spike to 8 cm, anthers vermiculiform, sessile; female spike to 1.5 cm, upper axillary, bracts cupular, dentate, enclosing the ovary, ovary *ca* 2 mm across, tomentose, styles 3, to 7 mm with filiform bases.

*Fl. & Fr.* October-March

*Distr.* Endemic to Peninsular India. Common in secondary forests; *PS 19712* Karimala

**Acalypha brachystachya** Hornem., Hort. Hafn. 1. 1807; FBI 5: 416. 1887; FPM 1330. 1925; FTSR 391. 1996.

Prostrate or procumbent herbs; stem striate, puberulus. Leaves ovate, acute, rounded to cordate at base, 3-5-nerved from base, sparsely hairy; petiole 0.5-2 cm long. Racemes to 1.5 cm long, bisexual, axillary. Female flowers 1-4 at the base of the raceme, sessile, sepals 3-5, oblong, glandular-ciliate; styles 3, bifid above. Male flowers many, towards the upper part of raceme; perianth lobes glandular pubescent; stamens 8, free, on a dome-shaped receptacle. Capsule 2 x 2 mm, hispid; seeds ovoid with hilum at one end.

*Fl. & Fr.* August-December

*Distr.* Indo-Malesia and West Asia. Common in rocky areas; *PS 30461* Vengoli

**Acalypha ciliata** Forssk., Fl. Aeg.-Arab. 162. 1775; FBI 5: 417. 1887; FPM 1330. 1925; FPL 418. 1990.

Subshrubs, branches pubescent. Leaves to 7 x 4 cm, ovate, cuneate, membranous, acuminate at apex, base rounded, puberulus, margin ciliate. Spikes axillary, to 2 cm; sepals 4, pubescent; female flowers crowded below; bracts 5 mm, campanulate, pubescent *ca.* 12-15 toothed, ciliate, ovary 1.5 mm; male flowers on the upper half minute. Capsule 3 mm across, smooth

*Fl. & Fr.* October-January

*Distr.* Paleotropics. Occasional in dry deciduous forests; *PS 19531* Thekkady

**Acalypha fruticosa** Forssk., Fl. Aeg.-Arab. 161. 1775; FBI 5: 415. 1887; FPM 1331. 1925; FPL 418. 1990.

Subshrubs, branchlets tomentose. Leaves to 4 x 2 cm, ovate, apex acute to acuminate, base oblique, crenate, puberulus above, tawny pubescent and yellow glandular below; petiole 1.5 cm, tomentose; Spikes axillary, pubescent; sepals 4, 1.5 mm, tomentose; ovary 0.6 mm. Capsule 2 mm across.

*Fl. & Fr.* October-February

*Distr.* Paleotropics. Occasional in dry deciduous forests; *PS 30394* Keerappadi

**Acalypha indica** L., Sp. Pl. 1003. 1753; FBI 5: 416. 1887; FPM 1330. 1925.



Herbs. Leaves to 5 x 4 cm, ovate, apex acute to acuminate, base cuneate, serrate, pubescent; petiole 4 cm. Spikes axillary, to 3.5 cm; female flowers below; bracts 3 x 5 mm, campanulate, folded, many nerved, pubescent; male flowers minute. Capsule 2 mm across, pubescent.

*Fl. & Fr.* July-September

*Distr.* Indo-Malesia and Tropical Africa. Occasional in dry and moist deciduous forests; *PS 30654* Keerappadi

**Acalypha racemosa** Heyne ex Baill., *Etud. Gen. Euphorb.* 443. 1858; FPL 418. 1990; FTSR 391. 1996. *A. paniculata* Miq., *Fl. Ind. Bat.* 1: 406. 1859; FBI 5: 415. 1887; FPM 1330. 1925.

Large herbs or subshrubs, stem pubescent. Leaves to 7 x 5 cm, ovate, apex acuminate to acute, base rounded to cordate, serrate, membranous, puberulus; petiole to 5.5 cm. Male flowers in axillary spikes, to 9 cm, pubescent; tepals 4, stamens minute; female flowers in terminal panicles; bracts minute; ovary 5 mm, style branches 6-12. Capsule 2.5 mm across, pubescent.

*Fl. & Fr.* June-August

*Distr.* Indo-Malesia and Tropical Africa. Fairly common in moist deciduous forests; *PS 19198* Vengoli

#### AGROSTISTACHYS Dalzell

**Agrostistachys borneensis** Becc., *Nelle For. Borneo* 331. 1902; FPL 419. 1990; FTSR 391. 1996. *A. longifolia* (Wight) Benth. ex Hook.f., FBI 5: 407. 1887 p.p. *Sarcoclinium longifolium* Wight, *Ic. tt.* 1887, 1888. 1852 p.p. *Agrostistachys meeboldii* Pax & Hoffm. in *Engl., Pflanzenf.* 57: 100. 1912; FPM 1318. 1925.

Small to medium trees with white latex. Leaves to 30 x 7 cm, oblanceolate, acute, base long-attenuate, coriaceous; nerves to 14 pairs, regular, nervules indistinct; petiole flat. Male racemes axillary, slender; bracts broadly ovate, ciliate; sepals 3 mm long, ovate; petals smaller, oblong; stamens 8, pistillode present. Female flowers lax in shorter racemes; sepals and petals similar to male flowers. Capsule 15 mm across; cocci globose, reddish; seeds globose, brown, smooth.

*Fl. & Fr.* October-February

*Distr.* Indo-Malaya. Common in evergreen forests; *PS 30220* Karimala

#### ANTIDESMA Linnaeus

- |   |                        |
|---|------------------------|
| 1. Leaves rotund to elliptic; densely pubescent below.....  | <b>A. ghaesembilla</b> |
| 1. Leaves otherwise, glabrous or glabrescent .....          | 2                      |
| 2. Leaves to 6 cm long, obtusely acute apex; stamen 2 ..... | <b>A. acidum</b>       |
| 2. Leaves 8-15 cm long, apex acuminate; stamens 3-5.....    | 3                      |
| 3. Female flowers sessile in close clusters.....            | <b>A. alexiteria</b>   |
| 3. Female flowers pedicellate in distant clusters.....      | <b>A. montanum</b>     |

**Antidesma acidum** Retz., *Obs. Bot.* 5: 30. 1788; FPL 420. 1990; FTSR 392. 1996; Chakrab. & Gangop., *JETB* 24: 8. 2000. *Stilago diandra* Roxb., *Pl. Corom.* 2: 35, t. 166. 1802 & *Fl. Ind.* 3: 759. 1832. *Antidesma diandrum* (Roxb.) Roth., *Nov. Pl. Sp.* 369. 1821; FBI 5: 361. 1887; FPM 1298. 1925.

Shrubs; branchlets glabrous. Leaves 2.5-6 x 2-4 cm, broadly elliptic, hispid below; nerves 5-7 pairs, looping; petioles 2-3 mm long; stipule minute. Male racemes simple or branched, 3-5 cm long; tepals 4, to 1.5 mm long, free; disk prominent; stamens 5. Flowers closely packed, sessile. Female racemes 2-4 cm long. Flowers many; pedicels 3 mm long; sepals 2 mm across, ovate, fimbriate, greenish yellow. Drupes 5 mm across, oblong, red, smooth.

*Fl. & Fr.* July-November

*Distr.* Indo-Malesia and South China. Common in moist deciduous forests; *PS 18938* Kothala; *NS 30428* Vengoli

**Antidesma alexiteria** L., Sp. Pl. 1027. 1753p.p., Hook. f., FBI 5: 359. 1887; Chakrab. & Gangop., JETB 24: 11. 2000. *A. zeylanicum* Lam., Tabl. Encycl. 1: 207. 1792; FPM 1297. 1925.

Small trees; branchlets glabrous. Leaves to 10 x 4 cm, elliptic-oblong, long-acuminate, mucronate at apex, acute at base, glabrous; nerves 7-9 pairs, sub-prominent, shining above; petiole 5 mm long, stipule ovate, hairy. Female spikes 3 cm long, axillary, densely hairy; bracts ovate, acute. Flowers closely packed; sepals 4, ovate, acute, hispid; ovary beaked, stigma recurved, glabrous.

*Fl.* March-September

*Distr.* South India and Sri Lanka. Common in semi-evergreen forests; *PS 30181* Kottayali

**Antidesma ghaesebilla** Gaertn., Fruct. 1: 189. 1788; FBI 5: 357. 1887; FPM 1298. 1925; Chakrab. & Gangop., JETB 24: 17. 2000. *A. pubescens* Roxb., Pl. Corom. 2: 35, t.167. 1802. *A. paniculatum* Roxb. ex Willd., Sp. Pl. 4: 764. 1806.

Small trees, branchlets pubescent. Leaves 4-8 x 4-6 cm, rotund to ovate, obtuse, base truncate, densely pubescent below; male spike terminal to 7 cm, woolly, flowers 2 mm across; female spike terminal and upper axillary, flowers 1.5 mm across. Tepals 5 or 6 *ca* 4 mm, ovate-lanceolate, basally connate, acute, ciliate; stamens 4, filaments 1 mm, inserted within disc, pistillode 1 mm, linear; ovary globose *ca* 2 mm. Drupe 4 mm across, globose.

*Fl. & Fr.* January-December

*Distr.* Indo-Malesia to Australia. Common in dry deciduous forests; *PS 19537* Thekkady

**Antidesma montanum** Blume, Bijdr. 1124. 1825. *A. pubescens* Blume, Bijdr. 1123. 1825, non Roxb. 1802. *A. pubescens* Roxb. var. *menasu* Tul., Ann. Sci. Nat. Bot. Ser. 3. 15: 215. 1851. *A. acuminatum* Wight, Ic. t. 1991. 1853; FBI 5: 363. 1887. *A. moritzii* (Tul.) Muell.-Arg., Linnaea 34: 67. 1865 & in DC., Prodr. 15: 252. 1866; FBI 5: 362. 1887. *A. menasu* (Tul.) Miq. ex Muell.-Arg. in DC., Prodr. 15:257. 1866p.p., Hook. f., FBI 5: 364. 1887p.p.; FPM 1297. 1925; FPL 420. 1990. *A. menasu* var. *linearifolia* Hook.f., FBI 5: 364. 1887.

Small trees. Leaves to 17 x 8 cm, ovate-oblong, abruptly acuminate at apex, acute to the base; nerves 7-9 pairs, regular, looping, prominent; petiole 5 mm long, hispid. Female racemes 7-12 cm long, terminal, usually branched, minutely hispid. Flowers 2 mm across; sepals ovate, free, concave, hispid. Male racemes shorter, axillary or terminal. Flowers sub-sessile; stamens 3. Drupes 5 x 3 mm, glabrous, reddish.

*Fl. & Fr.* January-December

*Distr.* Indo-Malesia and East Himalayas. Common in evergreen forests; *PS 19385* Karimala

#### APORUSA Blume

1. Male spikes to 2 cm long; capsule sparsely villous.....**A. acuminata**
1. Male spikes 3-4 cm long; capsule glabrous .....**A. lindleyana**

**Aporusa acuminata** Thw., Enum. Pl. Zeyl. 288. 1861; FBI 5: 348. 1887; FPM 1309. 1925; FPL 421. 1990; Chakrab. & Gangop., JETB 17: 158. 1993; FTSR 393. 1996.

Slender shrubs with weak branchlets. Leaves to 12 x 4 cm, elliptic-oblong, acute at base, entire, glabrous; nerves 7 or 8 pairs, irregular; intercostae reticulate; petiole 1 cm long, stipule 2 mm long, ovate, tomentose. Male flowers in 1.5 cm long spike, densely packed; stamens 3. Female flowers 1-3 together, axillary, fascicled; bracts ovate, tomentose; sepals 4, 1 mm long, ovate, tomentose; styles bifid. Capsule 12 x 10 mm, ovoid, glabrous or hairy; seeds 7 x 6 mm, obovoid; glabrous; aril red.

*Fl. & Fr.* March-May

*Distr.* Peninsular India and Sri Lanka. Fairly common in semi-evergreen forests; *PS 18832* Kottayali; *NS 19443* Pooppara

**Aporusa lindleyana** (Wight) Baill., *Etud. Gen. Euphorb.* 645. 1858; FBI 5: 349. 1887; FPM 1309. 1925; FPL 421. 1990; Chakrab. & Gangop., *JETB* 17: 164. 1993; FTSR 393. 1996. *Scepa lindleyana* Wight, *Ic. t.* 361. 1840.

Small to medium trees. Leaves to 18 x 8 cm, ovate-oblong, acuminate at apex, acute at base, coriaceous; nerves 7 pairs, prominent; petiole 2 cm long. Male spike solitary or fascicled; bracts ovate, ciliate; flowers 1-3 in each bract; sepals 4, ovate, ciliate; stamens 2. Female flowers 3-15, in small racemes, densely tomentose, pedicellate; sepals ovate, ciliate; ovary thinly hispid. Capsule 10 mm across, aril orange-yellow.

*Fl. & Fr.* January-April

*Distr.* Peninsular India and Sri Lanka. Very common in evergreen and semi-evergreen forests; *PS 18825* Parambikulam

#### BACCAUREA Loureiro

**Baccaurea courtallensis** (Wight) Muell.-Arg. in DC., *Prodr.* 15: 459. 1866; FBI 5: 367. 1887; FPL 421. 1990; FTSR 393. 1996; Chakrab. & Gangop., *JETB* 21: 527. 1997. *Pierardia courtallensis* Wight, *Ic. t.* 1912. 1852. *Baccaurea sapida* Bedd., *Fl. Sylv. t.* 280. 1872.

Trees, bole uneven with tubercles. Leaves alternate, often clustered towards the branch tips, to 17 x 7 cm, oblanceolate, abruptly acuminate, base acute; nerves 4-6 pairs; petiole 1-3 cm long. Flowers dioecious, in densely clustered to 15 cm long slender racemes, on old stem. Male flowers 2 mm across; sepals 5, ovate, obtuse, ciliate; stamens 5, free. Female flowers larger, sepals oblong, tomentose; ovary 3-celled, conical, fulvous tomentose, style absent, stigmas stout. Capsule 2.5-4 cm across, globose, 3-valved, tomentose, red; seeds 3, oblong, arillate.

*Fl. & Fr.* January-May

*Distr.* Endemic to Southern Western Ghats. Very common in evergreen forests; *PS 18831* Kottayali

#### BALIOSPERMUM Blume

**Baliospermum montanum** (Willd.) Muell.-Arg. in DC., *Prodr.* 15: 1125. 1866; FPM 1342. 1925; FPL 422. 1990; Chakra. & Balakr., *Bull. Bot. Surv. India* 32: 5. 1990. *Jatropha montana* Willd., *Sp. Pl.* 4: 565. 1805. *Baliospermum solanifolium* (Burm.f.) Suresh in Nicols. *et al.*, *Interp. Hort. Malab.* 106. 1988; FTSR 395. 1996. *B. axillare* Blume, *Bijdr.* 604. 1826; FBI 5: 461. 1887. *B. polyandrum* Wight, *Ic. t.* 1885. 1852.

Subshrubs, to 1.5 m tall. Leaves broadly ovate, or 3-lobed, acute or acuminate, base rounded, glabrous or sparsely hispid above and tomentose along the nerves beneath, inciso-crenate, with a pair of glands at base of lamina, to 10 x 15 cm; basally 3-5 nerved with 7-8 other lateral nerves; petiole to 6 cm long. Perianth lobes 4, concave, 1.5 mm long, pubescent. Ovary densely tomentose; style 2-fid. Capsule 3-lobed, 1.2 cm long; seeds ovoid.

*Fl. & Fr.* August-March

*Distr.* Indo-Malesia. Common in moist deciduous forests and plantations; *PS 19074* Peruvipallam

#### BISCHOFIA Blume

**Bischofia javanica** Blume, *Bijdr.* 1169. 1827; FBI 5: 345. 1887; FPM 1312. 1925; FPL 422. 1990; FTSR 395. 1996. *Microelus roeperianus* Wight & Arn., *Edinb. New Phil. J.* 14: 298. 1833.

Large trees with reddish exudations; bark thinly peeling, red inside, fibrous. Leaves 3-foliolate; leaflets to 16 x 9 cm, equal, ovate, acuminate, serrate or entire; petiole to 15 cm long. Flowers dioecious, in axillary paniced 15-20 cm long racemes; sepals 5, 1 mm long, recurved; stamens 5, free; ovary 3-celled, globose, glabrous, styles 2, hairy, spreading. Fruit a globose berry, 7 mm across; seeds 3, trigonous.

*Fl. & Fr.* March-October

*Distr.* Indo-Malesia to Pacific Islands. Occasional in evergreen and moist deciduous forests; *PS* 19290 Karimala; *NS* 30148 Kariamchola

#### BLACHIA Baillon

1. Peduncle more than 3 cm long ..... **B. umbellata**  
1. Peduncle to 2 cm long ..... **B. reflexa**

**Blachia reflexa** Benth., J. Linn. Soc. Bot. 17: 226. 1880; FBI 5: 402. 1887; FPM 1338. 1925.

Large shrubs. Leaves to 15 x 6.5 cm, elliptic, acuminate, base acute; nerves 10-12 pairs, irregular, intercostae reticulate; petiole 0.5 cm long. Female flowers in terminal peduncled umbel; pedicel 1 cm long, glabrous; sepals 5, 4 x 1 mm, oblong, acute, glabrous; styles 3 mm long. Capsule 1 cm across, glabrous; seeds 6 x 5 mm, globose, smooth, mottled with red.

*Fl. & Fr.* February-May

*Distr.* Endemic to Western Ghats. Common in evergreen forests; *PS* 18842 Kuriarkutty

**Blachia umbellata** (Willd.) Baill., Etud. Gen. Euphorb. 387. t.19. 1858; FBI 5: 402. 1887; FPM 1338. 1925; FTSR 396. 1996. *Croton umbellatus* Willd., Sp. Pl. 4: 545. 1805.

Shrubs; branchlets slender. Leaves to 15 x 5 cm, elliptic, acuminate at apex, base acute; nerves 10-13 pairs, irregular, looping; petiole 1 cm long. Male flowers 5 mm across, 5-10 together in a terminal umbel; pedicel 1.5 cm long; sepals 2.5 x 2 mm, ovate, acute, glabrous; stamens 15-20. Female flowers 8 mm across; 3-5, on stout peduncle, sepals 5, 4 x 2 mm, oblong, acute, glabrous; ovary glabrous; styles 3, 8 mm long, bifid. Capsule 18 mm across, 3-lobed.

*Fl. & Fr.* February-June

*Distr.* South India and Sri Lanka. Common in evergreen forests; *PS* 30185 Kottayali; 19661 Vengoli

#### BREYNIA J. R. Forster & J. G. A. Forster

1. Leaves to 4.5 x 2.5 cm; capsule to 1.5 cm across ..... **B. vitis-idaea**  
1. Leaves to 2 x 1.3 cm; capsule to 0.5 cm across ..... **B. retusa**

**Breynia retusa** (Dennst.) Alston, Ann. Roy. Bot. Gard. (Peradeniya) 11: 204. 1929; FPL 422. 1990; Chakrab. & Gangop., JETB 20: 505. 1996; FTSR 396. 1996. *Phyllanthus retusus* Dennst. Schluss. 24. 1818. *Breynia patens* (Roxb.) Rolfe, J. Bot. 11: 359. 1882; FBI 5: 329. 1887; FPM 1304. 1925. *Phyllanthus patens* Roxb., Fl. Ind. 3: 667. 1832.

Glabrous shrubs. Leaves ovate, glaucous below, base rounded, black when dried; nerves 6 pairs; petiole 3 mm long; stipule ovate, cordate at base. Female flowers 3 mm across, solitary; pedicels 5 mm long; sepals 6, obovate, obtuse, united with disk into a glandular tube; styles united at base, stigma bifid. Male flowers solitary, axillary; sepals 6, retuse or bilobed at apex; stamens 3. Capsule globose, pink; seeds 6, 5 x 3 mm, trigonous, white.

*Fl. & Fr.* March-May

*Distr.* Sri Lanka to Indo-China; Fairly common in evergreen forests; *PS* 19438 Pooppara

**Breynia vitis-idaea** (Burm. f.) Fischer, Kew Bull. 1932: 65. 1932; FPL 423. 1990; Chakrab. & Gangop., JETB 20: 509. 1996; FTSR 396. 1996. *Rhamnus vitis-idaea* Burm. f., Fl. Ind. 61. 1768. *Breynia rhamnoides* (Retz.) Muell.-Arg. in DC., Prodr. 15:440. 1866; FBI 5: 330. 1887; FPM 1304. 1925. *Phyllanthus rhamnoides* Retz., Obs. Bot. 5: 30. 1788.

Shrubs. Leaves ovate, rounded at base, glabrous; nerves 5-8 pairs, reticulate, black when dried; petiole 3 mm long; stipule ovate, obtuse. Female flowers axillary; pedicels 4 mm long; perianth 2 mm across, lobes ovate, acute. Male flowers 2-5 together, fascicled; perianth lobes 1.5 mm long. Capsule globose, red; seeds 6, 4 x 2 mm, trigonous, white, glabrous.

*Fl. & Fr.* October-May

*Distr.* Indo-Malesia. Fairly common in evergreen forests; *PS 19136* Kariamchola; *18910* Karimala

#### BRIDELIA Willdenow

1. Trees; flowers fascicled in terminal paniculate spikes.....**B. retusa**
1. Scandent shrubs; flowers in axillary fascicles ..... **B. scandens**

**Bridelia retusa** (L.) Spreng. in L., Syst. Veg. (ed. 16) 3: 48. 1826, non A. Juss. 1824; FBI 5: 268. 1887p.p.; FPM 1280. 1925; FPL 423. 1990; Chakrab. *et al.*, JETB 26: 321. 2002. *Bridelia airyshawii* P. T. Li, Acta Phyt. Sin. 20: 117. 1982; FTSR 397. 1996.. *Cluytia retusa* L., Sp. Pl. 1042. 1753. *C. spinosa* Roxb., Pl. Corom. t. 172. 1802. *Bridelia spinosa* (Roxb.) Willd., Sp. Pl. 4:979. 1805.

Medium trees; branchlets thinly hairy. Leaves to 22 x 11 cm, elliptic-oblong, acute, obtuse or retuse at apex, round or cordate at base, tomentose, below; nerves 23-25 pairs, prominent, dichotomous near the margins; nervules parallel. Flowers grouped in terminal branched spikes, monoecious, 6 mm across; sepals 5, reddish brown, 3 x 1.5 mm, lanceolate, acute, hispid outside; petals small, yellow, obovate; styles 3, dichotomous. Capsule 8 mm across, glabrous, black.

*Fl. & Fr.* May-September

*Distr.* Indo-Malaya. Common in moist deciduous forests; *PS 19638* Vengoli

**Bridelia scandens** (Roxb.) Willd., Sp. Pl. 4: 979. 1805; FPM 1281. 1925; FPL 424. 1990; FTSR 397. 1996. *Cluytia scandens* Roxb., Pl. Corom. t. 173. 1802. *Bridelia stipularis* (L.) Blume, Bijdr. 597. 1826; FBI 5: 270. 1887,p.p.; FPM 1281. 1925.

Scandent shrubs; branchlets hispid. Leaves to 11.5 x 7 cm, ovate-oblong, obtuse, hispid, below; nerves 8-10 pairs, prominent, dichotomous near the margins. Flowers 8 mm across, in axillary sessile clusters passing into terminal spike, pinkish; sepals 5, triangular, acute, hispid outside; petals obovate to orbicular, retuse, hispid; staminal column, slender; stamens 3-5; ovary depressed globose, styles 3, bifid at apex. Capsule 7 x 6 mm, obovoid; seeds 2, with a large depression on one side and a deep furrow on the other side.

*Fl. & Fr.* October-December

*Distr.* Endemic to Peninsular India. Common in moist deciduous forests and degraded forest areas; *PS 19131* Kariamchola; *19646* Vengoli

#### CLAOXYLON A. Jussieu

**Claoxylon beddomei** Hook.f., FBI 5: 413. 1887. *Micrococca beddomei* (Hook.f.) Prain, Ann. Bot. (London) 25: 630. 1911; FPM 1328. 1925; FTSR 410. 1996.

Slender herbs, glabrous. Leaves to 17 x 5 cm, elliptic-oblong, serrate; petiole 3-6 cm long, slender. Flowers dioecious. Male flowers in distant clusters on slender racemes, pedicellate with many imbricating bracts; sepals 5, orbicular, pubescent; stamens many, free. Female flowers 1- few on axillary raceme; bracts few; sepals 5, 2 x 1 mm, ovate, ciliate; ovary densely bristled hairy; styles 3, free, radiating. Capsule 3-lobed, 5 mm broad.

*Fl. & Fr.* December-February

*Distr.* Endemic to Southern Western Ghats. Common in evergreen forests; *PS 19456* Pooppara

#### CLEIDION Blume

**Cleidion javanicum** Blume, Bijdr. 613. 1826; FBI 5: 444. 1887; FPM 1325. 1925; FTSR 398. 1996. *C. spiciflorum* (Burm. f.) Merr., Interpr. Rumph. Herb. Amb. 322. 1917; FPL 424. 1990.

Small to medium dioecious trees; branchlets glabrous. Leaves to 15 x 6 cm, elliptic-oblong, obtusely acuminate at apex, acute at base, serrate, penninerved; petiole to 4 cm long; stipule ovate, acute, entire. Male flowers in axillary 16 cm long slender racemes; sepals 3, ovate, acute; stamens 30-50, free. Female flowers axillary, solitary; pedicel 4-5 cm long, slender; ovary 2-

celled, styles 2, connate at base, 2-fid above, linear. Fruit a 2-lobbed capsule, lobe 1 x 1 cm, globose; seeds 1 in each cell, globose.

*Fl. & Fr.* January-July

*Distr.* Indo-Malesia. Fairly common in evergreen forests; *PS 18810* Parambikulam; *19121* Kariamchola

#### CLEISTANTHUS J.D. Hooker ex Planchon

**Cleistanthus collinus** (Roxb.) Benth. ex Hook.f., *FBI* 5: 274. 1887; *FPM* 1282. 1925; *FPL* 425. 1990; *FTSR* 398. 1996. *Cluytia collina* Roxb., *Pl. Corom.* t.169. 1802.

Medium trees; bark dark brown, rough, flaking off in rounded thick scales, reddish inside. Leaves obovate or orbicular, obtuse or retuse, base rounded or obtuse, to 6.5 x 4 cm; lateral nerves 5-8 pairs, slender; petiole 0.3 cm long. Corolla lobes unequal, ovate lanceolate, 5 mm long, yellow. Capsule ovoid-oblong, 2 cm long; seeds globose, smooth.

*Fl. & Fr.* December-November

*Distr.* India and Sri Lanka. Common in dry deciduous forests; *PS 30061* Kuchimudi

#### CROTON Linnaeus

1. Herbs ..... **C. bonplandianum**
1. Shrubs or small trees ..... 2
2. Leaves silvery white beneath ..... 3
2. Leaves not silvery white beneath ..... 4
3. Leaves opposite or whorled ..... **C. zeylanicus**
3. Leaves alternate ..... **C. malabaricus**
4. Small trees; capsule to 1 cm across ..... **C. laccifer**
4. Scandent shrubs; capsule 1.5-2.5 cm across ..... **C. caudatus** var. **obovoideus**

**Croton bonplandianum** Baill., *Adansonia* 4: 339. 1864; *FPL* 426. 1990; *FTSR* 399. 1996. *Croton sparsiflorus* Morong. in *Ann. New York Acad. Sci.* 7: 221. 1893; *FPM* 1316. 1925.

Erect undershrubs; branches stellate-scaly. Leaves ovate-lanceolate, acute to acuminate at apex, base rounded, glabrous; nerves 10 pairs. Racemes to 7 cm long, terminal. Female flowers basal few, 3 mm across; sepals 5, triangular, glabrous; petals oblong, longer than sepals; torus densely villous; ovary densely hairy, styles 3, divided, lobes curled. Male flowers above the female ones in the raceme; stamens 10-15. Capsule obovoid, stellate hairy; seeds 4.5 x 2.5 mm, minutely pitted.

*Fl. & Fr.* Throughout the year

*Distr.* Native of South America; now naturalised in Old World Tropics. Common in degraded forest areas; *PS 30352* Parambikulam

**Croton caudatus** Geisel. var. **obovoideus** Balakr. & Chakrab., *Bull. Bot. Surv. India* 25: 190. 1983; *FTSR* 399. 1996.

Large scandent shrubs; bark rough, brown, branchlets stellate tomentose. Leaves ovate, caudate-acuminate, base cordate, margin toothed and stalked glandular, stellate pubescent on both sides, leaf base with *ca.* 5 stalked glands on either side to 12 x 8 cm; basally 3-5-nerved; petiole to 3 cm long. Racemes to 22 cm long, stellate pubescent. Calyx lobes ovate-acute 5 mm long, white tomentose. Capsule oblong, apically depressed, scabrid, 2 x 1.5 cm.

*Fl. & Fr.* March-August

*Distr.* Endemic to South India. Common along the margins of evergreen forests; *PS 19554* Kariamchola

**Croton laccifer** L., *Sp. Pl.* 1005. 1753, "*lacciferum*"; *FPM* 1315. 1925; *FTSR* 399. 1996. *C. aromaticus* sensu Hook.f., *FBI* 5: 338. 1887, p.p. non L. 1753; *FPL* 425. 1990.

Shrubs, branchlets stellate, brown tomentose. Leaves to 12 x 6 cm, ovate, acuminate, cordate at base, 3-ribbed from base, glands 2 pairs; upper leaves with acute base; petiole 2-3 cm long.

Racemes 10 cm long, solitary or paired, densely stellate hairy; female flowers 7 mm across; sepals ovate, acute; petals obovate, ciliate; styles 3, each dichotomously divided, glabrous. Male flowers many, similar to female flowers; stamens 20, filaments bearded. Capsule 1 cm across, globose, densely stellate hairy.

*Fl. & Fr.* March-September

*Distr.* Peninsular India and Sri Lanka. Common along the margins of evergreen forests at higher altitudes; *PS 18911* Karimala

**Croton malabaricus** Bedd., Ic. t. 181. 1868-1874; FBI 5: 386. 1887; FPM 1314. 1925; FPL 426. 1990; FTSR 399. 1996.

Small to medium trees, stellately scaly. Leaves to 18 x 12 cm, ovate, rounded at base, acuminate, silvery white, below; nerves 7 or 8 pairs; glands sessile; petiole 6-8 cm long; stipule 15 mm long, filiform. Racemes 10 cm long, terminal. Female flowers pedicelled, 10 mm across; sepals ovate, obtuse, silky tomentose; petals obovate; ovary stellate hairy. Male flowers smaller; stamens 10, filaments bearded. Capsule 2 x 2 cm, obovoid, emarginate, densely brown scaly; seeds 13 x 8 mm, oblong, mottled with brown.

*Fl. & Fr.* April-July

*Distr.* Endemic to Southern Western Ghats. Common in moist deciduous forests; *PS 30259* Pezha

**Croton zeylanicus** Muell.-Arg., Linnaea 34: 107. 1865 & in DC., Prodr. 15: 581. 1866; FPL 426. 1990; FTSR 400. 1996. *C. reticulatus* Heyne ex Muell.-Arg. in DC., Prodr. 15: 580. 1866; FBI 5: 380. 1887; FPM 1314. 1925.

Shrubs, densely covered with brown, fimbriate scales. Leaves to 20 x 6 cm, ovate-lanceolate, acuminate, rounded at base, white-scaly below; lateral nerves 6-10 pairs, glands 1 pairs, sessile; petiole 1-3 cm long. Racemes to 6 cm long. Female flowers pedicelled, 4 mm across; sepals ovate, obtuse; petals obovate, smaller, tomentose; ovary brown stellate hairy; styles 3, glabrous. Male flowers smaller; stamens many, filaments glabrous Capsule 1.3 x 1 cm, ovoid; seeds 8 x 7 mm, oblong, mottled with brown.

*Fl. & Fr.* August

*Distr.* Peninsular India and Sri Lanka. Common along the margins of evergreen forests at higher altitudes; *PS 19423* Pooppara; *19571* Kariamchola

#### DALECHAMPIA Linnaeus

**Dalechampia scandens** L., Sp. Pl. 1054. 1753, var. **velutina** (Wight) Muell.-Arg. in DC., Prodr. 15: 1245. 1866. *D. velutina* Wight, Ic. t. 1881. 1852; FBI 5: 467. 1888; FPM 1336. 1925.

Climbers with stinging hairs. Leaves tri-lobed, base cordate, thinly pubescent, middle lobe 6-10 x 3-5 cm, obovate, acute, margin entire or serrulate, lateral ones small and oblique, yellowish green, petiole to 7 cm. Flowers in peduncled clusters to 10 cm. Involucral bracts to 5 x 4 cm, tri-lobed, distinctly veined, membranous; male flowers *ca* 5 mm across, tepals 3 or 4, *ca* 3.5 mm, obovate, acute, filaments to 7 mm, connective apiculate; female flowers 6 mm across, tepals 6, to 5 mm, oblong, pinnatifid, pilose, ovary 5 mm across, style to 1 cm.

*Fl. & Fr.* December-February

*Distr.* Endemic to Peninsular India. Occasional in rocky areas; *PS 19872* Vengoli

**Note:** Present collection is an addition to the flora of Kerala

#### DIMORPHOCALYX Thwaites

**Dimorphocalyx lawianus** (Muell.-Arg.) Hook.f., FBI 5: 404. 1887; FPM 1337. 1925; FTSR 400. 1996. *Trigonostemon lawianus* Muell.-Arg., Linnaea 34: 212. 1865 p.p. *Dimorphocalyx glabellus* Thw. var. *lawianus* (Muell.-Arg.) Chakrab. & Balakr., Proc. Indian Acad. Sci. (Pl. Sci.) 100: 296. 1990.

Trees, branchlets slender, white. Leaves to 16 x 7 cm, elliptic, acuminate, base acute; nerves 13 pairs, petiole 2 cm long; stipule ovate, acute. Male flowers in 5 cm long axillary raceme, 8-10 mm across; calyx 5-toothed above; petals 5, 10 x 5 mm, obovate, white; stamens many, combined into a branched column. Female flowers few, in short racemes; sepals 5, 2.5 cm long, oblanceolate; corolla similar to male flowers; ovary 3-celled, densely hispid; styles 3, connate at base, bifid, spreading. Capsule 3-lobed, to 20 x 22 mm.

*Fl. & Fr.* February-April

*Distr.* Endemic to Western Ghats. Common in evergreen forests; *PS* 19803, 30356 Kariamchola; 19509 Orukomban

#### DRYPETES Vahl

- |  |                        |
|--|------------------------|
| 1. Ovary 3-celled.....                           | <b>D. roxburghii</b>   |
| 1. Ovary 1-celled.....                           | 2                      |
| 2. Leaves to 15 cm long.....                     | 3                      |
| 2. Leaves more than 20 cm long.....              | 4                      |
| 3. Branchlets and petiole tomentose.....         | <b>D. wightii</b>      |
| 3. Branchlets glabrous.....                      | <b>D. venusta</b>      |
| 4. Female flowers pedicelled, 3-20 together..... | <b>D. malabarica</b>   |
| 4. Female flowers sessile, 1 or 2 together.....  | <b>D. oblongifolia</b> |

**Drypetes malabarica** (Bedd.) Airy Shaw, Kew Bull. 23: 56. 1969; FTSR 401. 1996; Chakrab. *et al.*, JETB 21: 269. 1997. *Cyclostemon malabaricus* Bedd., For. Man. Bot. 199. 1873; FBI 5: 341. 1887; FPM 1302. 1925.

Medium trees with horizontal branches; branchlets angled, densely villous. Leaves to 26 x 8.5 cm; oblong, unequally obtuse at base, abruptly acuminate at apex; nerves 8 pairs, reticulate; petiole 1 cm long, hispid. Female flowers 18 mm across, clustered on old wood; pedicels 14 mm long, stout, densely fulvous tomentose; sepals 4, 7 x 4 mm, oblong, densely tomentose outside; ovary globose, densely hispid; stigma 4-lobed, peltate, black.

*Fl. & Fr.* February-April

*Distr.* Endemic to Southern Western Ghats. Fairly common in evergreen forests; *PS* 30625, *NS* 30800 Thekkady

**Drypetes oblongifolia** (Bedd.) Airy Shaw, Kew Bull. 23: 57. 1969; FPL 427. 1990; FTSR 401. 1996; Chakrab. *et al.*, JETB 21: 270. 1997. *Laneasagum oblongifolium* Bedd., Madras J. Lit Sci. 6: 71. 1861. *Cyclostemon macrophyllus* Blume, Bijdr. 598. 1826; FPM 1302. 1925. *C. macrophyllus* Blume var. *sessiliflora* Bedd., Fl. Sylv. t. 278. 1872. *C. macrophyllus* Blume var. *peninsularis* Hook.f., FBI 5: 341. 1887.

Medium trees with horizontal branches; branchlets scabrous. Leaves to 23 x 10 cm, oblong, rounded at base, acuminate at apex; nerves 9-11 pairs, prominent below, strongly reticulate. Female flowers 6.5 mm across, sessile, solitary or paired; bracts minute, orbicular; sepals 4, 6.5 mm across, orbicular, densely fulvous hairy outside; ovary globose, densely hairy; stigma discoid, shortly lobed, glabrous. Male flowers subsessile; sepals ovate; stamens many. Drupes 2 x 1.5 cm, obovoid, densely hispid, rind hard.

*Fl. & Fr.* April-June

*Distr.* Indo-Malesia. Very common in evergreen forests; *PS* 18821 Parambikulam; *PS* 18836 Kottayali

**Drypetes roxburghii** (Wall.) Hurusawa, J. Fac. Sci. Univ. Tokyo, Sect. 3. Bot. 6: 337. 1954; Chakrab. *et al.*, JETB 21: 271. 1997. *Putranjiva roxburghii* Wall., Tent. Fl. Nap. 61. 1826; FBI 5: 336. 1887; FPM 1311. 1925.

Small trees; branches drooping. Leaves 8-12 x 3.5-4.5 cm, elliptic-oblong, apex obtuse, base slightly oblique, coriaceous, shining; petiole 0.5 cm. Female flowers axillary, in groups of 3-4;



sepals 5, 2 x 1.5 mm, ovate, ciliate; ovary 3 mm, ovate, 3-celled, densely pubescent, style 7 mm, tomentose, dilated at apex. Drupe ovoid, 2 x 1 cm.

*Fl. & Fr.* August-February

*Distr.* Indo-Malesia. Common in the sides of streams in dry deciduous forests; *PS 30340* Keerappadi

**Drypetes venusta** (Wight) Pax & Hoffm. in Engl., Pflanzenf. 81: 268. 1922; Chakrab. *et al.*, JETB 21: 277. 1997. *Astylis venusta* Wight, Ic. t. 1992. 1853. *Hemicyclia venusta* (Wight) Thw. in Hook.'s J. Bot. Kew Gard. Misc. 7: 272. 1855; FBI 5: 339. 1887; FPM 1300. 1925. *Drypetes elata* (Bedd.) Pax. & Hoffm. in Engl., Pflanzenf. 81: 268. 1922; FPL 427. 1990; FTSR 401. 1996. *Hemicyclia elata* Bedd., Fl. Sylv. t. 279. 1872; FBI 5: 339. 1887; FPM 1300. 1925.

Trees with fluted bole and drooping branches; branchlets glabrous. Leaves to 9 x 3.5 cm, elliptic, abruptly acuminate, base acute; nerves 7-10 pairs, reticulate; petiole 5 mm long. Male flowers 8 mm across, fascicled, axillary; pedicels 3-6-together, 5-8 mm long, slender, minutely hispid; tepals 4, 4 x 2 mm, oblong, obtuse, hispid outside; stamens 10, filaments 3 mm long, glabrous; disk densely villous.

*Fl.* January

*Distr.* Endemic to Western Ghats. Common in evergreen forests at higher altitudes; *PS 30553* Karimala

**Drypetes wightii** (Hook. f.) Pax & Hoffm. in Engl., Pflanzenf. 81: 273. 1922; Chakrab. *et al.*, JETB 21: 277. 1997. *Hemicyclia wightii* Hook.f., FBI 5: 339. 1887; FPM 1300. 1925.

Small trees; bole fluted; branches drooping; bark white, smooth; branchlets tomentose. Leaves 4-7 x 2.5 cm, elliptic, acuminate, glabrous; nerves many, irregular, prominently reticulate; petiole 5 mm long, tomentose. Male flowers sub-sessile, solitary or fascicled; calyx lobes 4, ovate, acute, 2 mm long, densely hispid, connate at base; stamens few, filaments glabrous. Female pedicel 1 cm long, densely hispid. Capsule 13 x 0.8 cm, obovoid, glabrous.

*Fl. & Fr.* October-March

*Distr.* Endemic to Southern Western Ghats. Common in evergreen forests at higher altitudes; *PS 19174* Karimala; *19441* Pooppara

#### EPIPRINUS Griffith

**Epiprinus mallotiformis** (Muell.-Arg.) Croizat, J. Arnold Arbor. 23: 53. 1942; FPL 427. 1990; FTSR 403. 1996. *Symphyllia mallotiformis* Muell.-Arg., Linnaea 34: 156. 1865; FPM 1323. 1925. *Adenochlaena indica* (Bedd.) Bedd. ex Hook.f., FBI 5: 418. 1887.

Small trees; tender parts stellate-tomentose. Leaves to 17 x 8 cm, elliptic, acute; nerves 6 pairs, prominent, nervules reticulate; petioles unequal, to 6 cm long, upper leaves nearly sessile. Flowers in long axillary raceme. Female flowers 2-4, at basal parts of the raceme; sepals 5, 3 mm long, lanceolate, densely tomentose; ovary densely hairy, styles 3, to 15 mm long, twice bifid, glandular. Male flowers many, densely clustered along the upper part of the raceme; sepals 5, ovate, acute, thinly tomentose; stamens 5, free. Capsule 2.5 cm across, 3-lobed, lobes globular, densely stellate hairy; seeds 3, globose.

*Fl. & Fr.* April-July

*Distr.* Endemic to Southern Western Ghats. Fairly common in evergreen forests; *PS 19767* Pooppara; *30304* Pezha; *30546* Pandaravarai

#### EUPHORBIA Linnaeus

1. Shrub or small trees; leaves reduced and early caduceus ..... 2
1. Herbs; leaves well developed..... 3
2. Branchlets cylindrical ..... **E. nivulia**
2. Branchlets 3 angled ..... **E. trigona**

- 3. Leaves alternate below; opposite to whorled above..... **E. rothiana**
- 3. Leaves opposite only ..... 4
- 4. Erect herbs..... 5
- 4. Prostrate herbs..... 6
- 5. Cyathia stalked; leaves glaucous below ..... **E. indica**
- 5. Cyathia sessile; leaves not glaucous below ..... **E. hirta**
- 6. Leaf margins serrulate; involucre campanulate..... **E. thymifolia**
- 6. Leaf margins entire; involucre tubular ..... **E. prostrata**

**Euphorbia hirta** L., Sp. Pl. 454. 1753; FPM 1275. 1925; FPL 428. 1990; FTSR 403. 1996. *Chamaesyce hirta* (L.) Millisp., Publ. Field Columb. Mus. Bor. Ser. 2: 303. 1909. *Euphorbia pilulifera* L., Sp. Pl. 454. 1753; FBI 5: 250. 1887.

Erect herbs; stem villous, white or reddish. Leaves opposite, to 4 x 1.5 cm, ovate, unequal at base, acute at apex, serrate, hirsute below, 3-ribbed from base; petiole 3 mm long. Cyathia 20-50 together, 1-2 mm across, densely packed in shortly peduncled cymes, involucral bracts obconical, hispid, glands 5, reddish. male florets 4-6; ovary glabrous; styles 3, bifid from the base. Capsule 1 x 1.5 mm, 3-lobed, lobes acute, hispid; seeds 1 x 0.5 mm, 3-angular, rugose.

*Fl. & Fr.* Throughout the year

*Distr.* Native of Tropical America; now Pantropical. Common in degraded forest areas; *PS 19007*Thunakkadavu

**Euphorbia indica** Lam., Encycl. 2: 423. 1788. *Euphorbia hypericifolia* sensu Hook.f., FBI 5: 249. 1887, non L. 1753; FPM 1275. 1925.

Erect herbs, hispid. Leaves to 2 x 1.5 cm, oblong, ovate, apex obtuse, base, oblique, crenulate, glaucous beneath; petiole 3 mm, pubescent. Cyathia in stalked clusters, ca. 15, axillary; stalk to 1.5 cm, pubescent. involucre campanulate, 8 mm long, pubescent; glands 5, minute, appendages 0.5 mm long; male flowers 4-5; stalk 0.5 mm; female laterally pendulous; ovary 8 mm, pubescent. Capsule 2 x 1.5 mm, pubescent.

*Fl. & Fr.* July-September

*Distr.* Tropics of both hemispheres except Australia and Pacific Islands. Fairly common in the reservoir beds; *PS 19731* Parambikulam

**Euphorbia nivulia** Buch.-Ham., Trans. Linn. Soc. London 14: 286. 1824; FBI 5: 255. 1887; FPM 1277. 1925; FTSR 403. 1996. *Euphorbia neriifolia* L., Sp. Pl. 451. 1753.

Deciduous trees, to 6 m tall. Spines paired, short. Leaves alternate, elliptic-oblong or obovate, obtuse, base cuneate, glabrous, subsucculent, to 15 x 5 cm; lateral nerves obscure. Cyathia paired in subterminal lax cymes. Involucre broadly cupular, 0.5 x 1 cm; glands 5, oblong. Male florets in five fascicles. Female laterally pendulous; style stout, erect, branched, stigma broad, fimbriate.

*Fl. & Fr.* March-April

*Distr.* India and Myanmar. Occasional in degraded forest areas; *PS 19228* Vengoli

**Euphorbia prostrata** Ait., Hort. Kew 2: 139. 1789; FBI 5: 266. 1887; FPM 1276. 1925; FPL 428. 1990.

Prostrate herbs, branchlets pubescent. Leaves distichous, to 6 x 4 mm, elliptic-obovate, obtuse, base obliquely rounded, margin crenulate, stipulate. Cyathia axillary, involucre ca 1 x 0.7 mm, tubular glands 4; male ebracteolate, sessile, anthers 1 mm, dehiscence transverse; female laterally pendulous, ovary 5 mm across, style 3.5 mm, forked from base, stigma obtuse. Capsule prominently beaked angles with spreading hairs; seeds 4-angled.

*Fl. & Fr.* March-June

*Distr.* Native of West Indies; now Pan-tropical weed. Common in degraded forest areas; *PS 19061* Thunakkadavu

**Euphorbia rothiana** Spreng., Syst. Veg. 3: 796. 1826; FBI 5: 263. 1887; FPM 1278. 1925. *E. laeta* Heyne ex Roth, Nov. Pl. Sp. 230. 1821, non Ait. 1789.

Subshrubs, to 2.5 m tall, stem glaucous, glabrous. Leaves alternate, opposite or whorled, to 10 x 1.5 cm, acute at apex, entire, glabrous, glaucous below; base attenuate into a short petiole. Cyathium 2 x 2 mm, in terminal paniced cymes, 5-glandular around the rim of involucre. Male florets many, filaments glabrous; ovary long-stalked. Capsule 3 x 3 mm, cocci 3, globular, smooth; seeds 2.5 x 2 mm, obovoid, smooth.

*Fl. & Fr.* December-April

*Distr.* India and Sri Lanka. Occasional in grasslands; *PS 30208* Karimala; *PS 19575* Karimalagopuram

**Euphorbia thymifolia** L., Sp. Pl. 454. 1753; FBI 5: 252. 1887; FPM 1276. 1925; FPL 429. 1990; FTSR 404. 1996. *Chamaesyce thymifolia* (L.) Millsp., Publ. Field Mus. Nat. Hist. Bor. ser. 2: 412. 1916.

Prostrate herbs; branches radiating, slender, reddish, pubescent. Leaves opposite, oblong, obtuse, obliquely cordate at base, serrate, ciliate, subsessile, nervules aeriolate. Cyathium axillary, solitary or 2-5 together, 0.5 mm across; involucre 0.8 mm long, campanulate, 4-glandular. Male flowers 1-4; ovary tomentose, styles 3, Capsule 1.5 mm across, minutely adpressed pubescent; seeds 1 x 0.5 mm, 3-angled, transversally rugose.

*Fl. & Fr.* October-February

*Distr.* Tropical Asia. Common in degraded forest areas; *PS 30668* Thunakkadavu

**Euphorbia trigona** Mill., Gard. Dict. (ed. 8) 1768; FBI 5: 256. 1887. *E. hermentiana* Lem., Ill. Hort. Misc. 5: 63. 1858.

Armed succulents with milky latex, branchlets 3-angled, spines 2 mm, divergent, cauducous. Leaves to 2.5 mm, ovate, cauducous. Cyathia solitary or in groups, bracts paired to 3.5 x 4 mm, ovate, obtuse, dentate, glands 5 to 2.2 mm, bracteoles ca 2.5 mm, obovate, apex fringed; stamens numerous, filaments jointed, 2.6 mm; female flowers erect, ovary ca 3.7 mm across, 3-celled, style 3, ovule 1. Capsule to 7 mm, 3-lobed, 3.5 mm, obovoid.

*Fl. & Fr.* December-June

*Distr.* Indo-Malesia. Occasional in rocky areas in moist and dry deciduous forests; *PS 19227* Vengoli

#### EXCOECARIA Linnaeus

**Excoecaria oppositifolia** Griff. var. **crenulata** (Wight) Chakrab. & Gangop., JETB 18: 208. 1994. *E. crenulata* Wight, Ic. t. 1865. 1852; FBI 5: 473. 1888; FPM 1345. 1925; FPL 429. 1990. *E. robusta* Hook.f., FBI 5: 474. 1888; FPM 1345. 1925. *E. borneensis* Pax & Hoffm. in Engl., Pflanzenr. (Euphorb.-Addit.) 5: 422. 1914.

Large shrubs; branchlets glabrous. Leaves to 20 x 6 cm, oblanceolate, acuminate, narrowed to the base; nerves 10-15 pairs, regular; petiole 3 cm long; stipules 15 mm long, lanceolate. Male racemes 8 cm long, slender, bracts orbicular, 3 mm across, ciliate. Flowers solitary; sepals 3, 1 mm long, oblong; stamens 3, free, anthers sessile, pistillode present. Female flowers 2-5 on short terminal raceme; bracts similar to male flowers; sepals larger; styles 3-fid, recurved. Capsule 12 mm across, glabrous.

*Fl. & Fr.* April-May

*Distr.* Peninsular India and Sri Lanka. Common in evergreen forests; *PS 19213* Kariamchola; *NS 30180* Kottayali

#### FLUEGGEA Willdenow

**Flueggea virosa** (Roxb. ex Willd.) Baill., *Etud. Gen. Euphorb.* 593. 1858; FPM 1296. 1925. *Securinega virosa* (Roxb. ex Willd.) Baill., *Adansonia* 6: 334. 1866; FPL 439. 1990; FTSR 415. 1996. *Phyllanthus virosus* Roxb. ex Willd., *Sp. Pl.* 4: 578. 1805. *Flueggea microcarpa* Blume, *Bijdr.* 580. 1826; FBI 5: 328. 1887.

Branched shrubs, unarmed; branchlets often thorny. Leaves alternate, 1.5-5 x 2.5 cm, obovate, obtuse, glabrous; nerves 5-7 pairs, reticulate; petiole 5 mm long. Flowers dioecious, in axillary fascicles, 5-20 together, pedicels 6 mm long, slender; calyx lobes 5, 1.5 x 1 mm, oblong, white; stamens in male flowers 5, free, disk 5-lobed, staminode-like; ovary in female flowers conical, glabrous; styles 3, free, 2-fid; pistillode in male flowers 3 fid. Capsule 4 x 4 mm, depressed globose, glabrous, 3-valved; seeds 3, trigonous, rough.

*Fl. & Fr.* March-June

*Distr.* Tropical Africa, Asia and Australia. Common in the moist localities of moist deciduous forests; *PS 30348, NS 30806* Vengoli

#### GIVOTIA Griffith

**Givotia moluccana** (L.) Sreem., *Taxon* 24: 696. 1975; Matthew, *Kew Bull.* 46: 545. 1991. *Croton moluccanum* L., *Sp. Pl.* 1005. 1753. *Givotia rottleriformis* Griff., *Calcutta J. Nat. Hist.* 4: 388. 1844; FBI 5: 395. 1887; FPM 1342. 1925; FPL 430. 1990.

Medium trees; branchlets densely stellate-tomentose. Leaves alternate, 17 x 15 cm, broadly ovate, acute, cordate at base, dentate, glabrous above, densely stellate tomentose below; petiole to 10 cm long. Male flowers in axillary to 20 cm long, paniculate cymes; sepals 5, obovate, obtuse; stamens 20, free. Female flowers few in shorter panicles; styles 3, spreading, 2-fid. Capsule 3 cm across, globose, densely tomentose; seeds 3, oblong.

*Fl. & Fr.* October-February

*Distr.* Indo-Malesia. Common in moist and dry deciduous forests; *PS 19973* Keerappadi

#### GLOCHIDION J. R. Forster & J. G. A. Forster

- |   |  |
|---|--|
| 1. Leaves cordate at base; anthers 4 or more..... | 2  |
| 1. Leaves acute at base; anthers 3.....           | 3  |
| 2. Leaves densely tomentose below .....           | <b>Glochidion zeylanicum</b> var. <b>tomentosum</b>  |
| 2. Leaves glabrous below .....                    | <b>Glochidion zeylanicum</b> var. <b>zeylanicum</b>  |
| 3. Branchlets and leaves glabrous .....           | <b>G. ellipticum</b>                                 |
| 3. Branchlets and leaves densely tomentose.....   | 4  |
| 4. Terminal leaves to 9 x 3 cm.....               | <b>G. heyneanum</b>                                  |
| 4. Terminal leaves to 15 x 6 cm.....              | <b>Glochidion hohenackeri</b> var. <b>johnstonei</b> |

**Glochidion ellipticum** Wight,  *Ic. t.* 1906. 1852; FBI 5: 321. 1887; FPM 1308. 1925; FPL 430. 1990; Chakrab. & Gangop., *JETB* 19: 199. 1995; FTSR 404. 1996. *G. malabaricum* Bedd., *For. Man. Bot.* 194. 1873; FBI 5: 319. 1887; FPM 1308. 1925.

Small glabrous trees. Leaves to 11 x 3.5 cm, elliptic-oblong, abruptly acuminate, acute and oblique at base; nerves 5-7 pairs, narrow; petiole 5 mm long. Female flowers 2 mm across, 6-10 together in an axil; pedicels 6 mm long; sepals 6, 2 mm long, obovate, obtuse, hispid inside; ovary densely hispid, 8-celled; style column 1 mm long, 5-toothed at apex. Capsule 1 cm across, depressed above; hirsute; seeds 8, glabrous, brown.

*Fl. & Fr.* December-June

*Distr.* Endemic to Western Ghats. Common along the sides of vayals; *PS 30656* Parambikulam

**Glochidion heyneanum** (Wight & Arn.) Wight,  *Ic. t.* 1908. 1852; FBI 5: 323. 1887; Chakrab. & Gangop., *JETB* 19: 205. 1995. *Gynoon heyneanum* Wight & Arn., *Edinb. New Phil. J.* 14: 300. 1833 & in *Dietr., Syn. Pl.* 5: 388. 1852. *Glochidion velutinum* Wight,  *Ic. t.* 1707. f.2. 1852; FBI 5: 322. 1887; FPM 1307. 1925.

Small trees. Leaves elliptic, acute at both ends, densely velutinous-tomentose; nerves 7 pairs, nervules subparallel; petiole 5 mm long, tomentose. Flowers solitary or 2-3 together, pedicels 5 mm long; female sepals 5, ovate, acute, densely tomentose; ovary ovoid, style 1 mm long, 5-toothed at apex. Male flowers 4 mm across, 2 or 3 together; stamens 3. Capsule 8 mm across, tomentose; seeds 5-7, 2 x 2.5 mm, grey, smooth.

*Fl. & Fr.* July-August

*Distr.* India, Himalaya, Bangladesh and Myanmar. Fairly common in moist deciduous forests; *PS 30463* Vengoli

**Glochidion hohenackeri** (Muell.-Arg.) Bedd. var. **johnstonei** (Hook. f.) Chakrab. & Gangop., *JETB* 19: 210. 1995. *G. johnstonei* Hook.f., *FBI* 5: 314. 1887.

Small trees, branchlets villous. Leaves to 15 x 6 cm, ovate-oblong, acuminate at apex; unequal at base, thinly tomentose below, especially along the midrib; nerves 6-8 pairs, nervules prominently reticulate; petiole 2-3 mm long. Flowers in axillary clusters, densely tomentose.

*Fl.* March

*Distr.* Endemic to Peninsular India. Fairly common in moist deciduous forests; *PS 30706* Vengoli

**Glochidion zeylanicum** (Gaertn.) Juss., *Euphorb. Gen. Tent.* 107. 1824, var. **zeylanicum**; *FBI* 5: 310. 1887; *FPM* 1306. 1925; Chakrab. & Gangop., *JETB* 19: 226. 1995; *F TSR* 405. 1996.

Small glabrous trees. Leaves to 15 x 7 cm, ovate, obtusely acuminate, base round or cordate; nerves 8 pairs, nervules prominently reticulate; petiole 5 mm long. Flowers 3-5, in axillary umbels, peduncle 8 mm long, adnate to the stem; pedicels 4 mm long; sepals 4 or 5, ovate, obtuse, connate at base; style toothed at apex. Capsule 7 mm across, glabrous, beaked.

*Fl. & Fr.* March-May

*Distr.* Indo-Malesia. Common along the sides of vayals; *PS 30714* Vengoli

**Glochidion zeylanicum** (Gaertn.) Juss. var. **tomentosum** (Dalz.) Chakrab. & Gangop., *JETB* 19: 229. 1995. *G. tomentosum* Dalz. in Hook.'s *J. Bot. Kew Gard. Misc.* 2: 38. 1850; *FBI* 5: 309. 1887; *FPM* 1306. 1925.

Small trees; branchlets glabrous. Leaves to 15 x 7 cm, ovate-oblong, acute, base round to cordate, glabrous above; nerves 8 pairs, nervules parallel, prominent; petiole to 5 mm long. Flowers 4-6 together, in axillary umbel, peduncles adnate to the stem; pedicels 6-8 mm long; sepals 5, 3 x 2 mm, ovate, acute, tomentose, shortly toothed at apex; style 3 mm long, densely hispid. Capsule 10 mm across, depressed globose, beaked, hispid.

*Fl. & Fr.* March-July

*Distr.* Endemic to Western Ghats. Common in moist deciduous forests; *PS 19720* Parambikulam; *19810* Anakkalvayal; *19204* Rockpoint

#### HOMONOIA Loureiro

**Homonoia riparia** Lour., *Fl. Cochinch.* 637. 1790; *FBI* 5: 455. 1887; *FPM* 1333. 1925; *FPL* 431. 1990; *F TSR* 405. 1996. *Adelia neriifolia* Roth, *Nov. Pl. Sp.* 375. 1821.

Large shrubs; branchlets pubescent, reddish. Leaves spiral, closely packed, to 18 x 2 cm, linear-oblong, acute at either ends, penninerved, covered with yellow scales below and pubescent along nerves; petiole 1 cm long, tomentose; stipule filiform. Flowers in axillary 10-15 cm long racemes. Male flowers 3 mm across, sepals 2-5, glabrous, ciliate along the margins, yellowish red; stamens many, free. Female flowers sessile, densely packed; bracts ovate; sepals 2 mm long, lanceolate, ciliate; ovary densely hairy; styles 3, spreading, linear. Capsule 5 mm across, globose, hairy.

*Fl. & Fr.* December-May

*Distr.* Indo-Malesia and South China. Common along the riverine areas; *PS* 18878  
Parambikulam

### JATROPHA Linnaeus

1. Leaves glandular hairy, young leaves dark brownish ..... **J. glandulifera**
1. Leaves eglandular, young leaves not brownish ..... **J. villosa**

**Jatropha glandulifera** Roxb., *Fl. Ind.* 3: 688. 1832; *FBI* 5: 382. 1887; *FPM* 1340. 1925.

Shrubs. Leaves deeply 3-5 lobed, 6-10 x 6-8 cm, base cordate, margins serrate, gland tipped, apex shortly acuminate; petiole 6-10 cm, stipules filiform, branched, to 1.5 cm. Cymes to 12 cm; bracts 1.5 cm, linear-lanceolate, glandular hairy; flowers unisexual, 8 mm across; tepals villous at base; stamens 8 (5+3), filaments 3 mm. Capsule 3-lobes, 2 x 1.5 cm.

*Fl. & Fr.* February-May

*Distr.* Peninsular India, Sri Lanka and Tropical Africa. Occasional in dry deciduous forests; *PS* 30730 Keerappadi

**Jatropha villosa** Wight,  *Ic. t.* 1159. 1846. *J. wightiana* Muell.-Arg. in *DC.*, *Prodr.* 15: 1080. 1866; *FBI* 5: 383. 1887; *FPM* 1340. 1925. *J. peltata* Wight,  *Ic. t.* 1169. 1848.

Undershrubs, white tomentose. Leaves to 10 x 11 cm, broadly ovate, orbicular, lobes shallow, linear, basally 3-5 nerved, puberulus above, densely white tomentose below. Cymes terminal, to 5 cm; bracts 3 mm, linear, pubescent; calyx tube 1 mm, lobes 5 mm, oblong, imbricate, pubescent; corolla tube 4 mm, lobes 5 mm, oblong, pubescent; stamens 7-8, filaments connate, 3 mm, branched above, anthers 2 mm, oblong; disc of 5 glands, 0.5 mm, oblong.

*Fl. & Fr.* December-April

*Distr.* Endemic to Peninsular India. Fairly common in dry deciduous forests; *PS* 30391 Kuchimudi

### MACARANGA Du Petit-Thouars

**Macaranga peltata** (Roxb.) Muell.-Arg. in *DC.*, *Prodr.* 15: 1010. 1866; *FPM* 1326. 1925; *FPL* 432. 1990; *FTSR* 405. 1996. *Osyris peltata* Roxb., *Fl. Ind.* 3: 755. 1832. *Mappa peltata* (Roxb.) Wight,  *Ic. t.* 817. 1844-45. *Macaranga roxburghii* Wight,  *Ic. t.* 1949, f.4. 1853; *FBI* 5: 448. 1887. *M. tomentosa* Wight,  *Ic. t.* 1949, f.1. 1853.

Medium trees; bark brown, reddish inside, exudation red, gummy; branchlets thick, terete. Leaves ovate-orbicular, acuminate, peltate, to 20 x 15 cm; lateral nerves 8-10, radiating from the centre, puberulus below; petiole, to 18 cm long. Panicles to 5 cm long, tomentose; bracts concave 3 mm long. Stamens 3, free, filaments 5 mm long.

*Fl. & Fr.* January-February

*Distr.* India, Sri Lanka and Andamans. Common in moist deciduous and secondary forests; *PS* 30661 Karimala

### MALLOTUS Loureiro

1. Capsule smooth ..... 2
1. Capsule echinate or muricate ..... 4
2. Capsule prominently red glandular ..... **M. philippensis**
2. Capsule not red glandular ..... 3
3. Leaves fulvous tomentose below ..... **M. distans**
3. Leaves glabrous below ..... **M. atrovirens**
4. Leaves alternate, peltate ..... **M. tetracoccus**
4. Leaves opposite, not peltate ..... **M. aureo-punctatus**

**Mallotus atrovirens** Muell.-Arg., *Linnaea* 34: 195. 1865; FBI 5: 440. 1887; FPM 1322. 1925; FTSR 406. 1996.

Small trees; bark ash-grey, dull yellow inside; branchlets glabrous. Leaves opposite, elliptic to obovate, acute to shortly acuminate, base acute, glabrous, yellow glandular, densely below, entire or subentire, to 12 x 6 cm; lateral nerves 7-9 pairs, basal pair opposite, sessile glands absent; petiole 0.3-2 cm. Racemes to 10 cm long, pedicels 0.5 cm long, yellow glandular. Perianth lobes ovate-lanceolate, 2 mm long. Ovary glabrescent, densely glandular; stigma sessile, 2, plumose. Capsule 2-lobed, 5 x 7 mm, smooth, yellow glandular; style deciduous; seeds 2, plano convex or hemispherical, 3.5 x 4 mm; smooth.

*Fl. & Fr.* January-July

*Distr.* Endemic to Southern Western Ghats. Common along the riverine areas; *PS 18895* Muthalakkuzhi

**Mallotus aureo punctatus** (Dalz.) Muell.-Arg. in DC., *Prodr.* 15: 973. 1866; FPM 1323. 1925; FTSR 406. 1996. *Rottlera aureo-punctata* Dalz. in Hook.'s *J. Bot. Kew Gard. Misc.* 3: 122. 1851. *Mallotus lawii* Muell.-Arg., *Linnaea* 34: 192. 1865; FBI 5: 438. 1887 p.p.

Large shrubs; branchlets minutely pubescent. Leaves opposite, oblong or obovate, acuminate, base obtuse or subtruncate, shortly sinuate crenate, margin recurved, to 15 x 5 cm; lateral nerves 7-10 pairs, prominently reticulate; petiole to 1.5 cm long. Male racemes to 8 cm long, pubescent; female to 7 cm, flowers few, distant. Perianth lobes of male broadly ovate, obtuse, densely tomentose, 2 mm long. Ovary with soft echinate processes; style short, stigma 2, plumose. Capsule to 1 cm across.

*Fl. & Fr.* October-March

*Distr.* Endemic to Western Ghats. Fairly common in the margins of evergreen forests; *PS 19741* Pezha; *19507* Orukomban

**Mallotus distans** Muell.-Arg., *Linnaea* 34: 194. 1865; FBI 5: 441. 1887; FPM 1322. 1925; FTSR 406. 1996.

Shrubs to small trees, branchlets pubescent. Leaves opposite and alternate, ovate-lanceolate or oblong, acute or acuminate, base rounded, sessile glands at base prominent, pubescent or glabrous above, fulvous tomentose below, to 18 x 8 cm; lateral nerves 5-7 pairs, basal pair opposite; intercostae, scalariform; petiole to 5 cm, densely tomentose. Flowers sessile, fascicled on spikes. Perianth tomentose. Capsule 3-lobed, 1 cm across, brown stellate-tomentose.

*Fl. & Fr.* July-March

*Distr.* South India and Sri Lanka. Occasional in evergreen forests; *PS 18920* Karimala

**Mallotus philippensis** (Lam.) Muell.-Arg., *Linnaea* 34: 196. 1865; FBI 5: 442. 1887; FPM 1322. 1925; FPL 433. 1990; FTSR 408. 1996.

Small trees; branchlets rusty tomentose. Leaves to 18 x 8 cm, ovate, acuminate, 3-ribbed from the obtuse base, densely red-glandular beneath; nerves 6 pairs, nervules parallel, prominent; petiole 3-6 cm long, densely rusty puberulus. Flowers in terminal rusty puberulus panicle. Male flowers 4 mm across, sepals 3, ovate, acute, hairy; stamens many. Capsule 7 mm across, globose, densely red-glandular; seeds 1-4, globose, glabrous, brown.

*Fl. & Fr.* October-February

*Distr.* Indo-Malesia and Australia. Common in deciduous forests; *PS 19183* Rockpoint; *19991* Keerappadi; *19217* Kariamchola

**Mallotus tetracoccus** (Roxb.) Kurz, *J. Asiat. Soc. Bengal* 16: 245. 1873; FPL 434. 1990; FTSR 408. 1996. *Rottlera tetracocca* Roxb., *Fl. Ind.* 3: 827. 1832. *R. peltata* Wight,  *Ic. t.* 1873. 1852. *Mallotus albus* sensu Muell.-Arg., *Linnaea* 34: 188. 1865 excl. basionym. *Rottlera albus* var. *occidentalis* Hook.f., FBI 5: 429. 1887; FPM 1321. 1925.

Small trees; branchlets tomentose. Leaves to 18 x 16 cm, broadly ovate to orbicular, entire or shortly toothed; nerves 7 pairs, prominent, nervules parallel, brownish beneath; petioles unequal, to 20 cm long. Female flowers in branched terminal panicles; sepals 5-6, ovate, stellate-tomentose; ovary globose, densely hairy, styles 3, bifid, spreading. Capsule 15 mm across, 4-lobed, densely stellate hairy. Male flowers in groups of 3-6, sessile, sepals 4 or 5, orbicular, densely hairy; stamens many, free.

*Fl. & Fr.* October-February

*Distr.* India, Sri Lanka and China. Common in secondary forests; *PS 19291* Karimala

#### MARGARITARIA Linnaeus f.

**Margaritaria indica** (Dalz.) Airy Shaw, Kew Bull. 20: 387. 1966; FTSR 408. 1996. *Prosorus indicus* Dalz. in Hook.'s J. Bot. Kew Gard. Misc. 4: 346. 1852; FPM 1294. 1925. *Phyllanthus indicus* (Dalz.) Muell.-Arg., Linnaea 32: 52. 1863; FBI 5: 305. 1887.

Deciduous dioecious trees, bark brown, smooth. Leaves bifarious, to 10 x 5 cm, obovate, obtusely acuminate, glaucous beneath, membranous. Male flowers fascicled, many together; perianth lobes 4, ovate, acute; stamens 4, free; pistillode clavate. Female flowers solitary or a few together, axillary; pedicels 8-10 mm long, slender; perianth 1-seriate; lobes 4, 2 mm long, ovate, acute; capsule 8 mm across, depressed globose, 3-lobed; seeds trigonous, arillate.

*Fl. & Fr.* March-April

*Distr.* Indo-Malesia to Australia. Fairly common in evergreen forests; *PS 19411* Kariamchola; *30564* Kariamchola

#### MEINECKIA Baillon

**Meineckia parvifolia** (Wight) Webster, Acta Bot. Neerl. 14: 342. 1965; FTSR 410. 1996. *Peltandra parvifolia* Wight, Ic. t. 1892. 1852. *Neopeltandra suberosa* (Muell.-Arg.) Gamble, FPM 1286. 1925. *Phyllanthus suberosus* Muell.-Arg., Linnaea 32: 10. 1863; FBI 5: 287. 1887.

Leaves ovate, acute, base truncate or rounded, membranous, glabrous, to 3 x 2.5 cm; lateral nerves 3-4 pairs, slender; petiole to 2.5 cm long. Perianth lobes ovate or obovate, obtuse, margins hyaline. Capsule 3 mm across; seeds brown.

*Fl. & Fr.* October-December

*Distr.* Endemic to Peninsular India. Occasional in moist deciduous forests; *PS 30657* Padikkundu

#### MICROCOCCA Benth

**Micrococca mercurialis** (L.) Benth. in Hook., Niger. Fl. 503. 1849; FPM 1328. 1925; FTSR 410. 1996. *Tragia mercurialis* L., Sp. Pl. (ed. 3) 1391. 1794. *Claoxylon mercuriale* Thw., Enum. Pl. Zeyl. 271. 1861; FBI 5: 412. 1887; Susila *et al.*, Rheedeia 5:131.1995.

Annual herbs. Leaves ovate or ovate-lanceolate, base acute, serrate, puberulus, to 4 x 2.5 cm; lateral nerves ca. 4 pairs; petiole to 2 cm. Spikes lax, slender, to 5 cm long; bracts minute. Perianth lobes of male ovate; of female 3, lanceolate. Capsule 3-lobed, 5 mm across, glabrescent; seeds 1.2 mm across.

*Fl. & Fr.* June-December

*Distr.* Tropical Africa, Arabia, India, Sri Lanka and Myanmar. Common in degraded forest areas; *PS 30157* Muthuvarachal

#### PARACROTON Miquel

1. Leaves and racemes to 15 cm long, erect or suberect..... **P. integrifolius**
1. Leaves and racemes more than 20 cm long pendulous..... **P. pendulus** var. **zeylanicus**



**Paracroton integrifolius** (Airy Shaw.) Balakr. & Chakrab., Kew Bull. 48: 718. 1993. *Ostodes integrifolius* Airy Shaw, Kew Bull. 16: 362. 1963. *O. zeylanicum* var. *minor* sensu Gamble, FPM 1336. 1925, non (Thw.) Hook.f. 1887. *Fahrenheitia integrifolia* (Airy Shaw) Airy Shaw, Kew Bull. 20: 410. 1966.

Medium trees. Leaves to 15 x 7 cm, broadly elliptic, acuminate, distantly serrulate or entire. Racemes pubescent to 20 cm, flowers fascicled, male tepals ovate ca 2 mm, biseriate; stamens 10-20, filaments partially united, ca 2 mm; female tepals equal, ovary glabrous 4 mm across, strigose, styles 2, short. Capsule to 2 cm across, tomentose.

*Fl. & Fr.* November-December

*Distr.* Peninsular India and Sri Lanka. Common in evergreen forests; *PS 19313* Kothala

**Paracroton pendulus** (Hassk.) Miq. ssp. **zeylanicus** (Thw.) Balakr. & Chakrab., Kew Bull. 48: 719. 1993; FTSR 411. 1996. *Desmostemon zeylanicus* Thw., Enum. Pl. Zeyl. 278. 1861. *Ostodes zeylanica* (Thw.) Muell.-Arg., Linnaea 34: 214. 1865; FBI 5: 400. 1887; FPM 1336. 1925. *Fahrenheitia zeylanica* (Thw.) Airy Shaw, Kew Bull. 20: 410. 1966; FPL 429. 1990.

Medium trees. Leaves to 12 x 5 cm, obovate, acuminate, glabrous; nerves 6 pairs, nervules horizontal. Flowers in elongate pendulous racemes; male flowers 3-8 together, clustered, shortly pedicellate; bracts ovate, ciliate; sepals 5, equal, 2 mm long, ovate, glabrous, acute; petals 5, longer than calyx lobe, white; stamens many, filaments free; ovary 3-celled, ovule one in each cell; styles 3. Fruit a globose capsule, 3 cm across, rusty tomentose.

*Fl. & Fr.* August-December

*Distr.* Endemic to Western Ghats and Sri Lanka. Common in evergreen forests; *PS 19236* Vengoli; *19416* Pooppara

#### PHYLLANTHUS Linnaeus

- |   |                        |
|---|------------------------|
| 1. Fruits baccate .....                                 | 2                      |
| 1. Fruits capsular .....                                | 3                      |
| 2. Trees; stamens 3.....                                | <b>P. emblica</b>      |
| 2. Erect or scandent shrubs; stamens 5.....             | <b>P. reticulatus</b>  |
| 3. Annuals; stem single.....                            | 4                      |
| 3. Perennials with woody rootstock; stem branched ..... | 5                      |
| 4. Leaves oblong-lanceolate; perianth 5-lobed .....     | <b>P. virgatus</b>     |
| 4. Leaves broadly elliptic; perianth 6-lobed .....      | <b>P. gardnerianus</b> |
| 5. Leaves reddish; capsule densely muricate.....        | <b>P. urinaria</b>     |
| 5. Leaves green; capsule smooth.....                    | <b>P. amarus</b>       |

**Phyllanthus amarus** Schum. & Thonn., Kongel. Danske Vidensk.-Selsk. Skr. 4: 195. 1829; FPL 435. 1990; FTSR 412. 1996. *P. fraternus* Webster, Contr. Gray. Herb. 176. 53. 1955. *P. niruri* sensu Hook.f., FBI 5: 298. 1887, non L. 1753; FPM 1290. 1925.

Erect glabrous herbs; leafy branchlets to 4 cm long. Leaves to 8 x 3 mm, oblong, obtuse, chartaceous; nerves indistinct, glaucous beneath, stipule not peltate, lanceolate. Female flowers solitary; pedicels 2 mm long; sepals 5, oblong, obtuse with hyaline margins, glabrous; stamens 3, filaments connate. Capsule 2 x 2 mm, smooth; seeds 6, 1 x 1 mm, trigonous, prominently 6-ridged on outer face, rugose along concentric lines on lateral faces.

*Fl. & Fr.* November-January

*Distr.* Originally from America; now naturalised in the tropics. Fairly common in moist deciduous forests; *PS 30015* Parambikulam; *NS 19014* Thunakkadavu

**Phyllanthus emblica** L., Sp. Pl. 982. 1753; FBI 5: 289. 1887; FPL 436. 1990; FTSR 412. 1996. *Emblica officinalis* Gaertn., Fruct. 2: 122. 1791; FPM 1295. 1925.

Small to medium trees; leafy branchlets 8-18 cm long, villous. Leaves to 1 x 0.25 cm, numerous on lateral branchlets, oblong, obtuse, shortly apiculate, glabrous; nerves indistinct; stipules lanceolate, ciliate. Flowers densely clustered in leaf axils, pedicelled; sepals 6, 2 mm long, oblong, glabrous; stamens 3, filaments combined into a column. Capsule 1-2.5 cm across, subglobose, fleshy with 1 nut, glabrous.

*Fl. & Fr.* July-December

*Distr.* Throughout the tropics. Common in deciduous forests; *PS 19247*Thelikkal

**Phyllanthus gardnerianus** (Wight) Baill., *Etud. Gen. Euphorb.* 628. 1858; FPM 1290. 1925; FPL 436. 1990; FTSR 412. 1996. *Macraea gardneriana* Wight, *Ic. t.* 1902. f.3. 1852. *Phyllanthus simplex* Retz. var. *gardneriana* (Wight) Muell.-Arg., *Linnaea* 32: 32. 1863; FBI 5: 295. 1887.

Erect herbs or subshrubs, without short leafy lateral branchlets. Leaves to 4 x 1.5 cm, oblong, obtuse at both ends, glabrous; nerves 6-9 pairs, reticulate; petiole 1 mm long, stipule peltate, acuminate, chartaceous. Female flowers axillary, solitary; sepals 4, 2 x 1 mm, ovate, acute. Male flowers 2-3 together, shortly pedicelled, 2 mm across; stamens 3, free, erect. Capsule 5 x 5 mm, depressed globose, glabrous; seeds trigonous, minutely reticulate.

*Fl. & Fr.* November-May

*Distr.* Paleotropics. Occasional in grasslands; *PS 19738* Pezha; *NS 18926* Karimalagapuram

**Phyllanthus reticulatus** Poir. in Lam., *Encycl.* 5: 298. 1804; FBI 5: 288. 1887; FTSR 413. 1996. *Kirganelia reticulata* (Poir.) Baill., *Etud. Gen. Euphorb.* 613. 1858; FPM 1294. 1925.

Densely branched shrubs, branchlets rough, villous, reddish brown. Leaves to 3 x 1.3 cm, elliptic-oblong, obtusely acute, entire, glabrous, shortly petiolate; stipule lanceolate, sometimes spinescent. Flowers fascicled on leaf axils; pedicels 5-8 mm long; male sepals 5, 2 mm long, orbicular, reddish; stamens 5, outer filaments free, inner ones combined. Capsule 4 mm across, fleshy; seeds 1.5 x 1 mm, trigonous, brown, reticulate.

*Fl. & Fr.* September-February

*Distr.* Paleotropics. Occasional in moist deciduous forests; *PS 30285* Parambikulam

**Phyllanthus urinaria** L., *Sp. Pl.* 982. 1753; FBI 5: 293. 1887; FPM 1289. 1925; FPL 437. 1990; FTSR 413. 1996. *P. leprocarpus* Wight, *Ic. t.* 1895. f. 4. 1852.

Erect herbs, leafy branchlets scabrid, to 7 cm long. Leaves to 1.5 x 0.7 cm, oblong, obtuse, pinkish, serrulate, sessile; nerves 4-6 pairs, stipule ovate, cordate at base, acuminate. Flowers subsessile, axillary, fascicled; sepals 5 or 6, oblong or orbicular, obtuse; disk in male flowers 6-lobed, entire in female flowers. Capsule 2.5 mm across, depressed globose, coarsely verrucose; seeds 6, 1 mm long, transversally prominently ridged.

*Fl. & Fr.* January-June

*Distr.* Native of Tropical East Asia; now a Circumtropical weed. Fairly common in moist localities; *PS 19059* Thunakkadavu

**Phyllanthus virgatus** Forst. f., *Ins. Austr. Prod.* 65. 1786; FPL 437. 1990; FTSR 413. 1996. *P. simplex* Retz., *Obs. Bot.* 5: 29. 1788; FBI 5: 295. 1887; FPM 1289. 1925. *P. oblongifolia* Wight, *Ic. t.* 1902, f.1. 1852.

Erect herbs, glabrous; leafy branchlets scabrous. Leaves to 18 x 6 mm, 21-30 pairs on lateral branchlets, oblong, acute at either ends, serrulate; nerves 8-10 pairs; petiole to 1 mm long; stipule ovate, cordate at base, decurrent on either sides. Female flowers sessile, solitary; sepals 5 or 6, 1 mm long, ovate, acute. Male flowers solitary, subsessile; sepals ovate. Capsule 3 x 3 mm, rugose; seeds 6, 2 x 1.5 mm, trigonous, transversally strongly ridged connected with minute parallel crossbars.

*Fl. & Fr.* October-December

*Distr.* Indo-Malesia to Polynesia and China. Occasional in grasslands; *NS 5639* Karimala Hills

## RICINUS Linnaeus

**Ricinus communis** L., Sp. Pl. 1007. 1753; FBI 5: 457. 1887; FPM 1335. 1925; FPL 440. 1990.

Shrubs, stem glaucous. Leaves to 40 cm across, peltate, palmately 6-9-lobed, lobes lanceolate, serrate; nerves palmate, strongly reticulate; petiole to 20 cm long; stipule sheathing, large. Flowers in long terminal racemes. Male flowers at the base of the raceme, 7 mm across; sepals 9, ovate; stamens many, free. Female flowers terminal in the racemes, many, sepals similar to male flowers; ovary densely bristly; styles 3, free, bifid. Capsule 12 mm across, 3-valved; seeds oblong, carunculate, mottled with white and brown.

*Fl. & Fr.* September-January

*Distr.* Native of Tropical Africa; now cultivated throughout tropics. Fairly common near settlements; *PS 19201* Rockpoint

## SAPIUM Jacquemont

**Sapium insigne** (Royle) Benth. in Benth. & Hook. f., Gen. Pl. 3: 335. 1880; FBI 5: 471. 1888; FPM 1346. 1925; FPL 437. 1990; FTSR 413. 1996. *Falconeria insignis* Royle, Ill. 354. t.98. f.2. 1839. *F. malabarica* Wight, Ic. t. 1866. 1852.

Small trees; branchlets stout, latex milky. Leaves alternate, 18 x 7 cm, elliptic-oblong, acuminate, crenate, serrate, base with 2-sessile glands; nerves to 15 pairs, parallel; petiole to 5 cm long. Flowers monoecious; male and female flowers on separate spikes. Male spike to 25 cm long, stout, glandular; bracts distinct, ovate. Male flowers 5-10 together in each bracts, 1 mm across; sepals orbicular, stamens 2 or 3, free. Female spike shorter; flowers solitary in the bract; stigmas 3, sessile. Capsule 3-celled, subglobose; seeds 3, globose.

*Fl. & Fr.* February-May

*Distr.* Indo-Malesia. Fairly common in evergreen forests; *PS 19384* Karimala

## SAUROPUS Blume

1. Leaves to 2.5 x 1.5 cm, obtuse at apex.....**S. quadrangularis**
1. Leaves more than 5 x 2.5 cm, acuminate at apex..... 2
2. Fruits 2-2.5 cm across ..... **S. saksenianus**
2. Fruits 1 cm across ..... **S. androgynus**

**Sauropus androgynus** (L.) Merr., Bull. Bur. Forest. Philipp. Islands 1: 30. 1903; FPM 1303. 1925; Chakrab. & Gangop., JETB 20: 519. 1996. *Clutia androgyna* L., Mant. Pl. 1: 128. 1767. *Sauropus albicans* Blume, Bijdr. 596. 1826; FBI 5: 332. 1887. *S. indicus* Wight, Ic. t. 1952. f.2. 1853.

Erect shrubs; branchlets glabrous. Leaves ovate-lanceolate, truncate at base, glaucous below, glabrous; nerves 4-6 pairs, prominent below; petiole 2 mm long, slender; stipules lanceolate, 3 mm long. Female flowers solitary, axillary; pedicel 1 cm long. Capsule 1 cm across, violet, glabrous.

*Fl. & Fr.* October-January

*Distr.* Indo-Malaya. Common in moist deciduous forests; *PS 19797* Orukomban

**Sauropus quadrangularis** (Willd.) Muell.-Arg., Linnaea 32: 73. 1863; FBI 5: 335. 1887; FPM 1303. 1925; FPL 438. 1990; Chakrab. & Gangop., JETB 20: 534. 1996; FTSR 414. 1996. *Phyllanthus quadrangularis* Willd., Sp. Pl. 4: 585. 1805.

Glabrous shrubs. Leaves ovate-obtuse, emarginate at apex, glaucous below, black when dried; nerves 5 pairs, prominent; petiole 2 mm long; stipules cordate at base. Flowers solitary, axillary, pedicelled. Male flowers 3 mm across; sepals ovate, acute; stamens 3, anthers sessile on erect staminal column. Female sepals broadly ovate, obtuse, emarginate, united by the disk; styles 3, 2-fid at apex. Capsule 1.2 cm across, smooth, glabrous.

*Fl. & Fr.* January-March

*Distr.* India, China and Indo-China. Fairly common in moist deciduous forests and plantations; *PS 19819* Kannimara; *18977* Padippara

**Sauropus saksenianus** Manilal *et al.*, J. Indian Bot. Soc. 64: 294. 1985; Chakrab. & Gangop., JETB 20: 531. 1996; FTSR 414. 1996.

Shrubs to 2 m tall. Leaves shortly petiolate, ovate or oblong lanceolate, acuminate, mucronate, base obtuse or rounded, glabrous, glaucous below, to 13 x 4.5 cm; lateral nerves 6-8 pairs, slender; stipules lanceolate, 5 mm long. Flowers solitary. Perianth lobes oblong, unequal, alternate long, obovoid, larger lobe 3 mm long; smaller ones 2 mm long. Fruits depressed obovoid, creamy white, to 2.2 x 2.5 cm; pericarp 5 mm thick; seeds 6, trigonous, smooth, 8-10 x 5 mm; fruit pedicels 1.5 cm long, perianth scarcely enlarged.

*Fl. & Fr.* March-October

*Distr.* Endemic to Southern Western Ghats (Kerala). Fairly common in evergreen forests; *PS 19424* Pooppara

### SEBASTIANA Sprengel

**Sebastiania chamaelea** (L.) Muell.-Arg. in DC., Prodr. 15: 1175. 1866; FBI 5: 475. 1888; FPM 1344. 1925; FPL 438. 1990; FTSR 414. 1996. *Tragia chamaelea* L., Sp. Pl. 981. 1753.

Erect herbs with milky latex. Leaves to 6 x 0.7 cm, linear-oblong, obtuse, mucronate, lineolate along the margins, glabrous. Male flowers in short axillary raceme; bracts ovate, carries 1-3 flowers; sepals 4 or 5, ovate, ciliate; stamens 4 or 5, free. Female flowers solitary, axillary; sepals 4 or 5, larger than male flowers, oblong, ciliate; styles 3, recurved, glabrous. Capsule 6 x 6 mm, 3-lobed, cocci with 2 vertical rows of tubercles; seeds 3, oblong.

*Fl. & Fr.* Almost throughout the year

*Distr.* Indo-Malesia to Australia. Common in rocky areas of deciduous forests; *PS 19642* Vengoli

### TRAGIA Linnaeus

1. Leaves cordate at base ..... **T. hispida**

1. Leaves not cordate at base ..... **T. involucrata**

**Tragia hispida** Willd., Sp. Pl. 323. 1803; FBI 5: 465. 1888; FPM 1332. 1925. *T. involucrata* sensu Hook.f., FBI 5: 465. 1887, p.p.

Climbers with stinging hairs. Leaves to 15 x 10 cm, ovate, acuminate, base acute, margin serrate. Spike axillary to 15 cm; female flowers 3 mm across 1 or 2 at base and male above; male tepals 3, 2 mm, ovate, obtuse, glabrous, stamens 3, free; female tepals 6-lobed, hispid; style 3-gonous, stout, stigma 3. Capsule 3-lobed; seed glutinosa, glandular papillose.

*Fl. & Fr.* January-July

*Distr.* India, Myanmar and Sri Lanka. Common in moist deciduous forest; *PS 30009* Parambikulam

**Tragia involucrata** L., Sp. Pl. 980. 1753; FBI 5: 465. 1888, p.p.; FPM 1332. 1925; FTSR 415. 1996.

Leaves ovate or elliptic, caudate-acuminate, base acute or rounded, serrate, hispidulous to 10 x 6.5 cm; lateral nerves 6-8 pairs, basal pair opposite; petiole to 3 cm long. Spikes to 2 cm long; bract of male flowers spathulate; female flowers ebracteate. Capsule 0.6 x 1 cm, hispid.

*Fl. & Fr.* July-December

*Distr.* India and Sri Lanka. Common in moist deciduous forests; *PS 19054* Thunakkadavu

## TREWIA Linnaeus

**Trewia nudiflora** L., Sp. Pl. 1193. 1753; FBI 5: 423. 1887; FPM 1319. 1925; FPL 440. 1990.

Medium trees; bark yellowish-grey, smooth; branchlets glabrous. Leaves opposite, to 18 x 12 cm, broadly ovate, acuminate at apex, cordate at base, nerves 3 from the base; petioles unequal, 3-12 cm long. Male flowers in 15 cm long racemes, appears along with new leaves, 5 mm across, sepals 5, united; stamens many, free. Female flowers axillary, solitary or paired, long-pedicels 4-5 cm long; calyx lobes truncate, tomentose; ovary densely stellate-tomentose; styles 3, connate below, 2 cm long, papillose. Capsule 2 cm across, globose, tomentose; seeds 3, ovoid.

*Fl. & Fr.* February-April

*Distr.* Indo-Malesia. Common in moist deciduous and river banks; *PS 19193* Rockpoint

## BUXACEAE

### SARCOCOCCA Lindley

**Sarcococca coriacea** (Hook.) Sweet, Hort. Brit. 491. 1827; FTSR 416. 1996. *Pachysandra coriacea* Hook., Exotic Fl. 2: t.128. 1825.

Scandent shrubs. Leaves elliptic or elliptic-oblong, caudate-acuminate, base acute, coriaceous, to 12 x 5 cm; lateral nerves many, joining intramarginally, slender. Racemes to 1.5 cm long, bract ovate, 1.5 mm long; bracteoles 4. Perianth lobes 4, unequal pairs, 1.5 mm long.

*Fl. & Fr.* November-December

*Distr.* Endemic to Peninsular India. Common in evergreen forests; *PS 19157* Karimala

## URTICACEAE

1. Leaves 3-7 lobed; stipule foliaceous..... **Girardinia**
1. Leaves not lobed; stipules lanceolate or inconspicuous ..... 2
2. Plants with stinging hairs..... 3
2. Plants without stinging hairs ..... 4
3. Shrubs or small trees; leaves penninerved..... **Dendrocide**
3. Herbs or sub-shrubs; leaves 3-ribbed at base..... **Laportea**
4. Female flowers aggregated on fleshy receptacle ..... 5
4. Female flowers not aggregated on fleshy receptacle ..... 7
5. Leaves opposite; receptacle long peduncled ..... **Lecanthus**
5. Leaves alternate; receptacle sessile or shortly peduncled..... 6
6. Male and female flowers on fleshy receptacle ..... **Elatostema**
6. Male flowers in cymes; female aggregated on receptacle ..... **Procris**
7. Leaves opposite or opposite and alternate..... 8
7. Leaves alternate ..... 9
8. Fruiting perianth wingless ..... **Pilea**
8. Fruiting perianth winged..... **Pouzolzia**
9. Leaf base unequally cordate, three ribbed, entire ..... **Pellionia**
9. Leaf base equal, penninerved, dentate, serrate or sub-entire ..... 10
10. Leaves white tomentose below ..... **Debregeasia**
10. Leaves not white tomentose below..... 11
11. Flowers in sessile globose clusters ..... **Boehmeria**
11. Flowers in short cymes..... **Oreocnide**

### BOEHMERIA N. J. Jacquin

**Boehmeria glomerulifera** Miq. in Zoll., Syst. Veg. Ind. Archip. 101,104. 1854; FPL 451. 1990; FTSR 417. 1996. *B. malabarica* Wall., Arch. Mus. Hist. Nat. 8: 350. 1855-56; FBI 5: 575. 1888; FPM 1387. 1928.

Shrubs; stem pilose. Leaves to 15 x 8 cm, ovate, acuminate, serrulate, base rounded, pubescent below, glabrous above; lateral nerves 5-6 pairs, lowest pairs opposite, rib-like; petiole to 5 cm long. Flowers 10-20 together, axillary; male flowers 2 mm across; perianth lobes 4, united below, glabrous; stamens 4, free. Female perianth lobes 4 or 5, hispid. Achenes 1.2 x 1 mm, obovoid, glabrous, stigma 2 mm long, persistent.

*Fl. & Fr.* October-December

*Distr.* Indo-Malesia. Common in moist localities of evergreen forests; *PS 19912* Karimala; *19312* Kothala

#### DEBREGEASIA Gaudichaud-Beaupre

1. Leaves orbicular; spikes lateral paniculate ..... **D. wallichiana**
1. Leaves linear or oblong-lanceolate; spike lateral cymose ..... **D. longifolia**

**Debregeasia longifolia** (Burm. f.) Wedd. in DC., Prodr. 16:235. 1869; FPL 451. 1990; FTSR 418. 1996. *Urtica longifolia* Burm. f., Fl. Ind. 197. 1768. *Debregeasia velutina* Gaud., Voy. Bonite Bot. t. 90. 1844-46; FBI 5: 590. 1888; FPM 1389. 1928.

Shrubs; branchlets slender, densely shaggy-pubescent. Leaves to 16 x 5 cm, ovate to oblong-lanceolate, acuminate, base acute or obtuse, serrulate, 3-ribbed, midrib with 4 pairs of lateral nerves, nervules reticulate, densely white tomentose below, scabrous above; petiole 3 cm long; stipules linear-lanceolate. Spike 4 mm across; peduncles 5 mm long; bracts and bracteoles ovate, ciliate; male perianth lobes 4, free, 1 mm long, ovate, densely woolly; stamens 4, free.

*Fl. & Fr.* December-March

*Distr.* Indo-Malesia. Common in evergreen forests at higher altitudes; *PS 30134* Karimala

**Debregeasia wallichiana** (Wedd.) Wedd., Monogr. Utric. 464, t. 14. 1857; FBI 5: 591. 1888. *Missiessya wallichiana* Wedd., Ann. Sci. Nat. 1: 195. 1854. *Debregeasia ceylanica* Hook.f., FBI 5: 592. 1888; FPM 1389. 1928; FTSR 417. 1996.

Small trees; branchlets stout. Leaves to 25 cm across, subentire, densely white-tomentose beneath, base rounded, 3-ribbed, secondary nerves 8-11 pairs, curved below the margins, nervules prominent, parallel, regular; petiole to 15 cm long; stipule ovate, bifid above. Spike 6 mm across, globose; peduncled. Female flowers densely packed; perianth tubular, narrowed at apex, 3-5 toothed. Achenes 0.5 mm long, ellipsoid.

*Fl. & Fr.* January-March

*Distr.* Western Ghats and Sri Lanka. Occasional in evergreen forests; *PS 30333* Pezha

#### DENDROCNIIDE Miquel

**Dendrocniide sinuata** (Blume) Chew, Gard. Bull. s.s. 21: 206. 1965; FTSR 418. 1996. *Urtica sinuata* Blume, Bijdr. 505. 1826. *Urtica crenulata* Roxb., Fl. Ind. 3: 591. 1832. *Laportea crenulata* (Roxb.) Gaud. in Freye., Voy. Bont. Bot. 498. 1826; FBI 5: 550. 1888; FPM 1373. 1928.

Large shrubs to small trees; branchlets terete, white, covered with soft stinging hairs. Leaves to 20 x 10 cm, elliptic to oblong-lanceolate, acute at either ends, entire or crenate, lateral nerves 9 pairs; petiole to 6 cm long. Inflorescence axillary, peduncled cymes, branches dichotomous, to 20 x 20 cm. Male perianth lobes 4 or 5, ovate, cupular; female perianth lobes 4, ovate, free, pubescent; stamens 4, free; pistillode clavate; ovary 1-celled, ovules solitary; style 4 mm long, puberulus, persistent. Achenes 6 mm, ovoid, white, glabrous.

*Fl. & Fr.* January

*Distr.* Peninsular India and Sri Lanka. Common in evergreen forests at higher altitudes; *PS 30636* Karimala

#### ELATOSTEMA J. R. Forster & J. G. A. Forster

1. Leaves oblong-lanceolate, base slightly oblique ..... **E. acuminatum**
1. Leaves asymmetrically elliptic, base very oblique ..... 2
2. Branchlets glabrous; leaves to 15 x 5 cm ..... **E. Lineolatum** var. **lineolatum**

2. Branchlets yellowish tomentose; leaves to 7 x 1.5 cm..... **E. lineolatum** var. **falcigera**

**Elatostema acuminatum** (Poir.) Brongn. in Duper., Voy. Bot. 211. 1834; FBI 5: 566. 1888; FPM 1377. 1928; FPL 452. 1990; FTSR 418. 1996. *Procris acuminata* Poir. in Lam., Encycl. 5: 629. 1804.

Glabrous herbs with elongated stem. Leaves oblong-lanceolate, caudate-acuminate, base rounded, slightly oblique, coarsely crenate-toothed, to 15 x 3 cm; lateral nerves 7-9 pairs, slender, archingly joining along margin. Receptacle sessile, solitary; bracts obovate-obtuse; bracteoles linear.

*Fl. & Fr.* March-April

*Distr.* Indo-Malesia. Fairly common in evergreen forests; *PS 19458* Pooppara

**Elatostema lineolatum** Wight, Ic. t. 1984. 1853, var. **lineolatum**; FBI 5: 565. 1888; FPM 1376. 1928; FPL 452. 1990; FTSR 419. 1996.

Subshrubs; branches scandent, pilose. Leaves to 7 x 2.5 cm, linear, acuminate at apex, gibbous at one side, crenate, 3-ribbed from base, sessile, shortly hispid; lateral nerves 4 pairs from the midrib; cystolith scattered. Receptacle 0.5-1.5 cm across, 2-3 together, axillary. Male flowers pedicellate; bracteoles 3 mm long, oblanceolate; perianth lobes 4, 1.5 x 1 mm, hairy at apex, red-glandular; stamens 4, anthers deeply cleft at base.

*Fl. & Fr.* January-May

*Distr.* India, Myanmar and Sri Lanka. Occasional along the sides of streams in evergreen forests; *PS 30516* Pooppara

**Elatostema lineolatum** Wight var. **falcigera** Thw., Enum. Pl. Zeyl. 260. 1861; FBI 5: 565. 1888; FPM 1377. 1928; FTSR 419. 1996.

Perennial herbs, branchlets yellowish tomentose. Leaves unequally elliptic, to 7 x 1.5 cm caudate acuminate, base oblique, variously crenate, cystolith scarce. Receptacle solitary or few together, sessile. Achenes ribbed, ellipsoid.

*Fl. & Fr.* November-February

*Distr.* South India and Sri Lanka. Occasional in the moist localities of evergreen forests; *PS 19414* Pooppara

#### GIRARDINIA Gaudichaud-Beaupre

**Girardinia diversifolia** (Link) Friis, Kew Bull. 36: 145. 1981; FPL 453. 1990; FTSR 419. 1996.

*Urtica diversifolia* Link, Enum. Pl. Hort. Berol. 2: 385. 1822. *Girardinia heterophylla* Decne. in Jacq., Voy. 4: 151. t.153. 1844; FBI 5: 551. 1888 incl. var. *palmata*. *G. leschenaultiana* Decne. in Jacq., Voy. 4: 152. 1844; FPM 1372. 1928. *G. zeylanica* Decne. in Jacq., Voy. 4: 152. 1844; FPM 1373. 1928. *G. heterophylla* Decne. var. *zeylanica* (Decne.) Hook.f., FBI 5: 551. 1888.

Erect shrubs with sharp stinging hairs and prickles. Leaves alternate, to 18 x 22 cm, deeply palmately lobed, irregularly dentate, densely pubescent below; petiole to 12 cm long, prickly; stipule 15 x 6 mm, connate, lanceolate. Spikes simple or branched of 6 x 6 cm, curved. Female perianth lobes 2, opposite, 2 x 2 mm, keeled, bristled, male perianth lobes 4 or 5, free, valvate; stamens 4 or 5; ovary 1-celled, ovule solitary; stigma penicillate, papillose, 10 mm long. Achenes 2.5 x 2.5 mm, biconvex, orbicular, yellow, smooth.

*Fl. & Fr.* November-December

*Distr.* Tropical Asia. Fairly common in the openings of evergreen forests; *PS 19321* Kothala

#### LAPORTEA Gaudichaud-Beaupre

1. Inflorescence paniculate; pedicels broadly winged.....**L. bulbifera**

1. Flowers in interrupted clusters in long spike; pedicel wingless..... **L. interrupta**

**Laportea bulbifera** (Sieb. & Zucc.) Wedd., Arch. Mus. Hist. Nat. 9: 139. 1856. *Urtica bulbifera* Sieb. & Zucc., Sitzungsber. Math.-Phys. Cl. Koenigl. Bayer. Akad. Wiss. Muenchen 4: 214. 1846. *Laportea terminalis* Wight, Ic. t. 1972. 1853; FBI 5: 549. 1888; FPM 1373. 1928.

Prickly herbs. Leaves 10-16 x 5-8 cm, ovate, acute at apex, cordate at base, serrate, densely bristled above; nerves to 4 pairs, reticulate; petiole to 8 cm long. Cymes terminal to 10 cm across; pedicels flattened. Achenes 2 mm across, compressed, obovoid, black.

*Fl. & Fr.* November-February

*Distr.* India and Sri Lanka. Common in evergreen forests at higher altitudes; *PS 19774* Pooppara

**Laportea interrupta** (L.) Chew, Gard. Bull. s.s. 21: 200. 1965; FPL 453. 1990; FTSR 420. 1996. *Urtica interrupta* L., Sp. Pl. 985. 1753. *Fleurya interrupta* (L.) Gaudich., Voy. Uranie 12: 497. t.8. 1830; FBI 5: 548. 1888; FPM 1372. 1928.

Herbs with stinging hairs. Leaves 9-15 x 7-10 cm, broadly ovate, acuminate, rounded at base, coarsely serrulate; nerves 6 pairs, reticulate; petiole 6 cm long. Spikes to 22 cm long, interrupted, axillary; erect or horizontal. Female perianth lobes 1 mm long, ovate, hispid, keeled; ovary compressed; style 1 mm long; ovary compressed; male perianth lobes 4, 1 mm long, curved, hirtus; stamens 4. Achenes 1.5 x 1 mm, ovate, acute, rugose at margins.

*Fl. & Fr.* October-January

*Distr.* Paleotropics. Common in moist deciduous forests; *PS 19505* Orukomban

#### LECANTHUS Weddell

**Lecanthus peduncularis** (Wall. ex Royle) Wedd. in DC., Prodr. 16: 164. 1869; FPL 454. 1990; FTSR 420. 1996. *Procris peduncularis* Wall. ex Royle, Ill. Bot. Himal. t.83. f.2. 1836. *Lecanthus wightii* Wedd., Ann. Sci. Nat. Bot. ser. 4, 1: 187. 1854; FBI 5: 559. 1888; FPM 1374. 1928.

Fleshy herbs, sometimes rooting at nodes. Leaves in unequal pairs, 4 x 1.5 cm and 1 x 0.5 cm, ovate, base oblique, serrate, membranous, pilose; petiole to 1 cm, slender. Receptacle to 1 cm across; peduncles to 1.5 cm; female flowers-perianth of 3 unequal lobes, one hooded, to 2 mm and the rest small, flat. Achenes oblong, red, flat.

*Fl. & Fr.* September-December

*Distr.* Paleotropics. Fairly common in evergreen forests; *PS 19711* Karimala

#### OREOCNIDE Miquel

**Oreocnide integrifolia** (Gaud.) Miq., Ann. Mus. Bot. Lugd.-Bat. 4: 306. 1869; FPL 454. 1990; FTSR 420. 1996. *Villebrunea integrifolia* Gaud., Voy. Bonite Bot. t. 91. 1844; FBI 5: 589. 1888; FPM 1388. 1928.

Small trees. Leaves to 17 x 6 cm, oblong-oblongate, entire, acuminate, base acute; nerves 4-6 pairs, lowest pairs basal, punctate, glabrous; stipule 1 cm long, lanceolate. Flowers in axillary fascicles; male perianth 1.5 mm long, 4-lobed, united below; female perianth 2 mm long, tubular, narrowed above, toothed; stamens 3-5; pistillode obovate; ovary adnate to perianth tube, 1-celled, ovule basal; style absent; stigma discoid, fimbriate. Achenes adnate to the perianth, embraced by fleshy bracteoles, to 4 mm across.

*Fl. & Fr.* December-February

*Distr.* India, Myanmar and Sri Lanka. Occasional in evergreen forests; *PS 19287* Karimala; *19435, 19776* Pooppara

#### PELLIONIA Gaudichaud-Beaupre

**Pellionia heyneana** Wedd., Monogr. Urtic. 287. t.5. 1856; FBI 5: 561. 1888; FPM 1380. 1928; FPL 455. 1990; FTSR 421. 1996.

Herbs; stem arched, angled, densely lineolate. Leaves distichous, lamina to 20 x 6 cm, falcate-elliptic, inequilateral, acuminate, acute at base, 3-ribbed; petiole 1.5 cm long. Flowers in axillary peduncled cymes; peduncles to 15 cm long. Male flowers pedicelled, perianth reddish, lobes 4, equal, 2 mm long, oblong; stamens 4, free. Female flowers pedicelled, in short lateral



congested cymes; peduncle to 1.5 cm long; perianth reddish, lobes 5, unequal, oblong to 1.5 mm long. Achenes 0.6 x 0.5 mm, obovate, acute, biconvex, tubercled.

*Fl. & Fr.* March-May

*Distr.* South West India and Sri Lanka. Common in evergreen forests; *PS 19413* Pooppara

#### PILEA Lindley

1. Flowers obovate lanceolate, more the 1.5 cm long ..... **P. melastomoides**
1. Leaves elliptic obovate, less than 1 cm long..... **P. microphylla**

**Pilea melastomoides** (Poir.) Blume, Mus. Bot. Lugd.-Bat. 2: 54. 1856; FPL 455. 1990; FTSR 421. 1996. *Urtica melastomoides* Poir. in Lam., Encycl. Suppl. 4: 223. 1816. *Pilea trinervia* (Roxb.) Wight, Ic. t. 1973. 1853; FBI 5: 557. 1888; FPM 1379. 1928. *Urtica trinervia* Roxb., Fl. Ind. 3: 582. 1832.

Dioecious glabrous herbs. Leaves to 19 x 9 cm, ovate, acuminate, rounded at base, serrate, 3-ribbed, nervules parallel, pubescent along nervules below; lineoles crowded; petiole unequal in opposite pairs, to 10 cm long. Male panicle 10 cm across, axillary; flowers sessile, 4 mm across; perianth lobes 4, ovate, acute; stamens 4. Female panicle 2 cm across, shortly peduncled. Flowers smaller than male flowers; perianth lobes 1 mm long, stigmas 3-fid. Achenes 1 mm across, biconvex.

*Fl. & Fr.* August-December

*Distr.* Indo-Malesia. Occasional in grasslands; *PS 19588* Karimalagopuram

**Pilea microphylla** (L.) Liebm., Vidensk. Selsk. Skr. 5:296. 1851; FPM 1379. 1928. *Parietaria microphylla* L., Syst. Nat. (ed.10):1308. 1759. *Pilea muscosa* (L.) Lindl., Coll. Bot. t. 4. 1821; FBI 5: 551. 1888.

Herbs. Leaves to 0.4 x 0.2 mm, elliptic-ovate, subsucculent, 1-nerved, base acute, margin entire, apex subacute to obtuse; petiole to 1 mm. Flowers in stalked, umbellate clusters; tepals 4, free, concave, 0.7 mm, obtuse; stamens 4; filaments 0.7 mm; anthers 0.3 mm; ovary ellipsoid, 0.5 mm. Achenes ellipsoid, 1 mm.

*Fl. & Fr.* August-November

*Distr.* South America; introduced into other tropical countries. Common on the wet rocks in degraded forests; *PS 19044* Thunakkadavu

#### POUZOLZIA Gaudichaud-Beaupre

1. Flowers in axillary clusters ..... 2
1. Flowers in axillary or terminal racemes ..... 3
2. Leaves 3-ribbed from base; flowers 4-merous ..... **P. zeylanica**
2. Leaves 5-ribbed from base; flowers 5-merous ..... **P. auriculata**
3. Racemes axillary ..... **P. meeboldii**
3. Racemes terminal..... 4
4. Leaves glabrous ..... **P. wightii** var. **caudata**
4. Leaves variously hairy ..... 5
5. Leaves scabrid ..... **P. wightii** var. **scabra**
5. Leaves hispid or pubescent..... 6
6. Leaf apex acute..... **P. wightii** var. **nilghirensis**
6. Leaf apex acuminate..... **P. wightii** var. **wightii**

**Pouzolzia auriculata** Wight, Ic. tt. 1980, 1099. 1853; FBI 5: 582. 1888; FPM 1383. 1928; FPL 456. 1990.

Erect herbs; stem adpressed scabrous. Leaves alternate, to 5 x 2 cm, lanceolate, acute at base and apex; midrib with 2 pairs of lateral nerves, densely pilose below; petiole to 1.5 cm long;

stipule 7-10 mm long, lanceolate with filiform tip. Cymes dense, sessile. Male and female flowers together; bracteoles filiform; male perianth lobes 1.5 mm long, oblanceolate, hispid above; filament 2 mm long, glabrous. Female flowers sessile; perianth tube 2-toothed at apex, pubescent; ovary 2-winged; stigma 3-4 mm long. Achenes 1.5 x 1 mm, ovoid, polished.

*Fl. & Fr.* October-January

*Distr.* Peninsular India and Sri Lanka. Occasional in moist localities of deciduous forests; *PS 19990* Keerappadi; *NS 19846* Vengoli

**Pouzolzia meeboldii** W. W. Smith & Ramaswami, Rec. Bot. Surv. India 6: 40. 1914; FPM 1383. 1928; FPL 456. 1990; FTSR 422. 1996.

Erect shrubs; stem glaucous. Leaves ternate, to 18 x 4 cm, oblong-lanceolate, acuminate at apex, base rounded or cordate, sessile; intercostae parallel. Racemes to 12 cm long, axillary. Flowers 3-5 together; bracts 6 x 3 mm, ovate. Male flowers 2 mm across, truncate at apex; perianth lobes 4, transversally plicate. Female flowers smaller; perianth lobe 0.5 mm long, ciliate at apex, stigma 2 mm long. Achenes 1 mm long, ridged, brown.

*Fl. & Fr.* August-January

*Distr.* Endemic to Southern Western Ghats. Occasional in deciduous forests; *PS 19621* Vengoli

**Pouzolzia wightii** Bennet var. **caudata** (Bennet) Fischer in Gamble, FPM 1384. 1928; FPL 457. 1990. *P. caudata* Bennet Pl. Jav. Rar. 66. 1848; FBI 5: 585. 1888. *P. courtallensis* Wight, Ic. t. 2093. 1853.

Glabrous herbs. Leaves to 14 x 4 cm, lanceolate, acuminate, base acute, sessile or subsessile. Spike slender, paniculate, axillary and terminal, bracts to 5 x 3 mm, ovate. Male flowers hemispherical. Achenes 2 winged.

*Fl. & Fr.* November-January

*Distr.* Endemic to Southern Western Ghats. Occasional in grasslands; *PS 19959* Karimala

**Pouzolzia wightii** Bennet var. **nilghirensis** (Wight) Hook.f., FBI 5: 584. 1888; FPM 1383. 1928. *P. nilghirensis* Wight, Ic. t. 2097. 1863. *Memoralis neilgherrensis* (Wight) Wedd., Monogr. Urtic. 420. 1857.

Subshrubs, branchlets and leaves pubescent. Leaves to 5 x 3 cm, broadly ovate, lanceolate, apex acute, base truncate to cordate, pubescent below, reduced to bracts towards the apex, subsessile. Flowers in axillary clusters, transferred to terminal spikes; male flowers-tepals 4, incurved at the middle, 2.5 mm, obovate, mucronate, pilose above; stamens 5, filaments 2 mm, anthers oblong.

*Fl.* December-March

*Distr.* Endemic to Peninsular India. Fairly common in the margins of grasslands; *PS 19670* Karimala

**Pouzolzia wightii** Bennet, Pl. Jav. Rar. 66. 1838, var. **scabra** (Wight) Fischer in Gamble, FPM 1384. 1928. *Pouzolzia scabra* Wight, Ic. t. 1097. 1853; FBI 5: 584. 1888.

Scabrous herbs. Leaves opposite or whorled, to 10 x 2.5 cm, ovate-lanceolate, acute, base rounded. Spike terminal and axillary, pedunculate, bracts to 6 x 3 mm, ovate, acuminate base cordate. Male flowers ovate, perianth lobes 4, to 3mm. Achenes winged.

*Fl. & Fr.* December-January

*Distr.* Endemic to South India. Occasional along the margins of grasslands; *PS 30013* Karimala

**Pouzolzia wightii** Bennet, Pl. Jav. Rar. 1: 66. 1838, var. **wightii** Wight, Ic. t. 2093. f. 8. 1853; FBI 5: 584. 1888; FPM 1383. 1928; FPL 457. 1990.

Herbs; stem pilose. Leaves to 6.5 x 2.5 cm, ovate to elliptic, acuminate, 3-ribbed, hispid; stipule 8 x 6 mm, ovate. Spike to 35 cm long, terminal; bracts 12 x 8 mm, ovate, cordate at base.

Flowers 3-6 together in the axils of bracts. Male and female flowers mixed. Male flowers hemispherical, truncate above, shortly pedicelled; perianth lobes 4, 2.5 mm long, ciliate; filaments puberulus. Female flowers sessile; perianth tube striate, hispid. Achenes 1.5 x 1 mm, ovoid, wingless.

*Fl. & Fr.* October-January

*Distr.* Endemic to Southern Western Ghats. Occasional in opening of evergreen forests; *PS 19128* Kariamchola

**Pouzolzia zeylanica** (L.) Bennet, Pl. Jav. Rar. 1: 67. 1838; FPL 457. 1990; FTSR 422. 1996. *Parietaria zeylanica* L., Sp. Pl. 1052. 1753. *Parietaria indica* L., Mant. Pl. 1: 128. 1767. *Pouzolzia indica* (L.) Gaud., Voy. Uranie 12: 503. 1830; FBI 5: 581. 1888; FPM 1382. 1928.

Slender procumbent herbs. Leaves alternate or opposite, to 5 x 2.5 cm, ovate or elliptic, acute to acuminate, base rounded, entire, membranous; lateral nerves 3 or 4 pairs, basal pairs opposite; petiole to 2 cm. Flowers in axillary clusters; bracts 2, concave, scarious. Tepals 4, ovate-lanceolate, 1.5 mm long, sparsely villous. Achenes 2-winged.

*Fl. & Fr.* July-December

*Distr.* Tropical Asia. Common in deciduous forests; *PS 18804* Kannimara; *19099* Peruvripallam

#### PROCRIS Commerson ex Jussieu

**Procris crenata** Robins., Philipp. J. Sci. 5: 507. 1911; FTSR 422. 1996. *P. wightiana* Wall. ex Wedd., Monogr. Urtic. 336. 1856; FPM 1378. 1928. *P. laevigata* sensu Hook.f., FBI 5: 575. 1888, non Blume 1825-1826.

Succulent herbs, usually epiphytic, stem erect or scandent. Leaves to 8 x 2.5 cm, elliptic-lanceolate, crenate, penninerved, cystolith linear; petiole 3 mm long; lower part of the stem with small orbicular nanophylls. Flowers in axils of leaf scars; male flowers in small cymes; female flowers in peduncled receptacle; male perianth lobes 5, free, fleshy; female perianth lobes 3-5, free, fleshy, cucullate; stamens 5; ovary 1-celled, ovoid; ovule 1, basal; stigma sessile, globose. Achenes 1 mm long, ovoid, apiculate, rugose.

*Fl. & Fr.* October-January

*Distr.* Indo-Malesia and Africa. Occasional in evergreen forests; *PS 19702* Karimala

#### ULMACEAE

- |  |                   |
|--|-------------------|
| 1. Flowers fascicled in axils of leafscars; fruit winged ..... | <b>Holoptelea</b> |
| 1. Flower s in axillary cymes; fruit not winged.....           | 2                 |
| 2. Leaves entire, base rounded.....                            | <b>Celtis</b>     |
| 2. Leaves serrulate, base obliquely cordate.....               | <b>Trema</b>      |

#### CELTIS Linnaeus

**Celtis philippensis** Blanco var. **wightii** (Planch.) Soep. in Steenis, Fl. Males. ser. 1. 8: 62. 1977; FTSR 424. 1996. *C. wightii* Planch., Ann. Sci. Nat. Bot. ser. 3, 10: 307. 1948; FBI 5: 483. 1888; FPM 1349. 1928.

Trees; bark grey, white with black streaks inside; branchlets lenticellate, pubescent. Leaves to 9 x 5 cm, ovate, long-acuminate, entire, base rounded, coriaceous, pubescent along the nerves, reddish brown below when dry, petiole 7-15 mm long. Cymes 3 x 2 cm, axillary, usually on new shoots. Flowers few to many; sepals 2 x 1 mm, ovate, ciliate; disk villous; ovary ovoid, style 8 mm long, pubescent; male sepals same as female sepals; stamens 5, free. Drupes 7 x 5 mm, ovoid, smooth.

*Fl. & Fr.* April-July

*Distr.* Indo-Malesia to Australia and Tropical Africa. Occasional in moist deciduous forests; *PS 30126* Karimala

#### HOLOPTELEA Planchon

**Holoptelea integrifolia** (Roxb.) Planch., Ann. Sci. Nat. Bot. ser. 3, 10: 259. 1848; FBI 5: 481. 1888; FPM 1348. 1928; FPL 441. 1990; FTSR 424. 1996. *Ulmus integrifolius* Roxb., Pl. Corom. t. 78. 1798.

Deciduous polygamous trees. Leaves to 10 x 6 cm, ovate, entire, abruptly acuminate at apex, rounded or subcordate at base, punctate below, nerves 9 pairs; petiole 1.5 cm long. Flowers appear before leaves, in axillary congested 12 mm long cymes, monoecious or bisexual; sepals 4 or 5, free, 2 mm long, oblong, hispid; stamens 5, free; anthers pubescent. Female flowers with longer pedicels; ovary compressed, long-stipitate, 2-winged; 1-celled; ovule 1, style 2-fid. Fruit 3 cm across, samaroid, glabrous.

*Fl. & Fr.* February-April

*Distr.* Indo-Malesia. Occasional in deciduous forests; *PS 30568* Keerappadi

#### TREMA Loureiro

**Trema orientalis** (L.) Blume, Mus. Bot. Lugd.-Bat. 2: 62. 1856; FBI 5: 484. 1888; FPM 1350. 1928; FPL 442. 1990; FTSR 424. 1996. *Celtis orientalis* L., Sp. Pl. 1044. 1753.

Small dioecious trees; branchlets scabrous to adpressed pubescent. Leaves to 15 x 5 cm, alternate, ovate, acuminate, serrulate, cordate at base, 3-5-ribbed from base, tomentose below, scabrous above; lateral nerves 5 or 6 pairs; petiole 1 cm long. Flowers in axillary fascicles or cymes. Male flowers usually sessile; sepals 4 or 5, equal, 2 mm long, curved; stamens 5. Female flowers in cymes; sepals unequal, ciliate; ovary ovate, 1-celled, style 2-fid, curved, stigmas plumose. Fruit a drupe, 3 mm across, globose.

*Fl. & Fr.* September-December

*Distr.* Tropical Africa, Asia and Australia. Fairly common in secondary forests; *PS 18868* Karimthalappara; *19297* Parambikulam

#### MORACEAE

1. Herbs; female flowers aggregated in fleshy receptacle ..... **Dorstenia**
1. Trees, stranglers or woody climbers ..... 2
2. Flowers enclosed in syconia ..... **Ficus**
2. Flowers not enclosed in syconia ..... 3
3. Male flowers on globose or oblong beads; fruits sorosis ..... **Artocarpus**
3. Male flowers on disciform receptacle or cylindrical spike; fruit otherwise ..... 4
4. Female flowers solitary ..... **Antiaris**
4. Female flowers on globose heads ..... **Broussonetia**

#### ANTIARIS Leschenault

**Antiaris toxicaria** Lesch., Ann. Mus. Natl. Hist. Nat. 16: 478,t.22. 1820; FBI 5: 537. 1888; FPM 1367. 1928; FTSR 425. 1996. *A. innoxia* Blume, Rumphia 1: 172,t.54. 1835. *A. saccidora* Dalz. in Hook.'s J. Bot. Kew Gard. Misc. 3: 232. 1851.

Lofty deciduous trees with large buttresses, exudation sticky; bark greyish white, smooth pale white inside, strongly fibrous. Leaves bifarious, to 15 x 5 cm, elliptic-oblong, obtusely acuminate, base rounded or cordate, entire or distantly crenulate, subsessile; lateral nerves 6-8 pairs, coarsely reticulate below. Male flowers 3-5, crowded on an axillary peduncled 1.5 cm broad receptacle surrounded by imbricating bracts; sepals 3 or 4, oblanceolate to spatulate;

stamens 3-8. Female flowers solitary in an involucre of few connate bracts; sepals absent; ovary 1-celled, uni-ovulate. Drupes 1.5-2.5 x 1-2 cm, pyriform or obovoid, fleshy, scarlet.

*Fl. & Fr.* December-March

*Distr.* Paleotropics. Fairly common in evergreen forests; *PS 30761* Orukomban

#### ARTOCARPUS J. R. Forster & J. G. A. Forster

1. Fruit smooth, to 5 cm long..... **A. gomezianus** ssp. **zeylanicus**
1. Fruit echinate, more than 10 cm long ..... 2
2. Male spike more than 10 cm long; leaves below and young shoots hirsute ..... **A. hirsuta**
2. Male spike to 5 cm long; leaves and young shoots glabrous..... **A. heterophyllus**

**Artocarpus gomezianus** Wall. ex Trecul ssp. **zeylanicus** Jarrett, J. Arnold Arbor. 41: 90. 1960; FPL 443. 1990; FTSR 425. 1996. *A. lakoocha* sensu Fischer in Gamble, FPM 1369. 1928, non Roxb. 1832.

Medium to large trees, bark brownish black, pinkish inside; twigs grey adpressed tomentose. Leaves to 16 x 8 cm, elliptic-oblong, acuminate, base truncate or subcordate, subscabrous below; lateral nerves 9-15 pairs, regularly arching below the margins, intercostae reticulate; petiole 1-2.5 cm long. Male spike globose, 8 mm across, peduncles 1 cm long. Syncarp subglobose, uneven, fleshy, greenish yellow.

*Fl. & Fr.* February-June

*Distr.* South West India and Sri Lanka. Fairly common in evergreen forests; *PS 30165* Pezha

**Artocarpus heterophyllus** Lam., Encycl. 3: 209. 1789; FPL 443. 1990; FTSR 426. 1996. *A. integrifolius* Wight, Ic. t. 678. 1840; FBI 5: 541. 1888, non L.f. 1781; FPM 1369. 1928.

Large trees with white sticky sap, bark dark greyish-brown, trunk with warty tubercles; branchlets glabrous. Leaves to 15 x 7 cm, obovate or oblong-obovate, acute or obtuse, base cuneate, entire (seedling and coppice leaves often lobed); nerves 6-8 pairs, prominent, nervules reticulate; petioles 1-2 cm long; stipules 3-5 cm long, ovate-lanceolate. Spikes enclosed by spathe-like bracts; male from young branches; female from the trunk and mature branches. Perianth fleshy in fruit. Sorosis to 30 x 25 cm; seeds oblong, smooth.

*Fl. & Fr.* November-March

*Distr.* Widely cultivated in the tropics, origin is probably South India. Common in evergreen forests; *PS 18862* Karimthalappara

**Artocarpus hirsuta** Lam., Encycl. 3: 210. 1789; FBI 5: 541. 1888; FPM 1369. 1928; FPL 443. 1990; FTSR 426. 1996.

Very large trees with white sticky latex; bark brownish-black. Leaves to 18 x 12 cm, broadly ovate or elliptic, acuminate, base truncate or rounded, entire, coriaceous; nerves 8-12 pairs, prominent, regularly arched below the margins; nervules parallel; petiole 1-2.5 cm long; stipule 3-5 cm long, lanceolate, densely hirsute. Male spikes linear-oblong, to 15 cm long, cylindrical; peduncle to 4 cm long. Syncarp echinate, tomentose, to 12 x 8 cm, yellow when ripe.

*Fl. & Fr.* November-March

*Distr.* Endemic to Southern Western Ghats. Common in evergreen forests; *PS 18853* Kanthalppara

#### BROUSSONETIA Ventenat

**Broussonetia papyrifera** Vent., Table Regne Veg. 3: 547. 1799; FBI 5: 490. 1888; FPL 458. 1990.

Small trees. Leaves to 20 x 11 cm, ovate, acuminate, base truncate, serrate, tomentose below, scabrid above, petiole to 10 cm, stipule *ca* 1.5 cm, ovate acuminate. Male spike axillary,

cylindric, perianth 4-lobed; stamens 4; female heads to 2.5 cm across, perianth tubular 1 cm; style slender feathery. Achenes pendulous.

Malesia, China and Japan; introduced in India

*Fl. & Fr.* November-January

*Distr.* Malesia, China and Japan, introduced in India. Common along the sides of reservoir; *PS 19302* Kuriarkutty

#### DORSTENIA Linnaeus

**Dorstenia indica** Wall. ex Wight, Ic.t.1964. 1853; FBI 5: 494. 1988; FPM 1370. 1928; FPL 444. 1990; FTSR 426. 1996.

Herbs. Leaves alternate, to 9 x 2.5 cm, obovate or oblanceolate, acute, base attenuate or cuneate, membranous, distantly toothed, sparsely hirsute along the nerves beneath; petiole 1 cm long. Receptacle axillary, solitary, discoid, 5-angled, to 1.5 cm across, marginal lobes to 0.5 cm long; peduncles to 2 cm long. Male flowers towards the periphery of the receptacle; perianth connate and adnate with receptacle; stamens 3. Female flowers grouped at the centre; ovary sunken in the tissue of the receptacle; style lateral, stigmas 2. Fruit an achene.

*Fl. & Fr.* August-December

*Distr.* South India and Sri Lanka. Rare in evergreen forests; *PS 19610* Karimala

#### FICUS Linnaeus

- |   |   |
|---|---|
| 1. Climbers or scandent shrubs.....   | 2   |
| 1. Independent or epiphytic trees.....  | 3   |
| 2. Branchlets triangular; receptacles in axillary pairs.....                  | <b>F. rigida</b> var. <b>bracteata</b>                          |
| 2. Branchlets terete; receptacles fascicled on the naked branches.....        | <b>F. amplocarpa</b>  |
| 3. Figs cauliflorous or on trailing leafless branches.....                    | 4   |
| 3. Figs not cauliflorous.....   | 5   |
| 4. Leaves opposite, hispid pubescent.....                                     | <b>F. hispida</b>   |
| 4. Leaves alternate, glabrous.....  | <b>F. racemosa</b>  |
| 5. Receptacle more than two per axil.....                                     | <b>F. tsjahela</b>  |
| 5. Receptacle solitary or paired.....   | 6   |
| 6. Receptacle sessile.....  | 7   |
| 6. Receptacle peduncled.....  | 12  |
| 7. Leaves beneath and branchlets densely tomentose.....                       | 8   |
| 7. Leaves and branchlets glabrous.....  | 9   |
| 8. Fig solitary, more than 1.5 cm across.....                                 | <b>F. drupacea</b> var. <b>pubescens</b>                        |
| 8. Fig paired or clustered, to 1 cm across.....                               | <b>F. mollis</b>  |
| 9. Leaves broadly ovate, cusp more than 4 cm long.....                        | <b>F. religiosa</b>   |
| 9. Leaves otherwise, cusp to 2 cm long.....                                   | 10  |
| 10. Leaves cordate at base.....   | <b>F. arnottiana</b> (p.p.)                                     |
| 10. Leaves rounded or acute at base.....                                      | 11  |
| 11. Leaves strongly nerved above the base, obtuse at apex.....                | <b>F. microcarpa</b>  |
| 11. Leaves without such nerves, acuminate to caudate at apex.....             | <b>F. talbotii</b>  |
| 12. Leaf base asymmetric, one side gibbose or rounded other side cuneate..... | 13  |
| 12. Leaf base equal.....  | 14  |
| 13. Leaf apex obtuse or acute, minutely glabrous.....                         | <b>F. tinctoria</b> ssp. <b>parasitica</b>                      |
| 13. Leaf apex cuspidate; glabrous on both surface.....                        | <b>F. tinctoria</b> ssp. <b>gibbosa</b> var. <b>cuspidifera</b> |
| 14. Upper surface of leaves very glabrous, margin serrate or sub-entire.....  | <b>F. exasperata</b>  |
| 14. Upper surface of leaves glabrous or glabrescent, margins entire.....      | 15  |

15. Peduncle to 2 mm long; figs to 6 mm across .....	<b>F. arnottiana</b> (p.p)
15. Peduncle more than 5 mm long; figs more than 8 mm across .....	16
16. Figs with three persistent bracts at base .....	17
16. Figs without persistent bracts .....	20
17. Leaves to 13 x 6 cm; petiole to 5 cm long .....	18
17. Leaves more than 18 x 12 cm; petiole more than 10 cm long .....	19
18. Figs reddish; basal bracts glabrous .....	<b>F. beddomei</b>
18. Figs yellow; basal bracts tomentose .....	<b>F. dalhousiae</b>
19. Receptacle to 15 mm across; leaf base rounded .....	<b>F. virens</b> var. <b>wightiana</b>
19. Receptacle to 7 mm across; leaf base subcordate .....	<b>F. costata</b>
20. Figs solitary, green, more than 2 cm across .....	<b>F. callosa</b>
20. Figs paired, red, less than 1.5 cm across .....	<b>F. nervosa</b>

**Ficus amplocarpa** Govindarajalu & Masilamoney, Proc. Indian Acad. Sci. (Pl. Sci.) 91: 117. 1982. *Pogonotrophe macrocarpa* Miq., London J. Bot. 7: 74. 1848. *Ficus macrocarpa* (Miq.) Wight ex King, Ann. Roy. Bot. Gard. (Calcutta) 1: 166, t. 208. 1888 & in Hook. f., FBI 5: 534. 1888, non Bl., 1825: Gamble, FPM 1365. 1928.

Large climber; stem rounded, rooting; branchlets subglabrous. Leaves to 15 x 10 cm, ovate, cordate but sometimes unequal at base, abruptly acuminate at apex, 3-nerved from base, hispid below; lateral nerves 2 or 3 pairs, minutely hispid; petiole 7 cm long. Receptacle many together on lateral tubercles on old stem, globose, mottled with pink, pubescent; peduncle 1 cm long, bracteolate at the middle.

*Fl. & Fr.* November-February

*Distr.* South India and Sri Lanka. Occasional in evergreen and moist deciduous forests; *PS 30770* Orukomban

**Ficus arnottiana** (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 287. 1867; FBI 5: 513. 1888; FPM 1363. 1928; FTSR 428. 1996. *Urostigma arnottiana* Miq., London J. Bot. 6: 564. 1847.

Small trees; bark grey, reddish inside; branchlets glabrous, slender. Leaves to 17 x 10 cm, ovate, caudately acuminate at apex, acumen 4 cm long, deeply cordate at base; margins sometimes uneven; lateral nerves 10 pairs; intercostae reticulate; petiole 6-10 cm long; stipules 6 mm long, ovate, acuminate. Receptacle 6 mm across; sessile or very shortly peduncled, in axils of leaf scars or axillary, yellowish brown; bracteoles at the base of the fig.

*Fl. & Fr.* October-February

*Distr.* India and Sri Lanka. Occasional in deciduous forests; *PS 30202* Vengoli; *30484* Kuchimudi

**Ficus beddomei** King, Ann. Roy. Bot. Gard. (Calcutta) 1: 26. tt. 24 & 81 M. 1887; FBI 5: 513. 1888; FPM 1364. 1928; FPL 446. 1990; FTSR 428. 1996.

Tall trees; bark smooth, brown; branchlets with prominent stipular scars. Leaves to 18 x 12 cm, ovate, abruptly sharply acuminate, rounded to truncate at base; nerves 15 pairs, parallel, regularly looped below the margins, lowest pairs from base, nervules joined at the middle into a median vein; petiole 6 cm long; stipule 5 cm long, lanceolate, glabrous. Peduncle 1.5 cm long, stout, angled; bracteoles 6 x 3 mm, ovate. Receptacle globose, glabrous, green.

*Fl. & Fr.* November-January

*Distr.* Endemic to Western Ghats. Occasional in deciduous forests; *PS 19768* Pooppara; *19885* Velayudhankai

**Ficus callosa** Willd., Mem. Acad. Roy. Sci. Hist. (Berlin) 102. 1798; FBI 5: 516. 1888; FPM 1364. 1928; FPL 446. 1990.

Medium trees; bark dark grey, pale white inside; branchlets scabrous. Leaves to 20 x 12 cm, elliptic-oblong, obtusely acute at apex, rounded to cordate at base, minutely scabrous beneath, coriaceous, glossy above; nerves 10 pairs, prominent, regularly arched below the margins;

petiole 3-7 cm long; stipule 1 cm long, broadly ovate. Receptacle 2.5 cm across, axillary, globose, scabrous, yellow; peduncle 2.5 cm long, slender; bracteoles below the apex.

*Fl. & Fr.* March-May

*Distr.* Indo-Malesia. Fairly common in evergreen forests; *PS 30161* Pezha

**Ficus costata** Ait., Hort. Kew. 3: 452. 1789; Sasidh. & Jomy, Rheedeia 9:79.1999. *F. caudiculata* Trimen, J. Bot. 23: 243. 1885; FBI 5: 510. 1888. *F. mooniana* King in Hook.f., FBI 5: 514. 1888.

Medium trees, rarely epiphytic; branchlets slender, glabrous. Leaves to 13 x 6 cm, ovate-oblong, abruptly, sharply acuminate at apex, acumen 1 cm long, subcordate at base, reddish brown when dry, subcoriaceous; lateral nerves 16-18 pairs, joined below the margin into a narrow intramarginal vein, intercostae reticulate; petiole 3 cm long. Receptacle 8 mm across, smooth, yellowish; peduncle 5 mm long, glabrous; bracteoles 3, at apex of the peduncle.

*Fl. & Fr.* November-December

*Distr.* South India and Sri Lanka. Occasional in rocky areas of deciduous forests; *PS 19532* Thekkady; *30327* Pezha

**Note:** This species was considered endemic to Sri Lanka, recently reported from Thrissur and Periyar Tiger Reserve. Present collection from the sanctuary extends its range of distribution in Kerala.

**Ficus dalhousiae** Miq. in Hook.'s J. Bot. Kew Gard. Misc. 6: 571. 1854; FBI 5: 499. 1888; FPM 1364. 1928; FPL 446. 1990; FTSR 428. 1996.

Medium trees, young parts pubescent. Leaves 25-30 x 12-18 cm, broadly ovate-oblong, apex acute, base cordate, basally 5-nerved, nerves 10-12 pairs, subcoriaceous; petiole 4-10 cm, stipules 2 cm. Receptacles in pairs, axillary, 1 x 0.8 cm, obovoid, pubescent; peduncles to 8 mm, pubescent.

*Fl. & Fr.* October-April

*Distr.* Endemic to Southern Western Ghats. Fairly common in semi-evergreen forests; *PS 19798* Kariamchola

**Ficus drupacea** Thunb. var. **pubescens** (Roth) Corner, Gard. Bull. Straits Settlem. 17: 381. 1960 & 21: 13. 1965; FPL 446. 1990; FTSR 428. 1996. *F. mysorensis* Heyne ex Roth in Roem. & Schult., Syst. Veg. 1: 508. 1817; FBI 5: 500. 1888; FPM 1361. 1928. *F. mysorensis* Heyne ex Roth var. *pubescens* Roth in Roem. & Schult., Syst. Veg. 1: 508. 1817; FBI 5: 500. 1888; FPM 1361. 1928.

Large trees; bark dark brown, branchlets thick, fulvous tomentose. Leaves to 17 x 10 cm, ovate, acute; rounded to subcordate at base; lateral nerves to 17 pairs, parallel, looping below the margins forming an intramarginal vein; lowest pair narrow; petiole 3 cm long; stipule 2 cm long, glabrous towards the apex. Receptacle 2 cm across, paired, densely fulvous pubescent when young, glabrous when mature, yellow; bracteoles 3, ovate, tomentose towards the apex.

*Fl. & Fr.* August-October

*Distr.* India, Sri Lanka, Bangladesh and Laos. Common in moist deciduous forests; *PS 18827* Parambikulam

**Ficus exasperata** Vahl, Enum. Pl. 2: 197. 1806; FPL 447. 1990; FTSR 429. 1996. *F. asperrima* Roxb., Fl. Ind. 3: 554. 1832; FBI 5: 522. 1888; FPM 1366. 1928.

Small trees; bark thick, greyish brown; branchlets scabrous. Leaves to 20 x 12 cm, ovate to obovate, acute to acuminate at apex, base acute to round, coarsely scabrous; lateral nerves 4 pairs, basal pair opposite, intercostae coarsely reticulate; leaves of saplings and coppice often lobed; petiole 5 cm long. Receptacle solitary, 15 mm across, globose, yellow, deep pink when ripe, coarsely scabrid; peduncle 1 cm long, bracteoles 6 or 7, above the base, ovate.



*Fl & Fr.* January-March

*Distr.* East Africa, Arabia, India and Sri Lanka. Occasional in the streams of deciduous forests; *PS 30102* Parambikulam

**Ficus hispida** L. f., Suppl. Pl. 442. 1781; FBI 5: 522. 1888; FPM 1367. 1928; FPL 447. 1990; FTSR 429. 1996.

Small trees; branchlets hollow, cylindrical. Leaves to 18 x 10 cm, ovate-oblong or obovate-oblong, abruptly acuminate; base round to subcordate; lateral nerves 5 pairs, lowest pairs opposite, basal; intercostae subparallel; petiole 2 cm long; stipule 1.5 cm long, ovate, acute. Receptacles 2 cm across, many, fascicled, on slender drooping long leafless branches, obovoid-globose, hispid, greenish yellow; peduncles very short or absent

*Fl. & Fr.* October-February

*Distr.* Indo-Malesia to Australia. Occasional in moist deciduous forests; *PS 18808* Thellikkal

**Ficus microcarpa** L. f., Suppl. Pl. 442. 1781; FPL 448. 1990; FTSR 429. 1996. *F. retusa* King, Ann. Roy. Bot. Gard. (Calcutta) 1: 50. tt.61 & 84 P.1887, non L. 1767; FBI 5: 511. 1888; FPM 1362. 1928. *F. retusa* var. *nitida* sensu Hook. f., FBI 5: 511. 1888, non Thunb. 1781-1801; FPM 1362. 1928.

Medium trees with few aerial roots; bark smooth; branchlets angled, glabrous. Leaves 4-10 x 2-4 cm, elliptic to obovate, acute at base, coriaceous; lateral nerves to 11 pairs, lowest pair above the base, rib-like; petiole 1 cm long; stipule 1 cm long, ovate, glabrous. Receptacle 8 mm across, paired, sessile, globose, smooth, yellow; bracteoles 3, ovate, obtuse.

*Fl. & Fr.* August-February

*Distr.* Indo-Malesia to Pacific Islands and South China. Occasional in moist deciduous forests and grasslands; *PS 19239* Vengoli; *19903* Kariamchola

**Ficus mollis** Vahl, Symb. Bot. 1: 82. 1790. *Ficus tomentosa* Roxb. ex Willd., Sp. Pl. 4: 1136. 1806; FBI 5: 501. 1888; FPM 1361. 1928.

Large trees. Leaves to 11 x 6 cm, elliptic-ovate, apex obtuse, base cordate, densely tomentose, beneath with a gland at the base of the midrib, basally 5-nerved, nerves ca. 6 pairs; petiole 3.5 cm, densely fulvous tomentose, later glabrous, stipules 2.5 cm, lanceolate, tomentose. Receptacles in pairs, axillary, sessile, 0.5 cm across, tomentose.

*Fl. & Fr.* December-June

*Distr.* India and Sri Lanka. Occasional in dry deciduous forests; *PS 30062* Kuchimudi

**Ficus nervosa** Heyne ex Roth in Roem. & Schult., Syst. Veg. 1: 513. 1817; FBI 5: 512. 1888; FPM 1364. 1928; FPL 448. 1990; FTSR 429. 1996. *F. angustifolia* Roxb., Fl. Ind. 3: 554. 1832.

Large trees; bark greyish brown to black; branchlets glabrous. Leaves to 15 x 7 cm, ovate-oblong, obtusely shortly acuminate, rounded at base, coriaceous; lateral nerves to 12 pairs, lower ones opposite, forming an intramarginal vein; petiole 2.5 cm long; stipule 1 cm long, lanceolate. Receptacle 1.5 cm across, paired, axillary, reddish-brown, smooth; peduncle 1 cm long, bracteoles minute at the base of the peduncle.

*Fl. & Fr.* December-March

*Distr.* Indo-Malesia to Australia. Occasional in secondary forests; *PS 30025* Puliya

**Ficus racemosa** L., Sp. Pl. 1060. 1753; FPL 448. 1990; FTSR 430. 1996. *F. glomerata* Roxb., Pl. Corom. t. 123. 1799; FBI 5: 535. 1888; FPM 1364. 1928.

Small trees without aerial roots; branchlets puberulus, slender. Leaves to 15 x 6 cm, elliptic-oblong to lanceolate, acute at apex; acute to rounded at base; lateral nerves 8 pairs, lowest pair from the base, opposite, ribbed; intercostae reticulate; petiole 3 cm long; stipule 15 mm long,

glabrous. Tubercles branched, drooping, to 20 cm long; receptacles 2 cm across, globose, ashy-puberulus; peduncles 7 mm long; bracteoles 3, at the base of the peduncle.

*Fl. & Fr.* March-June

*Distr.* Indo-Malesia to Australia. Rare in the riverine areas; *PS 30106* Kuriarkutty

**Ficus religiosa** L., Sp. Pl. 1059. 1753; FBI 5: 513. 1888; FPM 1363. 1928; FPL 450. 1990. *Urostigma religiosum* (L.) Gasp. Ric. Caprifico 82. t. 7. ff.1-5. 1845.

Strangles. Leaves to 13 x 11 cm, broadly ovate, caudate, cusp to 8 cm, base truncate, 3-nerved; petiole to 12 cm, stipule to 1.5 cm, ovate-lanceolate, acute; figs , *ca* 8 mm across, monoecious, axillary paired; basal bract *ca* 4 mm, cupular, puberulus, apical bract 3; tepals 4, linear lanceolate; ovary 1 mm, ovoid-oblong.

*Fl. & Fr.* November-February

*Distr.* East Himalayas; planted and naturalised in India and neighbouring countries. Planted as avenue tree; *PS 19100* Peruvuripallam

**Ficus rigida** Jack, Malay. Misc. 2: 7-12. 1822, var. **bracteata** (Corner) Bennet, Indian J. For. 5:326. 1982; FPL 449. 1990. *F. glaberrima* Blume var. *bracteata* Corner, Gard. Bull. Straits Settlement. 17: 388. 1959(1960). *F. travancorica* King, Ann. Roy. Bot. Gard. (Calcutta) 1: 28. tt.26 & 820. 1887; FBI 5: 503. 1888; FPM 1365. 1928.

Large scandent epiphytic shrubs; branchlets angled, glabrous, stipular scars prominent. Leaves to 20 x 6 cm, oblong-lanceolate, acuminate, acute at base, reddish when dry; lateral nerves 14-16 pairs, prominent, regularly looping below the margins; lowest pair from the base, rib-like; petiole 3 cm long; stipule 4 cm long, glabrous. Receptacle 8-12 mm across, axillary, paired, globose, glabrous; peduncle 5 mm long; bracteoles 3, ovate, at the apex of the peduncle.

*Fl. & Fr.* August-December

*Distr.* Endemic to South India. Common in evergreen forests; *PS 19343* Thenkudippara, *19801* Kariamchola

**Ficus talbotii** King, Ann. Roy. Bot. Gard. (Calcutta) 1: 51. tt.63 & 84. 1887; FBI 5: 512. 1888; FPM 1363. 1928; FPL 449. 1990.

Large trees; branchlets glabrous, reddish. Leaves to 10 x 5 cm, ovate, acuminate to shortly caudate, acute to cuneate at base; lateral nerves 10-12 pairs, regularly looping below the margins, reddish brown when dry; petiole 2 cm long; stipule 6 mm long, ovate, pubescent. Receptacle paired, 6 mm across, obovoid, sessile; bracteoles ovate, obtuse, at base of the fig.

*Fl. & Fr.* August-December

*Distr.* India, Sri Lanka and Indo-China. Occasional in deciduous forests; *PS 19852* Vengoli

**Ficus tinctoria** Forst. f. ssp. **gibbosa** (Blume) Corner var. **cuspidifera** (Miq.) Chithra in Henry *et al.*, Fl. Tamil Nadu 2: 255. 1987. *F. cuspidifera* Miq., London J. Bot. 7: 434. 1848; FBI 5: 497. 1888. *F. gibbosa* Blume var. *cuspidifera* (Miq.) King, Ann. Roy. Bot. Gard. (Calcutta) 1: 6. t.2A.1887; FPM 1366. 1928.

Epiphytic or independent trees; aerial roots many, interlacing; bark smooth, white; branchlets slender, scabrous. Leaves 6-8 x 3-5 cm, elliptic-ovate or oblanceolate, gibbous to one side, acute at apex and base, scabrous; lateral nerves 3-5 pairs, distinct; petiole 6 mm long; stipule lanceolate, glabrous. Receptacle paired, 7 mm across, orange-yellow, globose, scabrous; peduncle 6 mm long, slender; bracteoles 3, at the base of the peduncle.

*Fl. & Fr.* October-December

*Distr.* India, China and Sri Lanka. Occasional in all forest types at higher altitudes; *PS 30232* Karimala

**Ficus tinctoria** Forst.f. ssp. **parasitica** (Koen. ex Willd.) Corner, Gard. Bull. s.s. 17: 476. 1960; FPL 449. 1990; FTSR 430. 1996. *F. parasitica* Koen. ex Willd., Mem. Acad. Roy. Sci Hist. (Berlin) 2: 102. 1798. *F. gibbosa* Blume var. *parasitica* (Koen. ex Willd.) King, Ann. Roy. Bot. Gard. (Calcutta) 1: t.2,16. 1887; FBI 5: 497. 1888; FPM 1365. 1928.

Large shrubs to small trees. Leaves 6-11 x 3-5.5 cm, ovate, acuminate or obtuse at apex, base acute, oblique, coriaceous, scabrid, nerves 4-7 pairs; petiole 1 cm. Receptacles in pairs or in clusters, axillary; peduncles 8 mm, pubescent.

*Fl. & Fr.* April-August

*Distr.* Indo-Malesia. Rare in the rocky areas at higher altitudes; *PS 30386* Kuchimudi; *30412* Kuchimudi

**Ficus tsjahela** Burm. f., Fl. Ind. 227. 1768; FBI 5: 514. 1888, "tjakela"; FPM 1362. 1928; FPL 450. 1990; FTSR 430. 1996.

Large deciduous trees, sometimes epiphytic; bark black, smooth, light pink inside, fibrous; branchlets glabrous. Leaves to 18 x 7 cm, ovate-oblong, abruptly acuminate, rounded at base, shining above, coriaceous; lateral nerves 10-12 pairs, regular, lowest pair opposite, very oblique, rib-like, nervules coarsely reticulate; petiole to 7 cm long; stipule to 6 cm long, lanceolate, yellowish red. Receptacle 5 mm across, in clusters of 3-6, sessile, globose, yellow; bracteoles 3, glabrous, yellow.

*Fl. & Fr.* October-December

*Distr.* Peninsular India and Sri Lanka. Common in deciduous forests; *PS 19295* Parambikulam

**Ficus virens** Ait. var. **wightiana** (Miq.) Chithra in Henry *et al.*, Fl. Tamil Nadu ser 1, 2: 256. 1987. *Urostigma wightianum* Miq., London J. Bot. 6: 566. 1847. *F. infectoria* Roxb. var. *wightiana* (Miq.) King, Ann. Roy. Bot. Gard. (Calcutta) 1: 63. t.77. 1887; FPM 1362. 1928. *F. wightiana* (Miq.) ex Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 286. 1867; FBI 5: 516. 1888.

Medium trees; branchlets glabrous. Leaves to 12 x 6 cm, ovate-oblong, bluntly acuminate at apex, rounded at base; lateral nerves 10 pairs, parallel, indistinct towards the margins, lowest pairs from the base, opposite, erose; petiole 3.5 cm long; stipule to 8 mm long, ovate. Receptacle 14 mm across, white; peduncles 5 mm long; bracteoles 3, at the apex of the peduncle, ovate.

*Fl. & Fr.* May-August

*Distr.* Endemic to Peninsular India. Occasional in evergreen forests; *PS 30698* Kariamchola

## SALICACEAE

### SALIX Linnaeus

**Salix tetrasperma** Roxb., Pl. Corom. t. 97. 1798; FBI 5: 626. 1888; FPM 1390. 1928; FPL 458. 1990.

Small trees, bark fissured, reddish; young shoots silky pubescent. Leaves to 15 x 3.5 cm, ovate, lanceolate, acuminate, rounded at base, crenate; petiole to 2.5 cm, stipules subulate. Catkin axillary, to 8 cm, silky villous; bracts ovate; female flowers-disc yellow, clasping the pedicel at the base; ovary ovoid, 4-6 ovuled, stigma 2, branched again. Capsule to 4 mm; seeds with long deciduous hairs.

*Fl. & Fr.* July-December

*Distr.* Indo-Malesia and South China. Fairly common in the riverine areas; *PS 30310* Orukomban

## BURMANNIACEAE

1. Perianth lobes uniseriate, hairy..... **Haplothismia**  
1. Perianth lobes biseriate, glabrous ..... **Burmannia**

## BURMANNIA Linnaeus

1. Perianth tube winged; flowers violet or purplish-blue.....**B. coelestis**  
1. Perianth tube not winged; flowers greyish white.....**B. championii**

**Burmattia championii** Thw., Enum. Pl. Zeyl. 325. 1864; FBI 5: 666. 1888; Hajra, Fasc. Fl. Ind. 19: 9. 1988; FPL 461. 1990. *B. dalzielii* Rendle, J. Bot. 40: 311. 1902 [Figure 9].

Saprophytes to 10 cm, stem simple or branched. Scales to 5 x 2.5 mm, lanceolate, spirally alternating. Cymes terminal, flowers to 7, *ca* 1 cm long, white, subsessile, bracts 4-5 x 2 mm, triangular, lanceolate, acute, perianth tube trigonous, lobes biseriate, outer lobe lanceolate, 2-2.5 x 1.5 mm, inner lobe spatulate or ligulate, acute, 1 x 0.5 mm; stamens 3, opposite to inner perianth lobe; ovary trigonous ellipsoid, style branched at apex, stigma funnel shaped.

*Fl. & Fr.* September-October

*Distr.* Indo-Malesia. Occasional in evergreen forests; *NS 19736, PS 30477* Parambikulam

**Note:** In India, this species was first reported from Silent Valley. The present collection from Parambikulam Wildlife Sanctuary is a new distribution locality.

**Burmattia coelestis** D. Don, Prodr. Fl. Nepal 44. 1825; FBI 5: 665. 1888; FPM 1399. 1928; Hajra, Fasc. Fl. Ind. 19: 9. 1988; FPL 462. 1990; FTSR 431. 1996. *Gonyanthes pusilla* Wall. ex Miers, Trans. Linn. Soc. London 18: 537. t. 38. f. 3. 1841. *Burmattia pusilla* (Wall. ex Miers.) Thw., Encycl. 325. 1864; FBI 5: 665. 1888. *B. coelestis* var. *pusilla* (Miers) Trimen, Fl. Ceylon 4: 131. 1898.

Autophytes, to 30 cm high, stem much reduced. Leaves absent. Flowers regular, on long terminal peduncle, 1-3 together; calyx tube 3-winged, 1 cm long, retuse at apex, bright pink; petals absent; stamens 3, anthers sessile, ovate, erect; ovary winged, ovules many, style 3-lobed. Fruit a winged capsule; seeds numerous, minute, reticulate.

*Fl. & Fr.* October-December

*Distr.* Indo-Malesia. Common in grasslands; *PS 19754* Pezha

## HAPLOTHISMIA Airy Shaw

**Haplothismia exannulata** Airy Shaw, Kew Bull. 1952: 277. 1952; Hajra, Fasc. Fl. Ind. 19: 15. 1988; Sasidh. & Sujanapal, Rheedeia 10: 131. 2000 [Figure 10].

Saprophytic herbs, stem 7-15 cm long, slender, simple or branched, muddy brown coloured; roots tuberous, clustered, up to 3.5 cm long, thickened towards the apex; leaves reduced to scales, many, more or less sheathing the stem, distichous, membranous, lower ones smaller and glabrous, *ca.* 0.5 x 0.4 cm, ovate, upper ones to 1.2 x 0.5 cm, puberulus, spathaceous, membranous; inflorescence pseudo-recemose, puberulus, 2-6 flowered; pedicels 4-5.5 cm long, from the axils of upper scales; flowers 1.5 cm long, perianth tube infundibular, base adnate to the ovary, 1 cm across at mouth, free at apex, limbs uniseriate up to 0.7 cm, persistent; stamens 6, opposite to the perianth segments; filaments basally attached to the perianth-hypanthium tube and free at apex, 1-1.5 mm long, incurved towards the base of the flower, alternate with teeth like projections and small ciliate structures on either side; anthers 1 mm, pendulous, ovate, basifixed, extrorse; ovary 0.5 cm, inferior, obovate, unilocular; ovules numerous, anatropous, placentae three, parietal; style very short, *ca.* 2 mm long; stigma trilobed, papillate, 4 mm long, base of the lobes slightly upcurved; fruit a capsule, loculicidal; seeds many, dark brown.

*Fl. & Fr.* October

*Distr.* Endemic to Southern Western Ghats (Kerala). Rare in evergreen forests; *PS 30387, NS 30476* Parambikulam

**Note:** Present collections from the type locality dispels the view on its existence. This narrow endemic species was considered as extinct due to habitat lose.

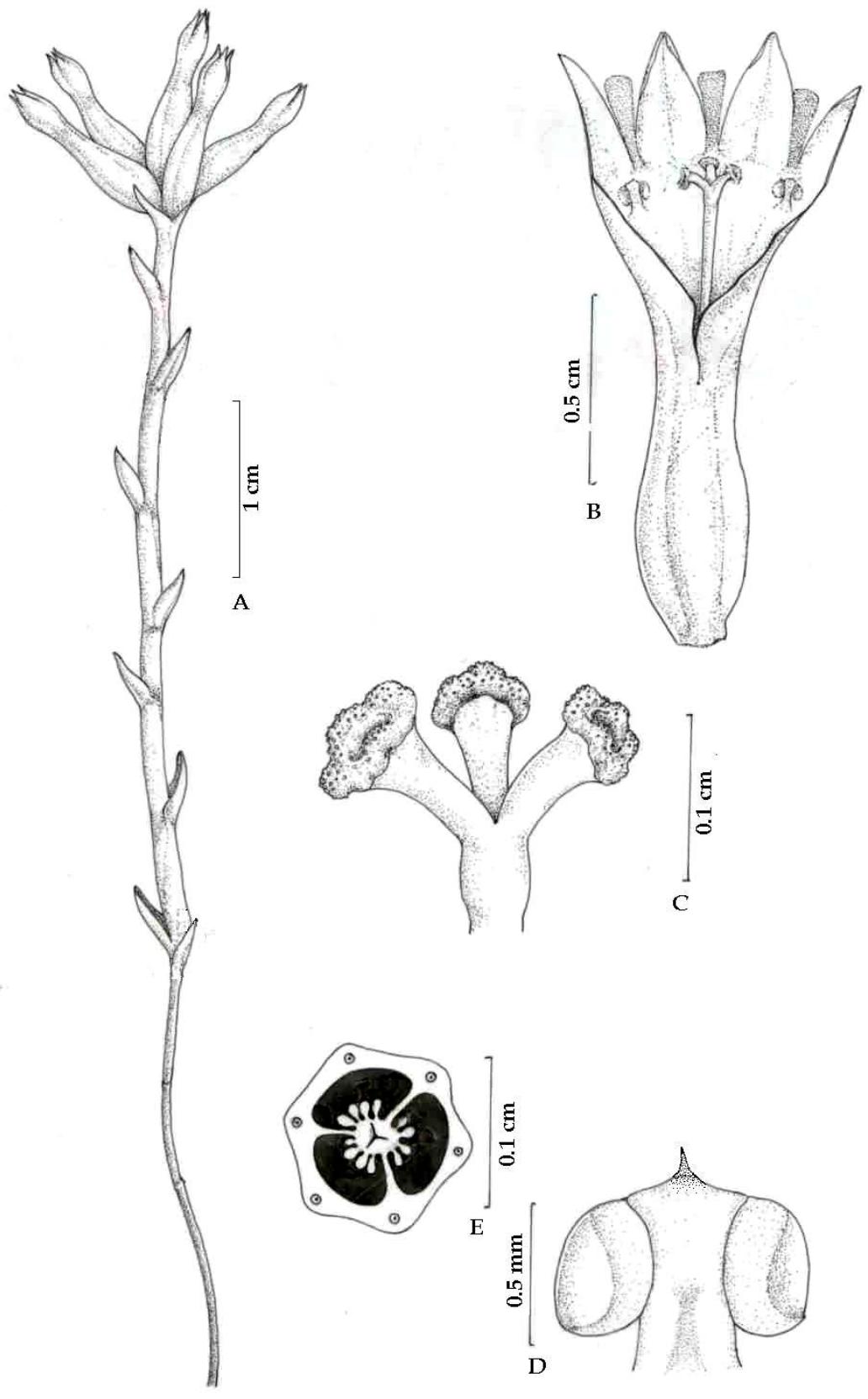


Figure 9. *Burmannia championii* Thw. **A.** habit; **B.** perianth tube split open; **C.** stigma; **D.** stamen without anther cells; **E.** cross section of ovary

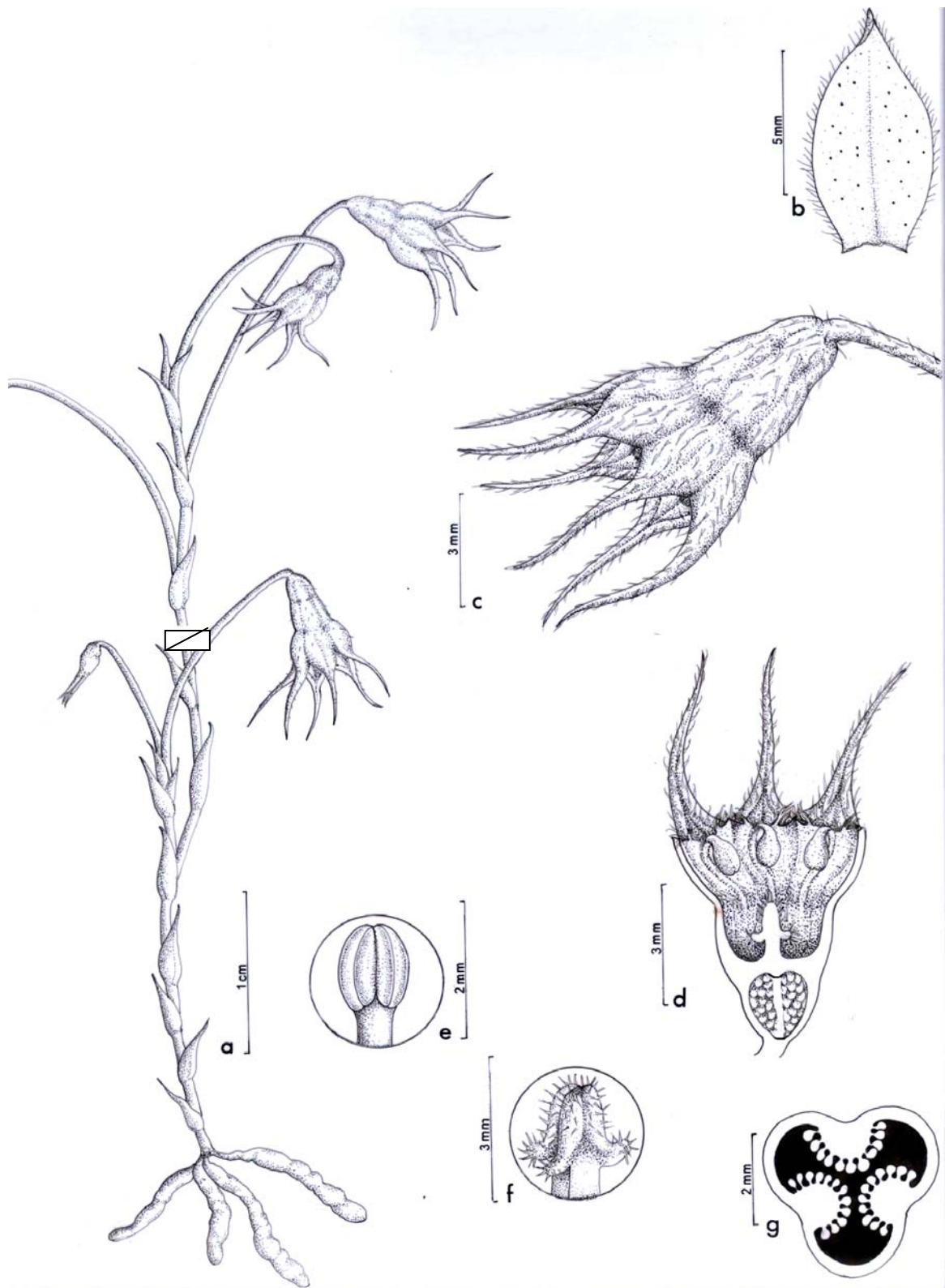


Figure 10. *Haplothismia exannulata* Airy Shaw. **a.** Habit; **b.** Scale; **c.** Single flower; **d.** Longitudinal section of flower; **e.** Anther; **f.** Stigma; **g.** Cross section of ovary

## ORCHIDACEAE

1. Epiphytic or lithophytic.....	2
1. Terrestrial .....	30
2. Leaves equitant.....	<b>Oberonia</b>
2. Leaves not equitant .....	3
3. Leaves terete .....	4
3. Leaves flat .....	5
4. Lip spurred.....	<b>Papilionanthe</b>
4. Lip not spurred .....	<b>Luisia</b>
5. Lip spurred .....	6
5. Lip not spurred, sometimes saccate .....	18
6. Spur double .....	<b>Diplocentrum</b>
6. Spur single.....	7
7. Plants leafless during flowering.....	8
7. Plants leafy during flowering .....	9
8. Column without foot.....	<b>Taeniophyllum</b>
8. Column with distinct foot bearing lateral sepals .....	<b>Chiloschista</b>
9. Column foot present .....	10
9. Column foot absent.....	11
10. Inflorescence paniculate, racemes many-flowered.....	<b>Aerides</b>
10. Inflorescence unbranched, racemes to 4-flowered .....	<b>Pteroceras</b>
11. Spur longitudinally septate .....	<b>Cleisostoma</b>
11. Spur not longitudinally septate .....	12
12. Inflorescence dense, drooping; spur distant from the base of the lip .....	<b>Rhynchostylis</b>
12. Inflorescence otherwise; spur at the base of the lip .....	13
13. Mouth of the spur closed by a horizontal plate .....	<b>Trichoglottis</b>
13. Mouth of the spur open .....	14
14. Midlobe of the lip ending in a backwardly pointed knob.....	<b>Xenikophyton</b>
14. Midlob of the lip not ending in a knob .....	15
15. Leaf apex 3-toothed, teeth acute .....	<b>Vanda</b>
15. Leaf apex unequally 2 lobed, lobes rounded.....	16
16. Stem elongated to 30 cm long; flowers in leaf opposed corymbs.....	<b>Acampe</b>
16. Stem under 3 cm long; flowers in terminal in axillary racemes .....	17
17. Leaves articulated at base; spur conical .....	<b>Smithsonia</b>
17. Leaves not articulated at base; spur saccate.....	<b>Gastrochilus</b>
18. Flowers with a mentum .....	19
18. Flowers without a mentum.....	21
19. Midlobe of lip with two awns at base.....	<b>Kingidium</b>
19. Midlobe of the lip not awned.....	20
20. Rhizome long; flowers 1-3 terminal.....	<b>Flickingeria</b>
20. Rhizome short; flowers in racemes or in lobed fascicles .....	<b>Dendrobium</b>
21. Column foot present .....	22
21. Column foot absent.....	25
22. Lip clawed, joined to the foot .....	23
22. Lip sessile .....	<b>Eria</b>
23. Scape lateral, racemose or umbellate .....	24
23. Scape terminal, flowers panicled.....	<b>Polystachya</b>
24. Flowers to 2 or in racemes .....	<b>Bulbophyllum</b>
24. Flowers in umbels.....	<b>Cirrhopetalum</b>
25. Bracts imbricating, convolute, concealing the flower .....	<b>Pholidota</b>
25. Bracts not imbricating, not concealing the flowers.....	26

26. Scape terminal; column long, curved .....	<b>Liparis</b>
26. Scape lateral; column very short .....	27
27. Pseudobulb absent .....	28
27. Pseudobulb present; ovoid or subglobose .....	29
28. Small plants; leaves basal, not keeled .....	<b>Sirhookera</b>
28. Robust plants; leaves equidistant on stem, keeled .....	<b>Cottonia</b>
29. Sepals and petals similar; pinkish brown .....	<b>Cymbidium</b>
29. Sepals and petals unequal; white .....	<b>Coelogyne</b>
30. Plants leafless; saprophytes .....	<b>Epipogium</b>
30. Plants leafy; autophytes .....	31
31. Plants without pseudobulbs or underground rhizome and tubers .....	32
31. Plants with pseudobulbs or underground rhizome .....	35
32. Stem up to 1 m high; leaves plaited .....	<b>Corymborkis</b>
32. Stem to 50 cm; leaves not plaited .....	33
33. Stem woody .....	<b>Tropidia</b>
33. Stem fleshy .....	34
34. Lip spurred; spur exerted beyond the base of the sepals .....	<b>Anoectochilus</b>
34. Lip saccate; spur not exerted beyond the base of the sepals .....	<b>Zeuxine</b>
35. Plants with pseudobulb .....	36
35. Plants with underground tubers; rhizome erect or creeping .....	39
36. Inflorescence few flowered, lateral, to 10 cm long .....	<b>Acanthephippium</b>
36. Inflorescence many flowered, terminal .....	37
37. Racemes 70-80 cm long; lip spurred .....	<b>Calanthe</b>
37. Racemes to 20 cm long; lip not spurred .....	38
38. Midlobe of the lip pectinate; side lobes obscure .....	<b>Seidenfia</b>
38. Midlobe of the lip not pectinate; side lobes well developed .....	<b>Crepidium</b>
39. Leaf one or two; leafless during flowering .....	40
39. Leaves 2-many; leafy during flowering .....	41
40. Leaves linear, acute .....	<b>Pachystoma</b>
40. Leaves cordate, orbicular .....	<b>Nervilia</b>
41. Spur absent; lateral sepals connate .....	<b>Disperis</b>
41. Spur present; lateral sepals free .....	42
42. Flowers pink; lip obcordate .....	<b>Brachycorythis</b>
42. Flowers white, cream or greenish; lip otherwise .....	43
43. Stigma lobes free; ovary and capsule spreading .....	<b>Habenaria</b>
43. Stigma lobes confluent; ovary and capsule appressed to flowering axis .....	<b>Peristylus</b>

#### ACAMPE Lindley

1. Leaf apex with a mucro between the lobes; flowers yellow with reddish brown bands ..... **A. praemorsa**
1. Leaf apex without a mucro; flowers yellow ..... **A. ochracea**

**Acampe ochracea** (Lindl.) Hochr., Bull. New York Bot. Gard. 6: 270. 1910. *Saccolabium ochraceum* Lindl., Bot. Reg. Misc. 2. 1842; FBI 6: 62. 1890.

Leaves 16-19 x 2 cm, oblong, keeled, obliquely bilobulate at apex. Panicles racemose, to 10 x 20 cm long; flowers yellow, 1.5 x 1.5 cm; dorsal sepal 7 x 2 mm, obovate, obtuse, 5-veined; lateral sepals 6 x 1-2 cm, obliquely oblong, acute, 3-veined; petals 7 x 1-2 mm, obovate-oblong or spatulate, 6-veined; lip 4 x 2 mm, triangular, obtuse, papillate, with 5 x 1 mm, cylindrical spur.

*Fl. & Fr.* January-March

*Distr.* Indo-Malesia. Rare in moist deciduous forests; *PS 30100* Velayudhankai



**Acampe praemorsa** (Roxb.) Blatt. & McCann, JBNHS 35: 495. 1932; FPL 465. 1990; FTSR 433. 1996. *Epidendrum praemorsum* Roxb., Pl. Corom. 34, t.43. 1795. *Saccolabium praemorsum* (Roxb.) Hook. f., FBI 6: 62. 1890. *Vanda wightiana* Lindl. ex Wight, Ic. t. 1670. 1851. *Acampe wightiana* (Lindl. ex Wight) Lindl., Folia Orch. Acampe 2. 1853; FPM 1447. 1928. *Saccolabium wightianum* (Lindl. ex Wight) Hook.f. Hook. f., FBI 6: 62. 1890.

Leaves to 20 x 3 cm, linear, thick, coriaceous; midrib impressed above. Corymbs leaf-opposed, to 6 cm long; flowers 1 cm across. Sepals and petals creamy yellow with reddish-brown transverse bands. Lip creamy white with narrow red streaks; midlobe ovate-obtuse, margins crispate, lateral lobes small, entire, spur short.

*Fl. & Fr.* March-April

*Distr.* India and Sri Lanka. Fairly common in moist deciduous forests and plantations; *PS 19851* Vengoli

#### ACANTHEPHIPIUM Blume ex Lindley

**Acanthephippium bicolor** Lindl., Bot. Reg. 20: t. 1730; FBI 5: 815. 1890; FPM 1426. 1928; FPL 466. 1990.

Pseudobulbs ovoid, 5-14 x 2-5 cm. Leaves 2 or 3, 20-40 x 6-12 cm, broadly lanceolate, acuminate. Flowers yellow with purplish red, 3.5 cm across, in 2-5-flowered racemes from the top of new pseudobulbs; bracts 3.5 x 3, cymbiform; sepals fused to form gibbous tube; dorsal sepals 3.2 x 1.1 cm, oblong, obtuse; lateral sepals as long as or broader than dorsal sepal, fused with the foot along their inner edges forming the base of the pitcher, obtuse, recurved at apex; petals 3.1 x 1.5 cm, spatulate, obtuse; lip 3-lobed, 1.5 x 2 cm, lateral lobes erect, rounded; midlobe recurved, oblong-spathulate, obtuse, disc 3-lamellate.

*Fl.* June-July

*Distr.* South India and Sri Lanka. Rare in evergreen forests; *PS 30772* Orukomban

#### AERIDES Loureiro

**Aerides ringens** (Lindl.) Fischer, Kew Bull. 1928: 284. 1928 & FPM 1442. 1928; FTSR 433. 1996. *Saccolabium ringens* Lindl., Gen. Sp. Orch. 221. 1833. *Aerides radicata* A. Rich., Ann. Sci. Nat. Bot. ser.2, 15: 65. 1841; FBI 6: 46. 1890. *A. linearis* Hook.f., FBI 6: 47. 1890. *Saccolabium rubrum* Wight, Ic. t. 1673. 1851, non Lindley.

Leaves 13-15 x 0.5 cm, linear, keeled, obliquely bilobulate. Flowers white with pink shades, 2 x 1.5 cm, in about 20 cm long, lax racemes; dorsal sepal 8 x 3 mm, oblong-ovate, acute, 5-veined; laterals 5 x 3.5 mm, broadly ovate, acute, 5-veined; petals 6 x 3 mm, oblong, obtuse, 5-veined; lip 6 x 2 mm, ovate, acute, side lobes oblong or orbicular small, midlobe linear-oblong, acute; disc with fleshy callus; spur 6 x 2 mm, cylindrical.

*Fl. & Fr.* June-July

*Distr.* South India and Sri Lanka. Common in deciduous forests; *PS 30299* Vengoli; *30415* Kuchimudi

#### ANOECTOCHILUS Blume

**Anoectochilus elatus** Lindl., Proc. Linn. Soc. Bot. 1: 178. 1857; FBI 6: 95. 1890 '*elatio*'; FPM 1453. 1928; FTSR 434. 1996.

Rhizome creeping. Leaves to 5 x 4 cm, ovate or elliptic, acute, dark maroon with golden netted veins; petiole 1.5 cm long. Flowers white, 2.5 x 1 cm, in about 20 cm long raceme; dorsal sepal ovate, acuminate, 1-veined; lateral sepals obovate-oblong, subacuminate, 1-veined; petals obliquely oblong, acuminate, 1-veined, connate with dorsal sepal; lip 3-lobed, 20 x 20 mm, side lobes 10 x 3 mm, oblong, retuse, curved, mesochile with 5-7 pairs of long fimbriate epichile, bilobed; spur bilobulate with spindle-shaped gland.

*Fl. & Fr.* November-December

*Distr.* Endemic to Southern Western Ghats. Rare along the margins of evergreen forests; *PS 30505* Pooppara

### BRACHYCORYTHIS Lindley

**Brachycorythis iantha** (Wight) Summerh., Kew Bull. 10: 238. 1955; FPL 468. 1990. *Platanthera iantha* Wight, Ic. t. 1692. 1851. *P. affinis* Wight, Ic. t. 1693. 1851. *Habenaria galeandra* Benth. in Hook. f., FBI 6: 163. 1890. *Phyllophax obcordata* (D. Don) Schltr., Report 16: 119. 1906; FPM 1476. 1928.

Unbranched herbs. Leaves 2.5-3 x 0.9-11 cm, elliptic-oblong, acute, 3-nerved, well spaced. Flowers pink, 1.5 x 1 cm; dorsal sepal 4.5 x 2 mm, ovate-lanceolate, acute, 3-veined; lateral sepals 7 x 2.5 mm, falcate, ovate-oblong, acute, 3-veined; petals 5 x 1.5 mm, lanceolate, obliquely acute at apex, 1 or 2-veined; lip 14 x 12 mm, obcordate with a large sinus, sac ovate, obtuse, 2 x 2 mm, biparted.

*Fl.* June-August

*Distr.* India and China. Rare in grasslands; *PS 30771* Karimala

### BULBOPHYLLUM Du Petit-Thouars

1. Inflorescence racemose ..... **B. neilgherrense**  
1. Inflorescence umbellate ..... **B. aureum**

**Bulbophyllum aureum** (Hook. f.) J.J. Sm., Bull. Buitz. 2, 8: 22. 1912; FTSR 435. 1996. *Cirrhopetalum aureum* Hook. f., FBI 5: 777. 1890; Fischer in Gamble, FPM 1420. 1928.

Pseudobulb ovoid, 1.5 x 1 cm, tapering towards apex, ridged, distantly placed on stout rhizomes. Leaves solitary, to 5 x 1.5 cm, elliptic-oblong, base subacuminate to form 1 cm long petiole, apex obtuse-emarginate. Flowers 1 or 2, golden yellow, 3 x 1 cm, in about 4 cm long slender peduncle; bract 4.8 x 1.6 mm, lanceolate, acute, 3-veined; dorsal sepals elliptic, obtuse at apex, 5-veined; lateral sepals oblong, lanceolate, acute, 5-veined; petals ovate, oblong, broad at base, 3-veined; lip ovate-oblong, obtuse, curved, fleshy.

*Fl. & Fr.* December-January

*Distr.* Southern Western Ghats. Occasional in evergreen forests at higher altitudes; *PS 30773* Karimalapuram

**Bulbophyllum neilgherrense** Wight, Ic. t. 1650. 1851; FBI 5: 761. 1890; FPM 1418. 1928; FPL 468. 1990; FTSR 435. 1996. *B. sterile* (Lam.) Suresh in Nicols. *et al.*, Interpr. Hort. Malab. 298. 1988. *Epidendrum sterile* Lam., Encycl. 1: 189. 1783.

Pseudobulb ovoid, ridged, to 3.5 x 2 cm. Leaves solitary, to 16 x 4 cm, oblong, base subacute with 1 cm long petiole, apex acute. Flowers brownish-yellow to brown, 12 x 8 mm, in 18-20 cm long dense raceme; dorsal sepal 5 x 1.1 mm, ovate, acute-apiculate, 5-veined, hooded; lateral sepals falcately elliptic-acuminate, 5-veined; petals ovate, acute, apiculate, 1-veined, glandular; lip 4 x 1-2 mm, acute, side lobes falcate.

*Fl. & Fr.* December-January

*Distr.* Endemic to Peninsular India. Fairly common in evergreen forests; *PS 30017* Puliayala

### CALANTHE R. Brown

**Calanthe sylvatica** (Thouars) Lindl., Gen. Sp. Orch. 250. 1833. *Centrosia sylvatica* Thouars, Aust. Afri. t. 35,36. 1822. *Bletia masuca* D. Don, Prodr. Fl. Nepal 30. 1825. *Calanthe masuca* (D. Don) Lindl., Gen. Sp. Orch. 249. 1833; FBI 5: 850. 1890; FPM 1432. 1928; FPL 469. 1990; FTSR 436. 1996. *C. emarginata* (Blume) Lindl., Gen. Sp. Orchid. Pl. 249. 1833.

Robust herbs to 40 cm tall. Leaves to 35 x 15 cm, puberulus, broadly elliptic, acuminate. Flowers pale blue, 3-4 cm across, in large terminal racemes, scape to 40 cm long, tomentose. Sepals oblong, acute, to 2 x 1.2 cm. Petals little smaller than the petals. Lip white with purple shades, spur 4 cm long.

*Fl.* October-November

*Distr.* Widespread from in Africa, Madagascar and Indo-Malesia. Fairly common in evergreen forests at higher altitudes; *PS 30060* Kanthalppara

### CHILOSCHISTA Lindley

**Chiloschista glandulosa** Blatt. & McCann, JBNHS 35. 488. 1932.

Small leafless epiphytes, roots to 2 mm thick. Scape 5 cm long, narrowed to base, thickening upwards, glandular pubescent. Flowers 3 or 4, brownish yellow; bracts 2.5 x 2 mm, ovate, apiculate; dorsal sepal 5 x 2 mm, obovate-oblong, obtuse, 5-veined; lateral sepals 4 x 2.5 mm, oblong, subacute; petals 5 x 3 mm, ovate, acute; lip 3-lobed, lateral lobes 3 x 3, oblong acute; mid lobe 1.5 x 1.5 mm, ovate, acute.

*Fl. & Fr.* January-March

*Distr.* Endemic to Southern Western Ghats. Rare in deciduous forests; *PS 18886* Muthalakkuzhi

### CIRRHOPETALUM Lindley

**Cirrhopetalum gamblei** Hook.f., FBI 5: 778. 1890; FPM 1420. 1928. *C. macraei* sensu Wight, Ic. t. 1652. 1851, non Lindl. 1820. *Bulbophyllum gamblei* (Hook. f.) J.J. Smith, Bull. Jard. Bot. Buitenz. ser. 2, 8: 24. 1912, non Hook. f. 1890. *B. fischeri* Seidenf., Dansk Bot. Ark. 29: 202. 1973; FPL 468. 1990; FTSR 435. 1996.

Rhizomes stout, pseudobulbs ovoid. Leaves to 5.5 x 1.5 cm, oblong. Scape slender, to 7.5 cm long, flowers dull maroon, 1.2 cm long, to 8 in umbels. Lateral sepals to 1.2 x 0.25 cm, papillose, dorsal sepal 0.5 cm long. Petals oblong 3 mm long. Lip spatulate, recurved.

*Fl. & Fr.* October-November

*Distr.* South India, Sri Lanka and Laos. Rare in evergreen forests at higher altitudes; *PS 30236* Karimala

### CLEISOSTOMA Blume

**Cleisostoma tenuifolium** (L.) Garay, Bot. Mus. Leafl. Harvard 23: 175. 1972; FTSR 436. 1996. *Epidendrum tenuifolium* L., Sp. Pl. 952. 1753. *Sarcanthus pauciflorus* Wight, Ic. t. 1747. 1851. *S. peninsularis* Dalz. in Hook.'s J. Bot. Kew Gard. Misc. 3: 343. 1851; FBI 6: 67. 1890; FPM 1447. 1928.

Pendulous epiphytes, 20-30 cm long. Leaves 10-12 x 0.5 cm, linear, strongly keeled, acute. Flowers yellow, in 3-6 cm long, leaf-opposed racemes; dorsal sepal 4.5 x 1.2 mm, obovate-oblong, lanceolate, acute, 3-veined; lateral sepals 3 x 1 mm, elliptic, acute, 3-veined; petals 3 x 0.8 mm, falcately-oblong, truncate, 1-veined; lip 2 x 4 mm, 3-lobed, side lobes 1.5 x 1 mm, ovate, apiculate, midlobe, 2 x 1 mm, ovate, with 2 fleshy calli; spur 3 x 1 mm, oblong-ovoid.

*Fl. & Fr.* July-August

*Distr.* South West India and Thailand. Fairly common in evergreen forests; *PS 19908* Kariamchola

### COELOGYNE Lindley

1. Pseudobulbs subglobose, corrugated ..... **C. nervosa**  
1. Pseudobulbs ovoid, not corrugated ..... **C. breviscapa**

**Coelogyne breviscapa** Lindl., Fol. Orch. Coelogyne 4. 1854; FBI 5: 833. 1890; FPM 1430. 1928; FPL 470. 1990; FTSR 437. 1996. *Coelogyne angustifolia* Wight, Ic. t.1641. 1851.

Pseudobulb ovoid, ridged, 4 x 1 cm, tapering towards apex. Leaves 2 per pseudobulb, 15-17 x 1-1.5 cm, linear, acute. Flowers white, in 10-13 cm long, 4-6-flowered, raceme from the rhizome; floral bracts 2-3 x 1 cm, lanceolate, acute; dorsal sepal oblong-lanceolate, acute, 5-veined; lateral sepals oblong-lanceolate, acute, 5-veined; petals linear, acute, 3-veined; lip 12 x 7-8 mm, 3-lobed, middle ovate.

*Fl. & Fr.* March-April

*Distr.* Endemic to Southern Western Ghats. Common in deciduous and semi-evergreen forests; *PS 30160* Pezha

**Coelogyne nervosa** A. Rich., Ann. Sci. Nat. (ser. 2) 15: 16. 1841; FPM 1430. 1928; FTSR 437. 1996. *C. corrugata* Wight, Ic. t. 1639. 1851; FBI 5: 835. 1890.

Pseudobulb, wrinkled. Leaves 2 per pseudobulb, 6-15 x 2-2.5 cm, oblong-lanceolate, acute; petiole 2-3 cm long. Flowers white, in 8-12 cm long, 3-4-flowered raceme from the middle of leaves; bracts 12 x 19 mm, ovate, acute; dorsal sepal oblong or elliptic, acute, to apiculate, 9-veined; lateral sepals oblong-elliptic, acute, apiculate, 9-veined; petals elliptic, acute at both ends, 5-veined; lip 24 x 7-15 mm, ovate, acute, trilobed, side lobes, obliquely ovate.

*Fl. & Fr.* June-July

*Distr.* Endemic to Southern Western Ghats. Occasional in evergreen forests at higher altitudes; *PS 30237* Karimala

#### CORYMBORKIS Du Petit-Thouars

**Corymborkis veratrifolia** (Reinw.) Blume, Coll. Orch. Arch. Ind. 125. Pl. 42-43. 1859; FPM 1452. 1928. *Hysteria veratrifolia* Reinw., Nov. Pl. Ind. Gen.-Syll. Pl. Nov. 2: 5. 1825-26. *Corymbis veratrifolia* (Reinw.) Reichb. f., Flora 48: 184. 1865; FBI 6: 91. 1890.

Terrestrial, monopodial herbs. Leaves to 40 x 8 cm, plaited, elliptic-lanceolate, caudate-acuminate, sessile. Panicles axillary, to 12 cm, bracts ovate-lanceolate, to 1 cm; flowers *ca* 2.5 cm across, white, sepals and petals *ca* 1.5-2 cm, linear-lanceolate, lip unguiculate; column elongate, terete, rostellum bifid, foot absent, pollinia 2, clavate.

*Fl. & Fr.* November-January

*Distr.* India to Samoa. rare in evergreen forests; *PS 30305* Padikuttu

#### COTTONIA Wight

**Cottonia peduncularis** (Lindl.) Reichb. f., Cat. Orch. Schiller 52. 1857; FPL 471. 1990; FTSR 437. 1996. *Vanda peduncularis* Lindl., Gen. Sp. Orch. 216. 1833. *Cottonia macrostachya* Wight, Ic. t. 1755. 1851; FBI 6: 26. 1890; FPM 1439. 1928.

Epiphytes, 10-20 cm tall. Leaves few, spiral, closely packed, 8-10 x 1 cm, oblong, keeled, bilobed at apex. Flowers brown, in 20-40 cm long peduncle; dorsal sepal 9 x 4 mm, obovate-oblong, obtuse, 7-veined; lateral sepals 8 x 4.5 mm, obovate-oblong, obtuse, 7-veined; petals 8 x 3 mm, linear-oblong, obliquely truncate, 3-veined; lip 1.2 x 10 mm, subpanduriformis, 2-auricled at base with interposed calli, lateral lobes orbicular, midlobe trifid, lateral lobules orbicular.

*Fl.* March-May

*Distr.* South India and Sri Lanka. Fairly common in deciduous forests; *PS 30193* Kottayali

#### CREPIDIDIUM Szlachetko

**Crepididium acuminatum** (D. Don) Szlach., Syst. Orch. 123. 1995. *Malaxis acuminata* D. Don, Prodr. Fl. Nepal 29. 1825; FPL 484. 1990; FTSR 448. 1996. *Microstylis wallichii* Lindl., Gen. Sp. Orch. 20. 1830; FBI 5: 686. 1888; FPM 1407. 1928.

Plants without distinct pseudobulbs. Leaves 3-5, to 12 x 5, elliptic, glabrous. Scape to 10 cm long; bracts linear, 6 mm long, deflexed. Flowers 1.2 cm across, greenish-yellow, confined to the upper half of the scape. Lateral sepals ovate, acute, 3 mm long; dorsal oblong acuminate, 4 mm long. Petals linear, obtuse, 4 mm long. Midlobe of the lip 2-lobuled.

*Fl. & Fr.* February-May

*Distr.* Indo-Malesia. Common in wet areas of evergreen forests; *NS 5634* Karimala Hills

#### CYMBIDIUM Swartz

**Cymbidium aloifolium** (L.) Sw., Nov. Act. Sc. Upsal. 6: 73. 1799; FBI 6: 8. 1890p.p.; FPM 1436. 1928; FPL 471. 1990; FTSR 437. 1996. *Epidendrum aloifolium* L., Sp. Pl. 953. 1753. *E. pendulum* Roxb., Pl. Corom. 1: 35. t. 44. 1795. *Cymbidium pendulum* (Roxb.) Sw. & Lindl., Nova Acta Regiae Soc. Sci. Upsal. 6: 73. 1799; FPM 1436. 1928.

Robust epiphytes; roots numerous, densely covering the base. Leaves 30-35 x 1.5 x 2 cm, oblong, obtuse at apex. Flowers in 30-40 cm long, pendulous, lax slender racemes; sepals similar, 25 x 5 mm, linear-lanceolate, acute, 7-veined; petals 20 x 6 mm, oblong-lanceolate, acute, 5-veined; lip 17 x 10 mm, trilobed, lateral lobes obliquely oblong, obtuse, less than column; midlobe ovate, acute, disc with 2 fleshy calli at the mouth of the small saccate base.

*Fl.* April-May

*Distr.* Indo-Malesia. Common in deciduous forests; *PS* 19902 Kariamchola; 30581 Thoothanppara

#### DENDROBIUM Swartz

- |   |                         |
|---|-------------------------|
| 1. Stem short reduced to single pseudobulb.....       | <b>D. nanum</b>         |
| 1. Stem long with many nodes .....                    | 2                       |
| 2. Inflorescence terminal .....                       | <b>D. heyneanum</b>     |
| 2. Flowers on leafless nodes .....                    | 3                       |
| 3. Flowers fascicles on short tubercles on nodes..... | 4                       |
| 3. Flowers racemose .....                             | 5                       |
| 4. Stem clavate; operculum hairy .....                | <b>D. heterocarpum</b>  |
| 4. Stem not clavate; operculum not hairy .....        | <b>D. macrostachyum</b> |
| 5. Stem many branched; lip unlobed .....              | <b>D. herbaceum</b>     |
| 5. Stem unbranched; lip 3-lobed.....                  | <b>D. ovatum</b>        |

**Dendrobium herbaceum** Lindl., Bot. Misc. 69. 1840; FBI 5: 719. 1890; FPM 1416. 1928; FPL 473. 1990; FTSR 438. 1996. *D. ramosissimum* Wight, Ic. t. 1648. 1851.

Stem 30-40 cm long, branched, terete, leafless when flowering. Leaves 3-8 cm long, narrowly linear. Flowers white, in 4-6-flowered, 1-1.5 cm long, slender racemes; dorsal sepal oblong-lanceolate, acute, 3-veined; lateral sepals oblong, subacute, apiculate, falcate, 3-veined; petals subfalcately oblong, apiculate, 1-veined; lip 3 x 2 mm, side lobes ovate-orbicular; midlobe thick, orbicular, obtuse.

*Fl. & Fr.* December-January

*Distr.* Endemic to Peninsular India. Common in evergreen forests at higher altitudes; *PS* 30139, *NS* 30554 Karimala

**Dendrobium heterocarpum** Lindl., Gen. Sp. Orch. 78. 1830; FBI 5: 737. 1890; FPM 1416. 1928; FPL 473. 1990. *D. aureum* Lindl., Gen. Sp. Orch. 77. 1830.

Stem 20-35 cm, clavate. Leaves 8-10 x 2 cm, oblong-lanceolate, acute at both ends, 2 or 3 towards the tip. Flowers white, in short, 2-4 flowered raceme on leafless stem; dorsal sepal 23 x 9 mm, oblong-lanceolate, obtuse, 5-veined; lateral sepals obliquely ovate-oblong, lanceolate, subacute, 7-veined; petals obliquely elliptic, apiculate, 7-veined; lip 21 x 10-15 mm, quadrately ovate, apiculate, hairy within; side lobes ovate, obtuse; midlobe ovate, acute, apiculate, margins, crenulate.

*Fl. & Fr.* December-January

*Distr.* Indo-Malesia. Rare on trees in the margins of grasslands; *PS* 30414 Kuchimudi

**Dendrobium heyneanum** Lindl., Gen. Sp. Orch. 78. 1830; FBI 5: 718. 1890; FPM 1415. 1928; FPL 474. 1990; FTSR 438. 1996.

Stem 15-20 cm long. Leaves 8-10 x 0.6-0.8 cm, linear, acute, sessile, sheathed at base. Flowers white, in 8-10 cm long, 10-12 flowered, slender axillary or terminal racemes; dorsal sepal 9 x 2 mm, oblong-lanceolate; acute, 5-veined; lateral sepals 9 x 2.5 x 3 mm, obliquely ovate-lanceolate, acute; petals oblanceolate-linear, acute; lip 12.5 x 4-6.5 mm, obovate, side lobes oblong-lanceolate, acute; midlobe, ovate, subacute, apiculate, margins dentate.

*Fl. & Fr.* August-November

*Distr.* Endemic to Peninsular India. Common in deciduous forests; *PS* 30272 Pooppara

**Dendrobium macrostachyum** Lindl., Gen., Sp. Orch. 78. 1830; FBI 5: 735. 1890; FPM 1416. 1928; FPL 474. 1990; FTSR 439. 1996.

Stem pendulous, terete, 25-40 cm long. Leaves sessile, 6-7 x 1-1.5 cm, oblong-lanceolate, acute. Flowers on short tubercles of leafless nodes; pedicel 2 cm long; dorsal sepal 13-14 x 3 mm, oblong-lanceolate, acute, 5-veined; lateral sepals obliquely oblong-lanceolate, acute, 5-veined; petals 14 x 4 mm, lanceolate, acute, 3-veined; lip 17 x 9-10 mm, quadrate, crenulate, ciliate, apiculate at apex.

*Fl.* April

*Distr.* India and Sri Lanka. March-April. Common in moist deciduous forests and plantations; *PS 30383* Kariamchola; *NS 19484* Thellikkal; *PS 30178* Kottayali

**Dendrobium nanum** Hook.f., Ic. Pl. t. 19. 1853; FBI 5: 717. 1890; FPM 1415. 1928; FPL 474. 1990. *D. mabelae* Gammie, JBNHS 16: 567. 1905.

Small herbs; pseudobulbs ovoid, covered with basal portion of leaves. Leaves 3 or 4, 3 x 1.2 cm, lanceolate-elliptic. Racemes to 8 cm; flowers 6-8, pinkish white; bracts 0.5 cm, lanceolate; sepals to 8 mm; mentum to 5 mm; lip tri-lobed, narrowed to a short stalk; lateral lobes narrow, shortly pectinate; ovary with pedicels to 1 cm.

*Fl. & Fr.* April-July

*Distr.* Endemic to Southern Western Ghats. Fairly common in the evergreen forests at higher altitudes; *PS 30408* Kuchimudi; *NS 18993* Orukomban

**Dendrobium ovatum** (L.) Kranz. in Engl., Pflanzenr. 45: 71. 1910; FPM 1416. 1928; FPL 474. 1990; FTSR 439. 1996. *Epidendrum ovatum* L., Sp. Pl. 2: 952. 1753. *Dendrobium chlorops* Lindl., Bot. Reg. Misc. 44. 1844; FBI 5: 719. 1890. *D. barbatulum* Wight, Ic. t. 910. 1845, non Lindl. 1830.

Stem 20-40 cm long; leafless when flowering. Flowers white, in 15-20 cm long terminal and axillary racemes; dorsal sepal 10 x 3-3.5 mm, oblong, obtuse, 5-veined; lateral sepals elliptic-oblong, acute, subfalcate, 5-veined; petals 11 x 7.5 mm, obovate, orbicular, 3-veined; lip 13 x 6-7.5 mm, obovate; side lobes falcately ovate-orbicular; midlobe obovate, acute; disc with a tuft of green hairs.

*Fl. & Fr.* December-January

*Distr.* Endemic to Western Ghats. Rare in the margins of evergreen forests; *PS 30612* Pezha

#### DIPLOCENTRUM Lindley

1. Lip oblong, rounded; petals oblong, truncate..... **D. recurvum**  
1. Lip lanceolate, truncate; petals ovate, subacute..... **D. congestum**

**Diplocentrum congestum** Wight, Ic. t. 1682. 1851; FBI 6: 78. 1890; FPM 1449. 1928; FTSR 439. 1996.

Stem 2-4 cm long. Leaves 10-15 x 0.4 cm, linear, keeled, bilobed at apex. Flowers pink, in 10-20 cm long, rarely branched racemes; dorsal sepal 3-3.5 x 2 mm, elliptic, bimucronate at apex, 3-veined; lateral sepals broadly obovate, acute, 3-veined; petals 3 x 1.5 mm, oblong-elliptic, obtuse, 3-veined; lip 6 x 3 mm, ovate-lanceolate, obtuse, 5-veined, with 2 collateral spurs.

*Fl.* April-May

*Distr.* Endemic to Peninsular India. Common in deciduous forests; *PS 30613* Kuchimudi

**Diplocentrum recurvum** Lindl., Bot. Reg. sub t. 1522. 1832. & Gen. Sp. Orch. 218. 1833; FBI 6: 78. 1890; FPM 1449. 1928. *D. longifolium* Wight, Ic. t. 1681. 1852.

Stem 6-8 cm long. Leaves linear, 15-20 x 0.4 cm, keeled, or subterete, obtuse, mucronate. Flowers pink, in branched 25-35 cm long racemes; dorsal sepal 3 x 1.1 mm, oblanceolate, bimucronate, 3-veined; lateral sepals 4 x 2 mm, falcately oblong, lanceolate, obtuse, 3-veined;

petals 3 x 1.5 mm, oblong-lanceolate, subacute, 3-veined; lip 6.9 x 3 mm, oblong-lanceolate, obtuse, 7-veined, with 2 collateral spurs; disc with a fleshy ridge, forking at apex.

*Fl.* May-June

*Distr.* South India and Sri Lanka. Common in deciduous forests; *PS 30389* Kuchimudi

#### DISPERIS Swartz

**Disperis neilgherrensis** Wight, Ic. t. 1719. 1851; FBI 6: 169. 1890; FPM 1478. 1928. *D. zeylanica* Trimen, J. Bot. 23: 245. 1885; FBI 6: 169. 1890; FPL 475. 1990. *D. monophylla* Blatt. ex Fischer in Gamble, FPM 1478. 1928.

Terrestrial herbs with a tuber, stem 10-15 cm tall. Leaves to 10 x 9 mm, ovate, cordate, acute, sessile. Flowers pale-pink or rose, one or two in terminal raceme. Dorsal sepal and petals connate to form a hood over the column; dorsal sepal 9 x 2 mm, linear-lanceolate, 3-veined; lateral sepals obliquely obovate, obtuse, many-veined; petals 10 x 6 mm, obliquely obovate or elliptic, subacute, 3-veined; lip 5 x 5 mm, anchor shaped, bifid, with two long linear recurved arms with yellow papillae.

*Fl.* May-June

*Distr.* Endemic to Southern Western Ghats. Fairly common in evergreen forests; *PS 30588* Kariamchola

#### EPIPOGIUM R. Brown

**Epipogium roseum** (D. Don) Lindl., J. Linn. Soc. Bot. 1: 177. 1857; FPL 476. 1990; FTSR 440. 1996. *Limodorum roseum* D. Don, Prodr. Fl. Nepal 30. 1825. *Epipogium nutans* Reichb. f., Bonplandia 5: 36. 1836; FBI 6: 124. 1890; FPM 1460. 1928 'Epipogum'. *Podanthera pallida* Wight, Ic. t. 1759. 1851.

Saprophytic tuberous herbs, 15-25 cm tall; tuber 2-3 x 2 cm, ovoid or oblong. Flowers white, speckled with pink spots, racemose; dorsal sepal 9 x 1.4 mm, linear, subacute, obtuse, 3-veined; lateral sepals 10 x 1 mm, linear, subacute, 3-veined; petals 9.5 x 2 mm, oblong-lanceolate, obtuse. disc with 2 rows of tubercles; spur 3 x 2 mm, saccate; column 4 x 1.2 mm; ovary 3.5 x 1.2 mm.

*Fl.* April-May

*Distr.* Africa through Asia to Australia and New Guinea. Common in evergreen forests; *PS 18861* Karimthalappara; *NS 19418* Pooppara

#### ERIA Lindley

- |  |                      |
|--|----------------------|
| 1. Stem reduced to small discoid or globular pseudobulbs ..... | 2                    |
| 1. Stem elongate, plurinodal pseudobulb .....                  | <b>E. pauciflora</b> |
| 2. Inflorescence one-flowered; lip 3-lobed .....               | <b>E. reticosa</b>   |
| 2. Inflorescence many flowered; lip unlobed .....              | 3                    |
| 3. Flowers second.....   | <b>E. dalzellii</b>  |
| 3. Flowers not second .....                                    | <b>E. tiagii</b>     |

**Eria dalzellii** (Hook.) Lindl., J. Linn. Soc. Bot. 3: 47. 1859; FBI 5: 789. 1890; FPM 1425. 1928; FPL 477. 1990. *Dendrobium dalzellii* Hook. ex Dalz. in Hook.'s J. Bot. Kew. Gard. Misc. 4: 292. 1852. *D. fimbriatum* Dalz. in Hook.'s J. Bot. Kew Gard. Misc. 4: 292. 1852.

Pseudobulbs 1.5 cm in diameter. Leaves 3 or 4, 7 x 1 cm, oblanceolate, obtuse, mucronate. Racemes to 10 cm long. Flowers greenish-yellow; sepals subsimilar, lanceolate, acuminate, margins with stalked glands, 3-veined; petals slightly, narrower than sepals; lip 3 x 1 mm, falcate panduriform, minutely papillate; disc with 2 thick yellowish orange ridges.

*Fl.* September-October

*Distr.* Endemic to Western Ghats. Rare in evergreen forests; *PS 30629* Kothala

**Eria pauciflora** Wight, Ic. t. 1636. 1851; FBI 5: 779. 1890; FPM 1425. 1928.

Stem clavate, 8-10 cm tall. Leaves 2, 4-6 x 1 cm, oblong-lanceolate, acute. Flowers white, in 1.5-2 cm long, 2-flowered, terminal raceme; dorsal sepal 7.5 x 2.8 mm, obovate-oblong, acute, 3-veined; lateral sepals 10 x 5.5-7 mm, obliquely ovate, acute; petals 8.5 x 2 mm, oblong-lanceolate, subacute-obtuse, 3-veined; lip 6.5 x 3.6 mm, quadrate, emarginate at apex; disc with fleshy bilobed calli; midlobe with 3 fleshy ridges.

*Fl.* August-September

*Distr.* Endemic to Southern Western Ghats. Common in evergreen forests; *PS 30361* Kariamchola

**Eria reticosa** Wight, Ic. t. 1637. 1851; FBI 5: 787. 1890; FPL 477. 1990; FTSR 440. 1996. *E. braccata* sensu Fischer in Gamble, FPM 1425. 1928, non Lindl.

Pseudobulbs discoid, 6-10 mm diameter, reticulated. Leaves 2 per pseudobulb, 2-7 x 0.5-1.5 cm, oblanceolate to oblong-lanceolate, acute-apiculate, membranous. Flowers white, tinged with pink, solitary on 2-4 cm long slender scape from the pseudobulb; dorsal sepal 16-19 x 6-7 mm, oblong-lanceolate, obtuse, 7-veined; lateral sepals 16-20 x 6-11 mm, obliquely ovate-lanceolate, acute, 7-veined; petals 15-19 x 6 mm, oblong-lanceolate, subacute, 5-veined; lip 16-19 x 5-9 mm, elliptic-oblong or ovate, obtuse emarginate at apex; disc with 2 white ridges reaching subapically.

*Fl.* May-October

*Distr.* Endemic to Peninsular India. Rare in evergreen forests at higher altitudes; *PS 19752* Pezha

**Eria tiagii** Manilal *et al.*, JETB 5: 483. 1984.

Pseudobulbs compressed, *ca* 4 mm, dia. often sheathed. Leaves 2 or 3, to 2.5 x 0.5 cm, oblanceolate, apiculate sessile. Racemes zigzag to 5 cm, terminal, bracts *ca* 2 mm, acuminate. Flowers white, *ca* 6 mm, sepals lanceolate *ca* 5 x 2.5 mm, petals 4 x 2 mm, lanceolate, lip 3 x 1 mm, base clawed; disc with two linear calli at base, distal end crenulate.

*Fl. & Fr.* May-June

*Distr.* Endemic to Southern Western Ghats (Kerala). Rare in evergreen forests at higher altitudes; *PS 19743* Pezha

#### FLICKINGERIA Hawkes

**Flickingeria nodosa** (Dalz.) Seidenf., Dansk Bot. Ark. 34: 41. 1980; FTSR 442. 1996. *Dendrobium nodosum* Dalz. in Hook.'s J. Bot. Kew Gard. Misc. 4: 292. 1852. *D. macraei* Hook. f. in Hook.f., FBI 5: 714. 1890, non Lindl. 1830. *Desmotrichum fimbriatum* Fischer in Gamble, FPM 1412. 1928, non Blume 1825. *Ephemerantha macraei* sensu Joseph, Orch. Nilgiris 88. 1982, (Lindl.) Hunt & Summerh. 1961.

Tufted epiphytes with creeping root stock and sympodially branched stem, 20-30 cm long, each branch ends in a fusiform pseudobulb. Leaves one per pseudobulb, 7-10 x 2 cm, oblong-lanceolate, obtuse. Flowers white, 1-3 from the tip of a pseudobulb; bracts 1.8 x 2.5 mm, ovate, acuminate, 3-veined; dorsal sepal 10.5 x 3.5 mm, oblong-lanceolate, acute, 5-veined; lateral sepals 10 x 4.5 mm, obliquely oblong-lanceolate, acute, 7-veined; petals 9.5 x 2.5 mm, lanceolate, acute, 3-veined; lip 12 x 6 mm, 3-lobed; lateral lobes oblong, obtuse; midlobe subquadrate, recurved, crenulate.

*Fl.* March-April

*Distr.* Endemic to Southern Western Ghats. Rare in the margins of evergreen forests at higher altitudes; *PS 30194* Kottayali; *NS 30382* Pandaravarai

#### GASTROCHILUS D. Don

**Gastrochilus flabelliformis** (Baltt.&McCann) Sald., Fl. Hassan Dist. 830. 1976. *Saccolabium flabelliformis* Blatt. & McCann, JBNHS 35: 722. 1931.



Leaves to 4.5 x 1 cm, falcate with purple tinges, unequally bilobed at apex. Racemes to 1.5 cm long; flowers *ca* 5 mm across, sepals *ca* 1.5 x 1 mm, ovate, petals *ca* 1 x 0.5 mm, spatulate yellow with red spots, lip 3-lobed, saccate, 3 x 2 mm, side lobes obtuse, midlobe fan shaped, crenate, white; column *ca* 1 mm dia, winged purple coloured, rostellum bifid, pollinia 2, glandular, 0.1 mm, stipe narrow.

*Fl. & Fr.* October-November

*Distr.* Endemic to Western Ghats. Fairly common in evergreen forests; *PS 30201* Kariamchola

#### HABENARIA Willdenow

- |  |                            |
|--|----------------------------|
| 1. Petals 2-paritite.....  | 2                          |
| 1. Petals entire.....  | 3                          |
| 2. Leaves basal; inflorescence 1 or 2 flowered.....                    | <b>H. rariflora</b>        |
| 2. Leaves cauline; inflorescence many flowered .....                   | <b>H. multicaudata</b>     |
| 3. Inflorescence secund or subsecund; bracts cucullate .....           | <b>H. barnesii</b>         |
| 3. Inflorescence not secund; bracts not cucullate.....                 | 4                          |
| 4. Sidelobes of lip linear-oblong.....                                 | <b>H. ovalifolia</b>       |
| 4. Sidelobes of lip semi-ovate to recurved, cuneate or fimbriate ..... | 5                          |
| 5. Ovary long pedicelled; flowers 1-3 .....                            | <b>H. longicorniculata</b> |
| 5. Ovary sessile; flowers more than 5 .....                            | 6                          |
| 6. Sidelobes of lip obovate, oblong .....                              | <b>H. longicornu</b>       |
| 6. Sidelobes of lip ovate, obtuse.....                                 | <b>H. plantaginea</b>      |

**Habenaria barnesii** Summerh. ex Fischer in Gamble, FPM 187. 1936; FTSR 443. 1996.

Stem to 20 cm high. Leaves to 2.5 x 0.5 cm, oblong-lanceolate, acute. Flowers in secund spikes; bracts 2.5 x 1 cm, cucullate, foliaceous, almost concealing flowers; dorsal sepal 3.5 x 2 mm, ovate, obtuse, 5-veined; lateral sepals 5 x 2.5 mm, falcately ovate-lanceolate, obtuse, 5-veined; petals 4 x 1.5 mm, falcately linear-lanceolate, obtuse, 2-veined; lip 10 x 15 mm, 3-lobed; lateral lobes linear; midlobe oblong, obtuse; spur 1.5 cm long, cylindric, obtuse, shorter than ovary.

*Fl.* August-September

*Distr.* Endemic to Southern Western Ghats. Rare in wet areas of grasslands; *PS 19677* Karimala

**Habenaria longicorniculata** Grah., Cat. Bombay Pl. 202. 1839; FPL 482. 1990; FTSR 444. 1996.

*H. longicalcarata* A. Rich., Ann. Sci. Nat. (Ser. 2) 15: 71, t. 3B. 1841; FBI 6: 141. 1890; Fischer in Gamble, FPM 1470. 1928.

Stem 20-60 cm high. Leaves clustered towards base of stem, to 15 x 2 cm, oblong-lanceolate or linear-lanceolate, acute. Scape to 40 cm long. Flowers white, 2.5 cm across; sepals 1 x 0.6 cm, obliquely ovate; dorsal sepal concave; petals 1 x 0.3 cm, spatulate, obtuse; lip 3-partite, side lobes 1 x 0.6 cm, oblong, subcuneate, oblique at apex, subentire, 1 x 0.6 cm; midlobe linear-oblong, little shorter than the side lobes, narrower; spur to 12 cm long, linear, subclavate, to 12 cm long.

*Fl.* July-August

*Distr.* Endemic to Peninsular India. Fairly common in wet areas of grasslands; *PS 30774* Vengoli

**Habenaria longicornu** Lindl., Gen. Sp. Orch. 322. 1835; FBI 6. 139. 1890; FPM 1470. 1928; FPL 482. 1990; FTSR 444. 1996. *H. montana* A. Rich., Ann. Sci. Nat. Bot. 15: t. 4A.1841.

Stem 10-40 cm high. Leaves to 12 x 2.5 cm, clustered towards the middle of the stem, linear-oblong, lanceolate, acute or acuminate. Scape to 25 cm tall. Flowers to 8, 2.5 cm across; bracts shorter than the 2.5 cm long ovary; sepals ovate, acute; petals linear-oblong, narrower; lip 3-

partite; side lobes 1.2 x 0.5 cm, cuneate, apex obliquely truncate, fimbriate; midlobe linear, shorter; spur to 10 cm long, apex clavate.

*Fl.* September-October

*Distr.* Endemic to Peninsular India. Fairly common in deciduous forests; *PS 30480* Vengoli

**Habenaria multicaudata** Sedgw., Rec. Bot. Surv. India 6: 352. 1919; FPM 1469. 1928; FPL 482. 1990.

Stem 2-30 cm high. Leaves cauline, 6-20 x 2-5 cm, elliptic-oblong, clustered near the middle of the stem. Flowers greenish-white, in many flowered, 30 cm long racemes; bracts shorter than ovary, sheathing; lateral sepals falcate; petals bilobed, lobes filiform; lip 3-lobed, lobes filiform; lateral lobes arched; midlobe shorted; spur shorter than the ovary, curved, swollen at apex.

*Fl.* August-November

*Distr.* Endemic to Southern Western Ghats. Occasional in grasslands; *PS 30127* Karimala

**Habenaria ovalifolia** Wight, Ic. t. 1708. 1851; FBI 6: 149. 1890; FPM 1471. 1928; FTSR 444. 1996.

Stem 30-60 cm high, robust. Leaves 15-18 x 4-5.5 cm, elliptic-oblong, acute, clustered to the middle of the stem. Flowers greenish-white, in 45-50 cm long, lax raceme, peduncle 30-35 cm long; bracts 11-12 x 2.5-3 mm, lanceolate, acuminate; dorsal sepal 4 x 5 mm, broadly elliptic, obtuse; lateral sepals 4 x 2.5 mm, obliquely elliptic-oblong, subacute to obtuse, 3-veined; petals 5 x 2.5 mm, obliquely oblong-obtuse; lip, 6 x 11 mm, 3-lobed; lobes unequal, lateral lobes 6 x 1 mm, obliquely oblong-lanceolate, obtuse; spur 16 x 8 mm, cylindrical, subacute.

*Fl.* July-August

*Distr.* Endemic to Western Ghats. Occasional in deciduous forests; *PS 30082* Kuchimudi

**Habenaria plantaginea** Lindl., Gen. Sp. Orch. 323. 1835; FBI 6: 141. 1890; Fischer in Gamble, FPM 1470. 1928; FPL 483. 1990; FTSR 444. 1996.

Stem 6-20 cm high. Leaves 3 or 4, elliptic or elliptic-oblong, acute, adpressed to the ground. Flowers white, lax raceme; dorsal sepal 5 x 4 mm, broadly ovate, obtuse, hooded; lateral sepals 6 x 3.5 mm, obliquely elliptic, obtuse; petals 4 x 2 mm, obliquely elliptic-oblong, obtuse, 1-veined; lip 3-lobed; lateral lobes 6 x 7 mm, ovate, subacute, crenate; midlobe 6 x 2 mm, spathulate, subacute; spur 33 mm long, cylindric, acute.

*Fl.* September-October

*Distr.* India, Burma and Sri Lanka. Common in moist deciduous forests; *PS 30807* Velayudhankai

**Habenaria rariflora** A. Rich., Ann. Sci. Nat. (Ser. 2) 15: 70, t. 2 D. 1841; FBI 6: 136. 1890; Fischer in Gamble, FPM 1460. 1928.

Stem 10-12 cm high. Leaves 2.5-3.5 x 0.4 cm, linear, acute. Flowers white, 1 or 2, in 5-10 cm long, terminal raceme; dorsal sepal 6 x 6 mm, broadly ovate, obtuse, 5-veined; lateral sepals 7.5 x 3 mm, obliquely elliptic-oblong, subacute; petals 6 x 3 mm, unequally biparted, larger lobe 6 x 3 mm, ovate, acute; smaller lobe 11 x 0.5 mm, linear acute; lip 15 x 3 mm, 3-lobed; lateral lobes 11 x 0.5 mm, linear, acute, midlobe, 6 x 1 mm, oblong, obtuse; spur 40 x 2 mm, cylindric, obtuse.

*Fl.* July-September

*Distr.* Peninsular India. Occasional in grasslands; *PS 30813* Karimala

#### KINGIDIUM P. F. Hunt

**Kingidium niveum** Sathish in Sathish & Manilal, Cat. India Orch. 53. t.16. 1994; FTSR 445. 1996.

Leaves to 7 x 2 cm, oblong-elliptic, coriaceous, acute. Flowers white, 2-4, in 3-5 cm long, slender raceme; dorsal sepal 6 x 3.5 mm, elliptic-oblong, obtuse, 5-veined; lateral sepals 5 x 4.5,

ovate, obtuse; petals 4.5 x 3 mm, obovate, obtuse; lip 4.5 x 6.5 mm, 3-lobed; side lobes, 2 x 1.5 mm, obovate, toothed along margins, fleshy, bilobulate, lamellate; midlobe 4 x 6.5 mm, triangular, base with fleshy callus, margins subentire, disc with 2 pairs of unequal antennae.

*Fl.* October-November

*Distr.* Endemic to Southern Western Ghats (Kerala). Fairly common in evergreen forests; *PS 19909* Kariamchola

#### LIPARIS L.C. Richard

1. Leaves linear or linear-oblong; pseudobulbs elongated ..... **L. viridiflora**
1. Leaves elliptic; pseudobulbs small..... 2
2. Lip obovate-orbicular, 3-lobed..... **L. elliptica**
2. Lip sub-pandurate, emarginate, 2-lobed..... **L. wrayii**

**Liparis elliptica** Wight, Ic. t. 1735. 1851; FTSR 446. 1996. *L. viridiflora* sensu Hook.f., FBI 5: 704. 1890, non Lindl. 1830; FPM 1411. 1928.

Pseudobulb 2 x 1.5 cm, ovoid, laterally compressed, 2-leaved. Leaves 10-11 x 2.5-3 cm, linear-elliptic, acute; petiole 1 cm long. Flowers white, in about 20 cm long, terminal raceme; dorsal sepal elliptic, obtuse, 1-veined; lateral sepals elliptic-oblong, apiculate, 1-veined; petals linear, subacute; lip 3 x 2 mm, ovate, subacuminate, with an ear like folding subapically.

*Fl.* April-May

*Distr.* Indo-Malesia. Fairly common in evergreen forests; *NS 5748* Karimala Hills

**Liparis viridiflora** (Blume) Lindl., Gen. Sp. Orch. 31. 1830; FPL 483. 1990; FTSR 446. 1996. *Malaxis viridiflora* Blume, Bijdr. 392. 1825. *Liparis longipes* Lindl. in Wall., Pl. Asiat. Rar. 1: 31,t.35. 1830; FBI 5: 703. 1890; FPM 1411. 1928.

Pseudobulb 8 x 2 cm, tapering towards apex. Leaves 2 per pseudobulb, 20-25 x 2 cm, linear, acuminate. Flowers creamy, in 20 mm long raceme; dorsal sepal oblong acute, 1-veined; lateral sepals obliquely oblong, obtuse, 1-veined; petals linear, acute, 1-veined; lip 2.5 x 2 mm, oblong, acute, obtuse.

*Fl.* September-October

*Distr.* Indo-Malesia. Occasional in evergreen and semi-evergreen forests; *PS 19786* Kanthalppara

**Liparis wrayii** Hook.f., FBI 6: 181. 1890. *L. indiraii* Manilal & Sathish Kumar, Pl. Syst. Evol. 145: 155-158. 1984.

Terrestrial herbs, base swollen. Leaves 3 or 4 to 8 x 3 cm, elliptic, acute, sessile, margin undulate. Racemes terminal, bracts 3 mm, deltoid, flowers creamy-yellow, sepals ca 5 x 2 mm, lanceolate, acute, petals to 5 x 1 mm, linear, lip 5 x 3 mm, subpandurate, emarginate, apex shortly pectinate; disc with two calli at base, column ca 3 x 2 mm, covered, foot absent, pollinia ovoid, waxy.

*Fl. & Fr.* June-July

*Distr.* Indo-Malesia. Rare in evergreen forests; *PS 18990* Orukomban

#### LUISIA Gaudichaud-Beaupre

1. Slender pendent herbs; lip apex with two divergent lobes ..... **L. evangelinae**
1. Erect tufted herbs; lip apex ovate-acute..... **L. zeylanica**

**Luisia evangelinae** Blatt. & McCann, Rev. Fl. Pres. Bombay 16: 493. 1932; FTSR 447. 1996. *L. tenuifolia* Blume var. *evangelinae* (Blatt. & McCann) Sant. & Kapad., Orch. Bombay 214. 1966.

Stem pendent, to 20 cm long. Leaves 15 x 0.2 cm. Peduncle short, to 1.5 cm long. Flowers 3 cm long. Sepals creamy white, oblong, 1.2 x 0.4 cm. Petals linear, creamy white with purple blotches, 2 x 0.2 cm. Lip pandurate, 2.2 x 1 cm, white with purple blotches.

*Fl. & Fr.* December-January

*Distr.* Endemic to Western Ghats. Fairly common evergreen forests; *PS 30144* Kariamchola

**Luisia zeylanica** Lindl., *Fol. Orch. Luisia* 3. 1853; FTSR 447. 1996. *Cymbidium triste* Wight,  *Ic. Pl. Ind. Orient.* t. 911. 1845 & t. 1689. 1851. *C. tenuifolium* sensu Wight,  *Ic. t.* 1689. 1851, non Willd. 1805-1806. *Luisia teretifolia* Hook.f., *FBI* 6: 22. 1890, Gaud. 1826; FPM 1438. 1928.

Stem erect, to 20 cm tall. Leaves to 15 cm long, linear, obtuse. Flowers yellow, in short leaf-opposed clusters; dorsal sepal oblong-lanceolate, obtuse, 5-veined; lateral sepals oblong, obtuse, keeled, 5-veined; petals oblong, acute, 5-veined; lip 6 x 2-4 mm, 3-lobed; side lobes small, obliquely ovate, obtuse; midlobe 4 x 2.5, cordately ovate, obtuse, saccate at base.

*Fl.* March-August

*Distr.* South Asia. Occasional in deciduous forests; *PS 30298* Vengoli

### NERVILIA Commerson ex Gaudichaud-Beaupre

1. Petiole long; leaves raised above the ground; scape more the 5-flowered ..... **N. aragoana**
1. Petiole small; leaves adpressed to the ground; flowers 1-3 on scape ..... 2
2. Leaves green; scape one flowered ..... **N. crociformis**
2. Leaves green with purple blotches; scape two flowered ..... **N. plicata**

**Nervilia aragoana** Gaud., *Frey. Voy. Bot.* 422, t.35. 1829; FPM 1459. 1928; FTSR 448. 1996. *Pogonia carinata* Lindl., *Gen. Sp. Orch.* 414. 1840; *FBI* 6: 120. 1890. *P. flabelliformis* Lindl., *Gen. Sp. Orch.* 415. 1840; *FBI* 6: 121. 1890.

Tubers *ca.* 2 cm across, subglobose, white. Leaf 12 x 8 cm, cordate, broadly ovate, acuminate, with 15-20 cm long petiole. Scape 20 cm tall, lax-flowered. Flowers greenish; sepals 20 x 4 mm, oblanceolate, acute; petals 20 x 5 mm, similar to sepals; lip 22 x 5 mm, 3-lobed, obovate; lateral lobes oblong, acute; midlobe ovate, acute, crenulate, crimped, incurved, 8 mm long.

*Fl.* April-May

*Distr.* Indo-Malesia, China to Australia and the Pacific. Common in evergreen forests; *PS 30367* Kariamchola

**Nervilia crociformis** (Zoll. & Mor.) Seidenf., *Dansk. Bot. Ark.* 32: 151. 1978. *Bolborchis crociformis* Zoll. & Mor. in *Moritzi, Syst. Verg. Pl. Zoll.* 89. 1846. *Nervilia crispata* (Blume) Schltr., *Bot. Jahrb.* 45: 402. 1911. *Pogonia crispata* Blume, *Mus. Bot. Lugd.-Bat.* 1: 32. 1849. *Nervilia monantha* Blatt. & McCann, *JBNHS* 35: 724. 1932. *N. prainiana* (King & Pantl.) Seidenf., *Dansk. Bot. Ark.* 32: 149. 1978; FTSR 449. 1996. *Pogonia prainiana* King & Pantl., *J. Asiat. Soc. Bengal (Pt. 2)* 65: 129. 1896.

Tubers *ca.* 2 cm across, subglobose. Leaves green, 6-7 x 7 cm, orbicular, cordate, velvety with short greenish white hairs on upper surface. Flowers pink, solitary; scape 10 cm long; sepals and petals similar, 30 x 5 mm, linear-oblanceolate, acute; petals slightly narrower; lip 20 x 15 mm, 3-lobed; lateral lobes oblong, obtuse; midlobe truncate, crisped; disc with purplish hairs.

*Fl.* May-June

*Distr.* Indo-Malesia, China, New Guinea and Australia. Fairly common in evergreen and deciduous forests; *PS 19569* Kariamchola; *30504* Karimala

**Nervilia plicata** (Andr.) Schltr., *Bot. Jahrb.* 45: 403. 1911; FPM 1548. 1928; FPL 485. 1990; FTSR 449. 1996. *Arethusa plicata* Andr., *Bot. Rep.* 5. t.321. 1803. *Cordyla discolor* Blume, *Bydr.* 417. 1825. *Epipactis plicata* Roxb., *Fl. Ind.* 3: 454. 1832. *Pogonia plicata* (Roxb.) Lindl., *Gen. Sp. Orch.* 415. 1840; *FBI* 6: 119. 1890. *P. discolor* (Blume) Blume, *Mus. Bot. Lugd.-Bat.* 1:

32. 1849. *Nervilia discolor* (Blume) Schltr. In Engl., Bot. Jahrb. 45: 403. 1911. *Pogonia biflora* Wight, Ic. t. 1758. 1851; FBI 6: 119. 1890 *Nervilia biflora* (Wight) Schltr., Bot. Jahrb. 45: 403. 1911; FPM 1549. 1928.

Tubers 1.5 x 2 cm across, subglobose, white. Leaf green with purple blotches, 7 x 6 cm, sessile, cordate, orbicular, obtuse, hairy, margins wavy. Scape to 16 cm long, 2-flowered; bracts 5 x 2 mm, ovate-lanceolate; sepals and petals brownish, similar, 20 x 4 mm, oblong, lanceolate, acute; lip dark violet, 18 x 10 mm, elliptic, obtuse, margin wavy.

*Fl.* February-March

*Distr.* India to Thailand. Fairly common in evergreen forests; *PS* 19570, 30355 Kariamchola

#### OBERONIA Lindley

- |  |                        |
|--|------------------------|
| 1. Flowers non-resupinate, opening inwards .....   | <b>O. tenuis</b>       |
| 1. Flowers resupinate, opening outwards .....      | 2                      |
| 2. Leaves not articulated at base .....            | 3                      |
| 2. Leaves articulated at base .....                | 4                      |
| 3. Petals toothed .....                            | <b>O. brachyphylla</b> |
| 3. Petals entire .....                             | <b>O. recurva</b>      |
| 4. Scape terete, not winged laterally .....        | <b>O. verticillata</b> |
| 4. Scape flattened or two winged laterally .....   | 5                      |
| 5. Leaves dull brown, oblong, obtuse .....         | <b>O. santapau</b>     |
| 5. Leaves green or yellowish-green, ensiform ..... | 6                      |
| 6. Disc of lip saccate .....                       | <b>O. sebastiania</b>  |
| 6. Disc of lip not saccate .....                   | <b>O. mucronata</b>    |

**Oberonia brachyphylla** Blatt. & McCann, JBNHS 35: 257. 1931; Ansari & Bal., Orch. Monogr. 4:38.1990; FPL 486. 1990.

Leaves to 4 x 0.6 cm, oblong-ensiform, acuminate. Scape terete. Spike to 7 cm long. Flowers 2 x 1 mm, greenish-orange yellow, scattered; dorsal sepals ovate, acute; lateral sepals obliquely ovate, subacuminate; petals oblong, obtuse, dentate; lip 3-lobed; lateral lobes ear-like, dentate; midlobe obovate, 2-lobuled; lobules oblong, dentate at apex, sinus without any protuberance; disc obovate-orbicular, concave.

*Fl.* January-April

*Distr.* Endemic to Southern Western Ghats. Common evergreen and deciduous forests; *PS* 19501 Orukomban; *NS* 19827 Kannimara; *PS* 19407 Kariamchola

**Oberonia mucronata** (D. Don) Ormerod & Seiden. in Seiden., Contrib. Orchid. Fl. Thailand 13: 20. 1997. *Stelis mucronata* D. Don, Prodr. Fl. Nepal 32. 1825. *Oberonia iridifolia* Lindl. var. *denticulata* (Wight) Hook.f., FBI 5: 675. 1888; FPM 1406. 1928. *O. denticulata* Wight, Ic. t. 1625. 1851; Ansari & Bal., Orch. Monogr. 4:21.1990; FPL 487. 1990; FTSR 450. 1996.

Leaves to 20 x 2 cm, oblong-ensiform, acute. Scape flattened. Spike to 30 cm long. Flowers brownish yellow, 2.5 x 1 mm, in verticils; bracts 1.3 x 0.8 mm, oblong-lanceolate, obtuse, denticulate; sepals similar, ovate, acute; petals ovate, acute, denticulate; lip 1.5 x 1.5 mm, quadrate, 3-lobed; lateral lobes oblong, dentate; midlobe 2-lobuled; lobules oblong-ovate, acute, deeply dentate, diverging; disc ovate, indistinct.

*Fl.* November-December

*Distr.* Indo-Malesia to Pacific. Common in moist deciduous forests and plantations; *PS* 19826, *NS* 19828, *PS* 19829 Kannimara

**Oberonia recurva** Lindl., Bot. Reg. 25,8. 1839 & Fol. Orch. Oberonia 5. 1859; FBI 5: 680. 1888; Ansari & Bal., Orch. Monogr. 4:38.1990; FTSR 450. 1996. *O. lingmalensis* Blatt. & McCann, JBNHS 35: 255. 1931.

Leaves to 2.5 x 0.6 cm, linear-ensiform, acute. Scape terete. Spike to 6 cm long. Flowers 1.5 x 1 mm, orange-yellow, in verticils; dorsal sepal oblong or ovate, obtuse; lateral sepals ovate, acuminate; petals oblong-ovate or oblanceolate, acute; lip 3-lobed; lateral lobes ear-like, curved upwards; midlobe oblong, 2-lobuled; lobules oblong-ligulate, diverging, sinus narrow, without any protuberance; disc obovate, concave.

*Fl.* April-May

*Distr.* India to Thailand and Sri Lanka. Fairly common in evergreen forests; *PS 19357* Pezha

**Oberonia santapau** Kapad., JBNHS 57: 265. 1960; Ansari & Bal., Orch. Monogr. 4:18.1990; FPL 487. 1990; FTSR 450. 1996. *O. lindleyana* Wight, Ic. t. 1624. 1851, non Brongn. ex Duperr. 1834; FBI 5: 681. 1888; FPM 1407. 1928.

Leaves to 17 x 2.5 cm, oblong, obtuse, dull brown. Scape flattened. Spike to 19 cm long, thick. Flowers 3 x 1.5 mm, reddish-brown, in verticils; dorsal sepal oblong, obtuse; lateral sepals oblong-ovate, subacute; petals linear, truncate, reflexed; lip 3-lobed; lateral lobes longitudinally elongated, subcrenate; midlobe 2-lobuled; lobules oblong, crenate, converging, sinus broad, with a conical protuberance; disc ovate, crescent-shaped, cushion like band.

*Fl.* November-December

*Distr.* Endemic to Southern Western Ghats. Occasional in evergreen forests at higher altitudes; *PS 30372* Pandaravarai; *NS 30411* Kuchimudi

**Oberonia sebastiana** Shetty & Vivek., Bull. Bot. Surv. India 17: 157. 1975; Ansari & Bal., Orch. Monogr. 4:11.1990.

Leaves to 20 x 1.5 cm, ensiform, acute. Scape flattened. Spike to 30 cm long. Flowers 2.5 x 1 mm, yellow, subverticillate; dorsal sepal oblong, obtuse; lateral sepals ovate, subacute; petals oblong, obtuse; lip semi-orbicular, 3-lobed; lateral lobes oblong-ovate, wing-like; midlobe, 2-lobuled; lobules obovate, cuneate, diverging; disc crescent-shaped, saccate.

*Fl.* October-December

*Distr.* Endemic to Southern Western Ghats. Rare in moist deciduous and semi-evergreen forests; *PS 19879* Velayudhankai

**Oberonia tenuis** Lindl., Fol. Orch. Oberonia 4. 1859; FBI 5: 682. 1888. *Malaxis tenuis* (Lindl.) Reichb. f., Walp. Ann. 6: 211. 1861. *Iridorchis tenuis* (Lindl.) Ktze., Rev. Gen. Pl. 2: 669. 1981.

Leaves to 6 x 8 cm, sub-falcate, linear-lanceolate, acute. Inflorescence to 12 cm terete, scape to 5 mm, bracts 3 mm, small subulate, gland dotted. Flowers *ca* 3 mm, brownish-red, sepal *ca* 1 x 0.5 mm, lanceolate, ovate, acuminate, subequal, gland dotted, petals *ca* 1 x 0.3 mm, linear, gland dotted, lip 3-lobed, lateral lobes erect, surrounding the column, gland dotted, midlobe obscurely 3-lobulate, column short, pollinia 4.

*Fl. & Fr.* May-July

*Distr.* South India and Sri Lanka. Fairly common in evergreen forests; *PS 19300* Orukomban

**Oberonia verticillata** Wight, Ic. t. 1626. 1851; FBI 5: 677. 1888; FPM 1405. 1928; Ansari & Bal., Orch. Monogr. 4:28.1990. *O. verticillata* var. *longibracteata* Blatt. & McCann, JBNHS 35: 255. 1931. *O. spiralis* Blatt. & McCann, JBNHS 35: 256. 1931, non Griff. 1851, nec. Lindl. 1852.

Leaves to 15 x 1.2 cm, oblong-ensiform, acute. Scape terete; spike to 27 cm long. Flowers orange-yellow, 4.5 x 2 mm, in verticils; dorsal sepal oblong-ovate, obtuse; lateral sepals obliquely ovate, acute; petals oblong or ovate, obtuse; lip 3-lobed; lateral lobes rounded, auricled; midlobe 2-lobuled; lobules orbicular or obovate, serrate, overlapping each other, sinus narrow; disc indistinct.

*Fl.* September-January

*Distr.* Endemic to South India. Occasional in evergreen and moist deciduous forests; *PS 30453* Vengoli

### PACHYSTOMA Blume

**Pachystoma pubescens** Blume, Bijdr. 376. 1825; FTSR 451. 1996. *Apaturia senilis* Lindl., Gen. Sp. Orch. 130. 1831. *Pachystoma senile* (Lindl.) Reichb. f., Bonplandia 3: 251. 1855; FBI 5: 812. 1890; FPM 1426. 1928; FPL 488. 1990.

Terrestrial herbs, with 'V'-shaped tuber, leafless when flowering. Leaves 1 or 2, linear, to 20 x 1.5 cm; scape above ground portion 25-40 cm long. Flowers 3-8, towards the apex of scape, pink-purple; bracts 1.5-2.5 x 4 mm, ovate, acuminate; sepals pubescent outside, subsimilar, elliptic-oblong, acute, 5-veined; petals 13 x 1-2.5 mm, oblanceolate-oblong, obliquely acute, 3-5-veined; lip 11 x 4-8 mm, 3-lobed; side lobes obliquely ovate, obtuse; midlobe 4.5 x 4 mm, oblong, obtuse; disc ridged, base saccate.

*Fl.* January

*Distr.* Indo-Malesia. Occasional in grasslands; *PS 19308* Karimala

### PAPILIONANTHE Schlechter

**Papilionanthe cylindrica** (Lindl.) Seidenf., Descr. Epidendr. Koing 1791:33.1995; *Aerides cylindricum* Lindl., Gen. Sp. Orch. 240.1833; FBI 6.44.1890; FPM 1442.1928. *Papilionanthe subulata* auct. non (Willd.) Garay: Pradhan, Indian Orch. 563. 1979; FPL 488. 1990.

Epiphytes, to 40 cm high; stem woody. Leaves scattered, 6-8 x 0.3 cm, linear, terete, acute. Flowers white, one or two in 1.5-2 cm long, short, leaf opposed racemes; dorsal sepal 11 x 8 mm, ovate, obtuse, 5-7-veined; lateral sepals 13 x 8 mm, obliquely ovate-lanceolate, obtuse, 7-veined; petals 11 x 9 mm, ovate, obtuse, 7-veined; lip 15 x 12 mm, 3-lobed; lateral lobes oblong, obtuse; midlobe tongue-shaped, recurved, obtuse; disc with 2-longitudinal calli.

*Fl.* April-May

*Distr.* India and Sri Lanka. Occasional in semi-evergreen forests; *PS 30815* Karimala

### PERISTYLUS Blume

1. Side lobes of lip filiform, distinct from the midlob.....**P. aristatus**
1. Side lobes of lip not filiform, similar to the midlob.....**P. plantagineus**

**Peristylus aristatus** Lindl., Gen. Sp. Orch. 300. 1835; FPM 1474. 1928; FPL 489. 1990. *Habenaria aristata* (Lindl.) Hook. f. in Trimen, Cat. Ceylon Pl. 91. 1885; FBI 6: 158. 1890, non King & Pantl, 1898.

Leaves 4-7 x 2 cm, elliptic-lanceolate, subacuminate. Flowers white, in 10-18 cm long, lax spike, peduncle 12-15 cm long; bracts lanceolate, margins finely erose; dorsal sepal 5 x 1.8 mm, elliptic-oblong, obtuse; lateral sepals 4.1 x 1.8 mm, obliquely ovate-oblong, obtuse; petals 5.5 x 2.1-2.5 mm, oblanceolate-oblong, obtuse; lip 5 x 2 mm, 3-lobed; lobes very unequal; lateral lobes 7.5-8 x 0.5 mm, linear, acute, midlobe 2.5 x 0.9 mm, oblong, obtuse; spur 3.2 x 1.5 mm, ellipsoid, acute, with cylindrical stalk.

*Fl.* August-September

*Distr.* India and Sri Lanka. Fairly common in semi-evergreen forests; *PS 19734* Pezha

**Peristylus plantagineus** Lindl., Gen. Sp. Orch. 300. 1835; FPM 1475. 1928; FTSR 452. 1996. *Habenaria wightii* Trimen, Cat. Pl. Ceylon 91. 1885; FBI 6: 162. 1890.

Leaves to 16 x 4.5 cm, oblong or broadly elliptic, acute, glabrous and glossy. Flowers creamy, many, in 20-25 cm long spikes; bracts 8-10 x 2 mm, linear-lanceolate; sepals pale brown, oblong, obtuse; petals 2.5 x 2 mm, orbicular; lip white, 2 x 2 mm, obscurely 3-lobed, broadly ovate-oblong.

*Fl.* July-August

*Distr.* India and Sri Lanka. Common in deciduous forests; *PS 19876* Velayudhankai

### PHOLIDOTA Lindley ex W. J. Hooker

**Pholidota imbricata** Hook., Exot. Fl. t. 138. 1825; FPM 1431. 1928. *P. pallida* Abraham & Vatsala, Intr. Orch. 288. 1981, non Lindl. 1836; FPL 490. 1990; FTSR 452. 1996.

Epiphytes, to 35 cm long. Pseudobulb 5 x 2 cm, sheathed, ovoid, subtetragonal smooth, crowded. Leaves to 40 x 5.5, solitary, oblanceolate-oblong, acute, coriaceous, shallowly plicate. Flowers creamy orange, in 50-60 cm long, terminal, pendulous racemes; bracts 6-9 x 5-6 mm, ovate or orbicular, acute, imbricating distichous; dorsal sepal ovate, obtuse, 3-5-veined; lateral sepals ovate, cymbiform, connate at base, acute, 3-5-veined; petals linear, subacute, 1-veined; lip 8 x 8.4 mm; saccate 5-veined; midlobe bifid, lobules rounded.

*Fl. & Fr.* May-August

*Distr.* Indo-Malesia. Common in deciduous forests and plantations; *PS 30156* Muthuvarachal

#### POLYSTACHYA W. J. Hooker

**Polystachya concreta** (Jacq.) Garay & H.R. Sweet, *Revista Soc. Colomb. Orquideol.* 9: 206. 1974; FTSR 453. 1996. *Epidendrum concretum* Jacq., *Enum. Pl. Carib.* 30. 1760. *Polystachya purpurea* Wight, *Icon.* t. 1679. 1851; FBI 6: 21. 1890; FPM 1437. 1928. *P. wightii* Reichb. f. in Walp., *Ann.* 6: 640. 1861; Fischer in Gamble, FPM 1437. 1928. *Onychium flavescens* Bl., *Bijdr.* 325. 1825. *P. flavescens* (Bl.) J. J. Sm., *Fl. Buitenz.* 6: 284, f. 218. 1905; FPL 490. 1990.

Epiphytes, to 15 cm high with globose pseudobulb, 1 x 1 cm. Leaves 6-10 x 0.9-1 cm, linear-lanceolate, obtuse, 3-4 per pseudobulb. Flowers pinkish-brown, in 10-15 cm long dense terminal raceme, flowers bearing portion about 2-3 cm long; dorsal sepal ovate, acute, 3-veined; lateral sepals ovate, acute, basally connated and jointed with the column foot, 3-veined; petals linear, obtuse, apiculate, 1-veined; lip 2 x 1.5-2.8 mm, 3-lobed; lateral lobes obliquely oblong, acute; midlobe orbicular-ovate, truncate at apex; disc with a longitudinal callus; column short continued into a long foot; pollinia 2, globose.

*Fl.*: July-August

*Distr.* South India and Sri Lanka. Rare in evergreen forests; *PS 30809* Karimala

#### PTEROCERAS Hasskarl

**Pteroceras monsooniae** Sasidh. & Sujanapal sp. nov. (in press) [Figure 11].

Epiphytic herbs, stem to 2 cm tall erect, unbranched, Leaves 3(4), distichously alternate, to 4-8 x 1-2 cm, sessile, articulate, linear or elliptic-lanceolate, slightly wider towards the apex, unequally bilobed, lobes rounded; leaf sheath imbricate, glabrous, covering the internodes. Inflorescence racemose, from the axils of older leaf sheath, 2-7, unbranched, at right angles to the stem, 1-3 cm long; peduncle terete, *ca.* 4 mm diameter, grey, densely covered with soft brown prickles; bracts *ca.* 6 mm long, persistent, broadly ovate, spinulose at apex, prickly on abaxial side; base 6 mm wide, more or less sheathing the peduncle; flowers 2-4, sessile, spirally alternating (one opens at a time). Sepals and petals free, spreading, sparsely prickly on abaxial side, greyish-white; median sepal *ca.* 1.8 x 1 cm, laterals adnate to the column foot, elliptic-obovate, apex acute; petals *ca.* 1.4 x 0.8 cm, oblong-obovate, apex rounded, glabrous or slightly muricate on abaxial side. Labellum to 6 mm long, distinctly stalked, stalk *ca.* 4 mm long, side lobes 4 x 3 mm, embracing the column before anthesis and spreading (open) after anthesis, apical part widened, apex obliquely rounded, midlobe small, with a porrect spur. spur sac like, *ca.* 3 mm across and 2 toothed at mouth, apex rounded with 2 dorsal ridges, lower ridge yellowish *ca.* 2 mm; rostellum *ca.* 3 mm deeply bifid 3 mm, clinandrium 3 mm diameter, apiculum 2 mm long. Anther terminal, triangular with a caudate apex, strongly incumbent, dehiscing ventrally, to form 2 flaps; pollinia 2, obovoid, 1.5-1.8 x 1 mm, cleft deeply, 'L' shaped, stipe *ca.* 2 mm long, narrowed to the base, bilobed at apex, lobes rounded, viscidium obovate, to 1 mm long, broader than the stipe. Ovary *ca.* 1 cm, terete, twisted to left, faintly 6-ribbed, sparsely echinate. Capsule ellipsoid, to 2.8 x 1.6 cm, 6 ribbed depressed at apex.

*Fl. & Fr.* May-June

*Distr.* Known only from the type locality. Rare in the margins of deciduous forests at higher altitudes; *PS 30407*, *NS 30596* Kuchumudi



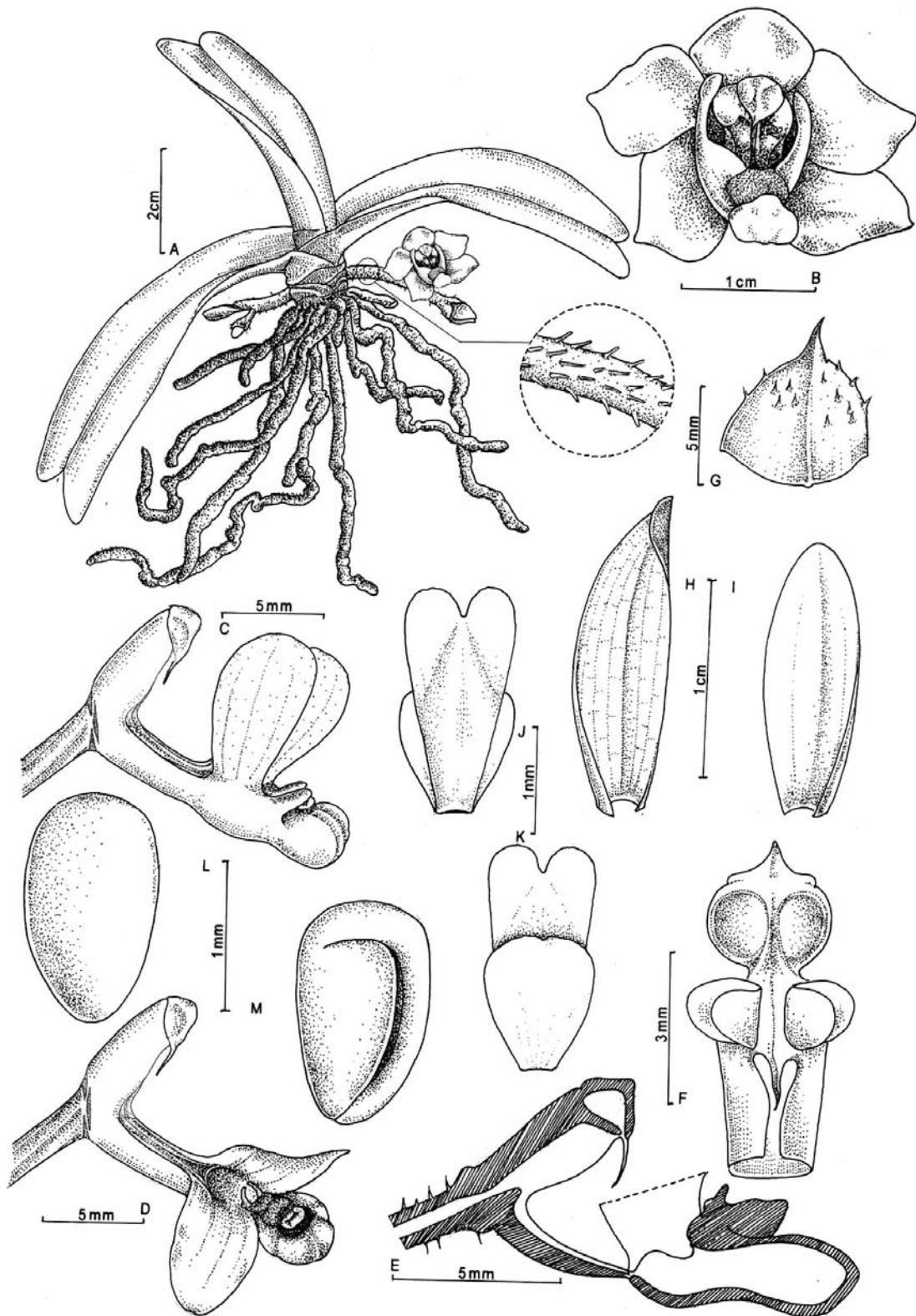


Figure 11. *Pteroceras monsooniae* Sasidharan & Sujanapal. **A.** habit; **B.** flower; **C.** & **D.** column with lip (dorsal and ventral view); **E.** flower L.S. (sepals and petals removed); **F.** column; **G.** bract; **H.** sepal; **I.** petal; **J.** & **K.** stipe with viscidium (dorsal and ventral view); **L.** & **M.** pollinia

### RHYNCHOSTYLIS Blume

**Rhynchostylis retusa** (L.) Bl., Bijdr. 286, t. 49. 1825; FBI 6: 32. 1890; FPM 1440. 1928; FPL 492. 1990; FTSR 454. 1996. *Epidendrum retusum* L., Sp. Pl. 953. 1753.

Epiphytes, to 40 cm tall; stem stout, woody. Leaves to 30 x 2 cm, lorate, obliquely bilobed at apex with a mucro in between, lobules rounded. Flowers violet pink, closely packed in 30-40 cm long, stout, compact, pendulous axillary raceme; sepals and petals similar; dorsal sepal ovate or ovate-oblong, obtuse; lateral sepals 8 x 7 mm, obliquely ovate, subacute; petals 6 x 3 mm, oblong-ovate, obtuse; lip entire, oblong, pink; clawed; claw deflexed, deeply inflexed, cuneiform; disc 2-lobed; spur 5 mm long, laterally compressed, tip emarginate; puberulus inside; column short; foot very short; pollinia 2, globose, with long caudicle.

*Fl.* June-July

*Distr.* India to Philippine Islands. Common in moist deciduous forests and plantations; *PS 30808* Sungam

### SEIDENFIA Szlachetko

**Seidenfia rheedei** (Sw.) Szlach., Syst. Orch. 122. 1995. *Malaxis rheedei* Sw., Kongl. Vetensk. Acad. Nya Handl. 21: 235. 1800; FTSR 448. 1996. *Microstylis versicolor* Lindl., Gen. Sp. Orch. 21. 1830; FPM 1408. 1928. *M. rheedei* (Sw.) Lindl., Gen. Sp. Orch. 21. 1830p.p.; FBI 5: 690. 1890. *Malaxis versicolor* (Lindl.) Abeywickr., Ceylon J. Sci. Biol. Sci. 2:147.1959; FPL 484. 1990.

Terrestrial herbs, to 40 cm tall. Leaves 15-18 x 5-6 cm, elliptic-lanceolate, acuminate. Flowers orange-yellow, turning purplish, 8 x 3.5 mm, in about 15-25 cm long terminal dense racemes; dorsal sepal linear, obtuse, 3-veined; lateral sepals linear, obtuse, 3-veined; petals lanceolate, obliquely truncate, 1-veined; lip 1.6 x 3 mm, subquadrate, pectinate, 9-10 toothed.

*Fl.* July-September

*Distr.* India to Thailand, China and Sri Lanka. Common in moist localities of evergreen and semi-evergreen forests; *PS 18989, 19528* Orukomban; *NS 30443* Karimala

### SIRHOOKERA O. Kuntze

**Sirhookera latifolia** (Wight) O. Ktze., Rev. Gen. Pl. 681. 1891; FPL 493. 1990; FTSR 454. 1996. *Josephia latifolia* Wight, Ic. t. 1743. 1851; FBI 5: 823. 1890; FPM 1428. 1928.

Epiphytes with very short stem and vermiform roots. Leaves 9-10 x 2-2.5 cm, oblong, acute. Flowers white, in 15-20 cm long branched racemes; dorsal sepal obovate, obtuse, 3-veined; lateral sepals elliptic-oblong, obtuse, 3-veined; petals oblong, obtuse, 1-veined; lip 4 x 2 mm, 3-lobed; lateral lobes smaller, oblong, obtuse, incurved; midlobe ovate, obtuse or acute.

*Fl.* August-September

*Distr.* South India and Sri Lanka. Rare in evergreen and semi-evergreen forests; *PS 19747* Pezha

### SMITHSONIA Saldanha

1. Inflorescence longer than leaves; lip sac with tuft of hairs..... **S. maculata**  
1. Inflorescence shorter than leaves; lip sac naked within ..... **S. straminea**

**Smithsonia maculata** (Dalz.) Sald., JBNHS 71: 74. 1974. *Micropera maculata* Dalz., Hook.'s J. Bot. Kew Gard. Misc. 3: 282. 1851. *Saccolabium maculatum* (Dalz.) Hook.f., FBI 6: 64. 1890. *Gastrochilus maculatus* (Dalz.) O. Ktze., Rev. Gen. Pl. 2: 661. 1891.

Leaves 2 or 3, to 10 x 3 cm, oblanceolate, apex unequally bilobed, base sheathed. Racemes lateral; flowers *ca* 10 x 8 mm, sessile, yellowish with purple bands; bracts *ca* 2.5 x 2 mm, persistent, broadly ovate, sepals and petals 5-6 x 3.5 mm, obovate, oblong rounded, lip fleshy, 3-lobed, lateral lobes *ca* 2.5 mm long, midlobe *ca* 2.5 x 2 mm, obscurely 3-lobed, rounded; spur conical *ca* 5 mm long.

*Fl. & Fr.* June-July

*Distr.* Endemic to South India. Occasional in evergreen forests; *PS 19781* Kanthalppara; *30363* Kariamchola

**Smithsonia straminea** Sald., JBNHS 71: 74. 1974 & in Sald. & Nicols., Fl. Hassan Dist. 850. 1976; FPL 493. 1990; FTSR 454. 1996.

Leaves to 4 x 0.6 cm, oblong, unequally lobed at apex. Racemes to 1.5 cm long; flowers to 5, pale yellow; sepals 3 x 1 mm; dorsal ovate-acute concave, laterals obovate-acute. Lip white, 2.5 x 1 mm; midlobe with short lateral wings; spur purple, 1.5 mm long.

*Fl.* May

*Distr.* Endemic to South India. Fairly common in evergreen forests; *PS 19299* Pezha

#### TAENIOPHYLLUM Blume

**Taeniophyllum scaberulum** Hook.f., FBI 6: 77. 1890; FPM 1448. 1928; Rajesh *et al.*, Rheedea 7:43.1997.

Leafless epiphytic herbs, roots subterete, 5-8 x 0.1 cm. Flowers creamy white, 4 x 2 mm, in 1.5-2 cm long, flexuous spikes; bracts 0.9 x 1 mm, ovate, acute, persistent; sepals and petals united into a 6 toothed tube; lobes ovate, acute; lip ovate, acute, tip recurved, base saccate.

*Fl.* February-June

*Distr.* Endemic to Southern Western Ghats (Kerala). Occasional in deciduous forests; *PS 19497* Thelikkal

**Note:** This endangered tiny orchid was recently rediscovered after 140 years from Periyar Tiger Reserve.

The present collection from the sanctuary is a new distribution locality.

#### TRICHOGLOTTIS Blume

**Trichoglottis tenera** (Lindl.) Reichb.f., Gard. Chron. 699. 1872; FTSR 455. 1996. *Oeceoclades tenera* Lindl., Gen. Sp. Orch. 236. 1833. *Cleisostoma tenerum* (Lindl.) Hook.f., FBI 6: 73. 1890; FPM 1448. 1928.

Scandent epiphytes. Leaves 3 x 1-1.5 cm, elliptic-oblong, obtuse. Flowers yellow, in few-flowered, stout raceme; dorsal sepal elliptic, obtuse, 5-veined; lateral sepals oblanceolate, falcate, obtuse, 3-veined; petals smaller than sepals, oblong, obtuse, 5-veined; lip adnate to the base of column, 7 x 7.5 mm, 3-lobed; lateral lobes oblong, lanceolate, obtuse; midlobe ovate, obtuse, 3-lobed, rounded; spur 3 x 1 mm, cylindrical.

*Fl.* April-May

*Distr.* South India and Sri Lanka. Rare along the margins of evergreen forest at higher altitudes; *PS 30235* Karimala

#### TROPIDIA Lindley

**Tropidia angulosa** (Lindl) Blume, Coll. Orch. Arch. Ind. 122. 1858; FBI 6: 92. 1890; FPM 1452. 1928; FPL 494. 1990. *Cnemidia angulosa* Lindl., Bot. Reg. t. 1618. 1833. *Govindooia nervosa* Wight, Ic. t. 2090. 1853.

Terrestrial woody herbs, to 30 cm tall; stem sheathed below the leaves. Leaves 2 or 3, towards apex, 10 x 6 cm, elliptic, acute, sessile, membranous. Flowers white, in 8-10 cm long, in many-flowered terminal spike; bracts 21 x 1 mm, linear, 3-veined, spreading; dorsal sepal narrowly oblong, acute; lateral sepals oblong, acute, connate nearly to the apex forming a mentum enclosing the lip; petals oblong, obtuse; lip 20 x 1 mm, obpanduratus, obtuse; spur cylindrical; column short; pollinia 2, clavate.

*Fl.* August-September

*Distr.* Indo-Malesia. Rare in evergreen forests; *PS 30016* Pezha

#### VANDA Jones ex R. Brown

1. Flowers to 5 cm long; petals tessellated ..... **V. tessellata**
1. Flowers to 2 cm long; petals not tessellated..... **V. testacea**

**Vanda tessellata** (Roxb.) Hook. ex D. Don in Loud., Hort. Brit. 372. 1830; FPM 1445. 1928. *Epidendrum tessellatum* Roxb., Pl. Corom. t. 42. 1795. *Vanda roxburghii* R.Br., Bot. Reg. 6. t.506. 1820; FBI 6: 52. 1890.

Scandent epiphytic shrubs. Leaves 2-ranked, to 15 x 2.2 cm, oblong, recurved conduplicate, 2-lobed at apex, with a central acute tip, base sheathing, coriaceous, closely packed. Racemes axillary; flowers 5 cm across, white outside, inner tessellate with brown spots; petals to 5 cm; lip bluish dotted with purple, 3-lobed, side lobes 7 mm; spur 5 mm, conical; column 5 mm.

*Fl. & Fr.* March-July

*Distr.* India, Myanmar, China and Sri Lanka. Fairly common in dry deciduous forests; *PS 30385* Kuchimudi

**Vanda testacea** (Lindl.) Reichb. f., Gard. Chron. 2: 166. 1877; FPL 495. 1990; FTSR 456. 1996. *Aerides testacea* Lindl., Gen. Sp. Orch. 238. 1833. *Vanda parviflora* Lindley, Edward's Bot. Reg. 30: Misc. 57. 1844; FBI 6: 50. 1890; FPM 1444. 1928.

Stout herbs. Leaves 9-16 x 1 cm, strap-shaped, keeled, unequally lobed at apex. Flowers pinkish, in 10-15 cm long, raceme; dorsal sepal obovate-oblong or spatulate, obtuse, 5-veined; lateral sepals elliptic-subacute, 5-veined; petals spatulate, obtuse, 5-veined; lip 10 x 5 mm, 3-lobed; lateral lobes 3 x 1.5 mm, oblong, obliquely lanceolate, obtuse; midlobe 6.5 x 5 mm, obconical, emarginate, margins finely close-dentate, with 2 parallel fleshy ridges; spur cylindrical.

*Fl.* April-May

*Distr.* India, Myanmar and Sri Lanka. Common in deciduous forests and plantations; *PS 19825* Kannimara; *30296* Parambikulam

#### XENIKOPHYTON Garay

**Xenikophyton smeeanum** (Reichb. f.) Garay, Bot. Mus. Leaflet. Harvard Univ. 23: 374. 1974. *Saccolabium smeeanum* Reichb. f., Gard. Chron. ser 3, 2: 214. 1887. *Rhynchostylis latifolia* Fischer, Kew Bull. 1927: 358. 1927; FPM 1440. 1928.

Erect epiphytes. Leaves 5-7.5 x 1.5-2.5 cm, oblong, apex unequally bilobed, channelled above. Raceme simple or branched to 10 cm long; bracts *ca* 2 mm, ovate-lanceolate, acuminate, sepal and petal *ca* 3 x 2 mm, ovate-oblong, obtuse, lip obscurely 3-lobed, arched, base spurred, column short, pollinia 2.

*Fl. & Fr.* May-August

*Distr.* Endemic to Southern Western Ghats. Fairly common in evergreen forests at higher altitudes; *PS 30376* Pandaravarai

#### ZEUXINE Lindley

1. Lobules of lip irregularly toothed..... **Z. longilabris**  
1. Lobules of lip not toothed..... **Z. flava**

**Zeuxine flava** (Wall ex Lindl.) Benth. ex Hook.f., FBI 6: 108. 1890. *Etaeria flava* Wall. ex Lindl., Wall. Cat. 7380. A & B, non c, 1832. *nom nud.* *Monochilus flavum* Wall. ex Lindl., Gen. & Sp. Orch. 437. 1840.

Stem to 36 cm high, rhizome creeping, 5-10 cm long. Leaves 5 x 2 cm, elliptic, acute; petiole 2 cm long, sheathed. Flowers white with orange base, in 5-10 cm long, dense spike; peduncle 15-18 cm long; bracts 10 x 45 mm, ovate, acuminate; dorsal sepal ovate-lanceolate, obtuse, 1-veined; lateral sepals elliptic, obtuse, 3-veined; petals subfalcate, oblong, obtuse, 1-veined; lip 3 x 1.5-3.5 mm; midlobe 2-lobed, each 1.5 x 1-1.8 mm, 'T' shaped on spreading, squarish; hypochile saccate, with backwardly curved glands; margins of mesochile incurved.

*Fl.* February-March

*Distr.* Indo-Malesia. Occasional in evergreen forests; *PS 30611* Orukomban

**Zeuxine longilabris** (Lindl.) Benth. ex Hook. f., Gen. Sp. Pl. 3: 600. 1883; FBI 6: 107. 1890; FPM 1456. 1928; FPL 495. 1990. *Monochilus longilabris* Lindl., Gen. Sp. Orch. 478. 1840. *Monochilus affine* Wight, Ic. t. 1728. 1858, non Lindl.

Stem to 30 cm tall, rhizome creeping, 5-10 cm long. Leaves 3-4.5 x 1-1.5 cm, ovate or elliptic, acute with sheathing base. Flowers white, in 15-25 cm long, lax spike; peduncle 10-18 cm long, hairy; bracts 8 x 3 mm, ovate, acuminate, pubescent outside; dorsal sepal ovate, acute, 3-veined; lateral sepals ovate-lanceolate, slightly oblique, obtuse, 3-veined; petals subfalcate, oblong, elliptic, acute, 2-veined; lip 12 x 1.5-9 mm, saccate at base with, bilobed, backwardly curved glands inside; epichile 8 x 3.5 mm, 2-lobuled, each elliptic-oblong, falcate, with dentate margins.

*Fl.* March-April

*Distr.* Indo-Malesia. Rare in evergreen forests; *PS 30620* Kariamchola

## ZINGIBERACEAE

- |  |                     |
|--|---------------------|
| 1. Flowers in racemes or panicles .....  | 2                   |
| 1. Flowers in spike.....   | 3                   |
| 2. Inflorescence terminal on leafy stem.....   | <b>Alpina</b>       |
| 2. Inflorescence lateral from the rhizome.....   | <b>Elettaria</b>    |
| 3. Leaves spirally alternating; strobilus bright red.....  | <b>Costus</b>       |
| 3. Leaves distichous; strobilus otherwise .....  | 4                   |
| 4. Bracts pouched, basally connate.....  | <b>Curcuma</b>      |
| 4. Bracts not as above .....   | 5                   |
| 5. Spike terminal on leafy stem .....  | 6                   |
| 5. Spike lateral from the rhizome .....  | 8                   |
| 6. Ovary unilocular with parietal placentation .....   | <b>Globba</b>       |
| 6. Ovary trilocular with axile placentation .....  | 7                   |
| 7. Inflorescence enclosed by the leaf sheath; flowers few and exerted .....                          | <b>Boesenbergia</b> |
| 7. Inflorescence not enclosed in the leaf sheath; flowers many with distinct imbricating bracts..... | <b>Hedychium</b>    |
| 8. Anther connective broad crest-like .....  | <b>Amomum</b>       |
| 8. Anther connective produced into long tail at apex .....   | <b>Zingiber</b>     |

## ALPINIA Roxburgh

**Alpinia smithiae** Sabu & Mangaly, Edinb. J. Bot. 48: 69. 1991; Sabu & Mangaly, Rheedeia 2: 50.1992; FTSR 457. 1996.

Leafy stem to 3 m tall. Leaves oblong-lanceolate, acuminate, base oblique, densely pubescent below and glabrous above, to 60 x 10 cm; ligule to 1 cm long, entire. Panicle to 20 cm long; pedicels 0.5-1 cm long, densely pubescent. Bracts towards the apex, 3.5 x 1.2 cm; bracteoles white, larger than the bracts. Corolla white, tube 1 cm long; dorsal lobe 2.5 x 1.5 cm; laterals 2.5 x 1 cm. Lip orange-yellow with dark red veins, 3.5-4 x 3.5 cm, orbicular, slightly narrowed towards base; lateral lobes subulate. Anther 1.2 cm long, hairy at back; crest rounded, 4 x 3 mm.

*Fl.* March-April

*Distr.* Endemic to Southern Western Ghats (Kerala). Fairly common in evergreen forests; *PS 30580* Thoothanppara

## AMOMUM Roxburgh

- |  |                       |
|--|-----------------------|
| 1. Leaves silvery silky below; inflorescence to 3 flowered.....            | <b>A. hypoleucum</b>  |
| 1. Leaves not silvery silky below; inflorescence more than 8 flowered..... | 2                     |
| 2. Ligule bifid; ovary and capsule ribbed.....                             | <b>A. pterocarpum</b> |
| 2. Ligule entire; ovary and capsule echinate.....                          | 3                     |
| 3. Capsule muricate; calyx lobes strongly cuspidate.....                   | <b>A. muricatum</b>   |
| 3. Capsule echinate; calyx lobes obtuse.....                               | <b>A. cannicarpum</b> |

**Amomum cannicarpum** (Wight) Benth., Gen. Pl. 3: 644. 1876; FBI 240. 1892; FPM 1487. 1928; FTSR 458. 1996. *Elettaria cannicarpum* Wight, Ic. t. 2007. 1853.

Leafy stem 2-3 m high, erect, straight, loosely clumped; rootstock horizontal, much branched, reddish outside, light pink inside. Leaves 50 x 8 cm, oblong-lanceolate, acuminate, glabrous, nearly sessile, lower leaves smaller; ligule 1 cm long, orbicular, reddish. Spike 1-few, to 16 cm long, obovoid; peduncles covered with imbricating bracts; basal empty bracts 3.5 cm long, ovate, obtuse, formed into sheath at base, reddish brown; bracteoles 2 cm long, tubular. Flowers one or two in a bract; calyx lobes obtuse; corolla lobes equal, 2 x 1 cm, obtuse, glabrous. Capsule 1.5 cm across, dark brown.

*Fl. & Fr.* January-May

*Distr.* Endemic to Western Ghats. Fairly common in evergreen and moist deciduous forests  
*PS 30746* Parambikulam

**Amomum hypoleucum** Thw., Enum. Pl. Zeyl. 318. 1861; FBI 6: 240. 1892; FPM 1487. 1928.

Leafy stem to 2 m tall, rhizome creeping. Leaves petiolate, to 65 x 11 cm, oblong-lanceolate, acuminate, silvery pubescent below, ligule short. Inflorescence on creeping runners; peduncle to 7 cm, spike to 5 cm, narrow, to 3 flowered; bracts to 3 x 1 cm, oblong, glabrous; bracteoles longer than bracts; calyx trilobed; corolla white; labellum yellow, lateral stamens reduced, filaments to 8 mm long; anthers to 1 cm, connective prolonged, epigynous glands 2. Capsule globose, to 2 cm diameter, with 7-8 ridges; seeds 5 x 3 mm, ovate, black, aril white.

*Fl. & Fr.* June-December

*Distr.* South India and Sri Lanka. Fairly common in evergreen forests; *PS 30747* Kariamchola

**Amomum muricatum** Bedd., Madras J. Sci. ser. 3, 1: 59. 1864; FPM 1487. 1928; FTSR 458. 1996.

Leafy stem 1.5-3 m high, densely clumped, erect, straight. Leaves 30 x 7 cm, elliptic-oblong, acuminate, sessile, glabrous; ligule 3 mm long, truncate, Spike 2-5-together, 14-15 cm long, shortly peduncled; floral bracts 3.5 x 1.5 cm, obovate, obtuse, ciliate; yellow with brown lines; bracteoles 2 cm long, lobes obtuse. Flowers densely packed; calyx tube 2.5 cm long, lobes obtuse, cuspidate; corolla tube 2.8 cm long, lobes unequal, to 3 x 1.8 cm, oblong, obtuse, yellow with red lines; anthers 9 mm long, crest, 15 mm broad, auriculate; lip 4 x 3 cm; middle lobes emarginate, yellow, with brown streaks. Capsule 1.5-2 cm across, brown.

*Fl. & Fr.* January-June

*Distr.* Endemic to Southern Western Ghats. Occasional in evergreen forests at higher altitudes; *PS 18905* Karimalagapuram

**Amomum pterocarpum** Thw., Enum. Pl. Zeyl. 317. 1861; FBI 6: 241. 1892. *A. microstephanum* Baker in Hook. f., FBI 6: 239. 1892; FPM 1487. 1928; FPL 497. 1990; FTSR 458. 1996.

Leafy stem to 2 m high, clumped, erect; rhizome to 4 cm thick, old ones blue inside. Leaves to 50 x 12 cm, elliptic-oblong, acute at either ends, glabrous, usually clustered towards the apex; petiole 3 cm long; ligule 3 mm long, whitish. Spikes 5-15 cm long, 3-4 together, bracts 6-7 x 4 cm, broadly elliptic, obtuse, pale pink. Flowers solitary in a bract; lip 4 x 3 cm, obovate, white with yellow centre. Capsule 3 cm long, glabrous; wings 3-8 mm broad, entire.

*Fl. & Fr.* January-May

*Distr.* South India and Sri Lanka. Rare in moist deciduous forests; *NS 30775* Kuchumudi

#### BOESENBERGIA O. Kuntze

**Boesenbergia pulcherrima** (Wall.) O. Ktze., Rev. Gen. Pl. 2: 685. 1891; FPL 498. 1990; FTSR 458. 1996. *Gastrochilus pulcherrima* Wall., Pl. Asiat. Rar. 1: 22, t. 24. 1829; FBI 6: 217. 1890.

Leafy stem to 15-25 cm long. Leaves few, scattered, to 13 x 6 cm, broadly elliptic, acute at both ends, thinly tomentose beneath; petiole to 2 cm long; sheath saccate. Spike to 5 cm long, terminal, one sided; bracts 20 x 8 mm, obovate, obtuse; bracteoles tubular, deeply cleft to the

base. Flowers solitary in each bracts; calyx tube short, truncate; corolla tube 15 mm long; lobes equal, 10 x 4 mm, oblong; lip 20 x 15 mm, obovate, acute, white with brown spots; lateral staminodes 10 x 5 mm obovate; filaments 2 mm long; anthers parallel, not crested; ovary 3-celled, oblong; ovules few; style filiform. Fruit an oblong capsule.

*Fl. & Fr.* July-November

*Distr.* Southern Western Ghats. Occasional in moist deciduous and semi-evergreen forests; *PS 19525* Orukomban

#### COSTUS Linnaeus

**Costus speciosus** (Koenig) Smith, Trans. Linn. Soc. London 1: 249. 1791; FBI 6: 249. 1892; FPM 1490. 1928; FPL 498. 1990; FTSR 459. 1996. *Banksea speciosa* Koenig in Retz., Obs. Bot. 3: 75. 1783. *Costus nepalensis* Rosc., Monandr. Pl. t. 80. 1828.

Leafy stem 1-2 m tall, fleshy; rhizome horizontal, cylindrical. Leaves spiral, to 25 x 6 cm, oblong, acute, sessile, glabrous. Spike strobilioid, terminal, to 10 x 7 cm; bracts 3 cm long, oblong, mucronate, bright red. Flowers solitary in each bract, calyx 2 cm long, tubular; corolla 3-lobed, pinkish-white; lip 5 cm across, orbicular, white with yellow centre, entire; staminal filaments petaloid; anthers parallel. Capsule globose, reddish; seeds few, angled.

*Fl. & Fr.* December-January

*Distr.* Indo-Malesia. Common in moist deciduous and semi-evergreen forests; *PS 19628* Vengoli

#### CURCUMA Roxburgh

- |   |                                       |
|---|---------------------------------------|
| 1. Inflorescence both lateral and terminal .....  | 2                                     |
| 1. Inflorescence either terminal or lateral.....  | 4                                     |
| 2. Pseudostem more than 30 cm tall; rhizome yellow in centre white towards periphery .....      |                                       |
| .....   | <b>C. pseudomontana</b>               |
| 2. Pseudostem to 15 cm tall; rhizome either yellow or white .....                               | 3                                     |
| 3. Inflorescence without a coma; rhizome yellow.....  | <b>C. oligantha</b> var. <b>lutea</b> |
| 3. Inflorescence with a coma; rhizome white .....   | <b>C. nilghirensis</b>                |
| 4. Inflorescence terminal .....   | 5                                     |
| 4. Inflorescence lateral.....   | 7                                     |
| 5. Leaves glabrous; rhizome orange coloured .....   | <b>C. vamana</b>                      |
| 5. Leaves pubescent below at least on tip; rhizome yellow coloured.....                         | 6                                     |
| 6. Sessile tubers absent; anther lobes without a spur.....                                      | <b>C. ecalcarata</b>                  |
| 6. Sessile tubers many, branched; anther lobes with a spur.....                                 | <b>C. longa</b>                       |
| 7. Leaves with a purple patch along the midrib .....  | <b>C. zedoaria</b>                    |
| 7. Leaves without a purple patch along the midrib.....  | 8                                     |
| 8. Rhizome aromatic; lateral staminodes without a patch of glandular hair.....                  | <b>C. aromatica</b>                   |
| 8. Rhizome not aromatic; lateral staminodes with a patch of glandular hairs at the centre ..... | <b>C. haritha</b>                     |

**Curcuma aromatica** Salisb., Parad. Lond. t.96. 1807; FBI 6: 216. 1890; FPM 1483. 1928; Jose & Sabu, Rheedeia 3:145.1993. *C. zedoaria* sensu Roxb., Asiat. Res. 11: 333. 1810, non (Christm.) Rosc.

Rhizome orange yellow inside. Leaves to 65 x 20 cm, elliptic, acute at either ends; petiole to 30 cm long; ligule membranous, obtuse. Spike 15-17 x 7 cm; crown purplish blue; bracts 4 x 3 cm, orbicular or obovate, yellowish green, tomentose. Flowers brownish-yellow; calyx 1.5 cm long, lobes obtuse, corolla lobes 1.2 x 0.8 cm, glabrous, brownish; anthers 4 mm long; tail 3.5 mm long, divaricating; lip yellowish, 1.5 x 1.5 cm, shallowly 3-lobed; midlobe emarginate; lateral staminode 1.2 x 1 cm.

*Fl. & Fr.* August-December

*Distr.* India, Sri Lanka and China. Rare in moist localities of moist deciduous forests; *PS 19445* Pooppara

**Curcuma ecalcarata** Sivar. & Indu Balachandran, Notes Roy. Bot. Gard. Edinb. 41: 321. 1983; Jose & Sabu, Rheedea 3:151.1993; FTSR 459. 1996.

Rhizome branching, yellow inside. Leaves elliptic oblong to lanceolate, acuminate, to 20 x 8 cm; ligule acute. Spike from the centre of the leaves; lower bracts green, oblong-obtuse; coma yellow or yellowish-white. Calyx truncate at apex, 1 cm long. Corolla about 2 cm long, dorsal lobe, larger, concave, hooded. Staminodes bright yellow. Lip 3-lobed, midlobe larger. Anthers not spurred.

Fl. July-October

*Distr.* Endemic to Western Ghats. Very common in moist deciduous forests and plantations; *PS 30416* Vengoli

**Curcuma haritha** Mangaly & Sabu, Rheedea 3: 152. 1993.

Rhizome pale yellow or white inside, branching with root tubers. Leaves 20-40 cm long, elliptic, acuminate, pubescent beneath. Spikes lateral, 15-18 x 4 cm, appearing before the leaves; peduncle *ca.* 14 cm long; bracts 4 x 2.5 cm, rounded at apex, pubescent, corona purple. Flowers few in each bracts; calyx 1.4 cm long, pubescent, lobes acute; corolla tube 3 cm long, glabrous, lobes 1.5 x 0.9 cm, oblong, obtuse, hairy, pale yellow; lip 2 x 1.7 cm, emarginate, or very obscurely 3-lobed, glabrous; lateral staminodes 2 x 1 cm, oblong, with a patch of glandular hairs at centre; anthers 6 mm long, glandular hairy; spur 3 mm long, acute, curved; ovary pubescent.

*Fl. & Fr.* April-June

*Distr.* Endemic to Southern Western Ghats (Kerala). Rare in moist deciduous forests; *PS 19560* Padippara

**Curcuma longa** L., Sp. Pl. 2. 1753; FBI 6: 214. 1890; FPM 1483. 1928; Jose & Sabu, Rheedea 3:155.1993; FTSR 464. 1996. *Curcuma domestica* Valetton, Bull. Jard. Bot. Buitenz. ser. 2. 27: 31. 1981.

Rhizome conical, deep yellow inside, sessile tubers many, shoots to 130 cm tall. Leaves 4-6, to 50 x 15 cm, oblong-lanceolate, tapering at both ends. Inflorescence terminal, to 30 cm, white or greenish, fertile bracts to 30, compactly arranged; flowers to 5 cm; bracteoles 3-2 cm, ovate-oblong; calyx truncate, 3-lobed, labellum trilobed, yellow, lateral staminodes linear, style filiform, stigma bilipped; ovary 5 mm.

*Fl.* September

*Distr.* Cultivated throughout the tropics. Cultivated in settlements; *PS 30756* Vengoli

**Curcuma neilgherrensis** Wight, Ic. t. 2006. 1853; FBI 6: 210. 1892; FPM 1482. 1928; Jose & Sabu, Rheedea 3:160.1993. *C. angustifolia* sensu Dalz. & Gibs., Bombay Fl. 274. 1861, non Roxb.

Rhizome to 3 x 1 cm, conical, white inside, roots ending in fusiform tubers, shoots to 25 cm. Leaves 6-9, to 18 x 8 cm, ovate-elliptic, acute, sparsely pubescent. Inflorescence lateral, to 15 x 5 cm; coma oblong-lanceolate, pink; flowers to 5 cm long, light yellow; labellum 2 cm across, yellow with medium cleft; lateral staminodes longer than corolla, connective prolonged, glandular hairy, style filiform, stigma bilipped; ovary 4 mm.

*Fl.* April-June

*Distr.* Endemic to Western Ghats. Rare in grasslands; *PS 19390* Karimala; *NS 30368* Pandaravarai

**Curcuma oligantha** Trin. var. **lutea** (Ansari *et al*) Bhat, Indian J. For. 10:68. 1987; Jose & Sabu, Rheedea 3:163.1993. *C. kannanorensis* Ansari *et al* var. *lutea* Ansari *et al.*, Curr. Sci. 51: 294. 1981.

Rhizome yellow inside, conical, shoots to 30 cm. Leaves to 15 x 8 cm, ovate-elliptic, acuminate, glabrous or glabrescent. Inflorescence lateral, to 15 cm; fertile bracts lanceolate,



pinkish-green; flowers to 5 cm; labellum to 2 x 1.5 cm, shortly 3-lobed, orange yellow; lateral staminodes 2 x 1 cm, tip acute.

*Fl.* May-June

*Distr.* Endemic to Southern Western Ghats. Occasional in grasslands; *PS 19390* Karimala

**Curcuma pseudomontana** Graham, Cat. Pl. Bombay 210. 1839; FPM 1483. 1928; FPL 499. 1990; Mangaly & Sabu, *Rheedea* 3:165.1993; FTSR 459. 1996. *C. montana* sensu Baker in Hook.f., FBI 6: 214. 1890 p.p., non Rosc. 1807.

Rhizome small, roots without tubers. Leaves 3-5, oblong, acuminate, base narrowed, to 28 x 8 cm; petiole and sheath to 18 cm long. Spikes terminal, to 13 cm long; bract ovate-oblong, obtuse, 4 cm long. Corolla purple. Flowers exserted, to 3.5 cm long, yellow; calyx tube 1.5 cm long; corolla lobes lanceolate, to 1.2 cm long; staminodes oblong, to 2 cm. Lip broadly ovate, to 3 cm.

*Fl.* July-August

*Distr.* Endemic to Peninsular India. Occasional in the margins of evergreen forests; *PS 30369* Kariamchola

**Curcuma vamana** Sabu & Mangaly, JETB 10: 307. 1988; Jose & Sabu, *Rheedea* 3:167.1993; FTSR 460. 1996. *C. peethapushpa* Sasidh. & Sivar., Notes Roy. Bot. Gard. Edinb. 45: 425. 1989.

Rhizome short, roots fibrous, some of them terminating in tubers. Leaves 3-5, oblong-acuminate, glabrous, 12-15 x 4-8 cm; petiole above sheath 8-12 cm. Spikes terminal, peduncle 4-5 cm, 5-7 bracteate; bracts ovate-orbicular, 2 cm across. Calyx glabrous, tube 3-4 mm long, lobes subequal. Corolla funnel-like, dorsal lobe concave; laterals ovate-oblong. Lateral staminodes spatulate, pale yellow, 5 x 4 mm. Lip yellow, fan-shaped, crenulate along margins, shortly 2-fid apex, pubescent below. Filaments 2 cm long, anther white, basal appendage short and straight. Fruits oblong, 1 cm long; seeds 8-10, smooth, aril white, lacinate.

*Fl. & Fr.* July-October

*Distr.* Endemic to Southern Western Ghats (Kerala). Common in moist deciduous forests; *PS 30425* Vengoli

**Curcuma zedoaria** (Christm.) Rosc., Trans. Linn. Soc. London 8: 354. 1807; FBI 6: 210. 1890; FPM 1482. 1928; Jose & Sabu, *Rheedea* 3:168.1993; FTSR 460. 1996. *Amomum zedoaria* Christm. in Christm. & Panzer, Linn. Pflanzenf. Syst. 5: 12. 1779. *Curcuma zerumbet* Roxb., *Asiat. Res.* 11: 332. 1810.

Rhizome orange yellow inside; tubers ellipsoidal. Leafy stem 50-80 cm high. Leaves to 35 x 15 cm, elliptic, acute at both ends, deep blue patches along the midrib on both surfaces; petiole obscure; ligule 1 mm wide, membranous; sheath round. Spike lateral, 20-22 cm long, with a purple corona; peduncle to 10 cm long; bracts 5 x 3.5 cm, obovate, obtusely acute, deep purple at apex, glabrous; crown with acute bracts. Calyx 1.2 cm long, lobes obtuse; corolla lobes apiculate, pale yellow; lip 1.5 x 1.5 cm, orbicular, emarginate.

*Fl. & Fr.* May-August

*Distr.* Cultivated and naturalised in Indo-Malaya. Rare along the margins of vayals in moist deciduous forests; *PS 30749* Parambikulam

#### ELETTARIA Maton

**Elettaria cardamomum** (L.) Maton, Trans. Linn. Soc. London 10: 254. 1811; FBI 6: 251. 1892; FPM 1491. 1928; FPL 499. 1990; FTSR 460. 1996. *Amomum cardamomum* L., Sp. Pl. 1: 1. 1753. *Alpinia cardamomum* (L.) Roxb., *Asiat. Res.* 11: 355. 1810 & Pl. Corom. 3: 19. t. 226. 1819.

Rhizome branched, thick. Leafy shoots to 2 m high, tufted. Leaves bifarious, to 60 x 10 cm, elliptic-lanceolate, acute at either ends. Flowers in prostrate or erect, 30-50 cm long, panicles; bracts scarious, 3-4 cm long, carrying 2-7 flowers; calyx tubular, 1 cm long, split on 1 side; corolla

white, lobes unequal, to 2 cm long, oblong; labellum 1 x 0.5 cm, obovate, white with red lines; anther cells parallel, shortly spurred; staminodes short; style filiform, stigma funnel shaped. Capsule *ca.* 13 x 8 mm, ellipsoid, striate; seeds many, angular, fragrant.

*Fl. & Fr.* Throughout the year

*Distr.* Indo-Malesia and China. Occasional in evergreen forests at higher altitudes, also cultivated; *PS 30317* Pooppara

#### GLOBBA Linnaeus

1. Leaves glabrous; bracts persistent ..... **G. marantina**  
1. Leaves pubescent; bracts deciduous ..... **G. ophioglossa**

**Globba marantina** L., Mant. Pl. 2: 170. 1771; FBI 6: 206. 1890; FTSR 462. 1996. *G. bulbifera* Roxb., Asiat. Res. 11: 358. 1810; FBI 6: 206. 1890; FPM 1481. 1928. *G. marantinoides* Wight, Ic. t. 6: 15. t. 2001. 1853.

Stem to 50 cm high, usually solitary, stem slender. Leaves bifarious, to 20 x 5 cm, oblong-lanceolate, acute at apex, sessile, glabrous. Spike terminal, to 10 cm long, often with bulbils towards the base; bracts 1-2 cm long, broadly ovate, greenish. Flowers solitary in each bracts; calyx 5 mm long, funnel shaped, 3-lobed; corolla 14 mm long, lobes short, yellow; lip as long as the corolla, deeply 2-lobed; anthers broadly winged; lateral staminodes oblong; ovary 1-celled; ovules many on 3-parietal placentas; stigma turbinate. Capsule 1 x 6 mm, oblong, glabrous, coarsely rugose.

*Fl. & Fr.* July-December

*Distr.* Indo-Malesia. Common in moist deciduous forests and plantations; *PS 19890* Thelikkal

**Globba ophioglossa** Wight, Ic. t. 2002. 1853; FBI 6: 202. 1890; FPM 1480. 1928; FPL 500. 1990; FTSR 462. 1996.

Stem to 60 cm tall. Leaves linear or ovate-lanceolate, finely caudate-acuminate, to 18 x 5 cm. Panicles to 8 cm long; oblong, 5 x 2 cm, deciduous. Calyx 4 mm long. Corolla yellow, 1.5 cm long, tube narrow, 8 mm long. Lobes ovate-acute. Lip obovate. Filaments unappendaged.

*Fl. & Fr.* July-September

*Distr.* Endemic to Peninsular India. Common in moist deciduous forests and plantations; *PS 18987* Orukomban; *NS 30366* Kariamchola

#### HEDYCHIUM Koenig

1. Bracts ciliate on margin, sparsely pubescent; stamens longer than the lip ..... **H. flavescens**  
1. Bracts not ciliate on margin, glabrous; stamens shorter than the lip ..... **H. coronarium**

**Hedychium coronarium** Koenig in Retz., Obs. Bot. 3: 73. 1783; FBI 6: 225. 1892; FPM 1485. 1928.

Stem to 1.5 m high, robust, densely clumped; rhizome horizontal. Leaves to 30 x 10 cm, oblong, acuminate, glabrate; ligule 2 cm long, acuminate. Spike 15 x 7 cm, ovoid; bracts 5 x 2 cm, oblong, obtuse, glabrous. Flowers 2-4 in each bracts; calyx 4 cm long, not split, glabrous; corolla tube 9 cm long, narrow, glabrous, lobes 3.5 cm long, slender, glabrous; lip 6 x 6 cm; lobes emarginate, white; anthers 1.5 cm long, filaments shorter than lip.

*Fl. & Fr.* All the season

*Distr.* Widely cultivated and naturalised in the tropics. Occasional in the sides of streams in evergreen forests; *PS 30745* Parambikulam

**Hedychium flavescens** Carey ex Rosc., Monandr. t. 50. 1825; FPM 1485. 1928; FPL 501. 1990; FTSR 462. 1996. *H. coronarium* Koenig var. *flavescens* Baker in Hook.f., FBI 6: 226. 1892. *H. subditum* Turrill, Kew Bull. 1914: 370. 1914.

Stem to 1.5 m high, robust, densely clumped. Leaves 40-50 x 8 cm, lanceolate, acuminate at apex, glabrous above; ligule acute, sparsely hairy. Spike 17 x 11 cm, ovoid; bracts 5 x 2.5 cm, closely imbricating. Flowers 2-6 in each bracts; calyx 4.5 cm long, split along one side; corolla tube 8 cm long, narrow, lobes linear-oblong; anther curved; lip 6 x 6 cm, lobes emarginate, sulphur yellow; lateral staminodes 5-6 x 2 cm, glabrous.

*Fl. & Fr.* August-September

*Distr.* India and Sri Lanka. Rare in the sides of streams in evergreen forests; *PS 30325* Pezha

### ZINGIBER Boehmer apud Ludwig

- |   |                      |
|---|----------------------|
| 1. Peduncle less than 5 cm long or sessile.....           | 2                    |
| 1. Peduncle over 10 cm long .....                         | 3                    |
| 2. Leaves linear, to 30 x 5 cm; outer bract ovate .....   | <b>Z. wightianum</b> |
| 2. Leaves broad, to 40 x 15 cm; bracts linear-oblong..... | <b>Z. cernuum</b>    |
| 3. Spike globose or oblong, to 5 cm diameter .....        | <b>Z. zerumbet</b>   |
| 3. Spikes narrowly cylindric, to 2 cm diameter.....       | 4                    |
| 4. Leaves glabrous; rhizome fragrant.....                 | <b>Z. officinale</b> |
| 4. Leaves pubescent; rhizome not fragrant.....            | <b>Z. nees anum</b>  |

**Zingiber cernuum** Dalz. in Hook.'s J. Bot. Kew Gard. Misc. 4: 342. 1852; FBI 6: 245. 1892; FTSR 463. 1996. *Z. nimmonii* Dalz. in Hook.'s J. Bot. Kew Gard. Misc. 4: 341. 1852; FBI 6: 244. 1892; FPM 1489. 1928.

Leafy stem 60-100 cm high, erect; rhizome erect and branching, violet inside. Leaves to 30 x 8 cm, elliptic, acuminate, pubescent below, sessile; ligule 7 x 5 mm, ovate. Spikes 2-3, 7-12 cm long, ovoid; floral bracts 5-6 x 1.5 cm, oblong, obtuse, curved, green or white with red lines, glabrous. Flowers densely packed; calyx 2 cm long, lobes truncate, ciliate; corolla tube 5 cm long, white; lobes 3.5 x 1.5 cm, lanceolate, white with red lines; anthers 1.5 cm long; lip 4 x 3 cm, yellow with reddish brown lines, side lobes very short, rounded; ovary densely hairy.

*Fl. & Fr.* July-August

*Distr.* Endemic to Western Ghats. Common in semi-evergreen forests; *PS 19513* Orukomban

**Zingiber nees anum** (Graham) Ramam. in Sald. & Nicols., Fl. Hassan Dist. 769. 1976; FTSR 463. 1996. *Alpinia neesiana* Graham, Cat Pl. Bombay 2-7. 1139. *Zingiber macrostachyum* Dalz. in Hook.'s J. Bot. Kew Gard. Misc. 4: 342. 1852; FBI 6: 247. 1892; FPM 1490. 1928.

Leafy stem 40-70 cm high, solitary or 2-4 together, erect, rhizome creeping, yellow inside. Leaves 25-35 x 3.5 cm, elliptic-oblong, acute at base, sessile; ligule 8 mm long, ovate. Spikes to 25 cm long, enlarging in fruit, terete on erect peduncle of 30-35 cm long; floral bracts 3 x 1.4 cm, obtuse, reddish. Flowers solitary in each bract; calyx 2 cm long, glabrous; corolla tube 2 cm long, lobes unequal, larger lobe 3.5 x 1.5 cm, elliptic, acute, glabrous; lip 3.5 x 3.5 cm, 3-lobed; lobes obtuse, glabrous, middle lobe emarginate; ovary glabrous. Capsule 3-4 cm long, ellipsoid, smooth, red inside, 3-valved.

*Fl. & Fr.* July-October

*Distr.* Endemic to Western Ghats. Common in evergreen forests at higher altitudes; *PS 19572* Kariamchola

**Zingiber officinale** Rosc., Trans. Linn. Soc. London 8: 348. 1807; FBI 6: 246. 1892; FPM 1489. 1928. *Amomum zingiber* L., Sp. Pl. 1: 1. 1753.

Leafy stem to 60 cm high, rhizome thick, dull yellow. Leaves to 25 x 2 cm, elliptic-oblong, acuminate. Peduncles to 30 cm long, erect; spike 3-5 x 3 cm, obovoid; bracts 2.5 x 2 cm, obovate, green. Flowers few; calyx 2 cm long; corolla white, tube small; labellum 3 x 2.5 cm, white, obovate.

*Fl. & Fr.* July-December

*Distr.* Cultivated in Tropical countries. Common in moist deciduous forests; *PS 30474* Vengoli

**Zingiber wightianum** Thw., Enum. Pl. Zeyl. 315. 1861; FBI 6: 244. 1892; FPM 1489. 1928; FTSR 463. 1996. *Z. squarrosum* Wight, Ic. t. 2004. 1853, Roxb. 1832.

Leafy stem to 1 m tall, rhizome thick, fleshy, white to pale yellow inside. Leaves oblong-lanceolate, acuminate, glabrous, to 30 x 6 cm; ligule to 5 mm long. Peduncle to 3 cm long, sheath membranous, deciduous. Spikes to 8 x 5 cm, bracts lanceolate, acuminate, to 5 x 1 cm. Calyx tubular, 2 cm long. Corolla greenish-yellow, 2.5 cm long. Lip obovate, yellow with purple-red streaks, 3 cm long; lateral lobes oblong, 1 cm long.

*Fl.* September-October

*Distr.* Peninsular India and Sri Lanka. Common in the rocky areas of moist deciduous forests; *PS 19654* Vengoli

**Zingiber zerumbet** (L.) Smith, Exot. Bot. 2: 105, t. 112. 1804; FBI 6: 247. 1892; FPM 1490. 1928; FTSR 464. 1996. *Amomum zerumbet* L., Sp. Pl. 1. 1753.

Leafy stem 40-90 cm high, rhizome thick, fragrant, yellowish inside. Leaves 30 x 8 cm, oblong, acute at either ends, sessile, pubescent below. Spike to 15 cm long, cylindrical, on erect peduncle 30-45 cm long, floral bracts 3.5 x 3 cm, obovate, thinly pubescent above, green, changing to red. Flowers white, solitary in each bract; corolla 2-3 cm long; lip 2.5 x 2 cm, white or pale yellow; midlobe orbicular.

*Fl. & Fr.* August-December

*Distr.* Indo-Malesia. Common in moist deciduous forests; *PS 30748* Thunakkadavu

## MARANTACEAE

1. Shrubs; inflorescence a terminal panicle ..... **Schumannianthus**
1. Herbs; inflorescence a small spike from the rhizome..... **Stachyphrynium**

### SCHUMANNIANTHUS Gagnepain

**Schumannianthus virgatus** (Roxb.) Rolfe, J. Bot. 14: 244. 1907; FPM 1494. 1928; FPL 502. 1990; FTSR 464. 1996. *Phrynium virgatum* Roxb., Asiat. Res. 11: 324. 1810. *Maranta virgata* (Roxb.) Wall. ex Wight, Ic. t. 2015. 1853. *Clinogyne virgata* (Roxb.) Benth. ex Baker n Hook.f., FBI 6: 258. 1892.

Erect shrubs, to 3 m high; stem thickened at nodes. Leaves bifarious, to 40 x 18 cm, ovate-oblong, cuspidate at apex, rounded at base; petiole to 1 cm long. Panicle to 50 cm long, branches slender, dichotomous; bracts 3-5 x 0.6 cm, lanceolate. Flowers paired in each bract; corolla white, tube short; lobes oblong; stamens 1, outer staminodes petaloid, white, to 1.5 cm long; inner staminodes smaller; ovary densely hairy. Berry obovoid, rugose.

*Fl. & Fr.* Throughout the year

*Distr.* South India and Sri Lanka. Common along the moist areas in moist deciduous and evergreen forests; *PS 19459* Pooppara

### STACHYPHRYNIUM Schumann

**Stachyphrynium spicatum** (Roxb.) Schum. in Engl., Pflanzenr. 11: 46. 1902; FPM 1494. 1928; FPL 502. 1990; FTSR 464. 1996. *Phrynium spicatum* Roxb., Fl. Ind. 1: 5. 1820.

Herbs, rhizome creeping, nodose. Leaves 2-5 together, lamina to 20 x 7 cm, ovate-oblong, abruptly acuminate at apex, rounded at base; petiole to 30 cm long, sheathing at base. Spike 1 or 2, basal, 3-5 cm long, sessile or shortly peduncled. Flowers 3-8, sessile; bracts 15 x 7 mm, ovate; corolla dull white, 2.5 cm long; lobes oblong; stamen 1, petaloid; anthers adnate on the margin; staminodes obovate, clawed. Capsule 8 x 6 mm, ovoid; seeds wrinkled.

*Fl. & Fr.* November-January

*Distr.* Endemic to South India. Common in moist deciduous and evergreen forests; *PS 30336* Orukomban

## MUSACEAE

### ENSETE Bruce ex Horan

**Ensete superbum** (Roxb.) Cheesman., Kew Bull. 3: 100. 1948; FPL 503. 1990; FTSR 465. 1996. *Musa superba* Roxb., Pl. Corom. t. 223. 1811; FBI 6: 261. 1892; FPM 1497. 1928.

Erect shrubs with unbranched globose leafsheaths formed into a pseudostem of 50-100 cm diam. Leaves spirally arranged, to 3 x 0.8 m, oblong, entire with channelled midrib. Spadix 50-100 cm long, with 3-5 spathes at base; bracts several, to 20 x 14 cm, ovate, obtuse, brown. Flowers many on each bracts; unisexual, female flowers towards the base and male flowers above; sepals and 2 petals united into a sheath, 3.5 cm long, 5-lobed; third petals forms into a membranous sheath; stamens 5, perfect. Fruit oblong; seeds few, subglobose, black.

*Fl. & Fr.* August-December

*Distr.* Peninsular India. Occasional in rocky areas of grasslands; *PS 30737* Karimala

## HAEMODORACEAE

1. Leaves linear flat; filaments free ..... **Ophiopogon**  
1. Leaves elliptic plicate; filaments united ..... **Peliosanthes**

### OPHIOPOGON Ker-Gawler

**Ophiopogon intermedius** D. Don, D. Don, Prodr. Fl. Nepal 48. 1825; FBI 6: 209. 1892; FPM 1499. 1928; FPL 503. 1990; FTSR 465. 1996. *O. indicus* Wight, Ic. t.2050. 1853.

Densely tufted scapigerous perennial herbs; rootstock rhizomatous. Leaves clustered, 25-40 x 0.7 cm, linear-oblong, ribbed, narrowed to the base into a petiole. Scape to 35 cm long. Flowers 4-10 in raceme, pedicel 5 mm long; tepals 6, white with pink shades, 6 x 4 mm, oblong, obtuse; stamens 6, filaments free, shorter than tepals; anthers sagittate at base; ovary 3-celled; ovules one in each cell. Berry 7 mm across, globose, glabrous, blue; seeds 1-3, globose or trigonous.

*Fl. & Fr.* August-March

*Distr.* Endemic to India. Common in evergreen and semi-evergreen forests; *PS 19568* Kariamchola

### PELIOSANTHES Andrews

**Peliosanthes teta** Andr. ssp. **humilis** (Andr.) Jessop, Blumea 23: 155. 1976 & in Steenis, Fl. Males. I. 9: 299. 1979; FTSR 466. 1996. *P. humilis* Andr., Bot. Rep. 10,t.634. 1811. *P. neilgherrensis* Wight, Ic. t. 2052. 1853; FBI 6: 266. 1892; FPM 1498. 1928. *P. courtallensis* Wight, Ic. t. 2051. 1853; FBI 6: 266. 1892; FPM 1498. 1928.

Scapigerous perennial herbs; stem solitary or loosely tufted. Leaves few, clustered, to 32 x 10 cm, elliptic, acute at either ends, plicate; petiole to 38 cm long. Racemes to 20 cm long, many-flowered; bracts 1 cm long, lanceolate. Flowers purple, many, 6-8 mm across, 1-few in each bract; tepals 6, oblong, connate at base; stamens 6, filaments shorter than tepals, united at base into a ring. Berry 8 x 8 mm, top-shaped, glabrous, bluish black; seeds 1-3, globose.

*Fl. & Fr.* August-February

*Distr.* Indo-Malesia. Rare in evergreen forests at higher altitudes; *PS 30195* Kothala

## DIOSCOREACEAE

### DIOSCOREA Linnaeus

1. Leaves simple ..... 2  
1. Leaves 3-7 foliolate..... 5  
2. Leaves opposite or sub-opposite, base truncate or rounded, coriaceous..... 3  
2. Leaves alternate, base cordate, membranous..... 4

- 3. Inflorescence brown pubescent ..... **D. oppositifolia** var. **oppositifolia**
- 3. Inflorescence glabrous..... **D. oppositifolia** var. **dukumensis**
- 4. Leaves to 30 cm across; perianth lobes linear-oblong ..... **D. bulbifera**
- 4. Leaves to 14 cm across; perianth lobes ovate-obtuse ..... **D. wallichii**
- 5. Stem unarmed..... **D. tomentosa**
- 5. Stem prickly..... 6
- 6. Leaves with prominent ribs; fertile stamens 6 ..... **D. hispida**
- 6. Leaves without prominent ribs; fertile stamens 3..... **D. pentaphylla**

**Dioscorea bulbifera** L., Sp. Pl. 1033. 1753; FBI 6: 296. 1892; FPM 1511. 1928; FPL 507. 1990; FTSR 468. 1996. *D. sativa* sensu Hook.f., FBI 6: 295. 1892, non L. 1753.

Stem ridged, twining to left, glabrous. Leaves to 20 x 15 cm, broadly ovate, acuminate, 11-nerved from the base; intercostae parallel; petiole 10-20 cm long; lower leaves much larger, to 32 cm across. Spike 4-8 cm long, slender, pendulous, 2-3 together or solitary; peduncle to 20 cm long, axillary. Flowers distant; bracts lanceolate, subulate at apex; tepals 1.5 x 0.5 mm, oblong, acute, glabrous; stamens 6, free.

*Fl.* November-January

*Distr.* Paleotropics. Common in deciduous forests; *PS 30002* Pezha

**Dioscorea hispida** Dennst., Schluss. 15. 1818; FPM 1511. 1928; FPL 508. 1990; FTSR 469. 1996. *D. daemonia* Roxb., Fl. Ind. 3: 805. 1832; FBI 6: 289. 1892.

Stem twining to the left, glabrous. Leaflets subequal, to 17 x 12 cm, obovate, abruptly sharply acuminate at apex, cuneate to the base, shortly petiolulate, ribs 5, prominent intercostae coarsely reticulate, thinly hispid; lateral leaflets gibbous at base; petiole 12 cm long. Panicles to 45 cm long, axillary. Racemes fascicled, shortly peduncled, to 1 cm long.

*Fl. & Fr.* November-January

*Distr.* South and South East Asia. Common in deciduous forests; *PS 30450* Vengoli

**Dioscorea oppositifolia** L., Sp. Pl. 1033. 1753, var. **oppositifolia**; FBI 6: 292. 1892; FPM 1512. 1928; FPL 508. 1990; FTSR 469. 1996. *D. oppositifolia* L. var. *linnaei* Prain & Burkill, Asiat. Soc. Bengal 10: 30. 1914.

Stem turning to right, glabrescent. Leaves opposite or sub-opposite, to 13 x 4 cm, ovate or rounded, abruptly acuminate, base rounded. Spike pubescent, to 10 cm, male tepals ovate, obtuse, pubescent, female tepals orbicular, pubescent. Capsule 2 x 3 cm, glabrous.

*Fl. & Fr.* September-February

*Distr.* Indo-Malesia. Common in deciduous forests; *PS 19839* Vengoli; *30491* Kuchimudi

**Dioscorea oppositifolia** L. var. **dukumensis** Prain & Burkill, J. & Proc. Asiat. Soc. Bengal 10: 30. 1914; FPM 1512. 1928; FBI 6: 292. 1892.

Stem terete, twining to right, glabrous. Leaves 8-15 x 2-5 cm, opposite, elliptic, ovate or oblong, rounded or acute at base, 3-5 nerved; margins coriaceous; petiole to 3 cm long. Spike 2-6 cm long, slender, 3-6 together along the peduncle; peduncle 15-20 cm long; bracts lanceolate. Male tepals ovate, obtuse; stamens 6. Female Flowers distant; tepals 1mm long, orbicular, glabrous. Capsule 20 x 30 mm, glabrous.

*Fl. & Fr.* September-March

*Distr.* Indo-Malesia. Rare in moist deciduous forests; *PS 30826* Vengoli

**Dioscorea pentaphylla** L., Sp. Pl. 132. 1753; FBI 6: 281. 1892; FPM 1511. 1928; FPL 508. 1990; FTSR 469. 1996. *D. pentaphylla* L. var. *linnaei* Prain & Burkill, J. Asiat. Soc. Bengal 10: 23. 1914; FPM 1511. 1928.

Stem twining to the left, terete, glabrous. Leaves 5-foliolate, alternate, middle leaflets larger, to 10 x 4 cm, elliptic, acute at both ends, rusty tomentose or glabrous; petiole 6-7 cm long. Spike 10-30 cm long; bracts minute. Female tepals 2 x 1.5 mm, acute, tomentose. Male spike slender,

panicked; flowers closely packed; tepals 1 mm long, oblong; stamens 3. Capsule 25 x 13 mm, oblique at base, truncate at apex.

*Fl. & Fr.* January

*Distr.* Indo-Malesia and China. Occasional in deciduous forests; *PS 30460* Vengoli; *30492* Kuchimudi

**Dioscorea tomentosa** Koen. ex Spreng., Pl. Min. Cogn. Pug. 2: 92. 1815; FBI 6: 289. 1892; FPM 1511. 1928; FPL 509. 1990; FTSR 469. 1996.

Stem twining to the left, terete, tomentose. Leaves 3-foliolate, leaflets subequal, to 13 x 10 cm, broadly ovate, oblique at base, abruptly acuminate; petiole 15-18 cm long. Spikes to 30 cm long, densely tomentose, distantly flowered fascicles at nodes on long peduncle. Female flowers sessile; bracts 4 mm long, ovate; tepals 2 x 1 mm, oblong, acute, hairy. Capsule 25 x 15 mm, oblong, tomentose.

*Fl. & Fr.* October-May

*Distr.* India and Sri Lanka. Rare in the deciduous forests; *PS 19755* Pooppara

**Dioscorea wallichii** Hook.f., FBI 6: 295. 1892; FPM 1512. 1928; FPL 509. 1990; FTSR 469. 1996. *D. aculeata* L., Sp. Pl. 1033. 1753 p. p.; FBI 6: 296. 1892.

Stem twining to the right, smooth or scarcely prickly towards the base. Leaves to 12 x 12 cm, orbicular, bluntly acuminate, widely cordate at base; nerves 12 pairs from the base, glabrous, intercostae parallel; petiole to 14 cm long. Spikes 7-10 cm long, 3-6 together at nodes on 30-40 cm long peduncle; bracts and bracteoles ovate, acuminate. Male tepals 1 x 1 mm, ovate, acute; stamens 6.

*Fl.* November-January

*Distr.* India, Myanmar and Thailand. Common in deciduous and semi-evergreen forests; *PS 30733* Vengoli

## SMILACACEAE

### SMILAX Linnaeus

1. Peduncles to 10 cm long; berry globose ..... **S. wightii**  
1. Peduncles to 4 cm long; berry ovoid..... **S. zeylanica**

**Smilax wightii** A. DC., Monogr. Phan. 1: 174. 1878; FBI 6: 310. 1892; FPM 1519. 1928.

Branchlets terete, armed with prickles. Leaves to 15 x 13 cm, broadly ovate, obtuse, cuspidate, cordate at base, 5-ribbed; petiole 1-3 cm long, sheath narrow, flagellate. Peduncle to 10 cm long; umbels alternate, 2 or 3. Flowers many; pedicels 1.5 cm long, 2 cm in fruit. Berry 7 x 7 mm, globose.

*Fl. & Fr.* November-May

*Distr.* Endemic to Southern Western Ghats. Rare in deciduous forests; *PS 30209* Vengoli; *30247* Pezha

**Smilax zeylanica** L., Sp. Pl. 1029. 1753; FBI 6: 309. 1892; FPM 1518. 1928; FPL 511. 1990; FTSR 471. 1996. *S. macrophylla* Roxb., Fl. Ind. 3: 793. 1832; FBI 6: 310. 1892. *S. ovalifolia* Roxb., Fl. Ind. 3: 794. 1832.

Branchlets angular. Leaves 10-20 x 3-15 cm, ovate, oblong, orbicular, elliptic or lanceolate, acuminate, acute or obtuse. Umbels solitary or 2-3; peduncle 1-4 cm long; pedicels many, 0.7 cm long. Drupes 8 x 6 mm, ovoid, acute, glabrous.

*Fl. & Fr.* March-July

*Distr.* Indo-Malesia. Common in deciduous forests; *PS 18844* Kuriarkutty

## AGAVACEAE

1. Leaves basal, thick fleshy, base terete or subterete ..... **Sansevieria**
1. Leaves cauline, coriaceous, flat ..... **Dracaena**

### DRACAENA Vandelli ex Linnaeus

**Dracaena terniflora** Roxb., Fl. Ind. 2: 159. 1832; FPL 506. 1990; FTSR 466. 1996. *D. terminalis* Wight, Ic. t. 2054. 1853.

Stout perennial subshrubs; stem covered with annular leaf scars. Leaves spiral, closely packed, to 24 x 5.5 cm, elliptic-lanceolate, acuminate; petiole 5 cm long. Racemes terminal, 15-25 cm long, erect. Flowers many, closely packed; perianth lobes 6, biseriate, similar, united into a tube below, 2 cm long; stamens 6, free, epitepalous; anthers oblong. Fruit a berry. 1.5 cm across, 3-lobed.

*Fl. & Fr.* March-October

*Distr.* India and South East Asia. Common in evergreen and semi-evergreen forests; *PS 18843* Kuriarkutty; *18919* Karimala

### SANSEVIERIA Thunberg

**Sansevieria roxburghiana** Schult. & Schult. f., Syst. 7: 357. Fl. 12D & E. 1829; FBI 6: 271. 1892. *S. zeylanica* Roxb., Pl. Corom. t. Syst. Veg. 7: 357. f. 12 D & E. 1829.

Perennial herbs. Leaves basal, 30-60 x 1-1.5 cm, sessile, subterete at base, apex flat, fleshy, base sheathing, sessile. Racemes to 40 cm long; bracts 6 x 3 mm, lanceolate; flowers 3-5 in a cluster; perianth tube to 1 cm, lobes 6, 1 x 0.5 mm, greenish, tinged purple, 1-nerved, base tapering; stamens attached near the middle of the perianth lobes. Berry 5 mm across, globose.

*Fl. & Fr.* December-February

*Distr.* Coromandel coast. Rare in the rocky areas of deciduous forests; *PS 19986* Pandaravarai

## HYPOXIDACEAE

1. Rhizome small; leaves linear, flat; fruit dehiscent ..... **Hypoxis**
1. Rhizome elongate; leaves elliptic-lanceolate; fruit indehiscent ..... 2
2. Flowers to 3; stamen perigynous ..... **Curculigo**
2. Flowers more than 5; stamens epigynous ..... **Molinieria**

### CURCULIGO Gaertner

**Curculigo orchiooides** Gaertn., Fruct. 1: 63. t. 16. f.11. 1788; FBI 6: 279. 1892; FPM 1502. 1928; FPL 505. 1990; FTSR 467. 1996. *C. malabarica* Wight, Ic. t. 2043A.1853. *C. brevifolia* Dryander in Ait., Hort. Kew (ed. 2) 253. 1811.

Rhizome oblong, to 15 cm long. Leaves subsessile, lanceolate, plicate, base sheathing, to 15 x 1.5 cm, pilose. Perianth yellow, 1.5 cm across; tube 3 cm long, narrow, sparsely pilose. Ovary villous.

*Fl. & Fr.* June-December

*Distr.* Indo-Malesia. Common in all forest types; *PS 18903* Anakkalvayal

### HYPOXIS Linnaeus

**Hypoxis aurea** Lour., Fl. Cochinch. 200. 1790; FBI 6: 277. 1892; FPM 1501. 1928; FTSR 468. 1996.

Rhizome globose, 1 cm long, roots fleshy. Leaves linear, to 15 x 0.5 cm. Scapes 2 or 3, slender, to 10 cm long; flowers 1 or 2. Perianth yellow, 1 cm long, pilose, lobes elliptic-lanceolate. Capsule cylindrical-turbinate, 1 cm long.

*Fl. & Fr.* May-August

*Distr.* Indo-Malesia. Occasional in grasslands; *PS 30510* Karimala



## MOLINERIA Colla

**Molineria trichocarpa** (Wight) Balakr., JBNHS 63: 330. 1966; FPL 505. 1990. *Hypoxis trichocarpa* Wight, Ic. t. 2045. 1853. *H. latifolia* Wight, Ic. t. 2044. 1853. *H. leptostachya* Wight, Ic. t. 2045. 1853. *H. pauciflora* Wight, Ic. t. 2046. 1853. *Molineria finlaysoniana* Baker, J. Linn. Soc. Bot. 17: 121. 1878; FPM 1502. 1928. *Curculigo finlaysoniana* (Baker) Wall. ex. Hook.f., FBI 6: 279. 1892. *C. trichocarpa* (Wight) Bennet & Raizada, Indian J. For. 4: 61. 1981; FTSR 467. 1996.

Rhizome narrowly oblong, to 10 cm long. Leaves elliptic-lanceolate, acuminate, base attenuate, plicate, glabrous, to 30 x 5 cm; petiole to 30 cm. Racemes to 8 cm long; bracts linear, 1 cm long. Bisexual flowers towards base of racemes; male towards the apex. Perianth yellow, pubescent, 1 cm across, lobes oblong-obtuse. Ovary pilose. Fruit narrowly oblong.

*Fl. & Fr.* August-April

*Distr.* Peninsular India and Sri Lanka. Occasional in evergreen forests; *PS 19455, NS 30312* Pooppara

## AMARYLLIDACEAE

1. Flowers sessile; staminal filaments free ..... **Crinum**

1. Flowers pedicelled; staminal filaments basally united ..... **Pancratium**

## CRINUM Linnaeus

**Crinum latifolium** L., Sp. Pl. 291. 1753; FBI 6: 283. 1892; FPM 1504. 1928; FPL 504. 1990.

Herbs; rootstock bulbous, *ca.* 6 cm across. Leaves many, densely clustered, 30-45 x 7-8 cm, flat or widely channelled, oblong, curved, acute or obtuse; sheath closed, membranous. Flowers sessile, 12-16 together, on stout peduncled umbel; peduncle 50-60 cm high, thick; spathe membranous; perianth tube 7 cm long, narrow, lobes 6, 8 x 2.5 cm, oblong, acute, pinkish white, spreading or deflexed; stamens 6, filaments long, attached at the throat of perianth tube; anthers 12 mm long, linear. Capsule oblong; seeds many.

*Fl. & Fr.* March-June

*Distr.* Indo-Malesia and Africa. Common in deciduous forests; *PS 30349* Vengoli

## PANCRATIUM Linnaeus

**Pancratium triflorum** Roxb., Fl. Ind. 2: 126. 1832; FBI 6: 285. 1892; FPM 1505. 1928; FPL 505. 1990; FTSR 466. 1996. *P. verecundum* Wight, Ic. t. 2023. 1853, non Ait. 1789; FBI 6: 286. 1892.

Herbs, rootstock a bulb formed by leaf sheaths, 4 cm across. Leaves clustered, to 30 x 2 cm, linear-oblong, flat, acute, glabrous; sheath membranous. Flowers umbellate, on 35 cm long scape, 3-7 together, covered by a membranous spathe; pedicels to 2 cm long; perianth funnel-shaped, tube 5 cm long, lobes 6, 2 cm long, linear-oblong; stamens 6, inserted at the mouth of perianth tube, filaments webbed by membranous white corona; anthers linear. Capsule subglobose; seeds many.

*Fl. & Fr.* January-May

*Distr.* India and Sri Lanka. Common in rocky areas of deciduous forests; *PS 30349* Vengoli; *NS 30176* Kottayali

## LILIACEAE

1. Cladodes present; leaves reduced to spines ..... **Protasparagus**

1. Cladodes absent; leaves normal ..... 2

2. Climbers; leaf tip tendrilled ..... **Gloriosa**

2. Scapigerous herbs; leaf tip not tendrilled ..... 3

3. Rootstock tuberous; perianth tube present ..... **Chlorophytum**

3. Rootstock bulbous; perianth tube absent..... **Scilla**

#### CHLOROPHYTUM Ker-Gawler

1. Racemes lax, paniculate ..... **C. nimmonii**  
1. Racemes dense, unbranched ..... 2  
2. Scape shorter than the leaves; filaments glabrous..... **C. malabaricum**  
2. Scape as long as or longer the leaver; filaments papillose..... **C. attenuatum**

**Chlorophytum attenuatum** (Wight) Baker, J. Linn. Soc. Bot. 15: 332. 1876; FBI 6: 335. 1892; FPM 1526. 1928; FPL 510. 1990. *Phalangium attenuatum* Wight, Ic. t. 2037. 1853.

Tuberous herbs. Leaves many, to 50 x 1 cm, linear-lanceolate, acuminate, glabrous, with a white patch along the midrib. Raceme terminal, to 30 cm long, slender, unbranched. Flowers many, densely packed; bracts ovate, acute, glabrous; perianth lobes white, to 8 x 3 mm, oblong, obtuse, spreading. Capsule to 7 x 7 mm, obovoid, obtusely 3-winged, glabrous; seeds many, orbicular, flat, black.

*Fl. & Fr.* October-January

*Distr.* Endemic to Western Ghats. Occasional in grasslands; *PS 30741* Karimala

**Chlorophytum malabaricum** Baker, J. Linn. Soc. Bot. 15: 331. 1876; FBI 6: 335. 1892; FPM 1526. 1928.

Tuberous herbs. Leaves to 20 x 1.5 cm, linear, obtuse, subacute. Scape terminal to 3, racemes simple or paniculate, to 15 cm; flowers lax, paired, often solitary; bracts 8 mm, lanceolate; bracteole 3 mm, linear, 4.5 x 0.5 mm, pedicel, 6 mm joined; flowers *ca.* 3 cm across, perianth lobes oblong, subequal, white; stamens 6, to 3 mm; ovary 6-lobed. Capsule 6 mm across, globose, 3-winged; seeds *ca.* 3 x 2 mm, ovoid.

*Fl. & Fr.* July-November

*Distr.* Endemic to Peninsular India. Rare in grasslands; *PS 19574* Karimalagopuram

**Note:** Present collection is the new record for the flora of Kerala.

**Chlorophytum nimmonii** (Graham) Dalz. in Hook.'s J. Bot. Kew Gard. Misc. 2: 142. 1850; FTSR 471. 1996. *Anthericum nimmonii* Graham, Cat. Pl. Bombay 220. 1839. *Chlorophytum orchidastrum* sensu Hook.f., FBI 6: 336. 1892p.p., non Lindl. 1824; FPM 1526. 1928.

Roots tuberous. Leaves to 35 x 5 cm, lanceolate, about 25-nerved, glabrous. Scape to 60 cm long; bracts ovate-lanceolate, 8 mm long; flowers often paired; pedicels 1 cm long. Flowers white, 1.5 cm across. Perianth lobes oblong, obtuse, 8 mm long. Capsule 2-lobed, 3rd lobe aborted.

*Fl. & Fr.* August-November

*Distr.* Peninsular India and Tropical Africa. Common in moist deciduous forests; *PS 19558* Padippara

#### GLORIOSA Linnaeus

**Gloriosa superba** L., Sp. Pl. 305. 1753; FBI 6: 358. 1892; FPM 1519. 1928; FPL 510. 1990; FTSR 471. 1996.

Climbing herbs, tuber horizontal. Leaves scattered, to 20 x 4 cm, lanceolate, acuminate into a tendril. Flowers axillary, solitary; pedicels 15 cm long, reflexed at tip; tepals 6, similar, 7 cm long, oblong, petaloid, variegated with uneven margins, yellow at lower half, red above. Capsule septicidal, many-seeded.

*Fl. & Fr.* July-September

*Distr.* Paleotropics. Fairly common in deciduous forests and degraded forest areas; *PS 19140* Kariamchola

#### SCILLA Linnaeus

**Scilla hyacinthina** (Roth) Macbr., Contr. Gray Herb. 56: 14. 1918; FPL 511. 1990. *Ledebouria hyacinthina* Roth, Nov. Pl. Sp. 195. 1821. *Barnardia indica* Wight, Ic. t. 2041. 1853. *Scilla indica* (Wight) Baker, Sunders Refug. Bot. 3: 12. 1870, non Roxb. 1832; FBI 6: 348. 1892; FPM 1527. 1928.

Perennial bulbous herbs. Leaves to 15 x 3 cm, radical. Scapes to 3, racemes to 20 cm, flexuous; peduncle, pink; flowers 8 mm across, perianth deeply six lobed, lobes to 4 x 1 mm, oblong, obtuse, pink; pedicel pink, to 1.5 cm; stamens 6, adnate to the base of the perianth; ovary 3-lobed ca 1.5 mm; style to 3 mm. Capsule to 7 x 4 mm, globose, loculicidal.

*Fl. & Fr.* January-July

*Distr.* India, Sri Lanka and Abyssinia. Common in rocky areas of deciduous forests; *PS 18949* Vengoli

#### PROTASPARAGUS Obermeyer

**Protasparagus racemosus** (Willd.) Oberm., S. Afr. J. Bot. 2: 244. 1983. *Asparagus racemosus* Willd., Sp. Pl. 2: 152. 1799; FBI 6: 316. 1892; FPM 1517. 1928; FTSR 470. 1996.

Perennial climbers, root tuberous, cladodes 3-angled, compressed, curved, 2-7 together; branches angled. Racemes 2-4 cm long; bracts minute, ovate; pedicel 4 mm long; tepals obovate, white. Berry 7 mm across, globose, smooth.

*Fl. & Fr.* February-August

*Distr.* Paleotropics. Common in deciduous forests; *PS 19090* Amakkundu

### PONTEDERIACEAE

#### MONOCHORIA K. B. Presl

**Monochoria vaginalis** (Burm. f.) Presl, Reliq. Haenk. 1: 128. 1827; FPM 1529. 1931; FPL 512. 1990. *Pontederia vaginalis* Burm. f., Fl. Ind. 80. 1768. *P. plantaginea* Roxb., Fl. Ind. 2: 123. 1832.

Marshy herbs; stem erect. Leaves few to several, lamina to 6 x 4 cm, ovate, acute at apex, cordate to hastate at base; petiole to 30 cm long. Flowers in racemes from upper nodes of emergent stem; bracts lanceolate; perianth lobes free, similar, petaloid, blue, to 15 mm long; stamens 6, one larger than others; ovary ellipsoid; style 1, filiform. Capsule 8 x 6 mm, oblong; seeds many, ribbed.

*Fl. & Fr.* Throughout the year

*Distr.* India to China, Malesia and Japan. Occasional in wet rocky areas; *PS 19625* Vengoli

### COMMELINACEAE

- |   |                     |
|---|---------------------|
| 1. Epiphytic herbs; branchlets prostrate.....                 | <b>Belosynapsis</b> |
| 1. Terrestrial herbs; branchlets erect.....                   | 2                   |
| 2. Flowers enclosed in spathes or bracteoles.....             | 3                   |
| 2. Flowers not enclosed in spathes or bracteoles.....         | 4                   |
| 3. Bracteoles in closely inbricating pairs; stamens 6.....    | <b>Cyanotis</b>     |
| 3. Bracteoles absent; stamens 3.....                          | <b>Commelina</b>    |
| 4. Inflorescence dense; fertile stamens 6.....                | <b>Floscopa</b>     |
| 4. Inflorescence lax; fertile stamens 3.....                  | 5                   |
| 5. Flowers secund; fruit indehiscent.....                     | <b>Pollia</b>       |
| 5. Flowers not secund; fruit dehiscent.....                   | 6                   |
| 6. Panicle long peduncled, to 20 cm; flowers regular.....     | <b>Aneilema</b>     |
| 6. Panicle shortly peduncled, to 5 cm; flowers irregular..... | <b>Murdannia</b>    |

## ANEILEMA R. Brown

1. Inflorescence glabrous; staminodes absent..... **A. montana**
1. Inflorescence glandular hairy; staminodes 2..... **A. scaberrimum**

**Aneilema montana** (Wight) Clarke in DC., Monogr. Phan. 3: 217. 1881; FBI 6: 382. 1892; FPM 1546. 1931; FPL 513. 1990; FTSR 472. 1996. *Dictyospermum montanum* Wight, Ic. t. 2069. 1853.

Erect or subscaudent herbs. Stem 30-70 cm long, glabrous. Leaves to 18 x 4 cm, clustered towards the apex, elliptic-lanceolate, scabrid above; sheath to 2.5 cm long, pubescent on one side; mouth truncate. Panicle very lax, to 30 cm long; branches pubescent. Flowers 6 mm across, solitary, pedicelled; sepals oblong, obtuse, glabrous; petals white, 5 x 3 mm, obovate, obtuse; filaments glabrous. Capsule 3-4 mm long, globose; seeds planoconvex, rugose, brown.

*Fl. & Fr.* August-November

*Distr.* Endemic to Peninsular India. Common in moist localities in deciduous forests; *PS 19573* Kariamchola; *30514* Parambikulam; *19417* Pooppara

**Aneilema scaberrimum** (Blume) Kunth, Enum. 4: 69. 1843; FBI 6: 382. 1892; FPM 1546. 1931; FPL 514. 1990; FTSR 473. 1996. *Commelina scaberrima* Blume, Enum. Pl. Jav. 1: 4. 1827. *Dictyospermum protensum* Wight, Ic. t. 2071. 1853. *Rhophalephora scaberrima* (Blume) Faden, Phytologia 37: 480. 1977.

Procumbent herbs, rooting at lower nodes. Leaves distantly placed, to 20 x 5 cm, oblong-lanceolate, acuminate, base rounded and then cuneate, puberulus above; sheath closed, to 3 cm, puberulus, mouth with long hairs. Cymes paniced, terminal; bracts 2-5 mm, persistent, funnel shaped; flowers white, 3-merous. Capsule 3 mm across, globose, pubescent; seed one.

*Fl. & Fr.* August-October

*Distr.* Indo-Malesia. Common in moist localities of deciduous forests; *PS 19563* Kariamchola

## BELOSYNOPSIS Hasskarl

**Belosynopsis vivipara** (Dalz.) Fischer, Kew Bull. 1928:252.1928 & FPM 1551. 1931; FPL 515. 1990. *Cyanotis vivipara* Dalz. in Hook.'s J. Bot. Kew Gard. Misc. 3: 226. 1851; FBI 6: 388. 1892.

Epiphytic herbs with creeping branches; 5-15 cm high; stem hirtus. leaves basal and cauline, basal, to 10 x 1.5 cm, oblong-lanceolate, densely villous below, glabrous above; sheath tubular, hairy. Cymes sessile, few, along the creeping branches; bracteoles absent. Flowers few together; sepals free, 1.5 x 1.5 mm, elliptic, acute, hairy; petals 3 x 1.5 mm, obovate, acute, pink; filaments bearded. Capsule 6-seeded.

*Fl. & Fr.* August-December

*Distr.* Endemic to Western Ghats. Common in evergreen forests; *PS 19773* Pooppara

## COMMELINA Linnaeus

1. Spathe ovate-lanceolate, base cordate-sagittate..... 2
1. Spathe funnel shaped or cucullate..... 5
2. Spathes sagittate, auriculate at base ..... **C. attenuata**
2. Spathes not sagittate, not auriculate at base ..... 3
3. Capsule 2-celled; spathes truncate at base ..... **C. imberbis**
3. Capsule 3-celled; spathes cordate at base ..... 4
4. Leaves lanceolate; posticous cells of the capsule keeled ..... **C. diffusa**
4. Leaves linear to oblong; posticous cells of the capsule not keeled..... **C. wightii**
5. Spathes cucullate; mouth sparsely hairy or glabrous ..... **C. erecta**
5. Spathes funnel shaped; mouth rufous or glandular hairy..... 6
6. Leaves ovate or oblong, base narrowed into petiole; ovary 2-locular ..... **C. benghalensis**
6. Leaves lanceolate or elliptic-lanceolate, base not narrowed into a petiole; ovary 3-locular ..... **C. paludosa**

**Commelina attenuata** Koenig ex Vahl, Enum. Pl. 2: 168. 1806; FBI 6: 372. 1892; FPM 1539. 1931; FTSR 473. 1996.

Slender scandent or procumbent herbs. Leaves linear-lanceolate, acute, base not narrowed, glabrous, to 7 x 1.5 cm. Spathe ovate-lanceolate, acuminate, base sagittate-auriculate, to 3.5 x 2.5 cm; peduncle to 5 cm long. Sepals ovate-obtuse, concave, 5 mm long. Petals pale blue. Stamens 3; staminodes 3, all naked. Ovary tomentose, 2-celled; ovules 2 in each cell.

*Fl. & Fr.* August-November

*Distr.* India and Sri Lanka. Occasional in grasslands; *NS 5735* Karimala Hills

**Commelina benghalensis** L., Sp. Pl. 41. 1753; FBI 6: 370. 1892; FPM 1539. 1931; FPL 516. 1990; FTSR 473. 1996.

Procumbent herbs, pubescent. Leaves to 5 x 2.5 cm, ovate, acute or obtuse, rounded at base; sheath 1 cm long, mouth with red bristles. Spathe 1 x 1.5 cm, hairy. Flowers 10-12 mm across; sepals 3 mm long, obovate, red-glandular; petals 5 mm long, blue; stamens 3, filaments glabrous; staminodes 2; ovary with two-ovuled 2 cells and one-ovuled 1 cell. Capsule 3-celled, seeds 4 or 5, oblong, smooth, brown.

*Fl. & Fr.* October-January

*Distr.* Africa, India, China, Japan and Malesia. Common in moist deciduous forests and vayals; *PS 19055* Thunakkadavu

**Commelina diffusa** Burm. f., Fl. Ind. 18. 1768; FPL 516. 1990; FTSR 474. 1996. *C. nudiflora* sensu Hook.f., FBI 6: 369. 1892, non L. 1753; FPM 1538. 1931.

Diffuse or procumbent herbs; stem reddish, glabrous. Leaves 6-9 x 0.8-1.2 cm, lanceolate, acute, rounded at base; margin scabrid; sheath tubular, 2 cm long, mouth ciliate. Peduncle terminal, 4 cm long; spathe 2.5 x 1.4 cm, ovate, cordate at base, margin ciliate; cymes puberulus. Flowers 3-together; sepals 5.5 x 2.5 mm, red-glandular; petals 4 x 3 mm, blue with red glands; stamens 3, one anther longer, filaments glabrous; ovary oblong, pubescent, 3-celled. Seeds reticulate.

*Fl. & Fr.* July-November

*Distr.* Pantropical. Common in deciduous forests; *PS 30739* Vengoli

**Commelina erecta** L., Sp. Pl. 41. 1753; FPL 516. 1990; FTSR 474. 1996. *C. undulata* R. Br., Prodr. 270. 1810; FBI 6: 373. 1892. *C. kurzii* Clarke, J. Linn. Soc. Bot. 11. 1869; FBI 6: 373. 1892; FPM 1540. 1931.

Decumbent herbs; stem 20-40 cm high, pubescent on one side. Leaves 8-12 x 2.5 cm, narrowly elliptic-lanceolate, acute at base, scabrid. Spathe 1 x 2 cm, acute on one side, shortly peduncled. Cymes few in a spathe, 2-4-flowered. Flowers 13 cm across; sepals 5 x 3 mm, obovate, acute; petals clawed, blue; stamens 3, one anther shorter than others; ovary 3-celled, 3-ovuled, glabrous. Capsule 3-celled, glabrous; seeds 4 x 3 mm, oblong, powdery.

*Fl. & Fr.* September-December

*Distr.* India, Africa and Australia. Common in deciduous forests; *PS 19559* Padippara

**Commelina imberbis** Ehrenb. ex Hassk. in Schweinf., Beitr. Fl. Aethiop. 206. 1867. *C. persicariaefolia* Wight ex Clarke in DC., Monogr. Phan. 3: 171. 1881; FBI 6: 372. 1892; FPM 1539. 1931. *C. jacobii* Fischer, Kew Bull. 1928: 277. 1928 & FPM 1539. 1931. *C. alisagarensis* Kumar *et* Deodikar, Proc. Indian Acad. Sci. (Pl. Sci.) 13: 168. 1941.

Decumbent herbs, glabrous. Leaves 10-13 x 3 cm, ovate-lanceolate, acuminate, rounded at base, pubescent, shortly petiolate; sheath 3.5 cm long, hirtus, margin ciliate. Spathe 3.5 x 2.5 cm, broadly ovate, cordate at base, hairy; cymes solitary or paired, red-glandular. Flowers 15-16 mm across, 2-5 together; sepals lanceolate, acute; petals clawed, bluish red; stamens 3, one anther larger and coiled; staminodes 3, 4-lobed; ovary tomentose; one cell empty, others 2-ovuled.

*Fl. & Fr.* August-October

*Distr.* Africa, India and Sri Lanka. Fairly common in moist localities of evergreen forests; *PS* 19056 Thunakkadavu

***Commelina paludosa*** Blume, Enum. 1: 2. 1827; FPL 517. 1990. *C. obliqua* Ham. ex D. Don, Prodr. Fl. Nepal 45. 1825, non Vahl, 1805; FBI 6: 372. 1892; FPM 1539. 1931. *C. polyspatha* Wight, Ic. Pl. Ind. Or. t. 2066. 1853.

Diffuse herbs. Leaves to 13 x 4 cm, lanceolate, acute or acuminate, narrowed at base, scabrous or softly villous; sheaths to 2 cm, mouth rufous haired; spathes to 2 x 1.5 cm, infundibular, base cordate, solitary in terminal heads. Flowers to 1 cm across, blue, sepals unequal, ovary 3-celled, 3-ovuled. Capsule 4 mm, trigonous, 3-seeded.

*Fl. & Fr.* November-December

*Distr.* Himalayas and India. Fairly common in moist localities of moist deciduous forests; *PS* 19770 Pooppara

***Commelina wightii*** Rao, Bull. Bot. Surv. India 3: 168. 1961 (1962); FPL 517. 1990. *C. glabra* (Wight) Clarke in A. & C. DC., Monogr. Phan 3: 179. 1881; FBI 6: 371. 1892; FPM 1539. 1931. *Heterocarpus glaber* Wight, Ic. t. 2067. 1853.

Procumbent herbs, glabrous. Leaves 3-5 x 1-1.5 cm, linear-lanceolate or linear-oblong, acute, base obtuse, margin ciliate; sheath to 5 cm, ciliate, peduncle slender to 2-4 cm, scabrous, pubescent; spathe 1-2 x 5-1 cm, ovate-lanceolate, acuminate, base deeply cordate. Flowers yellow, 3 mm across, sepals 3-4 x 3 mm, ovate, obtuse, petals to 10 x 5 mm; stamens 3; ovary globose, 2-ovuled. Capsule globose.

*Fl. & Fr.* July-August

*Distr.* Endemic to Southern Western Ghats. Common in vayals and wet rocky areas; *PS* 19811 Anakkalvayal

#### CYANOTIS D. Don

1. Inflorescence covered by leafsheaths ..... **C. axillaris**
1. Inflorescence not covered by leafsheaths ..... 2
2. Leaves chartaceous; branchlets cottony ..... 3
2. Leaves membranous; branchlets villous or glabrous ..... 4
3. Leafbase obtuse; plants purplish ..... **C. arachnoidea**
3. Leafbase cordate; plants not purplish ..... **C. fasciculata**
4. Bracteoles prominently nerved; capsule with a free central column ..... 5
4. Branchlets not prominently nerved; capsule without a free central column ..... 6
5. Basal bracts broader than long ..... **C. papilionacea**
5. Basal bracts longer than broad ..... **C. burmanniana**
6. Cymes solitary, recurved; leaf sheath to 5 mm ..... **C. cristata**
6. Cymes clustered, strait or obscurely recurved; leaf sheath more than 1 cm ..... 7
7. Leaves silky villous below; seeds rugose ..... **C. villosa**
7. Leaves appressed pilose below; seed pitted ..... **C. pilosa**

***Cyanotis arachnoidea*** Clarke in DC., Monogr. Phan. 3: 250. 1881; FBI 6: 386. 1892; FPM 1550. 1931; FPL 518. 1990; FTSR 475. 1996. *C. pilosa* Wight, Ic. t. 2083. 1853, non Roem. & Schult.

Stem suberect, densely covered with white-cottony hairs. Leaves to 20 x 1.5 cm, upper leaves much smaller, ovate to linear-lanceolate. Cymes terminal; peduncle 4 cm long; bracts 1.7 x 1 cm, ovate, acute, hairy; bracteoles curved, falcate, 10-25 pairs, 6 x 1.5 mm, densely cottony hairy. Sepals 6 x 1.5 mm, united at the base; corolla tube 7 mm long; lobes triangular, acute;

filaments bearded; ovary densely hairy at apex; style bearded. Capsule 2.5 mm long, oblong, hairy; seeds transversally rugose, black.

*Fl. & Fr.* July-December

*Distr.* Peninsular India and Sri Lanka. Occasional in grasslands; *NS 5740* Karimala Hills

**Cyanotis axillaris** (L.) D. Don, Prodr. Fl. Nepal 46. 1825; FBI 6: 388. 1892; FPM 1550. 1931. *Commelina axillaris* L., Sp. Pl. 42. 1753. *Tonningia axillaris* (L.) O. Ktze., Rev. Gen. Pl. 2: 721. 1891. *Amischophacelus axillaris* (L.) Rao & Kammathy, J. Linn. Soc. Bot. 59. 306. 1966.

Stem procumbent, terete, succulent. Leaves 5-6 x 0.6 cm, lanceolate, acute to acuminate, glabrous; sheath closed, saccate, glabrous. Flowers axillary, solitary or 2-3 together, sessile, 6-8 mm across; sepals oblanceolate, base united, acute, keel winged and ciliate; petals united; lobes triangular, acute, bluish violet; stamens 6, filaments free, bearded at the tip; ovary oblong, densely hairy towards the apex. Capsule 3-celled; seeds 3 in each cells, oblong with scar at one end, pitted, dark brown.

*Fl. & Fr.* November-February

*Distr.* Indo-Malesia. Common in moist deciduous forests; *PS 19250* Thellikkal

**Cyanotis burmanniana** Wight, Ic. t. 2089. f. 2. 1853. *C. papilionacea* Schult. f. var. *burmanniana* Clarke in DC., Monogr. Phan. 3: 246. 1881; FBI 6: 385. 1892.

Stem procumbent, sparsely hairy. Leaves 2-4 x 1.5 cm, lanceolate, acute, sparsely hairy on both sides; sheath to 1 cm. Cymes peduncled terminal and upper axillary; bracts 9 x 4 mm, broadly ovate, acuminate, bracteole to 8 x 3 mm, cuneate, ciliate, 4-8 pairs in cymes, sepals to 5 x 1.5 mm, lanceolate, united at base, hairy along margin, corolla tube 4 mm, lobes lanceolate, blue, filaments bearded. Capsule ovoid, seeds yellowish-brown.

*Fl. & Fr.* August-December

*Distr.* Endemic to Western Ghats. Common in wet rocky areas; *PS 30472* Vengoli

**Cyanotis cristata** (L.) D. Don, Prodr. Fl. Nepal 46. 1825; FBI 6: 385. 1892; FPM 1549. 1931; FPL 519. 1990; FTSR 475. 1996. *C. cristata* L., Sp. Pl. 42. 1753.

Stem erect or decumbent, glabrous or pubescent on one side. Leaves 2-5 x 1-2 cm, ovate, acute or obtuse, cauline, cordate at base, ciliate along the margins, often reddish; sheath closed. Cymes 15-30-flowered, curved; bracts ovate, acute; bracteoles falcate, glabrous or ciliate along the margins. Flowers sessile; sepals 4 mm long, oblanceolate; keel ciliate; corolla tubular, tube 11 mm long, lobes obtuse; filaments bearded. Capsule 3.5 mm long, glabrous with few apical hairs; seeds striate, with two pits on two faces, brownish black.

*Fl. & Fr.* June-December

*Distr.* Paleotropics. Common in the wet rocky areas; *PS 19859* Vengoli

**Cyanotis fasciculata** (Heyne ex Roth) Schultes f., Syst. Veg. 7: 1152. 1830; FBI 6: 387. 1892; FPM 1550. 1931; FPL 520. 1990. *Tradescantia fasciculata* Heyne ex Roth, Nov. Pl. Sp. 189. 1821. *Cyanotis rosea* Wight, Ic. t. 2086. 1853, in part. *C. decumbens* Wight, Ic. t. 2088. 1853, in part.

Stem procumbent, tufted, covered with cottony hairs. Leaves to 3 x 0.7 cm, lanceolate, falcate, folded, rounded at base, long-hairy; sheath 1.5 cm long, saccate. Cymes axillary, solitary; peduncles 2 cm long; bracts 2 x 0.5 cm, lanceolate, acuminate; bracteoles 2-4 pairs, falcate, acute. Flowers few, sessile; sepals 5 x 2 mm, united at the base, hairy; corolla tube 6 mm long, campanulate, lobes obtuse, blue; filaments bearded; style densely hairy. Capsule 2.5 mm long, pilose at apex.

*Fl. & Fr.* August-October

*Distr.* Peninsular India and Sri Lanka. Fairly common in the wet rocky areas and moist deciduous forests; *PS 30738* Vengoli

**Cyanotis papilionacea** (L.) Schultes f., Syst. Veg. 7: 1151. 1830; FBI 6: 384. 1892; FPM 1549. 1931; FTSR 475. 1996. *Tradescantia papilionacea* L., Mant. Pl. 2: 513. 1771.

Stem branched, rooting at lower nodes, branchlets pubescent. Leaves to 2 x 0.7 cm, oblong-lanceolate, apex acute, pubescent, mucronate; sheath to 5 mm, pubescent. Flowers axillary and terminal, blue; bracts 1.5 cm, ovate, lanceolate; bracteoles to 10 pairs, pubescent, ciliate, acute. Capsule 2 mm, pilose at the apex, oblong.

*Fl. & Fr.* September-November

*Distr.* Endemic to Peninsular India. Occasional in wet grasslands; *PS 19751* Pezha

**Cyanotis pilosa** Schult. & Schult. f., Syst. Veg. 7: 1155. 1830; FBI 6: 387. 1892; FPM 1549. 1931; FPL 520. 1990.

Stem decumbent. Leaves 5-8 x 1-2 cm, linear-lanceolate or elliptic, acuminate, base cuneate, glabrous above, tomentose below, sheath to 1 cm, pilose. Cymes terminal and axillary 3-5 in a cluster, peduncle 1.5-1 cm, pilose; bracts to 2 cm, lanceolate, bracteoles to 1 x 5 cm, lanceolate, ciliate along the margin. Flowers 1 cm across, calyx lobes pilose, petals purple, ovate-orbicular; filaments hairy, style 1 cm. Capsule to 3 mm, pyramidal.

*Fl. & Fr.* November-December

*Distr.* Peninsular India and Sri Lanka. Occasional in wet grasslands; *PS 19949* Karimala; *30048* Kanthalppara

**Cyanotis villosa** (Spreng.) Schultes f., Syst. Veg. 7: 1155. 1830; FBI 6: 387. 1892; FPM 1540. 1931; FPL 520. 1990. *Tradescantia villosa* Spreng., Syst. Veg. 2: 116. 1825.

Stem erect or procumbent, villous. Leaves 2-8 x 0.8-2 cm, ovate, sessile, cordate at base, villous above and below; sheath tubular, thickly villous. Cymes terminal and upper axillary, sessile; bracts 1.2 cm long, ovate-lanceolate, villous; bracteoles ovate, curved, ciliate along the margins. Flowers few; sepals 6-7 mm long, free, lanceolate, keel ciliate; corolla tube 6-7 mm long, lobes obtuse, blue with red glands; filaments bearded; style dilated below the stigma. Capsule 2-3 mm long, hairy at apex; seeds paired.

*Fl. & Fr.* September-January

*Distr.* Peninsular India and Sri Lanka. Occasional in moist deciduous forests; *PS 30736* Vengoli

#### FLOSCOPA Loureiro

**Floscopa scandens** Lour., Fl. Cochinch. 193. 1790; FBI 6: 390. 1892; FPM 1522. 1931; FPL 521. 1990; FTSR 475. 1996. *Dithyocarpus rothii* Wight, Ic. t. 208. 1839.

Creeping or suberect marshy herbs; stem terete, pubescent along one line. Leaves scattered, 5-10 x 2-1.5 cm, elliptic-lanceolate, acuminate, acute at base, glabrous; sheath tubular, mouth oblique, hairy. Panicle 3-6 cm long; axis and branches pubescent. Flowers many, 3-5 mm across, regular, bisexual; sepals ovate, pubescent; petals obovate, glabrous, rose coloured; stamens 6, filaments free, glabrous; anthers small, obtuse, with broad connective; ovary 3-celled; ovule solitary in each cell. Capsule broadly ovoid; seeds elliptic, wrinkled, grey.

*Fl. & Fr.* October-January

*Distr.* Indo-Malesia. Common in marshy areas; *PS 19205* Rockpoint

#### MURDANNIA Royle

1. Inflorescence to 4-flowered, axillary ..... **M. pauciflora**
1. Inflorescence many flowered, terminal ..... 2
2. Staminal filaments naked ..... 3
2. Staminal filaments hairy ..... 4
3. Petals white; leaves elliptic-oblong, over 4 cm wide ..... **M. japonica**
3. Petals blue; leaves linear, to 3 mm wide ..... **M. semiteres**
4. Leafbase amplexicaule; leaves equidistant on stem ..... **M. spirata**
4. Leafbase not amplexicaule; leaves crowded toward the base ..... **M. simplex**



**Murdannia japonica** (Thunb.) Faden, Taxon 26: 142. 1977; FPL 522. 1990; FTSR 476. 1996. *Commelina japonica* Thunb., Trans. Linn. Soc. London 2: 332. 1794. *Aneilema lineolatum* Kunth, Enum. Pl. 4: 69. 1843; FBI 6: 370. 1892; FPM 1544. 1931. *A. latifolium* Wight, Ic. t. 2072. 1853.

Stout herbs; roots tuberous; stem rounded, smooth. Leaves to 23 x 6 cm basal and cauline, ovate, acute at apex, cordate at base, glabrous, coriaceous, sessile; cauline leaves smaller. Panicle to 20 x 10 cm, terminal, lax. Flowers 12 mm across, solitary or 2-3 together, pedicelled; sepals oblong-obtuse, red-glandular; petals white, obovate, obtuse; stamens 3, filaments bearded; staminodes 2-lobed, bearded. Capsule globose, beaked; seeds 2 x 1 mm, trigonous, with two round markings, tuberculate or reticulate, dark brown.

*Fl. & Fr.* July-January

*Distr.* Indo-Malesia. Common in rocky areas; *PS 19557* Padippara

**Murdannia pauciflora** (Wight) Brueck. in Engl. & Prantl, Pflanzenf. (ed. 2) 15a: 173. 1930; FPL 523. 1990. *Aneilema pauciflorum* Wight, Ic. t. 2077. 1853; FBI 6: 378. 1892; FPM 1545. 1931. *Murdannia wightii* Rao & Kammathy, Notes Roy. Bot. Gard. Edinb. 25: 184. 1965; FTSR 477. 1996.

Creeping herbs, rooting at nodes; stem 15-25 cm long, hairy along one side. Leaves 0.8-3 x 0.5-1 cm, ovate, acute, cordate to amplexicaule at base, ciliate along the margins. Cymes axillary, 1-4-flowered. Flowers blue; sepals 3 mm long, elliptic, keeled, glandular; petals 4 mm long, broadly elliptic, acute, blue; stamens 3, filaments naked, staminodes 3, yellow, 3-lobed. Capsule 4.5 x 2 mm, oblong, sharply beaked, glabrous. Seeds 3-6 in a cell, cylindrical, wrinkled, rugose, grey-black.

*Fl. & Fr.* September-November

*Distr.* Indo-Malesia. Fairly common wet localities of evergreen forests; *PS 19882* Velayudhankai; *NS 19212* Kariamchola

**Murdannia semiteres** (Dalz.) Sant., Poona Agri. Coll. Mag. 41. 284. 1951; FPL 523. 1990. *Aneilema semiteres* Dalz. in Hook.'s, J. Bot. Kew Gard. Misc. 3: 138. 1851. *A. paniculatum* Wall. ex Clarke in A. & C. DC., Monogr. Phan. 3: 215. 1881, non Wight 1853; FPM 1546. 1931. *Dichaespermum juncooides* Wight, Ic. t. 2073. 1853. *D. paniculatum* (Wall. ex Clarke) Hook. f. & Thoms. in Hook.f., FBI 6: 381. 1892, pro syn. *Murdannia juncooides* (Wight) Rao & Kammathy, Bull. Bot. Surv. India 6: 3. 1964; FTSR 477. 1996.

Erect tufted slender herbs. Leaves linear-lanceolate, acuminate, to 10 x 0.3 cm. Panicles terminal, branches slender; bracts ochreate, minute. Petals blue, oblong, 2 mm long. Staminal filaments naked. Ovary globose; ovules 2-seriate in each cell. Capsule 3-valved; seeds 6-8 in each cell, smooth.

*Fl. & Fr.* October-December

*Distr.* Endemic to Peninsular India. Common on wet rocky areas; *PS 19870* Vengoli

**Murdannia simplex** (Vahl) Brenan, Kew Bull. 7: 186. 1952; FTSR 477. 1996. *Commelina simplex* Vahl, Enum. Pl. 2: 177. 1806. *Aneilema sinicum* Ker-Gawl. in Edgew., Bot. Reg. t. 659. 1822; FBI 6: 379. 1892; FPM 1545. 1931. *A. secundum* Wight, Ic. t. 2075. 1853.

Suberect herbs; roots tuberous; stem 40-65 cm high, terete, glabrous. Leaves basal and cauline, 10-20 x 1-1.5 cm, linear-lanceolate, acute; cauline leaves smaller; sheath open, 2 cm long, ciliate. Cymes 8 cm long, terminal, paniced; peduncle 8 cm long. Flowers 5-20 in a cymes; pedicel 5-6 mm long; sepals 6 x 3 mm, elliptic, acute at apex; petals 8 x 5 mm, obovate, obtuse, narrow; staminodes 3, yellow, 3-lobed. Capsule 6.5 x 3 mm, ellipsoid, acute, beaked; seeds 3 x 2 mm, ellipsoid, rugose, brown.

*Fl. & Fr.* August-December

*Distr.* Paleotropics. Occasional in grasslands; *NS 5739* Karimala Hills; *PS 19589* Karimalagopuram

**Murdannia spirata** (L.) Brueck. in Engl. & Prantl, Pflanzenf. (ed. 2) 15a: 173. 1930; FPL 524. 1990; FTSR 477. 1996. *Commelina spirata* L., Mant. Pl. 2: 176. 1771. *Aneilema spiratum* (L.) R. Br., Prodr. 271. 1810; FBI 6: 377. 1892; FPM 1546. 1931.

Creeping herbs with erect branches; stem angled, pubescent along one side. Leaves to 2.5 x 1.2 cm, ovate, acute, cordate at base, glabrous. Panicle terminal and upper axillary, 5-20-flowered. Flowers 4-5 mm across; sepals obovate, obtuse, 5-nerved; petals obovate, obtuse, 3-nerved, blue; stamens 3, filaments hairy, connective produced into short beak; staminodes 3, with small anthers. Capsule obovoid, 3-celled; seeds 2 in each cell, rugose, dark brown, with circular scar on one face.

*Fl. & Fr.* October-December

*Distr.* Indo-Malesia. Common on wet rocky areas; *PS 1997I; NS 19634* Vengoli

#### POLLIA Thunberg

**Pollia sorzogonensis** Steud., Nom. ed. 2:368.1841; FBI 6:368.1892; FPM 1534.1931.

Stem 30-45 cm high stout. Leaves 30 x 10 cm, elliptic, acuminate, acute at base, glabrous. Panicle to 12 x 8 cm. long peduncled; branches hairy. Flowers pedicelled. Sepals obovate. Petals white, glabrous. Stamens 3, filaments naked; sterile anthers triangular. Ovary 3-celled, cells many ovuled. Fruits globose.

*Fl. & Fr.* September-January

*Distr.* India and Sri Lanka. Fairly common in open areas of evergreen forests; *PS 30498* Koorankuzhi

### ARECACEAE

- |   |                |
|---|----------------|
| 1. Climbing palms; fruits covered with scales.....  | <b>Calamus</b> |
| 1. Erect palms; fruits not covered with scales..... | 2              |
| 2. Leaves bipinnate .....                           | <b>Caryota</b> |
| 2. Leaves simple pinnate .....                      | 3              |
| 3. Leaflet base obliquely auriculate.....           | <b>Arenga</b>  |
| 3. Leaflet base not auriculate.....                 | <b>Phoenix</b> |

#### ARENKA Labillardiere

**Arenga wightii** Griff., Calcutta J. Nat. Hist. 5: 475. 1845; FBI 6: 422. 1892; FPM 1588. 1931; FPL 526. 1990; FTSR 478. 1996; PMK 15. 1999.

Monoecious palms; trunk to 6 m tall, covered with persistent leafsheaths, caudex 10-15 m across. Leaves pinnatisect, to 8 m long; leaflets to 100 x 5 cm, linear, auricled at base, glaucous below; petiole to 3 m long. Spadices to 1 m long, basipetal, male flowers and female flowers on separate spadices. Male flowers: tepals 6, biseriate, outer 3 mm long, orbicular; stamens many, free. Female flowers: tepals 6, biseriate, similar, accrescent; ovary 3-celled. Fruit globose.

*Fl. & Fr.* Throughout the year

*Distr.* Endemic to Western Ghats. Rare in rocky slopes of evergreen forests; *PS 30662, NS 30776* Thelliyalimattukkal

#### CALAMUS Linnaeus

- |  |                        |
|--|------------------------|
| 1. Leaflets grouped.....   | <b>C. thwaitesii</b>   |
| 1. Leaflets not grouped .....  | 2                      |
| 2. Leaflets over 5 cm wide.....  | <b>C. vattayila</b>    |
| 2. Leaflets under 3 cm wide.....   | 3                      |
| 3. Mouth of the sheath without large spines.....   | <b>C. gamblei</b>      |
| 3. Mouth of the sheath with large spines .....   | 4                      |
| 4. Base of the petiole with 1 or 2 pairs of spines, to 10 cm long; fruits stalked.....     | <b>C. pseudotenuis</b> |
| 4. Base of the petiole with more than 5 pairs of spines, to 18 cm long; fruit sessile..... | <b>C. hookerianus</b>  |

**Calamus gamblei** Becc. ex Becc. & Hook. f. in Hook.f., FBI 6: 493. 1893; FPM 1568. 1931; FTSR 479. 1996; PMK 24. 1999.

Clustering moderate sized cane; stem to 20 m or more long, with sheaths ca 2.5 cm diam. sheaths green, armed with spines, spines bulbous based, knee present. Leaves to 1.2 m long. Inflorescence flagellate, arising well above the mouth of the sheath. Partial inflorescence 5-6, to 90 cm long. Fruit 2 cm across, spherical or slightly tapers at base; scales deeply channelled, pale yellow, shining.

*Fl & Fr.* December-April

*Distr.* Endemic to Western Ghats. Rare in evergreen forests; *PS 30591* Kothala

**Calamus hookerianus** Becc., Ann. Roy. Bot. Gard. (Calcutta) 11: 83, 226. t. 70. 1908; FPM 1568. 1931; FTSR 479. 1996; PMK 25. 1999. *Calamus borneensis* Becc., Rec. Bot. Surv. Ind. 2: 205. 1926, non Miq. 1868.

Clustering moderate sized canes; stem to 10 m or more long, with sheaths to 4 cm diameter. Sheaths armed with spines; spines triangular; mouth of the sheath provided with long papery spines to 18 cm long. Leaves 2 m long; leaflets regular. Fruits *ca.* 1 x 0.8 cm, subglobose; scales yellowish-brown with a dark brown boarder. Endosperm not ruminant.

*Fl. & Fr.* February-April

*Distr.* Endemic to Western Ghats. Occasional in evergreen forests; *PS 18812* Parambikulam

**Calamus pseudotenuis** Becc. ex Becc. & Hook. f. in Hook., Hook. f., FBI 6: 445. 1892; FPM 1567. 1931; FPL 527. 1990; FTSR 480. 1996; PMK 30. 1999. *C. tenuis* Thw., Enum. Pl. Zeyl. 330. 1864.

Clustering moderate sized canes; stem to 7 m or more in length, with sheaths to 3.5 cm in diameter; sheath yellowish green, spines to 3.5 cm long, intermingled with thin smaller spines, brown-tomentose; mouth of the sheath with 3-4 longer spines, to 6 cm long; ocrea 10 cm long. Leaf to 1.6 m long; leaflets *ca.* 50 x 2.5 cm, regular, long-acuminate. Inflorescence 3 m long; partial inflorescence 70 cm long; rachillae 8 cm long. Fruit *ca.* 1.5 x 0.8 cm, subovoid.

*Fr.* December

*Distr.* South West India and Sri Lanka. Occasional in evergreen forests; *PS 18855* Kanthalppara; *19162* Karimala

**Calamus thwaitesii** Becc. & Hook.f., FBI 6: 441. 1892; FTSR 480. 1996; PMK 32. 1999. *C. thwaitesii* Becc. var. *canaranus* Becc., Ann. Roy. Bot. Gard. (Calcutta) 11: 138. 1908; FPM 1567. 1931.

Clustering and high climbing canes. Stem to 20 m or more in length, with sheath to 6 cm in diam; sheath armed with spines; spines arising from a raised rim-like surface, flat, black with yellow base; knee and ocrea absent; flagellum, petiole, rachis and sheath armed with stout spines in oblique whorls. Leaves 2 m long; leaflets grouped. Fruit *ca.* 2 x 1.3 cm, ovoid, scales in 12 vertical rows, with median grooves, yellow with brown margins. Endosperm not ruminant.

*Fr.* April

*Distr.* India and Sri Lanka. Very common in evergreen and semi-evergreen forests; *PS 18845*, *NS 30810* Kuriarkutty

**Calamus vattayila** Renuka, Curr. Sci. 56: 1012. 1987; FTSR 480. 1996; PMK 34. 1999.

Solitary or climbing canes; stem to 30 m long, with sheaths to 2.5 cm in diam; sheath dark green, sparingly spiny; knee conspicuous. Leaf to 1 m long, leaflets alternate, to 40 x 8 cm, elliptic, ciliate at apex, 6-veined; petiole to 25 cm long; spines erect, to 1 cm long; flagellum to 4 m long, with grouped recurved spines. Female inflorescence in heavy branches, to 1 m long. Fruit *ca.* 2.5 x 0.8 cm, oblong, scales in 25-30 rows, longer than broad, chest nut brown.

*Fr.* February

*Distr.* Endemic to South India. Rare in evergreen forests; *PS 19601*, *NS 30814* Kuriarkutty

## CARYOTA Linnaeus

**Caryota urens** L., Sp. Pl. 1189. 1753; Hook.f., FBI 6: 422. 1892; FPM 1560. 1931; FPL 529. 1990; FTSR 480. 1996; PMK 35. 1999.

Large palms; stem 30-60 cm thick, annular; caudex lax. Leaves to 6 x 4 m, spiral, bipinnate, leaflets to 40 x 20 cm, cuneate, straight on sides, dentate at oblique apex, sessile, alternate or paired. Spadix 3-4 m long, axillary, formed basipetally along the stem, branches many, narrow, pendent. Male flowers 1.5 cm long; sepals 3, 4 x 5 mm, orbicular; petals 3, 15 x 5 mm, oblong, calycine; stamens many, filaments united at base; Fruit globose, 1-2-seeded; seeds planoconvex; endosperm ruminant.

*Fl. & Fr.* Throughout the year

*Distr.* Indo-Malesia. Occasional in evergreen forests; *PS 30046* Kamamudi

## PHOENIX Linnaeus

**Phoenix loureirii** Kunth, Enum. Pl. Zeyl. 3: 257. 1841; FTSR 481. 1996; Barrow, Kew Bull. 53: 561. 1998. *P. humilis* var. *hanceana* Becc., Malesia 3: 379 & 392. 1890. *P. hanceana* var. *formosana* Becc., Philipp. J. Sci. 3: 339. 1908. *P. hanceana* var. *philippines* Becc., Philipp. J. Sci. 3: 339. 1908. *P. pusilla* Lour., Fl. Cochinch. 614. 1790, non Gaertn.

Dioecious coarse bushy shrubs, to 2 m tall, densely covered with leaf sheaths. Leaves in a dense caudex, to 1 m long, 60-70 cm broad, pinnately compound; lower leaflets transformed into sharp spines; upper ones 4-8 together, to 30 x 1 cm, linear-oblong, acuminate, folded. Spadix axillary, 20-30 cm across; branches spreading, to 18 cm long. Flowers sessile; perianth biseriate, outer smaller, connate, cupular; inner ovate, valvate; stamens 6, free; ovary of 3 free carpels, ovules solitary; stigma uncinat. Drupes 12 x 8 mm, obovoid, yellow.

*Fl. & Fr.* Throughout the year

*Distr.* India to Vietnam and China. Fairly common in grasslands; *PS 19389* Karimala

## PANDANACEAE

### PANDANUS S. Parkinson

**Pandanus thwaitesii** Mart., Bull. Soc. Bot. Ital. 369. 1904; FPM 1570. 1931; FTSR 481. 1996.

Dioecious shrubs with stilt roots. Leaves spiral close, 150 x 6 cm, 3-costate, linear-lanceolate, spiny along margins and costae, sessile, ash coloured below. Male spadix, terminal branched, each branch with a scape. Male flowers densely packed; perianth absent; stamens many. Female spadix branched; spathe oblong, to 20 cm long. Flowers closely arranged; perianth absent; ovary 1-celled; ovule solitary. Fruit an aggregate of drupe, to 6 x 5 cm; drupes obovoid, laterally connate with a hexagonal outer face.

*Fl. & Fr.* September-March

*Distr.* Endemic to South India. Fairly common in evergreen forests; *PS 30251* Pezha

## ARACEAE

- |   |                       |
|---|-----------------------|
| 1. Climbers with nodular adventitious roots.....                    | 2                     |
| 1. Erect rhizomatous herbs or shrubs.....                           | 3                     |
| 2. All leaves entire; perianth 6.....                               | <b>Pothos</b>         |
| 2. Leaves both dissented and entire; perianth absent.....           | <b>Rhaphidophora</b>  |
| 3. Leaves palmately or pinnately foliolate or dissected.....        | 4                     |
| 3. Leaves entire.....   | 6                     |
| 4. Spathe spirally twisted; rootstock creeping.....                 | <b>Anaphyllum</b>     |
| 4. Spathe not spirally twisted; rootstock not creeping.....         | 5                     |
| 5. Lamina pedatisect; plants leafy during flowering.....            | <b>Arisaema</b>       |
| 5. Lamina tripartly compound; plants leafless during flowering..... | <b>Amorphophallus</b> |

- 6. Epiphytes with bulbiferous shoots; leafless during flowering ..... **Remusatia**
- 6. Terrestrial or epiphytic without bulbiferous shoots; leafy during flowering ..... 7
- 7. Root stock creeping, not tuberous..... **Lagenandra**
- 7. Root stock tuberous, not creeping..... 8
- 8. Leaves ovate, to 25 cm long ..... 9
- 8. Leaves ovate-hastate or sub-orbicular, to 10 cm..... 10
- 9. Spathe limb linear, yellow; ovules parietal ..... **Colocasia**
- 9. Spathe limb ovate, green; ovules basal ..... **Alocasia**
- 10. Leaves triangular ovate; petiole with a bulbil at apex ..... **Typhonium**
- 10. Leaves orbicular petiole without a bulbil ..... **Ariopsis**

**ALOCASIA** (Schott) G. Don

**Alocasia fornicata** (Roxb.) Schott, Oesterr. Bot. Wochenbl. 4: 410. 1854; FBI 6: 526. 1893; FTSR 482. 1996. *Arum fornicatum* Roxb., Fl. Ind. 3: 501. 1832, non Wight, 1834.

Perennial herbs; stem erect, to 10 cm long, 2.5 cm thick. Leaves 2-5 together; blade to 42 x 26 cm, ovate, acute, shortly peltate, proximal lobes triangular, acute; nerves to 8 pairs, lowest pair bear the lateral nerves of basal lobes, intercostae regular, parallel; petiole to 45 cm long, canaliculate, slender, base sheathing. Peduncle 2-4 together, to 40 cm long, slender; spathe yellow, 12-14 cm long, tubular part 5 cm long, limb ovate, acuminate to the apex; spadix 10-12 cm long, pistillate lower part 1.5 cm long, sterile middle portion 2 cm long, staminate part 2 cm long and appendix 6 cm long.

*Fl. & Fr.* October-March

*Distr.* India and Sri Lanka. Rare in moist localities of semi-evergreen forests; *PS 30777* Pooppara

**AMORPHOPHALLUS** Blume ex Decaisne

- 1. Leaves bulbiferous at forks; peduncles to 25 cm long ..... **A. bulbifer**
- 1. Leaves not bulbiferous at forks; peduncles to 40 cm long..... **A. paeoniifolius**

**Amorphophallus bulbifer** (Roxb.) Blume, Rumphia 1: 148. 1837; FBI 6: 515. 1893; FPM 1587. 1931; FPL 531. 1990. *Pythonium bulbiferum* Schott & Endl., Melet. Bot. 18. 1832. *Arum bulbiferum* Roxb., Fl. Ind. 510. 1832.

Large herbs, corm globose, to 10 cm across. Leaves 3-partite, to 40 cm across, segment, pinnatisect, bulbiferous at the base and forks and on the nerves above; petiole to 1 cm long, spotted brown; leaflets, to 20 cm, obovate, lanceolate. Spadix sessile; spathe to 40 x 10 cm, at the broadest part, pale pink; male and female contiguous; female flowers covering 4.5 cm of the spike; male flowers to appendages cylindrical.

*Fl. & Fr.* January-April

*Distr.* India and Myanmar. Rare in deciduous forests; *PS 30446* Karimala

**Amorphophallus paeoniifolius** (Dennst.) Nicols., Taxon 26: 338. 1977; var. **paeoniifolius**: Sivad., Taxon 32: 128. 1983; FTSR 484. 1996. *Dracontium paeoniifolium* Dennst., Schluss. 13: 38. 1818. *Amorphophallus campanulatus* Decne., Ann. Mus. Natl. Hist. Nat. 3: 366. 1834; FBI 6: 513. 1893, p. p.; FPM 1587. 1931.

Large herbs, corm to 20 cm across, depressed globose, tubercled, pale pink inside; petiole to 50 cm long, 3-4 cm thick, green with brown patches; lamina 70-120 cm across; lobes to 14 x 5.5 cm, ovate, acuminate, decurrent at base into a wing to the petiole; nerves impressed above. Peduncle 5-6 cm long, thick; spathe 38 cm across, 25-45 cm high, campanulate, undulate, dull greenish brown; spadix as long as spathe; appendage obovoid, 20-25 cm across, uneven, rugose,

deep pink. Flowers on the lower half of the spadix. Berry 15 x 10 mm, oblong, obovoid, orange-red, glabrous.

*Fl & Fr.* May-October

*Distr.* India, Sri Lanka and Pacific Islands. Common in deciduous forests and plantations; *PS 30743* Thellikkal

#### ANAPHYLLUM Schott

**Anaphyllum wightii** Schott, *Bonplandia* 5: 127. 1857 & *Gen. Aroid.* t. 83. 1858; *FBI* 6: 551. 1893; *FPM* 1589. 1931; *FPL* 531. 1990; *FTSR* 484. 1996.

Tall herbs with a creeping rhizome. Leaves pinnatisect or pinnatipartite; lobes 3-8 pairs, to 28 x 10 cm, usually narrower, elliptic to oblong, acute, sessile or petiolulate; petiole 60-150 cm long, erect, 5-10 cm thick, smooth or transversally rugose, brownish. Spadix 15-30 cm long, 5-8 cm broad, spathe open, deep brown, once or twice twisted; spikes 4.5 cm long, 8-10 mm thick. Flowers bisexual, densely arranged, 3-6 mm across; perianth lobes 4, obovate, truncate; stamens 6, free, filaments broad; ovary 1-celled, ovule solitary; style short, stigma discoid. Fruit a globose achene.

*Fl. & Fr.* July-January

*Distr.* Endemic to Southern Western Ghats. Common in evergreen forests; *PS 30281* Kothala; *30036* Meenkara; *30518* Pezha

#### ARIOPSIS Nimmo

**Ariopsis peltata** Nimmo. in *Graham, Cat. Pl. Bombay* 252. 1839; *FBI* 6: 519. 1893; *FPM* 1580. 1931; *FPL* 532. 1990. *Remusatia vivipara* Wight,  *Ic. t.* 900. 1845, non Schott, 1832.

Epiphytic or terrestrial annuals, rootstock globose, to 1 cm across. Leaves 1 or 2, peltate, lamina 5-9 cm across, orbicular, entire, membranous, glabrous; petiole to 8 cm long, slender. Peduncle 2-5 cm long, solitary; spathe yellow or white, 3 cm long, cymbiform, open, tube absent; spike 2.5 cm long, cylindrical, 3 mm, thick. Female flowers 5-7, on one side of the spike towards the lower part; ovary ovoid, 1-celled, ovules many, on parietal placentas; stigma 4-lobed. Male flowers sunken in upper fleshy part of spadix; stamens 3; anthers divaricate, pubescent.

*Fl. & Fr.* May-June

*Distr.* India and Western Malesia. Fairly common on wet rocks of evergreen forests; *PS 19597* Karimala

#### ARISAEMA Martius

1. Leaves two; appendage of the spadix much longer than the spathe ..... **A. tortuosum**
1. Leaves single; appendage of the spadix as long as or smaller than the spathe..... 2
2. Appendage of the spadix blunt at apex; spadix to 22 cm long..... **A. leschenaultii**
2. Appendage of the spadix narrowed at apex; spadix to 10 cm long..... 3
3. Appendage of the spadix terminated into a knob; spathes limb yellowish, tube purple..... **A. barnesii**
3. Appendage of the spadix not terminated into a knob; spathe limb and tube greenish..... 4
4. Spathe limb triangular with a long acuminate tip..... **A. attenuatum**
4. Spathe limb broadly ovate; acute..... **A. murrayi**

**Arisaema attenuatum** Barnes & Fischer, *Kew Bull.* 1936: 275. 1936.

Corms 2-5 cm, depressed globose. Leaves radiatisect; leaflets 6-9, to 16 x 6 cm, elliptic-lanceolate, acute, base cuneate, membranous; petiole to 45 cm, sheathing peduncle as long as or slightly longer than the petiole; spathe to 17 cm, bright-green, stipe white outside, inner glossy, limb short, triangular, acuminate, dark green, with 3 stripes; spadix to 9 cm, appendage, attenuate, purplish with green tip. Berry 10 mm across, obovoid.

*Fl. & Fr.* May-July

*Distr.* Endemic to Southern Western Ghats. Occasional in grasslands; *PS 18929* Karimalagopuram

**Arisaema barnesii** Fischer, Kew Bull. 1933: 342. 1933 & FPM 1891. 1936; FPL 532. 1990; FTSR 484. 1996. *A. wightii* auct. non Schott. 1859; FBI 6: 507. 1893 p. p., non Schott. 1859; FPM 1891. 1931.

Corm 1-2 cm across, globose; petiole 20-45 cm long, smooth, base sheathing. Leaflets 6, 16 x 3 cm, elliptic-oblong, acuminate, base acute, glabrous, petiolule 1-2 cm long. Peduncle slender; spathe 6-10 cm long, tube 1-1.5 cm broad, purple with white lines, glabrous; limb ovate, finely caudate-acuminate, horizontal, green with white lines. Spadix 6 cm long, straight, narrowed at apex into a short tail.

*Fl. & Fr.* November-June

*Distr.* Endemic to Southern Western Ghats. Common in evergreen forests; *PS 19565* Kariamchola; *30277* Pooppara

**Arisaema leschenaultii** Blume, Rumph. 1: 93. 1836; FBI 6: 504. 1893; FPM 1585. 1931; FPL 532. 1990. *A. papillosum* Steud. ex Schott, Prodr. 46. 1860. *A. pulchrum* N. E. Br., J. Linn. Soc. Bot. 18: 252. t. 6. 1880; FBI 6: 505. 1893; FPM 1585. 1931.

Corm 1-6 cm across, depressed globose. Leaf one; leaflets 7-12, to 25 x 7 cm, lanceolate, acuminate; nerves many, close, parallel, forming an intramarginal vein, prominent, glabrous; petiole to 70 cm long, 1-3 cm thick, brownish. Spadix peduncled, below the level of leaf; spathe 10-22 cm long, tube 5-15 cm long, 1-3.5 cm broad, with thick greenish brown streaks; limb ovate, apex curved down, finely acuminate, green with brown streaks. Spadix 11-15 cm long, clavate at apex, female flowers many in lower 1-3 cm long; neuter flowers filiform, simple or bifurcate, to 1 cm long.

*Fl.* June-December

*Distr.* Endemic to Southern Western Ghats. Rare in evergreen forests at higher altitudes; *PS 18931* Karimalagapuram

**Arisaema murrayi** (Graham) Hook., Bot. Mag. 74: t. 4388. 1848; FBI 6: 507. 1893; FPM 1585. 1931; FTSR 485. 1996. *Arum murrayi* Graham, Cat. Pl. Bombay 229. 1839. *Arisaema tortuosum* var. *neglectum* sensu Nicols. in Sald. & Nicols., 785. 1976, non (Schott) Fischer 1931.

Corm to 2.5 cm across, globose. Leaf shortly pedatisect, lobes 5-6, elliptic or elliptic-lanceolate, acute, base cuneate, membranous, to 17 x 6 cm; petiole sheathing, to 40 cm long; peduncles as long as the petiole, spathe greenish, to 10 cm long, base tubular, to 3 x 1.5 cm; limb 6 x 5 cm, green with white streaks, reddish along margins; spadix 6 cm long; sterile appendages as long as spathe or shortly exerted. Berry obovoid, 3 or 4-angled at apex, 6 x 5 mm.

*Fl. & Fr.* May-October

*Distr.* Endemic to Western Ghats. Rare along the margins of evergreen forests at higher altitudes; *PS 18930* Karimalagapuram

**Arisaema tortuosum** (Wall.) Schott in Schott & Endl., Melet. Bot. 1: 17. 1832; FBI 6: 502. 1893; FPM 1584. 1931; FTSR 485. 1996. *Arum tortuosum* Wall., Pl. Asiat. Rar. 2: 10. t. 114. 1830. *Arisaema tortuosum* (Wall.) Schott var. *neglectum* (Schott) Fischer in Gamble, FPM 1585. 1931. *A. neglectum* Schott in Bonplandia 7: 26. 1859; FBI 6: 504. 1893. *A. murrayi* sensu Manilal, Fl. Silent Valley 332. 1988, non (Graham) Hook. 1848.

Corms 2-3 cm across, globose. Leaves paired, pedatisect; leaflets 8-10, to 12 x 4 cm, oblanceolate, abruptly acuminate, base acute, sparsely hispid below, petiolulate; petiole to 35 cm long, 2-together. Spadix solitary; peduncle usually shorter than the petiole; spathe 8-12 cm long, green; limb ovate, acuminate, with white and purple streaks; tube 4-6 cm long; spadix 12-18 cm long, sigmoidally curved, appendage narrow.

*Fl. & Fr.* August-December

*Distr.* Himalayas, South India and Sri Lanka. Common in grasslands; *PS 18921* Karimalagapuram

## COLOCASIA Schott

**Colocasia esculenta** (L.) Schott in Schott & Endl., Melet. Bot. 1: 18. 1832; FPL 533. 1990; FTSR 485. 1996. *Arum esculentum* L., Sp. Pl. 965. 1753. *Colocasia antiquorum* Schott in Schott & Endl., Melet. Bot. 1: 18. 1832; FBI 6: 523. 1893; FPM 1580. 1931.

Stout herbs; rhizome stoloniferous. Leaves few to many, peltate, to 28 x 18 cm, ovate, cordate to sagittate at base, glabrous; nerves 6 pairs, united to form an intramarginal vein; lowest pair with lateral nerves of the basal lobes, intercostae curved; petiole 30-45 cm long, cylindrical, smooth. Peduncle solitary or few together, 10-20 cm long, stout; spathe to 20 cm long, yellow, lanceolate, constricted above the base; limb acuminate. Spadix 10 cm long, cylindrical, appendages terete, obtuse. Male flowers above, to 5-6 cm of the spadix, stamens 6; female flowers on lower, 2 cm of the spadix; ovary 1-celled, ovules many on 2-4 parietal placentas. Neutral flowers many, peltate, between the female and male flowers. Fruit an aggregate of berries, globose.

*Fl. & Fr.* November-February

*Distr.* South Asia, widely cultivated. Common along the margins of vayals; *PS 30811* Anakkalvayal

## LAGENANDRA Dalzell

1. Leaves to 35 cm; cataphylls not keeled ..... **L. toxicaria**
1. Leaves to 10 cm; cataphylls 2-keeled.....**L. meeboldii**

**Lagenandra meeboldii** (Engl.) Fischer in Gamble, FPM 1576. 1931; FPL 534. 1990; FTSR 486. 1996. *Cryptocoryne meeboldii* Engl., Pflanzenr. 4. 23F: 234. 1920.

Annual or biennials, rhizome 0.5-1 cm thick, creeping. Leaves clustered; lamina 8 x 4 cm, ovate, acute, rounded at base; nerves numerous, regularly arching; petiole 5-10 cm long. Peduncle to 2.5 cm long, concealed in the leaf sheath. Spathe to 10 x 1.5 cm, ellipsoidal, long-acuminate at apex, twisted once or twice, smooth, yellowish, purple, tubular part 5 cm, closed chamber 2-3 cm long. Spadix 2 cm long, produced above into a cusp. Female flowers in a clusters of 5 mm across; male flowers in a globose clusters of 3 mm across; stamens 1 or 2.

*Fl. & Fr.* December-March

*Distr.* Endemic to Western Ghats. Rare in the streams of evergreen forests; *PS 30058* Kanthalppara

**Lagenandra toxicaria** Dalz. in Hook.'s J. Bot. Kew. Gard. Misc. 4: 289. 1852 & 5: t. 4. 1853; FBI 6: 495. 1893, p. p.; FPM 1889. 1936; FTSR 486. 1996.

Leaves broadly elliptic, acute, chartaceous, glabrous, to 30 x 15 cm; petiole to 25 cm long; cataphylls lanceolate, sheathing 10 cm long. Peduncle 4.5 cm long. Spathe 4.5 cm long, oblong, constricted above the tube, limb abruptly acuminate, acumen, sigmoidally curve, pale purple; spadix 1.5 cm long.

*Fl. & Fr.* Throughout the year

*Distr.* Endemic to Western Ghats. Occasional in the streams of evergreen forests; *PS 30099* Orukomban

## POTHOS Linnaeus

1. Petiole winged; spadix globose ..... **P. scandens**
1. Petiole not winged; spadix oblong or elongated ..... 2
2. Stem with prickles at nodes; leaves dimorphic; spike longer than the spathe ..... **P. armatus**
2. Stem without prickles at nodes; leaves similar; spikes shorter than spathe ..... **P. crassipedunculatus**

**Pothos armatus** Fischer, Kew Bull. 1929: 126. 1929 & FPM 1592. 1931; FTSR 487. 1996.

Armed climbers, spines 2-4 mm long, few at nodes. Lower leaves ovate-orbicular with cordate base, upper leaves to 18 x 4.5 cm, elliptic-oblong, acuminate at apex, acute at base;



nerves many, irregular, prominent below; petiole 1 cm long. Spadix on short lateral branchlets; peduncles 3-5 cm long with 3-4 cataphylls at base; spathe 1.5-2 cm long, oblong, acute; spadix 5 cm long, slender. Flowers 1.5 mm across, in distant groups of 3-5 together; bracts orbicular, puberulus; stamens 6; ovary obovoid, truncate above.

*Fl. & Fr.* January-March

*Distr.* Southern Western Ghats. Rare in evergreen forests; *PS 30095* Kottayali

**Pothos crassipedunculatus** Sivad. *et al.*, *Pl. Syst. Evol.* 168: 221-225. 1989 [Figure 12].

Root climbers, flagella to 2 m. Leaves to 20 x 7 cm, elliptic-lanceolate, acuminate, intramarginal veins looping at the margin, base cuneate, cordate; petiole to 2 cm, pulvinate. Inflorescence lateral, *ca* 1 cm long, cataphylls 3 or 4; peduncle to 4 cm; spathe 2-2.5 x 1.5 cm, ovate-acute, apiculate, white; spadix sessile, 2 x 0.4 cm, sub-cylindric. Flowers to 2 mm diameter, bisexual trimerous; tepals 6, fleshy, apex flat; filaments short, 3 x 0.6 mm; anthers 4-lobed, extrorse; stigma sessile, convex with tuft of papillae at centre; ovary trilobular.

*Fl. & Fr.* December-May

*Distr.* Endemic to Southern Western Ghats (Kerala). Rare in evergreen forests; *PS 19790* Orukomban

**Note:** This species was recently described from Agasthyamala. Present collection from the sanctuary is the first report outside its type locality.

**Pothos scandens** L., *Sp. Pl.* 968. 1753; *FBI* 6: 551. 1893; *FPM* 1592. 1931; *FPL* 535. 1990; *FTSR* 487. 1996.

Large climbers; stem angled, 2-4 mm thick. Leaf to 9 x 3 cm, lanceolate, acuminate, nerves many, united to form 2-3 narrow ribs, glabrous; petiole 3-6 cm long, broadly winged, wing broaden above. Spadix axillary; peduncle to 0.5 cm long, spathe 5 mm across, orbicular, obtuse, concave, brown; spadix 3-5 mm across, globose. Flowers densely packed; bracts 3-5, orbicular; stamens 6, free; ovary obovoid, stigma 3-toothed.

*Fl. & Fr.* October-November

*Distr.* India to Malesia and Madagascar. Common in all forest types; *PS 19725* Parambikulam

#### REMUSATIA Schott

**Remusatia vivipara** (Roxb.) Schott in Schott & Endl., *Melet. Bot.* 18. 1832; *FBI* 6: 521. 1893; *FPM* 1583. 1931; *FPL* 535. 1990; *FTSR* 487. 1996. *Arum viviparum* Roxb., *Hort. Bengal* 65. 1844. *Caladium viviparum* (Roxb.) Lodd., *Bot. Cab.* 3: t. 281. 1818. *Colocasia vivipara* (Roxb.) Thw., *Enum. Pl. Zeyl.* 336. 1864.

Epiphytic or lithophytic herbs with erect bulbiferous slender shoots. Leaves 20-30 cm across, ovate, acute, cordate at base, glossy above; nerves prominent; petiole to 40 cm long; spadix solitary, on erect, terminal peduncle, covered with large cataphylls; spathes obovate to rhomboid, spreading, yellowish white; tube short, 5 cm long, ellipsoid, limb to 10 x 7 cm, acute; spadix 5 cm long. Female flowers many, ovary globose, 1-celled; ovules many, parietal, stigma 3-lobed, globose. Male flowers many, on clavate above part of the spadix; stamens 6, united.

*Fl. & Fr.* January-June

*Distr.* Paleotropics. Common in evergreen forests at higher altitudes; *PS 19326* Thenkudippara

#### RHAPHIDOPHORA Hasskarl

**Rhaphidophora pertusa** (Roxb.) Schott, *Bonplandia* 5: 45. 1857; *FBI* 6: 546. 1893; *FPM* 1590. 1931; *FPL* 536. 1990; *FTSR* 487. 1996. *Pothos pertusa* Roxb., *Fl. Ind.* 1: 455. 1820. *Scindapsus pertusus* (Roxb.) Schott in Schott & Endl., *Melet. Bot.* 21. 1832.

Stout perennial climbers, stem cylindrical, 4 cm thick, fleshy. Leaves to 35 x 30 cm, broadly ovate, pinnatisect or rarely entire, rounded at base, acute at apex; petiole 20-35 cm long,

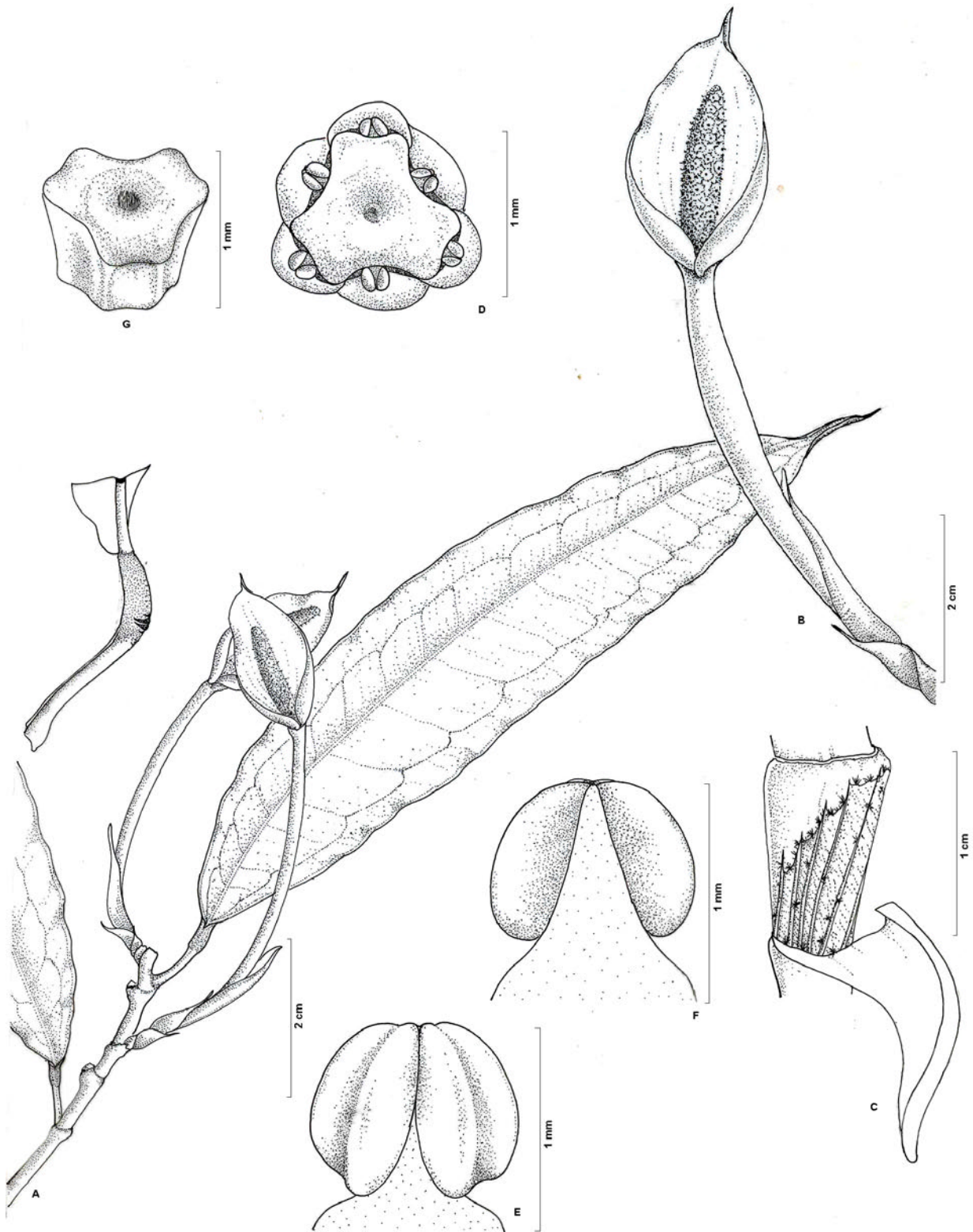


Figure 12. *Pothos crassipedunculatus* Sivad. et al. **A.** flowering twig; **B.** inflorescence; **C.** inflorescence node- cataphyll removed; **D.** flower; **E & F.** stamen dorsal and ventral view; **G.** pistill

channelled. Spadix solitary, axillary; spathe to 20 x 8 cm long, ovate-oblong, concave, acute, creamy white; spadix 12 cm long, 2 cm thick. Flowers unisexual, densely packed. Female flowers basal; ovary obconical, truncate, 1-celled; ovule solitary; stigma knob-like. Male flowers above; stamens 4-6, free.

*Fl. & Fr.* August-September

*Distr.* India and Sri Lanka. Rare in evergreen forests; *PS 30173* Kottayali

#### TYPHONIUM Schott

**Typhonium bulbiferum** Dalz. in Hook.'s J. Bot. Kew. Gard. Misc. 4: 113. 1852; FBI 6: 511. 1893; FTSR 488. 1996.

Corms about 1 cm across. Leaves 2 or 3, triangular-ovate, acute, base cordate, sagittate, to 6 x 4 cm; petiole to 10 cm long, slender with a bulbil at apex. Spathe pale purple, limb linear-lanceolate, pale reddish-purple, to 10 cm long; spadix as long as the spathe.

*Fl. & Fr.* April-May

*Distr.* Endemic to Western Ghats. Occasional in evergreen and semi-evergreen forests; *PS 30602* Parambikulam

### ERIOCAULACEAE

#### ERIOCAULON Linnaeus

1. Male flowers with two sepals; female petals linear..... **E. thwaitesii**
1. Male flowers with three sepals; female petals oblong or oblanceolate ..... 2
2. Appendage of seeds along the vertical walls..... **E. truncatum**
2. Appendage of seeds along the transverse walls..... 3
3. Involucral bracts longer than the floral bracts; peduncle to 4 cm long ..... **E. xeranthemum**
3. Involucral bracts equal to or smaller than the floral bracts; peduncles more than 8 cm long ..... 4
4. Sheaths to 3.5 cm; petals sub-equal..... **E. talbotii**
4. Sheaths to 7 cm; petals equal..... **E. parviflorum**

**Eriocaulon parviflorum** (Fyson) Ansari & Balakr., Eriocaul. India 53. 1994. *E. diana* Fyson var. *parviflora* Fyson, J. Indian Bot. Soc. 2: 260. 1921. *E. diana* Fyson var. *triloboides* Fyson, J. Indian Bot. Soc. 2: 260. 1921.

Leaves to 7 x 0.6 cm, falcate, acute, glabrous. Peduncle many, to 30 cm long; sheath to 5 cm long, limb small. Head 5 x 5 mm, receptacle pilose; involucral bracts 2 x 1 mm, obovate, glabrous, straw-coloured; floral bracts 2 x 1 mm, cuneate, black. Female sepals unequal, grey or black, smaller one hyaline, petals oblanceolate, hyaline, hairy; seeds oblong; appendages many, on transverse walls. Male sepals, united into a split tube, black, hairy at apex; petals 3, equal, hairy; anthers black.

*Fl. & Fr.* September-January

*Distr.* Endemic to Western and Central India. Common on wet areas of grasslands; *PS 19921* Karimala

**Eriocaulon talbotii** Ansari & Balakr., Eriocaul. India 172. 1994. *E. horsleykunda* Fyson var. *megalocephala* Fyson, J. Indian Bot. Soc. 3: 14. 1922.

Leaves to 6 x 0.5 cm, linear-ensiform, acuminate. Peduncles to 25 cm, virgate, sheath to 4 cm, limb incised. Head 1-1.3 cm across, spherical, grey; involucral bracts 2 mm across, ovate, obtuse; floral bracts *ca* 3 x 1 mm, oblanceolate, acute, apex hoary; male sepals 2 mm across, obovate, connate, apex hoary; petals *ca* 2 mm across, spathulate, obtuse, free; ovary sessile, globose, style trifid; seed globose, purple, seed coat aligned in vertical rows.

*Fl. & Fr.* June-December

*Distr.* Endemic to Western Ghats. Common on wet areas of grasslands; *PS 30740* Karimala

**Eriocaulon thwaitesii** Koern., Linnaea 27: 627. 1854; FBI 583. 1893; FPM 1620. 1931; Ansari & Balakr., Eriocaul. India 63. 1994; FTSR 490. 1996. *E. mariae* Fyson, Kew Bull. 1914: 331. 1914. *E. gamblei* Fischer, Kew Bull. 1930. 160. 1930 & in Gamble, FPM 1618. 1931.

Leaves 6-8 x 0.5 cm, lanceolate, acuminate, glabrous. Peduncles several to many, 10-30 cm long; heads 2.5-4 x 4-6 mm, globose; receptacle pilose, involucre bracts 2 x 1.5 mm, oblong, rounded to truncate at apex, straw-coloured; floral bracts 2 x 1 mm, cuneate, acute, hairy at apex, brown. Female sepals 2, lanceolate, keeled, brown; petals linear, hyaline; seed walls in vertical row. Male sepals 2, united at the base, glabrous, brownish; petals equal, hairy, glandulose.

*Fl. & Fr.* August-December

*Distr.* Peninsular India and Sri Lanka. Common on wet areas of grasslands; *NS 5775* Karimala Hills

**Eriocaulon truncatum** Bunch.-Ham. ex Mart. in Wall., Pl. Asiat. Rar. 3: 29. 1831; FBI 6: 578. 1893; FPM 1619. 1931; FPL 539. 1990; Ansari & Balakr., Eriocaul. India 118. 1994. *E. truncatum* var. *malaccense* Hook.f., FBI 6: 578. 1893.

Leaves 3-4 x 0.4 cm, lanceolate, acuminate at apex. Peduncles many, to 15 cm long; heads 3 x 5 mm, hemispherical; involucre bracts 3 x 1.5 mm, oblong, obtuse, at apex, straw coloured; floral bracts 2 x 1.2 mm, oblanceolate, obtuse, pale brown, glabrous. Female sepals 2, 1.5 mm long, linear, black; petals 3, linear, white, glabrous, glandulose; seeds oblong. Male sepals united, lobes shallow, black, glabrous; petals equal, glandulose.

*Fl. & Fr.* July-September

*Distr.* Indo-Malesia. Common on wet rocky areas; *PS 19724* Parambikulam

**Eriocaulon xeranthemum** Mart. in Wall., Pl. Asiat. Rar. 3: 29. 1832; FBI 6: 584. 1893; Ansari & Balakr., Eriocaul. India 58. 1994; FTSR 490. 1996. *E. pygmaeum* Dalz. in Hook.'s J. Bot. Kew Gard. Misc. 3: 281. 1851.

Leaves 0.8-2.5 x 0.15 cm, lanceolate, acuminate. Peduncles 1-few, 1-5 cm long; heads spreading, obconical; involucre bracts 3 x 1 mm, elliptic, acute, hyaline; floral bracts 1.2 mm long, oblanceolate, truncate and hairy at apex, black. Female sepals oblanceolate, one shorter and linear, brown; petals 3, oblong, hairy, glandulose; seeds oblong, appendages 2-3 on the base, lobes truncate, black; petals 3, subequal, glandulose.

*Fl. & Fr.* August-December

*Distr.* Tropical Africa and India. Rare in the sides of streams; *PS 19717* Parambikulam

## CYPERACEAE

1. Florets unisexual .....	2
1. Florets bisexual .....	3
2. Nut enclosed in a utricle .....	<b>Carex</b>
2. Nut not enclosed in utricle .....	<b>Scleria</b>
3. Hypogynous bristles present .....	4
3. Hypogynous bristles absent .....	6
4. Leaves with a prominent ligule .....	<b>Fuirena</b>
4. Leave eligulate .....	5
5. Nut beaked with persistent style base; spikelets in panicles; bristles setaceous .....	<b>Rhynchospora</b>
5. Nut not beaked, spikelets in simple umbel; bristles broad .....	<b>Lipocarpha</b>
6. Style base dilated and constricted above the nut; glumes spiral rarely distichous .....	7
6. Style base continuous with the nut; glumes distichous .....	8
7. Style fimbriate hairy; base conical .....	<b>Fimbristylis</b>
7. Style glabrous at mouth puberulus, base depressed globose .....	<b>Bulbostylis</b>

- 8. Rachilla persistent..... 9
- 8. Rachilla deciduous..... 10
- 9. Nut trigonous; stigmas 3..... **Cyperus**
- 9. Nut biconvex; stigmas 2..... **Pycreus**
- 10. Keels of nut bearing glumes winged or serrulate; stigmas 2..... **Kyllinga**
- 10. Keels of nut bearing glumes not winged or serrulate; stigmas 3..... **Mariscus**

**BULBOSTYLIS** Kunth

**Bulbostylis barbata** (Rottb.) Kunth ex Clarke in Hook.f., FBI 6: 651. 1893; FPM 1662. 1931; FPL 540. 1990. *Scirpus barbatus* Rottb., Progr. 27. 1772. *Isolepis barbata* (Rottb.) R. Br., Prodr. 222. 1810. *Isolepis barbata* (Rottb.) R. Br. var. *capillaris* Nees in Wight, Contrib. 109. 1834.

Densely tufted annual; culms 5-15 cm high, 5-6-ridged, smooth. Leaves 3-6 cm long, filiform, glabrous; sheath keeled, mouth with long-cilia. Umbels globose, 0.5-0.6 cm across, bracts 2-3, filiform with a broad base, surpass the head. Spikelets 3-5 mm long, sessile, clustered, 8-15 in an umbel, densely packed; glumes 2 x 1.2 mm, aristate, 6-12 in a spikelets, spirally disposed; arista curved out, scabrid. Nut 0.6 x 0.5 mm, trigonous, truncate at apex, thinly reticulate, pale brown.

*Fl. & Fr.* June-December

*Distr.* Old World tropics and Southern U.S.A. Common on wet rocky areas; *PS 30763* Vengoli

**CAREX** Linnaeus

- 1. Terminal spikelets with male flowers only..... **C. phacota**
- 1. All spikelets with male and female flowers..... **C. filicina**

**Carex filicina** Nees in Wight, Contrib. 123. 1834; FBI 6: 717. 1894; FPM 1686. 1931; FPL 541. 1990.

Perennials, culms to 120 cm tall, slender. Leaves 30-60 x 0.8 cm, scabrous. Sheath rounded, closed. Partial panicles 8-10 x 3 cm; bracts to 30 cm long; bracteoles filiform. Spikelets 1.5 cm long; male portion 3-4 mm long, narrower; pistillate glumes 2 mm long, reddish brown; utricle 3.5 mm long, scabrid, blotched with red spots; beak 1.5 mm long, deeply bifid. Staminate glumes 3 x 1.5 mm, acute.

*Fl. & Fr.* December-May

*Distr.* South and South East Asia. Common in marshy areas; *PS 18863* Karimthalappara

**Carex phacota** Spreng., L. Syst. Veg. 3:826.1826; FBI 6:708.1894; FPM 1686.1931; FPL 542. 1990. *C. lenticularis* D. Don, Trans. Linn. Soc. London 14: 331. 1824.

Perennials, culms 50-70 cm tall, triquetrous. Leaves cauline, 20-80 x 0.3-1 cm, linear, 3-costate; sheath keeled, open. Spikelets 5-7 in a terminal raceme, cylindrical; terminal one fully or partly male, others female, 5 cm long, 5 mm wide; pistillate glumes 2 x 1 mm, obovate, truncate at apex, aristate, blotched with red spots, hirtus; utricle 3 x 1.5 mm, puberulus, deep brown; staminate glumes 3 x 1.5 mm, obovate, emarginate, aristate; stamens 3.

*Fl. & Fr.* October-February

*Distr.* Indo-Malesia and Sri Lanka. Common in marshy areas; *PS 30778* Anakkavayal

**CYPERUS** Linnaeus

- 1. Rachilla broadly or narrowly winged on either side of the nut, often decurrent..... 2
- 1. Rachilla not conspicuously winged..... 4
- 2. Spikelets spicate or racemose; not clustered or digitate..... **C. compressus**
- 2. Spikelets digitally clustered or in very congested spikes..... 3
- 3. Glumes aristate..... **C. maderaspatanus**
- 3. Glumes not aristate..... **C. zollingeri**

4. Spikelets in elongated spikes or racemes..... **C. iria**  
 4. Spikelets in digitate clusters or in congested racemes..... 5  
 5. Glumes aristate not mucronate ..... 6  
 5. Glumes not aristate or mucronate..... **C. halpan**  
 6. Arista recurved; culms to 20 cm high ..... **C. cuspidatus**  
 6. Arista strait; culms 30-70 cm high..... **C. diffusus** ssp. **macrostachyus**

**Cyperus compressus** L., Sp. Pl. 46. 1753; FBI 6: 605. 1893; FPM 1640. 1931; FPL 543. 1990; FTSR 491. 1996.

Culms to 30 cm high, obtusely trigonous, slender, smooth. Leaves 15-20 x 0.1-0.5 cm, linear, glabrous; sheath rounded, open. Umbels 5-10 cm across, compound; bracts 3-5, unequal, 7-8 x 0.4 cm; rays 2-3, spreading. Spikelets 2.5-3 x 0.3-0.4 cm, 3-6 in each spike, 30-40 flowered, much compressed; rachis narrowly winged; glumes 3 x 2.5 mm, ovate, cuspidate, many-nerved, keeled. Nut 1.5 mm long, trigonous, brown, smooth.

*Fl. & Fr.* Throughout the year

*Distr.* Pantropical. Common in marshy areas; *PS 30758* Vengoli

**Cyperus cuspidatus** Kunth in HBK, Nov. Gen. Pl. 204. 1815; FBI 6: 598. 1894; FPL 544. 1990; FTSR 492. 1996. *C. uncinatum* sensu Fischer in Gamble, FPM 1639. 1931, non Poir. 1806.

Culms 10-20 cm high, densely tufted. Leaves 5-10 x 0.1-0.2 cm, linear, folded; sheath keeled, closed, glabrous. Umbel 4 x 4 cm, compound; rays 3, secondary rays absent; bracts 3, unequal, longest 10 x 0.2 cm; spikes 1.2 x 0.8 cm, ovoid, oblong or globose. Spikelets 40-50 in a spike, ovate, 10-flowered; glumes 2 x 1 mm, lanceolate, keeled, curved; arista 1.5-2 mm long. Nut obovoid, obtuse, pale brown, smooth.

*Fl. & Fr.* July-December

*Distr.* Pantropical. Common in marshy areas; *PS 19633* Vengoli

**Cyperus diffusus** Vahl ssp. **macrostachyus** (Boeck.) Koyama, Gard. Bull. Singapore 30. 139. 1977 & Rev. Handb. Fl. Ceylon 5: 198. 1985. *C. diffuses* Vahl var. *macrostachyus* Boeck., Linnaea 35: 533. 1868. *C. pubisquama* Steud., Syn. Pl. Glum. 2: 20. 1855; FBI 6: 604. 1893; FPM 1639. 1931.

Culms 40-70 cm high, robust, smooth. Leaves mostly basal, 3-costate. Umbel 5-35 cm across, compound; rays up to 15, secondary & tertiary rays present; bracts unequal, similar to leaves. Spikelets 5 x 2 mm, in groups of 1-5, digitate, 8-16 flowered; glumes 1.75 x 1.2 mm, broadly ovate, cuspidate, red-dotted. Nut 1.2 mm long, shortly beaked, smooth, grey-brown.

*Fl. & Fr.* October-January

*Distr.* India, China, Formosa, Solomon Islands and Malesia. Common in marshy areas; *PS 19189* Rockpoint

**Cyperus halpan** L., Sp. Pl. 45. 1753, 'haspan'; FBI 6: 600. 1893; FPM 1640. 1931; FTSR 492. 1996.

Culms 70-100 cm long, slender. Sheaths many at base, red-purple, bladeless. Umbels compound, rays 2-15, secondary rays also present; bracts few, smaller than the umbel, leafy. Spikelets sessile, 2-15 mm long, ovate, acute, 3-15-flowered, 1-5 together in umbellules; glumes ovate, keeled, 1-nerved. Nut trigonous, white, smooth.

*Fl. & Fr.* August-December

*Distr.* Pantropical. Occasional in marshy areas; *PS 19241* Vengoli

**Cyperus iria** L., Sp. Pl. 45. 1753; FBI 6: 606. 1893; FPM 1640. 1931; FPL 545. 1990; FTSR 492. 1996.

Culms 30-45 cm high, loosely tufted or solitary, acutely 3-angled. Leaves 0.6 cm broad; sheath keeled, closed by a membrane. Umbels 16 x 10 cm; bracts unequal, to 23 x 0.4 cm,

linear-oblong. Spikelets 3.5-4 x 2 mm, oblong, 6-8-flowered, 14-18 in a spike; glumes 1.2 x 1.2 mm, broadly ovate, obtuse, 1-nerved, keeled. Nut 1.25 x 1.5 mm, obovoid, dark brown, smooth.

*Fl. & Fr.* August-January

*Distr.* Tropical Asia and East Africa; introduced in U.S.A and West Indies. Common in marshy areas; *PS 19255* Thellikkal; *19632* Vengoli

**Cyperus maderaspatanus** Willd., Sp. Pl. 1: 278. 1798. *Mariscus maderaspatanus* (Willd.) Napper, J. E. Africa Nat. Hist. Soc. 28, 124: 10. 1971. *Mariscus squarrosus* Clarke in Hook. f., FBI 6: 623. 1893 quoad spec.; FPM 1645. 1931.

Culms 5-8 cm high, tufted, filiform. Leaves 5-10 x 0.1 cm, scabrid; whole plant red glandular. Umbel 3-5 x 3 cm; bracts 3-4 linear, 6-9 cm long; rays 1-5, secondary rays absent; spikes sessile, congested, head-like. Spikelets 10-11 x 2 mm, compressed, linear oblong, 5-12 together in a spike; rachilla winged; glumes 2-3 x 1 mm, 3-nerved. Nut 1.5 x 0.3 mm, pale brown.

*Fl. & Fr.* June-December

*Distr.* Pantropical. Occasional in marshy areas; *PS 30812* Pillakkalvayal

**Cyperus zollingeri** Steud., Syn. Pl. Glum. 2: 17. 1855. *C. ramosii* Kükenth., Feddes Repert 21: 326. 1925 & in Engl., Pflanzenr. 101: 136. 1935. *C. rubroviridis* Cherm., Bull. Soc. Bot. Fr. 66: 350. 1919. *C. sphacelatus* Rottb. var. *tenuior* Clarke, Trop. Afr. 8: 347. 1901.

Culms 30-80 cm high, triquetrous. Leaves to 40 x 0.4 cm, linear, acuminate. Umbel compound; bracts unequal, 5-20 cm long, leafy; rays 4-6; spike 1.5-3 cm long, dense. Spikelets oblong, perpendicular to the axis; rachis with deciduous wings on either side of the nut; glumes 3 x 2 mm, broadly ovate, obtuse, shortly cuspidate, margin hyaline; keel with several nerves. Nut obovate, smooth, dark brown.

*Fl. & Fr.* July-December

*Distr.* Tropical Africa, Madagascar, Malesia and Northern Australia. Common in marshy areas; *PS 19245* Vengoli

#### FIMBRISTYLIS Vahl

1. Styles bifid ..... 2
1. Styles trifid ..... 6
2. Nut covered with two rows of white glands on sides; culms stellate ..... **F. dipsacea**
2. Nuts and culms otherwise ..... 3
3. Spikelets clustered in a single head, sessile ..... **F. argentea**
3. Spikelets not clustered in a single head, peduncled ..... 4
4. Glumes not aristate ..... **F. dichotoma**
4. Glumes aristate ..... 5
5. Lowest glumes pubescent; bracts surpass the umbel ..... **F. aestivalis**
5. Lowest glumes glabrous; bracts never surpass the umbel ..... **F. bisumbellata**
6. Leaves distichous, folded; midrib strongly keeled; spikelet globose ..... **F. miliacea**
6. Leaves spiral; midrib not keeled; spikelet acute ..... 7
7. Spikelets many ..... **F. eragrostis**
7. Spikelets up to 6 ..... 8
8. Glumes spirally arranged ..... **F. tenera**
8. Glumes distichous ..... **F. narayanii**

**Fimbristylis aestivalis** (Retz.) Vahl, Enum. Pl. 2:288.1806; FBI 6:637.1893; FPL 549. 1990. *Scirpus aestivalis* Retz., Obs. Bot. 4:12.1768.

Densely tufted annuals; culms to 20 cm high, obtusely 5-angled. Leaves 10-20 x 0.11 cm, filiform, gland-dotted, scabrid. Umbel 3-6 x 3-4 cm, globose; bracts 3-4, leaf-like; rays 4-6, erect.

Spikelets few to many, 3-4 x 1.5 mm, acute, solitary, peduncled; glumes 1.7 x 0.9 mm, ovate, acute, 1-nerved. Nut 0.5 x 0.3 mm obovoid, smooth, dull brown.

*Fl. & Fr.* August-February

*Distr.* Asia and Australia. Common in marshy areas; *PS 30420* Parambikulam; *19336* Thenkudippara

**Fimbristylis argentea** (Rottb.) Vahl, Enum. Pl. 2: 294. 1806; FBI 6: 640. 1893; FPM 1659. 1931; FTSR 494. 1996. *Scirpus argenteus* Rottb., Descr. Ic. 27. 1772.

Tufted annuals; rhizome short, oblique; culms to 10 cm high, slender, 10-15-ridged. Leaves 5-8 x 0.1 cm, narrow to filiform; margins folded. Spikelets 3-5 x 2 mm, oblong, cylindrical; many in digitate umbel; glumes many, 1.5 x 0.7 mm, ovate, acute, 1-nerved, spirally disposed. Nut 0.7 x 0.4 mm, biconvex, faintly trabeculate, yellowish green, to pale brown.

*Fl. & Fr.* June-December

*Distr.* South and South East Asia. Common in moist deciduous forests and plantations; *PS 18980* Thunakkadavu

**Fimbristylis bisumbellata** (Forssk.) Bubani, Dodecanthea. 30. 1850; FPM 1898. 1931. *Scirpus bisumbellata* Forssk., Fl. Aeg.-Arab. 15. 1775. *Fimbristylis dichotoma* sensu Clarke in Hook.f., FBI 6: 635. 1893, non (L.) Vahl, 1809.

Densely tufted annuals; culms to 20 cm high, slender. Leaves to 10 x 0.15 cm, linear, scabrous; sheath rounded, glabrous, mouth with a short membranous ligule. Umbel 3 x 2.5 cm; bracts setaceous; rays 2-5, erect. Spikelets 2-4 mm long, peduncled; 8-15-flowered; glumes 1.5 x 0.8 mm, boat-shaped, mucronate, yellowish brown. Nut biconvex, obovate, smooth, dull yellow; style 1.5 mm long.

*Fl. & Fr.* July-December

*Distr.* North Africa, West Asia, India, Malesia, Taiwan, Ryukyu and North Australia. Occasional in grasslands; *PS 19688* Karimala

**Fimbristylis dichotoma** (L.) Vahl, Enum. Pl. 2: 287. 1806; FPM 1658. 1931; FPL 550. 1990. *Scirpus dichotomous* L., Sp. Pl. 50. 1753. *Fimbristylis diphylla* (Retz.) Vahl, Enum. Pl. 2: 289. 1806; FBI 6: 636. 1823. *Scirpus diphyllus* Retz., Obs. Bot. 15. 1789.

Perennials; culms 40-70 cm high, 2-3 mm thick, ridged. Leaves 15-25 x 0.2-0.3 cm, basal or scattered, linear to flat; sheath rounded; ligule a fringe or short hairs. Umbel 12 x 7 cm; bracts longer than the umbel. Spikelets 8-11 x 2-4 mm, solitary and pedicelled, ovate-oblong, acute; glumes 3 x 2 mm, acute, 3-nerved. Nut 1 mm long, oblong, biconvex, trabeculate with transverse oblong cells arranged in 12-13 vertical rows.

*Fl. & Fr.* July-December

*Distr.* Pantropical. Common in marshy areas; *PS 30719* Vengoli; 19246 Vengoli

**Fimbristylis dipsacea** (Rottb.) Clarke in Hook.f., FBI 6: 635. 1893; FPM 1658. 1931; FPL 550. 1990. *Scirpus dipsaceus* Rottb., Descr. Ic. 56. 1773. *Echinolytrum dipsaceum* (Rottb.) Desv., J. Bot. 1: 21. t. 1. 1808.

Small annuals, tufted; culms 2-5 cm tall, terete, spreading. Leaves 1-4 cm long; lower ones reduced to sheaths, usually basal, filiform, scabrid. Inflorescence a solitary spikelets or a simple umbel with 3 spikelets. Spikelets globose or top-shaped, 3 x 3 mm. few to several flowered; glumes acuminate-aristate, 7-nerved, greenish white. Nut 0.6 x 0.2 mm, brown.

*Fl. & Fr.* January-May

*Distr.* Tropical Africa and Asia. Common on wet rocky and marshy areas; *PS 30426* Vengoli

**Fimbristylis eragrostis** (Nees & Meyen ex Nees) Hance, J. Linn. Soc. Bot. 13: 132. 1873. *Abildgaardia eragrostis* Nees & Meyen ex Nees in Wight, Contrib. 95. 1834. *Fimbristylis nigrobrunnea* Thw., Enum. Pl. Zeyl. 434. 1884; FBI 6: 648. 1893; FPM 1659. 1931.



Perennials; rhizome vertical, 1-3 cm long, clothed with leaf sheaths; culms 15-30 cm high, solitary, slender, tetragonous. Leaves to 20 x 0.25 cm, flat, blunt at apex, glabrous. Umbels 3 x 3 cm, dense, globose; bracts 3, unequal, 1-3 cm long; rays 3-6, each with 1 or 2 spikelets. Spikelets 7-9 x 3 mm, oblong, acute; glumes 15-20 in a spikelet, 3 x 2 mm, acute, 1-nerved, brown. Nut 1 x 0.5 mm, obovate, obtuse, trabeculate; style base depressed globose.

*Fl. & Fr.* July-April

*Distr.* Indo-Malesia to Australia, China and Formosa. Common in moist deciduous forests and plantations; *PS 19498* Thellikkal

**Fimbristylis miliacea** (L.) Vahl, Enum. Pl. 2: 287. 1806; FBI 6: 644. 1893; FPM 1660. 1931; FPL 551. 1990. *Scirpus miliaceus* L., Syst. Nat. (ed. 10) 868. 1759. *Fimbristylis littoralis* Gaud., Freyc. Voy. Bot. 413. 1826. *Trichelostylis miliacea* (L.) Nees in Wight, Contrib. 104. 1834.

Annuals, culms to 25 cm high, caespitose. Leaves to 15 cm, flat, inrolled, obtuse, ligule absent, terete, oblong, to 8 mm, acute; spikelets 1 or 2, involucre bracts to 3, rachilla winged 1 mm, scarious, glumes to 4 mm, basally distichous, spiral at apex, keel 3-5-nerved; stamens 3, filaments to 4 mm, anthers ca 2 mm; style trifid, trigonous, ciliate, base pyramidal, stigma papillose. Nut to 2 mm, obovoid, trigonous, stipe 5 mm, angular.

*Fl. & Fr.* October-November

*Distr.* Cosmopolitan. Common in marshy areas; *PS 19263* Anakkalvayal

**Fimbristylis narayanii** Fischer, Kew Bull. 1931. 46. 1931 & in Gamble, FPM 1660. 1931; FPL 551. 1990.

Tufted annuals; culms 15-30 cm tall, acutely quadrangular. Leaves to 15 x 0.1 cm, narrowly ensiform, usually basal, glabrous. Umbel 4 x 2.5 cm; bracts 1-6, minute, scabrid; rays 2-5. Spikelets 1-3 together, 5-10 x 2 mm, compressed, elliptic, solitary, peduncled; glumes 3 x 1.5 mm, 1-nerved, 12-16 in the spikelets. Nut obovoid, obtuse, trabeculate and tubercled, pale brown; style base conical.

*Fl. & Fr.* July-December

*Distr.* Endemic to Southern Western Ghats (Kerala). Common in marshy areas; *PS 19941* Karimala; *19622* Vengoli

**Fimbristylis tenera** Schult., Syst. Veg. 2, Mant. 57. 1824; FBI 6: 642. 1893; FPM 1660. 1931; FPL 551. 1990; FTSR 495. 1996.

Slender short annuals; rhizome very short; culms 5-10 cm, very slender, loosely tufted. Leaves 3-8 cm long, linear; sheath rounded, hairy. Umbel simple, 1.5 x 1.5 cm. Spikelets 1-5, mostly peduncled, terete, acuminate; glumes few to many, keeled, brown. Nut obovoid, 0.8 mm long, dull grey, verruculose.

*Fl. & Fr.* July-November

*Distr.* Tropical Africa and Pakistan. Occasional in dry deciduous forests; *PS 30685* Keerappadi

#### FUIRENA Rottboel

**Fuirena umbellata** Rottb., Descr. Ic. 70. t.19. 1773; FBI 6: 666. 1893; FPM 1669. 1931. *F. pentagona* Wight & Arn. ex Nees in Wight, Contrib. 93. 1834. *F. uncinata* sensu Thw., Enum. Pl. Zeyl. 347. 1864, non Kunth 1837.

Stout perennials; rhizome creeping. Culms 40-70 cm high, 0.8 cm thick, ribbed. Leaves 13-18 x 1-2 cm, ciliate along the margins; nerves scabrid; sheath rounded, pubescent; ligule thick, collar like. Panicle 10 x 3 cm, with 2-5 partial panicles; bracts 2-5, leaf-like, 2-7 x 0.2-0.8 cm. Spikelets 10-25 in each cluster, 4-6 x 3 mm, ovoid; glumes 2.2 x 1.5 mm, ovate-oblong, emarginate at apex, cuspidate, glabrous, brown, outer bristle retrorsely barbed; inner bristle obovate, truncate. Nut 1.2 x 0.7 mm, obovoid.

*Fl. & Fr.* October-December

*Distr.* Pantropical. Common in marshy areas (vayals). *PS 19269* Anakkalvayal

## KYLLINGA Rottboel

1. Keels of nut bearing glume serrulate or spinulose.....**K. brevifolia**
1. Keels of not bearing glume not serrulate or spinulose..... 2
2. Glumes with a crest towards the upper part of the keel; stamens 3 .....**K. nemoralis**
2. Glumes without a crest; stamens 2..... **K. bulbosa**

**Kyllinga brevifolia** Rottb., Descr. Ic. 13. 1773; FBI 6: 588. 1893; FPM 1624. 1931. *Cyperus brevifolius* (Rottb.) Hassk. Cat. Hort. Bogor. 24. 1884

Culms 30-35 cm high, solitary along the creeping rhizome. Leaves flaccid; basal sheaths bladeless. Spike 0.8 x 0.6 cm, globose; bracts foliar. Spikelets 3.5 x 1.2 mm, lanceolate; upper glumes 3 x 2 mm, aristate, 5-nerved, margins hyaline; stamens 3. Nut 1.2 x 0.8 mm, obtuse, apiculate, dark brown.

*Fl. & Fr.* July-December

*Distr.* Pantropical. Common in moist deciduous forests; *PS 19475*Thelikkal; *19242*Vengoli

**Kyllinga bulbosa** Beauv., Fl. d' Oware & Benin 1: 11, t. 8, f. 1. 1804. *Cyperus triceps* (Rottb.) Endl., Cat. Hort. Acad. Uindb. 1: 94. 1842. *Kyllinga triceps* Rottb., Descr. Ic. 14. 1773, *nom. illegit.*; FBI 6: 587. 1893; FPM 1623. 1931; FPL 553. 1990; FTSR 496. 1996.

Culms 5-10 cm high, densely tufted. Leaves 2-6 x 0.1-0.2 cm, scabrid along margin and costa. Vertical spike 0.7 x 0.5 cm, conical, lateral shorter; bracts foliar. Spikelets 2 mm long, lanceolate; lower glumes smaller, upper glumes 1.5 x 1 mm, acute, nerves greenish white. Nut 1.2 x 0.5 mm, oblique, truncate at apex, yellowish brown.

*Fl. & Fr.* August-December

*Distr.* Tropical Africa, Asia and Australia. Common in marshy areas; *PS 30759*Vengoli

**Kyllinga nemoralis** (J.R & G.Forst.) Dandy ex Hutch. & Dalz., Fl. W. Trop. Africa 2: 486,487. 1936; FPL 552. 1990; FTSR 496. 1996. *Thryocephalon nemoralis* J. R & G. Forst., Char. Gen. Pl. 130.1776. *Kyllinga monocephala* Rottb., Descr. Ic. 13.1773; FBI 6:588.1893; FPM 1624.1931.

Rhizome slender, culms to 35 cm tall, closely arranged. Leaves to 30 x 0.3 cm, linear. Spikes to 4 x 7 mm, globose, white; bracts to 10 cm long. Spikelets 4 mm long, compressed, elliptic, densely packed; lower glumes 2 mm long, linear, upper glumes 2.5 mm long, concave, mucronulate, keel arcuate. Nut biconvex, yellowish.

*Fl. & Fr.* Throughout the year

*Distr.* Pantropical. Common on open rocky areas of moist deciduous forests; *PS 30713*Vengoli

## LIPOCARPHA R. Brown

1. Spikelets 3; glumes 7-nerved.....**L. sphacelata**
1. Spikelets 6-12; glumes 1-nerved ..... **L. chinensis**

**Lipocarpus chinensis** (Osbeck) Kern., Blumea, Suppl. 4: 167. 1958; FPL 553. 1990. *Scirpus chinensis* Osbeck, Dago. Ostind. Resa. 220. 1757. *Lipocarpus argentea* (Vahl) R. Br. ex Nees, Linnaea 9: 287. 1835; FBI 6: 667. 1893; FPM 1670. 1931. *Hypaelytrum argenteum* Vahl, Enum. Pl. 2: 283. 1806.

Culms 40-65 cm high, 2 mm thick. Leaves 10-20 x 0.5 cm, stiff; margins scabrid towards the apex; bracts to 8 cm long. Spikelets 0.5-1 x 0.5 cm, obtuse; glumes 2.5 x 1 mm, obtusely acute, keeled, yellow or pale brown. Nut 1.2 x 0.4 mm, obtuse, hardly triquetrous, brown.

*Fl. & Fr.* August-December

*Distr.* Pantropical. Common in marshy areas; *PS 19264*Anakkalvayal

**Lipocarpus sphacelata** (Vahl) Kunth, Enum. Pl. 2: 267. 1837; FBI 6: 667. 1893; FTSR 496. 1996. *Hypaelytrum sphacelatum* Vahl, Enum. Pl. 2: 283. 1805. *Tunga triceps* Roxb., Fl. Ind. 1: 183. 1820. *Lipocarpus triceps* (Roxb.) Nees in Wight, Contrib. 92. 1834; FPM 1670. 1931.

Culms 10-20 cm high, 0.5-1 mm thick. Leaves 7-10 x 0.15 cm, 1-costate, glabrous. Involucral bracts 2, dilated at base, 3-4 cm long, scabrid at top. Spikelets 8 x 5 mm, acute; glumes 2.5 x 0.8 mm, clawed, acute, 4-5-nerved. Nut 1.5 x 0.4 mm, acute, slightly curved, dark brown.

*Fl. & Fr.* August-December

*Distr.* Pantropical. Occasional in moist deciduous forests; *PS 19889* Velayudhankai

#### MARISCUS Vahl

1. Stem base thickened by sheaths ..... **M. dubius**
1. Stem bases not thickened by sheaths ..... 2
2. Inflorescence compound; spike globose, spikelets many flowered ..... **M. compactus**
2. Inflorescence simple; spike oblong; spikelets 1-4 flowered ..... 3
3. Rhizome slender, creeping; spikelets single flowered ..... **M. paniceus**
3. Rhizome thick, not creeping; spikelet 2-4 flowered ..... **M. sumatrensis**

**Mariscus compactus** (Retz.) Boldingh, *Zakfl. Landb. Java* 77. 1916; FPM 1645. 1931; FPL 554. 1990. *C. compactus* Retz., *Obs. Bot.* 5: 10. 1789. *C. spinulosus* Roxb., *Fl. Ind.* 1: 203. 1832. *Mariscus dilutus* (Vahl) Nees ex Wight, *Contrib.* 90. 1834. *M. microcephalus* Presl., *Reliq. Haenk.* 1: 182. 1828; FBI 6: 624. 1893.

Culms to 1 m, terete, densely shaggy. Leaves to 60 x 1 cm wide, canaliculate, cross nerves nodulose, scabrid below, sheath purplish. Umbel compound, to 10 cm, involucral bracts 5-10, overlapping, longest equal to the stem. Spike glabrous, racemose; spikelets to 80, 2-4 cm, narrow, linear, reddish-brown rachilla strait, glumes *ca* 2 x 1 mm, acute. Nut *ca* 1.5 x 0.5 mm, narrowly obovoid, beaked.

*Fl. & Fr.* March-September

*Distr.* South and South East Asia. Common in marshy areas; *PS 19813* Kannimara

**Mariscus dubius** (Rottb.) Kükenth. ex Fischer in Gamble, FPM 1644. 1931; FPL 554. 1990; FTSR 497. 1996. *Cyperus dubius* Rottb., *Descr. Ic. Rar.* 20,t.4. f.5. 1773. *Mariscus dregeanus* Kunth, *Enum. Pl.* 2: 120. 1837; FBI 6: 620. 1893 p.p.

Culms to 15 cm tall, tufted. Leaves to 20 x 5 cm, linear, basal. Spikes 1.5 cm across, globose; bracts 4, unequal, to 25 cm long. Spikelets 5 mm long, lanceolate, densely packed; glumes 3 mm long, broadly ovate, many-nerved, keeled. Nuts trigonous, ellipsoid.

*Fl. & Fr.* July-November

*Distr.* Tropical Africa, India, Indo-China to Malesia. Occasional in marshy areas; *PS 30427* Parambikulam

**Mariscus paniceus** (Rottb.) Vahl, *Enum. Pl.* 2: 373. 1805; FBI 6: 620. 1893; FPM 1644. 1931; FPL 555. 1990. *Kyllinga panicea* Rottb., *Descr. Ic.* 15. 1773. *Cyperus paniceus* (Rottb.) Boeck., *Linnaea* 36: 381. 1870.

Culms 15-30 cm high, 3-angled, 2-broad and one narrow sided. Leaves 20-30 x 0.3-0.4 cm, 1-costate, glabrous. Umbel simple; spikes 3-6, each 1-1.5 x 0.8 cm. Spikelets 3-4 x 0.6 mm, terete; glumes 4, lower two glumes smaller; third glume 3 x 1.5 mm, lanceolate, fourth glume 3.5 x 0.5 mm; stamens 2. Nut 2.5 mm long, brown.

*Fl. & Fr.* August-January

*Distr.* Indo-Malesia. Occasional in moist deciduous forests and vayals; *PS 19192* Rockpoint; *19469* Thunakkadavu; *NS 19482* Thellikkal

**Mariscus sumatrensis** (Retz.) Raynal, *Adansonia* 15: 110. 1975; FPL 556. 1990. *Kyllinga sumatrensis* Retz., *Obs. Bot.* 4: 13. 1786. *Mariscus sieberianus* Nees ex Clarke in Hook.f., FBI 6: 622. 1893; FPM 1645. 1931. *Cyperus cyperoides* (L.) Kunth, *Rev. Gen. Pl.* 3(2):333. 1898. *Scirpus cyperoides* L., *Mant. Pl.* 2: 181. 1771.

Culms 35-40 cm high. Leaves to 36 x 0.7 cm, nearly basal, midrib strongly depressed, margins recurved, scabrid. Umbel 3-4 x 5-7 cm, simple; bracts to 7-8, 20 x 0.4 cm; spikes 2.5-3 x 1 cm. Spikelets 3.5 x 1 mm, densely packed, perpendicular to the spike; glumes 4, third glume 3.2 x 2 mm, 1-nerved, fourth glume 3.2 x 1 mm, aristate 1-nerved; stamens 2. Nut curved.

*Fl. & Fr.* June-December

*Distr.* Pantropical. Common in marshy areas; *PS 19471* Thunakkadavu

#### PYCREUS P. Beauvois

- |  |                      |
|--|----------------------|
| 1. Apex of the glume obtuse, mucronate .....                                 | <b>P. pumilus</b>    |
| 1. Apex of the glume acute not mucronate.....                                | 2                    |
| 2. Nuts horizontally marked with white lines, cells vertically elongate..... | <b>P. stramineus</b> |
| 2. Nut not marked with white lines, cells isodiametric.....                  | <b>P. flavidus</b>   |

**Pycreus flavidus** (Retz.) Koyama, J. Jap. Bot. 51: 31. 1976 & in Dassan. & Fosb., Rev. Handb. Fl. Ceylon 5: 222. 1985; FPL 556. 1990. *Cyperus flavidus* Retz., Obs. Bot. 5: 13. 1788. *Pycreus globosus* (All.) Reichb. f., Fl. Germ. Excurs. 140. 1830; FPM 1627. 1931. *P. capillaris* (Koenig ex Roxb.) Nees ex Clarke in Hook.f., FBI 6: 591. 1893. *Cyperus capillaris* Koenig ex Roxb., Fl. Ind. 1: 194. 1832.

Culms 30-45 cm tall. Leaves 10-20 x 0.1 cm, glabrous, mouth of sheath with two truncate flaps. Umbel 8 x 8 cm; bracts 2-3, to 18 cm long; rays spreading. Spikelets 12-16 x 2 mm oblong, obtuse, 12-15 in a spike; glumes 2 x 1.2 mm, 30-40 in a spikelets, 3-5-nerved; keel curved, green. Nut 0.8-0.5 mm, biconvex, distinctly cuspidate, minutely muriculate, dark brown.

*Fl. & Fr.* August-January

*Distr.* South Europe, Africa and Central and South Asia. Common in marshy areas; *PS 19244* Vengoli

**Pycreus pumilus** (L.) Nees, Linnaea 9: 283. 1835; FBI 6: 591. 1893; FPM 9: 1627. 1931; FPL 557. 1990. *Cyperus pumilus* L., Cent. Pl. 2: 6. 1756. *Pycreus nitens* (Retz.) Nees, Nov. Acta Phys. Med. Acad. Caes. Leop. Carol. Nat. Cur. 19: 53. 1843; FBI 6: 591. 1893.

Culms 10-18 cm tall, slender, terete. Leaves up to 21 x 0.2 cm, linear, serrulate along the margins. Umbel 4 x 6 cm, spreading; bracts 4, unequal, longest 10-12 x 0.15 cm; rays 3-5, up to 2.5 cm long. Spikelets 1.2 x 0.3 cm, linear oblong; glumes 1.5 x 1 mm, aristate, keeled, 1-nerved, 26-34 in each spikelets. Nut 0.6-0.4 mm, truncate, cuspidate, glabrous, dark brown.

*Fl. & Fr.* August-February

*Distr.* South and South East Asia. Common on wet rocky areas; *PS 19865* Vengoli

**Pycreus stramineus** (Nees) Clarke in Hook.f., FBI 6: 589. 1893; FPM 1627. 1931; FPL 557. 1990. *Cyperus stramineus* Nees in Wight, Contrib. 74. 1834.

Culms 10-40 cm high, terete. Leaves 10-23 x 0.1-0.15 cm glabrous; sheath closed, mouth split. Umbel 2-7 cm long; bracts 2-4, unequal, 18-20 cm long; rays 0-2. Spikelets 1-2.5 x 0.3-0.5 cm, compressed, sessile, digitate; rachilla quadrangular, glabrous; glumes 2.5 x 2 mm, ovate obtuse, keeled, 2-5-nerved, reddish brown; stamens 2, filaments persistent. Nut 1.2 x 0.9 mm, apiculate, deep grey.

*Fl. & Fr.* August-January

*Distr.* Indo-Malesia. Common in marshy areas; *PS 19812* Kannimara

#### RHYNCHOSPORA Vahl

**Rhynchospora corymbosa** (L.) Brit., Trans. New York Acad. Sci. 11: 84. 1892; FPM 1672. 1931. *Scirpus corymbosus* L., Cent. Pl. 2: 7. 1756. *Rhynchospora aurea* Vahl, Enum. Pl. 2: 229. 1805; FBI 6: 670. 1893.

Rhizome globose, covered with spongy leaf sheaths. Culms 80-150 cm high. Leaves 60-90 x 0.8-1.5 cm; sheath sharply keeled, become spongy when old. Panicle 20-35 cm long. Partial

panicle corymbose. Spikelets 7-8 x 2.5 mm, clustered; all sessile; glumes 4, lower 3 sterile, uppermost one bisexual, 7.5 x 4 mm, shortly aristate, keeled with brown streaks, anthers 2.5 mm long, apiculate. Nut 3 x 1.5 mm, truncate, wrinkled with brown spots; style base 4.5 mm long conical with longitudinal depression on either sides, hypogynous bristle 8, 4.5 mm long.

*Fl. & Fr.* Throughout the year

*Distr.* Pantropical. Very common sedge in vayals; *PS 19240* Vengoli

### SCLERIA Bergius

- 1. Leaves linear; spikelets bisexual ..... **S. rugosa**
- 1. Leaves lanceolate; spikelets unisexual..... **S. caricina**

**Scleria caricina** (R. Br.) Benth., *Fl. Austral.* 7: 426. 1878; *FBI* 6: 688. 1894. *Diplacrum caricinum* R. Br., *Prodr.* 1: 241. 1810; *FPM* 1678. 1931. *D. zeylanicum* Nees in Wight, *Contrib.* 119. 1834.

Tufted annuals, culms 10-20 cm high, sub-erect, weak. Leaves scattered, 1-5 x 0.1-0.3 cm, lanceolate, scabrid along the nerves & margins; sheath rounded, closed, truncate at mouth. Cymes axillary, sessile. Female spikelets obovate, glumes 4, opposite each other, 2 mm long, aristate, 3-nerved, with a broad midrib; margins form into an appendages towards the base. Nut 0.6 x 0.4 mm, broadly ovate, obtuse, obscurely trigonous, striate, brown. Male spikelets ovate with four glumes; lower two glumes empty, upper opposed, aristate; stamens 2; filaments free.

*Fl. & Fr.* October-January

*Distr.* Tropical Asia and Australia. Common in marshy areas; *PS 30760* Vengoli

**Scleria rugosa** R. Br., *Prodr.* 240. 1810; Koyama in Dassan. & Fosb., *Rev. Handb. Fl. Ceylon* 5: 363. 1985; *FTSR* 499. 1996. *S. lateriflora* Boeck., *Linnaea* 38: 455. 1874. *S. flaccida* Clarke in Hook.f., *FBI* 6: 688. 1894, non Steud. 1855. *S. zeylanica* Trimen, *Handb. Fl. Ceylon* 5: 97. 1900, non Poir 1806.

Annuals, culms 30-55 cm high, 1-3 mm thick. Leaves 30-35 x 0.5 cm, linear, obtuse at tip; margins and nerves and wings of sheath retrorsely scabrid. Panicle 10-20 cm long; partial, bracts leafy, terminal one erect. Spikelets 3 together, 2 female and one male. Nut 3 x 2 mm, ovoid, acute, rugulose, white; disc 3-lobed, hemispherical or orbicular. Male spikelets 4.5 x 1.5 mm, ovate, glumes 3.5 x 1 mm, oblong; stamens 3, free.

*Fl. & Fr.* September-January

*Distr.* Asia and Australia. Occasional in grasslands; *PS 19955* Karimala

### POACEAE

- 1. Tall woody arborescent or shrubby plants..... 2
- 1. Perennial or annual herbs ..... 6
- 2. Lower nodes with branches ..... 3
- 2. Lower nodes without branches..... 4
- 3. Spikelets in globose heads; basal node with spinaceous root..... **Dendrocalamus**
- 3. Spikelets not in globose heads; basal node with fibrous roots ..... **Bambusa**
- 4. Stamens more than 16; fruit fleshy..... **Ochlandra**
- 4. Stamens 6; fruit not fleshy..... 5
- 5. Staminal filaments free..... **Schizostachyum**
- 5. Staminal filaments united in to a tube..... **Pseudoxytenanthera**
- 6. Spikelets unisexual..... **Coix**
- 6. Spikelets bisexual ..... 7
- 7. Stamens 6..... **Oryza**
- 7. Stamens to 3..... 8

8. Glumes deciduous along with spikelets; spikelets strictly 2-flowered .....	9
8. Glumes persistent; spikelets 1-many flowered .....	41
9. Spikelets laterally compressed in pairs, one sessile and one pedicelled, dissimilar and awned.....	10
9. Spikelets dorsally compressed, solitary, similar and awnless .....	29
10. Inflorescence a panicle .....	11
10. Inflorescence 1-many digitate or subdigitate racemes .....	20
11. Spikelets in groups of three, one sessile and two pedicelled .....	12
11. Spikelets paired .....	14
12. Inflorescence covered with long silky hairs; petiole to 5 cm.....	<b>Spodiopogon</b>
12. Inflorescence not covered with silky hairs; leaves sessile or shortly pedicelled .....	13
13. Panicles interrupted by spathes .....	<b>Apluda</b>
13. Panicles not interrupted by spathes .....	<b>Chrysopogon</b>
14. Panicles densely covered with long silky hairs .....	15
14. Panicles not as above.....	16
15. Glumes hairy; panicles cylindrical and spiciform .....	<b>Imperata</b>
15. Glumes glabrous, panicles lax .....	<b>Saccharum</b>
16. Panicle of paired racemes, one sessile, one pedicelled; plants aromatic .....	<b>Cymbopogon</b>
16. Panicles not as above; plants not aromatic.....	17
17. Panicles interrupted by spathes .....	18
17. Panicles not interrupted by spathes .....	19
18. Racemes with two involucre spikelets at base .....	<b>Themeda</b>
18. Racemes without two involucre spikelets at base .....	<b>Pseudanthistiria</b>
19. Upper lemma of sessile spikelets reduced to the base of the awn .....	<b>Capillipedium</b>
19. Upper lemma of sessile spikelets well developed.....	<b>Pseudosorghum</b>
20. Spikelets solitary, similar .....	<b>Dimeria</b>
20. Spikelets paired, dissimilar .....	21
21. Racemes solitary .....	22
21. Racemes 2-many .....	25
22. Second lemma of sessile spikelets awnless.....	<b>Rottboellia</b>
22. Second lemma of sessile spikelets awned .....	23
23. Lower spikelets of racemes awnless; upper spikelets awned, twisted together .....	<b>Heteropogon</b>
23. All spikelets of the racemes awned, awns not as above .....	24
24. Upper glumes awned; spikelets similar.....	<b>Pogonatherum</b>
24. Upper glumes not awned; spikelets dissimilar .....	<b>Dichanthium</b>
25. Racemes 2 on each peduncle.....	26
25. Racemes more than 2 on each peduncle .....	27
26. Lower glumes of sessile spikelets truncate at apex .....	<b>Apocypis</b>
26. Lower glumes of sessile spikelets acute or acuminate at apex.....	<b>Ischaemum</b>
27. Spikelets of each pair similar .....	<b>Eulalia</b>
27. Spikelets of each pair dissimilar.....	28
28. Lower glumes of sessile spikelets pitted.....	<b>Bothriochloa</b>
28. Lower glumes of sessile spikelets not pitted .....	<b>Arthraxon</b>
29. Spikelets awned or aristate .....	30
29. Spikelets not awned or aristate .....	32
30. Racemes more than 8 cm long; arranged digitally .....	<b>Alloteropsis</b>
30. Raceme to 5 cm long; arranged on a central axis.....	31
31. Leaves lanceolate; lower glumes awned .....	<b>Oplismenus</b>
31. Leaves linear; lower glume awnless.....	<b>Echinochloa</b>
32. Lower glumes absent or reduced to a minute scale.....	33
32. Lower glume well developed.....	35
33. Spikelets paired; lemma of upper floret thin with hyaline margins .....	<b>Digitaria</b>
33. Spikelets solitary; lemma of upper florets crustaceous .....	34

34. Spikelets oblong-lanceolate; lower glume strictly absent.....	<b>Axonopus</b>
34. Spikelets ovate-orbicular; lower glume a minute scale .....	<b>Paspalum</b>
35. Spikelets subtended by bristles .....	<b>Setaria</b>
35. Spikelets not subtended by bristles.....	36
36. Inflorescence of racemes arranged on a central axis .....	37
36. Inflorescence of lax or contracted panicle .....	38
37. Spikelets adaxial, oblong.....	<b>Brachiaria</b>
37. Spikelets abaxial, ovate.....	<b>Paspalidium</b>
38. Panicle very much contracted, cylindrical .....	<b>Sacciolepis</b>
38. Panicle lax, not cylindrical .....	39
39. Second lemma with two basal scars.....	<b>Ichnanthus</b>
39. Second lemma without such scars.....	40
40. Spikelets gibbous and laterally compressed.....	<b>Cyrtococcum</b>
40. Spikelets not gibbous and laterally compressed .....	<b>Panicum</b>
41. Leaves tessellately nerved .....	<b>Centotheca</b>
41. Leaves not tessellately nerved.....	42
42. Spikelets awned .....	43
42. Spikelets awnless.....	49
43. Spikelets with one floret.....	44
43. Spikelets with 2 or more florets.....	46
44. Awns of the spikelets trifid .....	<b>Aristida</b>
44. Awns of the spikelets simple.....	45
45. Inflorescence a panicle .....	<b>Garnotia</b>
45. Inflorescence a solitary raceme .....	<b>Perotis</b>
46. Spikelets with 3-7 fertile florets .....	<b>Tripogon</b>
46. Spikelets with one fertile floret .....	47
47. Inflorescence of 3-15 digitate racemes, upper lemma empty or reduced .....	<b>Chloris</b>
47. Inflorescence a panicle or of racemes arranged on a central axis; upper lemma developed .....	48
48. Panicle much contracted, spiciform, base of leaves amplexicaule.....	<b>Jansenella</b>
48. Panicles lax or slightly contracted, base of leaves not amplexicaule.....	<b>Arundinella</b>
49. Inflorescence of solitary, digitate or subdigitate racemes .....	50
49. Inflorescence a panicle .....	52
50. Spikelets with one floret.....	<b>Cynodon</b>
50. Spikelets with 2-many florets.....	51
51. Upper glumes aristate; rachis ends in a point .....	<b>Dactyloctenium</b>
51. Upper glumes not aristate; rachis ends in a spikelets.....	<b>Eleusine</b>
52. Spikelets with one floret.....	<b>Sporobolus</b>
52. Spikelets with 2-many florets.....	53
53. Glumes equal to or longer than the spikelets.....	<b>Isachne</b>
53. Glumes shorter than the spikelets.....	54
54. Paleas 2-keeled; keels ciliate or scabrid.....	55
54. Paleas not 2-keeled, glabrous .....	56
55. Lower glumes 1-3 nerved, upper 3-5 nerved .....	<b>Helictotrichon</b>
55. Lower glumes 1-nerved, upper 1-3 nerved .....	<b>Eragrostis</b>
56. Spikelets with one bisexual floret .....	<b>Coelachne</b>
56. Spikelets with more than one bisexual floret.....	<b>Zenkeria</b>

**ALLOTEROPSIS** J. S. Presl ex C. B. Presl

**Alloteropsis cimicina** (L.) Stapf in Prain, Fl. Trop. Africa 9: 487. 1919; FPM 1766. 1934; FKG 214. 1991; FTSR 502. *Milium cimicinum* L., Mant. Pl. 2: 184. 1771. *Axonopus cimicinus* (L.) P. Beauv., Ess. Agrost. 154. 1812; FBI 7: 64. 1896.

Annuals, culms 15-45 cm high, 3-5-together; nodes hairy. Leaves to 7 x 1.2 cm, lanceolate, cordate at base; margin ciliate; sheath rounded, hairy; ligule a row of hairs. Racemes 6-8, digitate, to 15 cm long; rachis triquetrous, serrulate. Spikelets similar; pedicels unequal; lower glume 2 x 1 mm, acuminate 3-nerved; upper 3.5 x 2 mm, acute, 5-nerved, ciliate along margins. Lower floret male, upper bisexual; first lemma 2.5 x 1 mm, ovate, obtuse, 5-nerved; palea hyaline, oblong; second lemma ovate, aristate, 3-nerved; palea 1.5 x 1 mm, 2-nerved. Stamens 3, free; ovary oblong; styles 2, free; stigmas feathery.

*Fl. & Fr.* Throughout the year

*Distr.* Old World tropics. Common in dry deciduous forests; *PS 30684* Keerappadi

#### APLUDA Linnaeus

**Apluda mutica** L., Sp. Pl. 82. 1753; FPM 1750. 1934; FKG 32. 1991; FTSR 502. 1996. *A. mutica* var. *aristata* (L.) Hack. ex Backer, Handb., Fl. Java 2: 54. 1928; FPL 563. 1990. *A. varia* Hack. ssp. *aristata* (L.) Hack., Monogr. Andropog. in A. & DC., Monogr. Phan. 6: 196. 1889; FBI 7: 150. 1896. *A. aristata* L., Amoen. Acad. 4: 303. 1759; FPM 1950. 1934. *A. varia* Hack. in DC., Monogr. Phan. 6: 197. 1889; FBI 7: 150. 1896.

Perennials; culms 30-150 cm high, erect, 2-5-together. Leaves 10-30 x 1.2 cm, linear-lanceolate, narrowed to the base; ligule membranous. Panicle lax; raceme enclosed by a boat shaped spathe. Sessile spikelets 7 x 3 mm; paleate containing 3 stamens; second lemma 2-cleft and awned at the sinus; palea oblong, 2-keeled, hyaline; stamens 3. Pedicelled spikelets reduced to empty glumes or carries a male floret.

*Fl. & Fr.* October-February

*Distr.* Tropical Asia and Australia. Occasional in moist deciduous forests; *PS 19860* Vengoli

#### APOCOPIS Nees

**Apocopis mangalorensis** (Hochst.) Henrard, Blumea 4: 523. 1941; FKG 33. 1991; FTSR 503. 1996. *Amblyachyrum mangalorensis* Hochst., Flora 39. 26. 1856.

Annuals; culms 30-45 cm high, tufted; nodes glabrous. Leaves 2-6 x 0.2-0.7 cm ovate-lanceolate, base rounded, densely covered with bulbous based hairs; sheath keeled, densely hairy; ligule membranous. Racemes 2, 2 cm long, compressed. Spikelets similar 4 x 2.5 mm, dorsiventrally compressed, brown; lower glume oblanceolate; upper glume oblong, 2-keeled; lower floret empty, upper bisexual; first lemma oblong, hyaline; palea oblong, hyaline; second lemma bifid at apex and awned; palea ciliate along the margins.

*Fl. & Fr.* September-February

*Distr.* Endemic to Peninsular India. Common in degraded forest areas; *PS 19861* Vengoli

#### ARISTIDA Linnaeus

**Aristida hystrix** L. f., Suppl. Pl. 113. 1781; FBI 7: 225. 1896; FPM 1809. 1934; FKG 326. 1991.

Annuals or perennials; culms to 60 cm high, tufted, geniculate, nodes glabrous. Leaves 5-10 x 0.1-0.2 cm, narrow, glabrous; sheath rounded, glabrous; ligule a row of hairs. Panicle 10-15 x 7 cm, lax; branches filiform, glabrous. Spikelets similar, 7-8 mm long, lanceolate, solitary, pedicelled; lower glume glabrous; upper glume acuminate, keeled; floret one; lemma lanceolate, 3-nerved, awned; awns 10-15 mm long; palea minute, hyaline.

*Fl. & Fr.* October-January

*Distr.* India and Sri Lanka. Fairly common in dry deciduous forests; *PS 30687* Keerappadi

#### ARTHRAOXON P. Beauvois

**Arthraxon lancifolius** (Trimen) Hochst., Flora 39: 188. 1856; FPM 1729. 1934; FKG 38. 1991. *Andropogon lancifolius* Trimen, Bull. Acad. Sci. Petersb. ser. 6: 271. 1832.

Culms procumbent; lower nodes rooting, nodes hairy. Leaves to 1.5 x 0.5 cm, ovate, acute, margins minutely serrulate, glabrous, base rounded with few long hairs; ligule a row of hairs.



Racemes 2, up to 2 cm long. Sessile spikelets 2.5-3 mm long, lanceolate, acuminate; lower glume 2-3 mm long, shortly bifid, smooth; upper glume shorter, aristate; first lemma 1 mm long; awn 8 mm long, geniculate, from the base of second lemma.

*Fl. & Fr.* October-January

*Distr.* Indo-Malesia. Common in moist deciduous forests; *PS 19833* Vengoli

#### ARUNDINELLA Raddi

1. Spikelets not awned ..... **A. leptochloa**
1. Spikelets awned ..... 2
2. Second lemma with seta on either side of the awn ..... **A. mesophylla**
2. Second lemma without seta ..... 3
3. Panicles effuse; spikelets to 1.5 mm long ..... **A. pumila**
3. Panicles contracted; spikelets more than 3 mm long ..... **A. ciliata**

**Arundinella ciliata** (Roxb.) ex Miq. in Verh., Kon. Ned. Inst. 3: 30. 1851; FPL 564. 1990; FKG 335. 1991; FTSR 504. 1996. *Holcus ciliatus* Roxb., Fl. Ind. 1: 321. 1820. *Arundinella holcooides* sensu Gamble, FPM 1801. 1934, non Trin. 1836. *A. agrostoides* sensu Hook. f., FBI 7: 71. 1896, non Trin. 1836.

Densely tufted annuals; culms 15-60 cm high; nodes bearded. Leaves 5-18 x 0.5-1 cm, ovate-lanceolate, rounded at base, glabrous; sheath rounded, covered with bulbous based hairs; ligule a fimbriate membrane. Panicle 5-25 cm long, congested; rachis and axis covered with bulbous based hairs. Spikelets 4 x 1 mm, lanceolate, pedicelled; glumes similar, 4 mm long, ovate, acuminate, 5-nerved; first lemma 2.5 x 1 mm, lanceolate, 3-nerved, empty; second lemma 1 x 0.5 mm, hyaline; awn 5 mm long.

*Fl. & Fr.* November-May

*Distr.* Endemic to Peninsular India. Occasional in rocky areas; *PS 19943* Karimala; *19834* Vengoli

**Arundinella leptochloa** (Nees ex Steud.) Hook.f., FBI 7: 76. 1890; FPM 1802. 1934; FPL 565. 1990; FKG 336. 1991; FTSR 504. 1996. *Panicum leptochloa* Nees ex Steud., Syn. Pl. Glum. 1: 62. 1854. *Arundinella lawsonii* Hook.f., FBI 7: 76. 1896.

Perennials; culms 30-120 cm high, tufted; nodes sparsely hairy. Leaves 7-30 x 0.5-0.8 cm, linear, densely tubercled hairy; sheaths rounded, hairy, ligule a narrow fimbriate membrane. Panicle 5-20 cm long, dense; axis and branches tubercled hairy. Spikelets pedicelled, 3-3.5 mm, long; glumes glabrous; lower 2.5 x 1.5 mm, ovate, acute; upper 3.5 x 2 mm, ovate, acuminate; first lemma 3 x 1.5 mm, ovate-lanceolate, 5-nerved, second lemma ovate, obtuse, 2-fid at apex, awnless.

*Fl. & Fr.* September-January.

*Distr.* Peninsular India and Sri Lanka. Fairly common in grasslands; *PS 19691* Karimala

**Arundinella mesophylla** Nees ex Steud., Syn. Pl. Glum. 1: 115. 1854; FBI 7: 69. 1896; FPM 1801. 1934; FPL 565. 1990; FKG 337. 1991; FTSR 504. 1996.

Tufted perennials, culms 30-70 cm high; nodes glabrous. Leaves 4-8 x 0.4-0.6 cm, ovate-lanceolate, rounded at base; sheath rounded, glabrous, ciliate along margins; ligule a row of hairs. Panicle 3-10 cm long, branches 5-10, racemiform; axis, rachis and glumes covered with bulbous based hairs. Spikelets 4-5 mm long, densely packed; glumes similar, 4-5 mm long; first lemma lanceolate, acute, reddish brown; palea smaller, hyaline; second lemma 2 x 1 mm, subcoriaceous, with seta on either sides of the awn; awn 5-6 mm long.

*Fl. & Fr.* October-January

*Distr.* Endemic to South India. Common in moist deciduous forests and plantations; *PS 30549* Pandaravarai; *19868* Vengoli; *30686* Keerappadi

**Arundinella pumila** (Hochst. ex A. Rich.) Steud., Syn. Pl. Glum. 1: 114. 1854; FPM 1801. 1934; FPL 565.1990; FKG 342. 1991. *Acratherum pumilum* Hochst. ex A. Rich., Tent. Fl. Abyss. 2: 414. 1851. *Arundinella tenella* Nees ex Steud., Syn. Pl. Glum. 1: 115. 1854; FBI 7: 71. 1896.

Slender annuals; culms 15-30 cm high, erect, few together or solitary; nodes hairy. Leaves 4-15 x 0.5-1 cm, linear-elliptic, densely hairy; sheath rounded, covered with bulbous based hairs; ligule a fimbriate membrane, 1.5 mm long. Panicle effuse, 7-25 cm long; axis & branches tubercled hairy, slender. Spikelets many, 1-2 mm long, lanceolate, glabrous; glumes similar, 1.5 x 0.5 mm ovate, acute; first lemma similar to upper glume; second lemma 0.7-1 x 0.5 mm, lanceolate; awn 2.5 mm long.

*Fl. & Fr.* September-December

*Distr.* Tropical Africa and Asia. Occasional in grasslands; *PS 19957* Karimala

#### AXONOPUS P. Beauvois

**Axonopus compressus** (Sw.) P. Beauv., Ess. Agrost. 12: 154. 1812; FKG 216. 1991. *Milium compressum* Sw., Prodr. 24. 1788.

Tufted perennials; culms 20-45 cm high, decumbent at base, sometimes flattened or compressed, nodes glabrous. Leaves 2-25 x 0.5-1.2 cm; ovate-lanceolate, acute or obtuse, hairy along the margins; sheath keeled, glabrous; ligule a narrow membrane; racemes 3-5, 5-8 cm long, sub-digitate, on a slender axis, narrow; rachis triquetrous, smooth. Spikelets 2-2.5 mm long, solitary, sessile, in two rows along the rachis; lower glume absent; upper glume 2 x 1 mm, ovate, 5-7 nerved, glabrous; Flowers two; lower empty or staminate, upper bisexual; first lemma ovate, acute, 3-nerved, epaleate; second lemma 2 x 0.75 mm, oblong, hyaline; palea oblong.

*Fl. & Fr.* July-February

*Distr.* Tropics and subtropics. common in open areas of moist deciduous forests and vayals; *PS 19478, 19897* Thellikkal

#### BAMBUSA Schreber

**Bambusa bambos** (L.) Voss in Vilmorin, Blumengartnerei 1: 1189. 1896; FTSR 505. 1996. *Arundo bambos* L., Sp. Pl. 81. 1753. *B. arundinacea* (Retz.) Willd., Sp. Pl. 2: 245. 1799; FBI 7: 395. 1896; FPM 1859. 1934; FPL 566. 1990.

Tufted tree grass, thorny, cylindric, hollow; branches from each node, clustered, horizontal. Culm sheaths glabrous; margin hairy; blade triangular, 15 x 10 cm, thickly hairy within. Leaves to 20 cm long, oblong-lanceolate, serrate along the margins; sheath rounded, ligule membranous; contraligule present. Panicle to 35 cm long, terminal and axillary; branches spreading. Spikelets 10-18 mm long, crowded, glabrous. Glumes 2, subequal, ovate, acute; florets many; lower lemmas ovate, acute, empty; upper lemmas similar to lower, bisexual; palea coriaceous, 2 keeled; hairy along the keels; stamens 4-6, free.

*Fl. & Fr.* sporadic, most of the culms in Keerappadi and surrounding areas were flowered during the year 2001

*Distr.* India and Sri Lanka. Common all over the Sanctuary except evergreen forests; *PS 30524* Pandaravarai

#### BOTHRIOCHLOA O. Kuntze

**Bothriochloa pertusa** (L.) A. Camus, Ann. Soc. Linn. Lyon 76: 164. 1931; FKG 54. 1991. *Holcus pertusus* L., Mant. 2: 301. 1771. *Amphilophis pertusa* (L.) Nash ex Stapf, Agr. News. Bridge. 15: 179. 1916; FPM 1731. 1934. *Andropogon pertusus* (L.) Willd., Sp. Pl. 4: 922. 1806; FBI 7: 173. 1896.

Perennials with creeping stolon; culms 15-50 cm tall; nodes bearded. Leaves 6-8 x 0.2-0.4 cm, linear, with long bulbous based hairs towards the base; sheath keeled, pubescent near the mouth, ligule a narrow membrane. Racemes 2-6 cm long, densely villous, partially spreading.

Sessile spikelets 3-4 mm long; lower glume coriaceous, densely hairy below the middle; upper glume boat shaped; awn 1.2-1.6 cm long; anthers 2 mm long. Pedicelled spikelet 3-4 mm long.

*Fl. & Fr.* October-January

*Distr.* Arabia eastwards to South East Asia, Pakistan, India, Tropical Africa. Common in degraded forest areas and road cuttings; *PS 19867*Vengoli

#### BRACHIARIA (Trinius) Grisebach

**Brachiaria ramosa** (L.) Stapf in Prain, Fl. Trop. Africa. 9: 542. 1919; FPM 1770. 1934; FKG 223. 1991. *Panicum ramosum* L., Mant. Pl. 1: 29. 1767; FBI 7: 36. 1896.

Annuals; culms 40 cm high, loosely tufted; nodes hairy. Leaves 10-15 x 0.5-1.3 cm, lanceolate, glabrous; sheath keeled; ligule a fimbriate membrane. Raceme 10-15, 7-8 cm long; rachis triquetrous, scabrous. Spikelets distant, paired, 2.5 x 1-2 mm, ovate; lower glume 1 x 1.5 mm, orbicular; upper glume 2.5 x 1.5 mm, ovate, thinly pubescent; second lemma 2 x 1 mm, coriaceous, rugose, 5-nerved.

*Fl. & Fr.* September-January

*Distr.* Africa and Tropical Asia. Common in moist deciduous forests and plantations; *PS 19486* Thellikkal

#### CAPILLIPEDIUM Stapf

**Capillipedium assimile** (Steud.) A. Camus in Lecomte, Fl. Gen. Indo-China 7: 314. 1892; FKG 55. 1991; FTSR 506. 1996. *Andropogon assimilis* Steud. in Zoll., Syst. Verz. 58. 1854; FBI 7: 179. 1896. *Capillipedium glaucopsis* Stapf. in Hook., Icon. Pl. 31: t. 3085. 1922; FPM 1730. 1934.

Annuals, culms 30-60 cm high, nodes bearded. Leaves 5-20 x 0.5-1.2 cm, lanceolate, scabrid; sheath keeled, glabrous; ligule membranous, hairy around. Panicles 8-10 cm long, effuse; axils of racemes with long hairs; joints densely villous. Sessile spikelets 3 x 1.5 mm, oblong; lower glume 3 x 1.5 mm, ovate, 5-nerved, ciliate along margins; upper glume ovate, keeled, 3-nerved; lower floret empty, upper bisexual; first lemma 1.5 x 1 mm, ovate, obtuse; second lemma forms the base of the awn; paleas absent; stamens 3; styles 2, free; stigma plumose. Pedicelled spikelets 3 x 1.5 mm; pedicels glabrous; lower glume 3 x 1 mm, 8-nerved; upper glume hyaline; first lemma oblong, hyaline; stamens 3; upper floret absent.

*Fl. & Fr.* August-December

*Distr.* India, Japan and China. Common in degraded forest areas; *PS 30779*Vengoli

#### CENTOTHECA Desvoux

**Centotheca lappacea** (L.) Desv., Nouv. Bull. Soc. Philom. 2: 189. 1810; FBI 7: 332. 1896; FPM 1848. 1934; FPL 567. 1990; FKG 354. 1991; FTSR 507. 1996. *Cenchrus lappaceus* L., Sp. Pl. ed. 2, 1488. 1763.

Tufted perennials; culms 30-70 cm high, robust, densely tufted, erect; nodes glabrous. Leaves 5-15 x 0.5-2.5 cm, elliptic-oblong, cuneate at base, glabrous; sheath keeled, glabrous; ligule a fimbriate membrane. Panicles 15-25 cm long, effuse, branches distant. Spikelets 5-6 mm long, elliptic, clustered; glumes similar, distichous, 2.5 x 1 mm, 5-nerved, keeled; florets 2-3, similar; lemma 3.5 x 0.4-1.5, lanceolate, obtuse, mucronate, 7-nerved, densely bristled along the dorsal surface; palea 2.5 x 0.5 mm, 2-nerved, 2-keeled; stamens 2; ovary elliptic; styles 2, free; stigmas plumose; the terminal floret usually reduced to a rachilla only.

*Fl. & Fr.* July-December

*Distr.* South East Asia and Tropical Africa. Fairly common in the moist deciduous forests; *PS 30780* Padippara

#### CHLORIS Swartz

**Chloris dolichostachya** Lagasca, Gen. Sp. Pl. 5. 1816; FKG 358. 1991. *Chloris incompleta* Roth, Nov. Pl. Sp. 60. 1821; FBI 7: 290. 1896; FPM 1938. 1934.

Perennials. Leaves to 30 x 0.8 cm, lanceolate, acuminate, base obtuse, pilose, convolute; ligule membranous. Spikes digitate, to 25 cm, 3-8 slender, rachis triquetrous, minutely serrate; spikelets 5 mm, linear, awned, 2-flowered; callus bearded; lower glume lanceolate, 2 mm, hyaline, 1 nerved, upper glume 5 mm, lanceolate, aristate, acuminate; fertile lemmas oblong, chartaceous, awns to 15 mm, palea 4 mm, lanceolate, delicate, sterile lemmas reduced to awns, to 6 mm.

*Fl. & Fr.* November-February

*Distr.* China, Indo-Malesia to Australia. Fairly common in degraded forest areas; *PS 19195* Vengoli; *NS 30683* Keerappadi

#### CHRYSOPOGON Trinius

1. Ligule a tuft hairs; pedicelled spikelets to 5 mm long..... **C. hackelii**
1. Ligule a fimbriate membrane; pedicelled spikelets 8-13 mm long ..... **C. zeylanicus**

**Chrysopogon hackelii** (Hook.f.) Fischer in Gamble, FPM 1739. 1934; FPL 568. 1990; FKG 62. 1991; FTSR 508. 1996. *Andropogon hackelii* Hook.f., FBI 7: 194. 1896.

Robust perennials; culms 80-150 cm high, nodes glabrous. Leaves 15-40 x 0.4-1 cm, linear-lanceolate, glabrous; sheath strongly keeled; ligule a tuft of hairs. Panicle 10-20 cm long, pyramidal. Sessile spikelets 5 x 1.5 mm, lanceolate; lower glume 5 x 1.5 mm, glabrous, aristate, arista 5 mm long; upper glume 5 mm long, linear-oblong; first lemma 3 x 1 mm, hyaline, ciliate along margins; second lemma oblong; awn 20 mm long; anther 2.5 mm long; pedicelled spikelets 4-5 mm long, acute, awnless.

*Fl. & Fr.* September-January

*Distr.* Endemic to Peninsular India. Common in grasslands; *PS 19685* Karimala

**Chrysopogon zeylanicus** (Nees ex Steud.) Thw., Enum. Pl. Zeyl. 366. 1864; FPM 1739. 1934; FKG 65. 1991; *Andropogon zeylanicus* Nees ex Steud., Syn. Pl. Glum. 1: 397. 1854; FBI 7: 192. 1896.

Perennials, tufted. Leaves to lanceolate, 30 x 0.5 cm, apex acute, pubescent, flat; ligule hairy; sheath to 7 cm, hairy. Panicles to 25 cm; callus with brown hairs; sessile spikelets 6-8 mm, awned, lower glume, 6 x 1 mm, oblong, upper oblong, 6 mm, notched and aristate at apex, second lemma awned, to 25 mm; pedicelled spikelets to 13 mm, linear-lanceolate, pedicels 3 mm, densely pubescent, with chocolate brown hairs.

*Fl. & Fr.* December-February

*Distr.* South India and Sri Lanka. Occasional in disturbed forest areas; *PS 19855* Vengoli

#### COELACHNE R. Brown

**Coelachne simpliciuscula** (Wight & Arn. ex Steud.) Benth., J. Linn. Soc. Bot. 19: 93. 1881; FKG 415. 1991. *Panicum simpliciusculum* Wight & Arn. ex Steud., Syn. Pl. Glum. 1: 96. 1854. *Coelachne pulchella* R. Br. var. *simpliciuscula* (Wight & Arn. ex Steud.) Hook.f., FBI 7: 271. 1896; FPM 1804. 1934.

Aquatic or marshy annuals; culms 10-25 cm high, erect or decumbent; nodes bearded. Leaves 2-5 x 0.2-0.5 cm, ovate-lanceolate, glabrous, rounded at base; sheath keeled, glabrous, ligule a row of hairs. Panicle 2-7 cm long, contracted, cylindrical, glabrous. Spikelets similar, 2 x 1 mm, ovate, glabrous; glumes similar, ovate-orbicular, 3-nerved; florets 2; lower bisexual, upper barren or with a rudimentary ovary; first lemma 2 x 1 mm, ovate, acute, hyaline; palea 2 x 1 mm elliptic; upper floret exerted.

*Fl. & Fr.* November-January

*Distr.* South East Asia, China and Madagascar. Common in grasslands; *PS 18936* Karimalagopuram

## COIX Linnaeus

**Coix lacryma jobi** L., Sp. Pl. 972. 1753; FBI 7: 100. 1896; FPM 1705. 1934; FPL 569. 1990; FKG 207. 1991; FTSR 508. 1996.

Tufted perennials; culms 25-100 cm tall, robust; nodes glabrous. Leaves 10-60 x 1-3.5 cm, lanceolate, scabrous; sheath rounded; ligule a fimbriate membrane. Inflorescence a false panicle with groups of peduncled racemes. Spikelets dissimilar, unisexual. Female spikelet 3-10 mm long, solitary at the base of the raceme, globose, enclosed in a white shiny case; lower glume oblong; upper ovate; lower floret barren; upper floret female. Male spikelets 5-15 x 2-4 mm, 2-4 in each raceme, lanceolate; lower glume lanceolate; upper glume oblong; lower floret male, upper empty, first lemma hyaline; palea delicate.

*Fl. & Fr.* November-January

*Distr.* Tropical Africa; introduced to India. Occasional near the water courses; *PS 19203* Rockpoint

## CYMBOPOGON Sprengel

1. Leaves 10-20 cm long; base cordate..... **C. caesius**  
1. Leaves 20-60 cm long; base not cordate ..... **C. flexuosus**

**Cymbopogon caesius** (Nees ex Hook.f. & Arn.) Stapf, Kew Bull. 1906: 360. 1906; FPM 1757. 1934; FKG 69. 1991. *Andropogon caesius* Nees ex Hook. & Arn., Bot. Beach Voy. 244. 1838. *Andropogon schoenanthus* var. *gracillimus* Hook.f., FBI 7: 205. 1896.

Annuals or Perennials; culms 50-100 cm high, erect; nodes glabrous. Leaves 10-30 cm long, lanceolate, rounded or cordate at base, glaucous below, glabrous; sheath glabrous; ligule 5 mm wide, membranous. Panicles 10-15 cm long, contracted. Racemes 1.5 cm long. Sessile spikelets 4 x 1.5 mm, oblong; lower glume oblong, narrowly winged along margins on upper half; upper glume boat-shaped, keeled; first lemma 3 mm long, oblong; second lemma 2-cleft; awn 12 mm long. Pedicelled spikelets 4 x 1 mm, elliptic, awnless.

*Fl. & Fr.* October-January

*Distr.* India, Pakistan, Sri Lanka, Arabia, East Africa from Sudan to South Africa. Fairly common in deciduous forests; *PS 30690* Keerappadi

**Cymbopogon flexuosus** (Nees ex Steud.) Wats., Atk. Gaz. N. W. Prov. Ind. 392. 1882; FPM 1756. 1934; FPL 569. 1990; FKG 71. 1991; FTSG 509. 1996. *Andropogon flexuosus* Nees ex Steud., Syn. Pl. Glum. 1: 388. 1854. *A. nardus* var. *flexuosus* (Nees ex Steud.) Hack. in DC., Monogr. Phan. 6: 603. 1889; FBI 7: 207. 1896.

Perennials; culms 60-300 cm tall, robust; nodes glabrous. Leaves 15-60 x 1-2 cm, linear-lanceolate; upper ones rounded at base, glaucous. Panicle 20-75 cm long, lax, reddish with drooping racemes; racemes 1.5-3 cm long slender, joints and pedicels hairy. Sessile spikelets 4 x 1 mm, lanceolate; lower glume oblong, winged at apex, margins infolded; first lemma hyaline, 3 mm long; second lemma with filiform lobes; awn 12 mm long; anthers 2 mm long. Pedicelled spikelets 4 mm long; pedicels hairy.

*Fl. & Fr.* November-January

*Distr.* India and South East Asia. Common in grasslands; *PS 19694* Karimala

## CYNODON Richard

**Cynodon dactylon** (L.) Pers., Syn. Pl. 1: 85. 1805; FBI 7: 288. 1896; FPM 1835. 1934; FPL 570. 1990; FKG 360. 1991; FTSG 510. 1996. *Panicum dactylon* L., Sp. Pl. 58. 1753.

Perennials; culms 5-30 cm long, stoloniferous; nodes glabrous. Leaves 2-5 x 0.2-0.7 cm, ovate-lanceolate, glabrous, rounded at base; sheath keeled, glabrous; ligule a fimbriate membrane. Racemes 3-6 cm long, digitate; rachis flat, glabrous, with two rows of spikelets. Spikelets

similar, 2.5 mm long, ovate-lanceolate, glabrous; floret one; lemma 2 x 1.5 mm, 1-nerved, strongly keeled; keel ciliate; palea 2 x 0.5 mm, 2-nerved, curved.

*Fl. & Fr.* Throughout the year

*Distr.* Tropical and warm temperate regions of the world. Common in degraded forest areas and plantations; *PS 19481* Thellikkal

#### CYRTOCOCCUM Stapf

1. Upper glume and lower lemma with glochidiate hairs..... **C. muricatum**
1. Upper glume and lower lemma without glochidiate hairs ..... 2
2. Panicles contracted; pedicels shorter than the spikelets ..... **C. oxyphyllum**
2. Panicles lax, effuse; pedicels longer than the spikelets ..... **C. patens**

**Cyrtococcum muricatum** (Retz.) Bor, Grass. Bur. Cey. Ind. Pak. 291. 1960; FKG 230. 1991. *Panicum muricatum* Retz., Obs. Bot. 4: 18. 1786.

Annuals; culms 10-35 cm high, erect or creeping, rooting at lower nodes; nodes glabrous. Leaves 2-5 x 0.5-1.3 cm, ovate-lanceolate, hairy below; sheath keeled, margins hairy; ligule membranous. Panicle 10-20 cm long, erect; racemes 1-2 cm long, arranged distantly on an axis, rachis angled, smooth. Spikelets 4 x 2 mm, few in each raceme; lower glume cuspidate; upper glume curved, glochidiate hairy; first lemma 4 x 2.5 mm, paleate; second lemma 3 x 1 mm, ovate, acute, 3-nerved; palea ovate, acute, 2-nerved.

*Fl. & Fr.* Throughout the year

*Distr.* Pantropical. Occasional in grasslands; *PS 19944* Karimala

**Cyrtococcum oxyphyllum** (Steud.) Stapf in Hook., Ic. Pl. t. 3096. 1922; FPM 1786. 1934; FKG 231. 1991; FTSR 510. 1996. *Panicum oxyphyllum* Steud., Syn. Pl. Glum. 1: 65. 1854. *P. pilipes* Nees & Arn. ex Buese in Miq., Pl. Jungh. 3: 376. 1854; FBI 7: 57. 1896.

Perennials or annuals; culms 20-50 cm high, slender, trailing or erect, rooting from lower nodes; nodes glabrous. Leaves 5-15 x 0.2-1.5 cm, lanceolate, cuneate at base, hairy along the margins; sheath keeled, margin ciliate; ligule membranous, truncate. Panicle contracted, erect. Spikelets 1.5 x 1 mm, with smaller pedicels; glumes sub-equal, ovate, glabrous, upper larger; first lemma 1.5 x 1 mm, epaleate; second lemma 1 x 1 mm, 3-nerved; palea 1 x 0.5 mm, 2-nerved.

*Fl. & Fr.* Throughout the year

*Distr.* Indo-Malesia and China. Common in moist deciduous forests and plantations; *PS 18816* Parambikulam

**Cyrtococcum patens** (L.) A. Camus, Bull. Mus. Hist. Nat. Paris 27: 118. 1921; FPM 1786. 1934; FKG 231. 1991. *Panicum patens* L., Sp. Pl. 58. 1753. *Cyrtococcum radicans* (Retz.) Stapf in Hook. Ic. Pl. t. 3096. 1922; FPM 1786. 1934. *Panicum radicans* Retz., Obs. Bot. 4: 18. 1786.

Annuals; culms 20-30 cm high, creeping, rooting from nodes; nodes sparsely hairy. Leaves 3-7 x 1-1.5 cm, elliptic, cuneate at base, glabrous; sheath keeled, ciliate along one margin; ligule membranous. Panicle 10-25 x 5-12 cm, lax; rachis and pedicels filiform. Spikelets 1.5 x 1 mm; glumes equal, concave, acute; first lemma 1.5 x 1 mm, ovate, acute, 3-nerved; second lemma 1.5 x 1 mm, ovate, acute, crustaceous, 3-nerved palea, 1.5 x 1 mm, oblong, subcoriaceous.

*Fl. & Fr.* September-December

*Distr.* Tropical Asia. Common in degraded forest areas; *PS 19222* Vengoli

#### DACTYLOCTENIUM Willdenow

**Dactyloctenium aegyptium** (L.) P. Beauv., Ess. Agrost. 15. 1812; FPM 1840. 1934; FTSR 511. 1996. *Cynosurus aegyptius* L., Sp. Pl. 72. 1753. *Eleusine aegyptius* (L.) Desf., Fl. Atlant. 1: 85. 1798.

Tufted annuals. culms 10-40 cm high, suberect or decumbent; nodes glabrous. Leaves 5-20 x 0.5-0.7 cm, oblong-lanceolate, rounded at base, glabrous; ligule a fimbriate membrane. Racemes 3-6, digitate, each 1-3 cm long; rachis flat, scabrid, ends in a sharp point. Spikelets similar, 4 x 2.5 mm, ovate, acute; lower glume 3 x 1.5 mm, ovate, 1-nerved; upper glume 2.5 x 1.5 mm, ovate, aristate, 1-nerved; keeled; florets 3-4; lemmas 3 x 1.5 mm, 3-nerved, keeled, mucronate; palea ovate, 2-nerved, 2-keeled; stamens 3, free; ovary oblong; styles 2, free; stigmas plumose.

*Fl. & Fr.* Throughout the year

*Distr.* Old World Tropics. Common in moist deciduous forests and degraded forest areas; *PS 30816* Vengoli

#### DENDROCALAMUS Nees

**Dendrocalamus strictus** (Roxb.) Nees, *Linnaea* 9: 476. 1834; *FBI* 7: 404. 1897; *FPM* 1858. 1934. *Bambos stricta* Roxb., *Pl. Corom.* 1: 58, t. 80. 1798.

Culms to 15 m high, unarmed. Leaves to 16 x 1.5 cm, ovate-lanceolate, apex long acuminate, spinescent; ligule dentate. Heads of spikelets globose, to 2.5 cm across; spikelets 6 mm long, ovate, lower glume 4 mm, upper 4.5 mm, ovate, lemmas 2, 5 mm, broadly ovate with a mucro; stamens 6, filaments free, 0.2 mm, anthers 2.5 mm, oblong.

*Fl.* A few culms flowered during the year 2000

*Distr.* South Asia. Rare in rocky areas of deciduous forests; *PS 19296* Parambikulam

#### DICHANTHIUM Willemet

**Dichanthium oliganthum** (Hochst. ex Steud.) Cope, *Kew Bull.* 35: 703. 1980; *FKG* 79. 1991; *FTSR* 511. 1996. *Andropogon oliganthus* Hochst. ex Steud., *Syn. Pl. Glum.* 1: 368. 1854; *FBI* 7: 201. 1896. *Indochloa oligantha* (Hochst. ex Steud.) Bor, *Kew Bull.* 9: 79. 1954. *Heteropogon oliganthus* (Hochst. ex Steud.) Blatt. & McCann, *JBNHS* 32: 623. 1928; *FPM* 1744. 1934.

Annuals; culms 5-25 cm high, tufted; nodes glabrous. Leaves 2-7 x 0.5-0.8 cm, ovate-lanceolate; rounded at base, tomentose, ciliate along the margins; sheath keeled, ligule 2 mm wide, membranous. Raceme solitary, terminal, 2-4 cm long. Sessile spikelets 4 x 1.5 mm, glabrous; lower glume 4 x 1.5 mm, margins incurved, coriaceous; upper glume similar, 1-nerved; awn 40-45 mm long. Pedicelled spikelets 6-7 mm long; glumes subequal, truncate to obtuse, 13-nerved; florets absent.

*Fl. & Fr.* October-January

*Distr.* Endemic to Southern Western Ghats. Occasional in grasslands; *NS 5769* Karimala Hills

#### DIGITARIA Heister ex Fabricus

1. Upper glume with two longitudinal patches of long hairs..... **D. bicornis**
1. Upper glume glabrous..... 2
2. Racemes to 5 cm long; lower glumes absent..... **D. longiflora**
2. Racemes more than 5 cm long; lower glume a minute scale ..... **D. ciliaris**

**Digitaria bicornis** (Lam.) Roem. & Schult., *Hort. Brit.* 24. n.1578. 1830; *FKG* 235. 1991. *Paspalum bicorne* Lam., *Tabl. Meth. Bot.* 1: 176. 1791. *Paspalum heterantherum* sensu Hook.f., *FBI* 7: 16. 1896, non 1843.

Annuals; culms 15-25 cm tall, tufted, rooting at lower nodes, nodes glabrous. Leaves 2-5 x 0.2-0.7 cm, lanceolate, sparsely hairy; sheath rounded, thickly covered with bulbous based hairs; ligule membranous, truncate. Racemes 2 or 3 together, 5-10 cm long, rachis flat. Spikelets 3 x 0.5 mm, lanceolate; lower glume minute; upper glume 2 x 0.5 mm, ciliate along the margins, first lemma lanceolate, hairy on back, empty; second lemma lanceolate, acuminate, coriaceous; palea similar to second lemma.

*Fl. & Fr.* Throughout the year

*Distr.* Pantropical. Fairly common in deciduous forests; *PS 30689* Keerappadi

**Digitaria ciliaris** (Retz.) Koeler, Descr. Gram. 27. 1802; FPL 571. 1990; FKG 237. 1991; FTSR 511. 1996. *Panicum ciliare* Retz., Obs. Bot. 4. 16. 1786. *Digitaria adscendens* Henrard, Blumea 1: 92. 1934. *Panicum adscendens* HBK, Nov. Gen. Sp. 1: 97. 1816. *Digitaria marginata* Link., Enum. Hort. Berol. 1: 102. 1821; FPM 1764. 1934. *Paspalum sanguinale* (L.) Lam. var. *rottleri* Hook.f., FBI 7: 15. 1896.

Annuals or perennials; culms 30-60 cm high; lower nodes rooting. Leaves 10-20 x 0.5-0.8 cm, linear-lanceolate, glabrous or hairy; margins scabrid; sheath bulbous based hairy or not; ligule membranous, 5 mm wide. Racemes few to many, 8-20 cm long; rachis flat, scabrid. Spikelets paired, similar, 3-3.5 mm long; lower glume minute; upper glume 2 x 0.5 mm, oblong, 7-nerved; first lemma 3 x 1 mm, lanceolate, ciliate along margins, empty; second lemma 3 x 1 mm, margins folded; palea 2 keeled, lanceolate.

*Fl. & Fr.* August-December

*Distr.* Tropics of Old World. Common in degraded forest areas and road cuttings; *PS 19254* Thellikkal; *30711* Vengoli

**Digitaria longiflora** (Retz.) Pers., Syn. Pl. 1: 85. 1805; FPM 1765. 1934; FKG 239. 1991; FTSR 512. 1996. *Paspalum longiflorum* Retz., Obs. Bot. 4: 15. 1786; FBI 7: 17. 1896.

Slender annuals; culms 20-30 cm high, creeping and geniculate, rooting from nodes. Leaves 1.5-5 x 0.4-0.7 cm, ovate-lanceolate, cordate at base, glabrous; sheath rounded. Racemes paired, to 5 cm long, slender, on erect axis. Spikelets 1.5 x 0.5 mm; lower glume absent; upper glume 1.5 x 5 mm, ovate, glabrous; first lemma 1.5 x 0.5 mm, elliptic, 9-nerved, epaleate. Second lemma and palea similar, 1.5 x 0.5 mm, ovate, coriaceous.

*Fl. & Fr.* Throughout the year

*Distr.* Old World tropics; introduced in the Neotropics. Occasional in grasslands; *PS 19671* Karimala

#### DIMERIA R. Brown

**Dimeria ornithopoda** Trimen, Fund. Agrost. 167. t.14. 1820; FBI 7: 104. 1896; FPM 1713. 1934; FPL 571. 1990; FKG 98. 1991; FTSR 512. 1996.

Annuals, culms to 50 cm high, tufted, slender, nodes sparsely bearded. Leaves to 6 x 0.4 cm, linear lanceolate, sparsely hairy. Racemes paired, 1-5 cm long, spreading; rachis triquetrous, glabrous. Spikelets 2 mm long; lower glume 2 mm long, linear-lanceolate, wingless or shortly winged below the apex; upper glume similar; lower floret empty; upper floret bisexual; awn 5-12 mm long.

*Fl. & Fr.* August-March

*Distr.* Endemic to South India. Common in degraded forest areas; *PS 19863* Vengoli; *19954* Karimala

#### ECHINOCHLOA P. Beauvois

**Echinochloa colonum** (L.) Link., Hort. Berol., 2: 209. 1833; FPM 1776. 1934; FPL 572. 1990; FKG 245. 1991; FTSR 513. 1996. *Panicum colonum* L., Syst. Nat. (ed. 10) 2: 870. 1759; FBI 7: 32. 1896.

Annuals; culms 20-50 cm high, sub-erect; nodes glabrous. Leaves 3-10 x 0.5 cm, linear-lanceolate, glabrous; sheath keeled; ligule absent. Racemes 3-8, each 1-1.5 cm long; rachis triquetrous. Spikelets ovate, densely packed; lower glume 1 x 1.5 mm, broadly ovate, acute, 5-nerved; margin ciliate; upper glume 2 x 2 mm, hirtus; first lemma 2.5 x 1.5 mm, shortly cuspidate; palea oblong, hyaline, 2-keeled; second lemma 1.5 x 1 mm, ovate, acute; palea hyaline.

*Fl. & Fr.* Throughout the year

*Distr.* Tropical Asia and Africa. Occasional in marshy areas and riverine; *PS 19487* Thellikkal



## ELEUSINE Gaertner

**Eleusine indica** (L.) Gaertn., Fruct. 1: 8. 1789; FBI 7: 293. 1896; FPM 1839. 1934; FPL 572. 1990; FKG 371. 1991; FTSR 513. 1996. *Cynosurus indicus* L., Sp. Pl. 72. 1753.

Tufted annuals, erect; culms round or compressed, 20-30 cm high; nodes glabrous. Leaves 20-30 x 0.6-1 cm, linear-lanceolate, rounded at base, glabrous; sheath keeled; ligule a narrow membrane. Racemes 2-6, sub-digitate, each 7-9 cm long; rachis flat, serrulate. Spikelets 6-8 mm long, ovate, compressed, glabrous; lower glume 2 x 1 mm, ovate, keeled, 1-nerved; upper glume 6-nerved, keeled; florets 5-8, all bisexual, lemmas 3.5 x 1.5 mm, keeled; palea, 2-nerved, 2-keeled.

*Fl. & Fr.* Throughout the year

*Distr.* Pantropical. Common in degraded forest areas and deciduous forests; *PS 19491* Thellikkal; *19243* Vengoli

## ERAGROSTIS N. M. Wolf

1. Keels of paleas ciliate..... 2
1. Keels of paleas glabrous or glabrescent..... 3
2. Inflorescence sticky; panicles narrowly oblong..... **E. viscosa**
2. Inflorescence not sticky; panicles oblong pyramidal..... **E. tenella**
3. Panicles spiciform..... **E. riparia**
3. Panicles lax..... 4
4. Branches of the panicles whorled..... **E. japonica**
4. Branches of the panicles not whorled..... 5
5. Leaf blade sub-amplexicaule at base; lemma punctuate..... **E. unioloides**
5. Leaf blade rounded at base; lemma not punctuate..... **E. subsecunda**

**Eragrostis japonica** (Thunb.) Trin., Mem. Acad. Sci. Petersburg (ser. 6) 1: 405. 1830; FKG 382. 1991; FTSR 514. 1996. *Poa japonica* Thunb., Fl. Jap. 51. 1784. *E. interrupta* Lam., Encycl. Tabl. 1: 185. 1791; FBI 7: 316. 1896. *E. diarrhena* (Schult.) Steud., Syn. Pl. Glum. 1: 266. 1854; FPM 1820. 1934. *E. interrupta* auct. non P. Beauv. var. *tenuissima* Stapf in Hook.f., FBI 7: 316. 1896.

Culms stout, tufted, to 75 cm tall, nodes glabrous. Leaves linear-lanceolate, base subcordate, to 25 x 0.5 cm; sheaths keeled. Panicles linear, to 40 cm long, branches verticillate or subverticillate. Spikelets oblong, to 2 x 0.7 mm.

*Fl. & Fr.* November-January

*Distr.* Pantropical. Common in plantations and roadsides; *PS 19046* Thunakkadavu

**Eragrostis riparia** (Willd.) Nees, Agrost. Brass. 512. 1829; FPM 1825. 1934; FKG 384. 1991. *Poa riparia* Willd., Ges. Natur. Freunde Berlin Neue Schrifften 4: 185. 1803. *Eragrostis tenella* (L.) Beauv. var. *riparia* (Willd.) Stapf in Hook.f., FBI 7: 315. 1896.

Small tufted grass. Leaves to 7 x 0.3 cm, lanceolate, apex acute; sheath to 2 cm; ligule a row of hairs. Panicles spiciform, contracted, to 5 cm long; spikelets 3-8 flowered, 1.5 mm, lower glumes *ca.* 1 mm, 1 nerved, membranous, oblong, upper glume similar to the lower glume; lemma oblong, 1 mm, rounded at apex; palea obovate, 2 keeled, 2-nerved, ciliate along the margins.

*Fl. & Fr.* November-January

*Distr.* Endemic to Peninsular India. Occasional in reservoir beds; *PS 18978* Thunakkadavu

**Eragrostis subsecunda** (Lam.) Four., Mex. Pl. 2: 118. 1886; Sreekumar, JETB 14: 626. 1990; FKG 386. 1991. *Poa subsecunda* Lam., Tab. Encycl. 1: 184. 1791.

Culms 30-60 cm high. Leaves 6-15 x 0.3 cm, linear-lanceolate, base rounded, sheath keeled, ligule obscure. Spikes to 20 cm long, lax, subsecund; spikelets 12 or more flowered, purplish green; lower glume 1-2 x 0.5 mm, lanceolate, 1-nerved, upper glume *ca.* 2.5 x 1 mm, ovate-

lanceolate, 3-nerved; paleas ca 2 x 1 mm, elliptic-lanceolate, 2-celled, ciliolate; lodicules 2, obovate, ovary oblong. Grains ovate.

*Fl. & Fr.* March-September

*Distr.* India, Sri Lanka and China. Fairly common in moist deciduous forests; *PS 19719* Parambikulam

***Eragrostis tenella*** (L.) P. Beauv. ex Roem. & Schult., *Syst. Veg.* 2:576. 1817; FKG 390. 1991. *Poa tenella* L., *Sp. Pl.* 69. 1753. *Eragrostis plumosa* (Retz.) Link, *Herb. Berol.* 1:192. 1827; FPM 1826. 1934. *Poa plumosa* Retz., *Obs. Bot.* 4:20. 1786. *Eragrostis tenella* var. *plumosa* (Retz.) Stapf in Hook.f., *FBI* 7:315. 1896.

Culms slender, to 50 cm long, nodes glabrous. Leaves linear-lanceolate, base rounded, to 15 x 0.5 cm; sheaths having at mouth; ligule fimbriate. Panicle oblong-pyramidal, to 12 cm long, lax. Spikelets yellowish, ovate or oblong, to 3 x 1 mm.

*Fl. & Fr.* July-November

*Distr.* Paleotropics. Fairly common in moist deciduous forests and plantations; *PS 30781* Thunakkadavu

***Eragrostis uniolooides*** (Retz.) Nees ex Steud., *Syn. Pl. Glum.* 1: 264. 1854; FPM 1826. 1934; FPL 575. 1990; FKG 392. 1991; FTSR 514. 1996. *Poa uniolooides* Retz., *Obs. Bot.* 5: 19. 1789. *Eragrostis amabilis* auct. non Wight & Arn. ex Nees, 1838: Hook. f., *FBI* 7: 317. 1896.

Culms 25-40 cm high, tufted. Leaves 5-15 x 0.3-0.7 cm, linear, base rounded with a tuft of hairs; ligule a rim of membrane. Panicle 10-25 cm long, very lax, effuse, glabrous. Spikelets few to many, 5-17 x 3-4 mm, ovate to oblong, purplish black; glumes subequal, ovate-lanceolate; floret 20-60, similar; lemmas ovate, acute; palea curved, keel scabrid; anthers 0.5 mm long.

*Fl. & Fr.* Throughout the year

*Distr.* India and South East Asia. Very common in degraded forest areas; *PS 19480, 19485* Thellikkal

***Eragrostis viscosa*** (Retz.) Trin., *Mem. Acad. Imp. Sci. St.-Petersb.*, ser. 6. 1: 397. 1830; FPM 1826. 1934; FKG 393. 1991. *Poa viscosa* Retz., *Obs. Bot.* 4: 20. 1786. *Eragrostis tenella* (L.) P. Beauv. ex Roem. & Schult. var. *viscosa* (Retz.) Stapf in Hook.f., *FBI* 7: 315. 1896.

Culms 10-35 cm high, suberect or decumbent, slender. Leaves 5-10 x 0.2-0.4 cm, lanceolate, base rounded; ligule a narrow rim only. Panicle 10-15 x 3-4 cm, contracted, branches filiform, glabrous; axis below the panicle viscid. Spikelets 4-5 x 1-1.5 mm, oblong, white; glumes equal; florets 10-14, similar; lemmas broadly ovate, acute; palea, 1 x 0.5 mm; keels ciliate.

*Fl. & Fr.* Throughout the year

*Distr.* Pantropical. Common in openings of deciduous forests and plantations; *PS 30718* Vengoli

#### EULALIA Kunth

***Eulalia trispicata*** (Schult.) Henrard, *Blumea* 3: 453. 1940; FPL 575. 1990; FKG 104. 1991; FTSR 514. 1996. *Andropogon trispicatus* Schult., *Syst. Veg.* 2: 452. 1824. *Eulalia tristachya* (Roxb.) O. Ktze., *Rev. Gen. Pl.* 2: 775. 1891; FPM 1715. 1934. *Pollinia argentea* Trin., *Bull. Acad. Sci. Petersb.* 1: 71. 1836; *FBI* 7: 11. 1896.

Culms 50-100 cm high, erect, pinkish, loosely tufted. Leaves 10-45 x 0.2-1 cm, linear, glabrous, drying purplish; sheath rounded, ligule a membrane. Racemes 3-15, to 15 cm long, reddish or purple; joints and pedicels hairy. Spikelets many, densely packed, 4 mm long, oblong; lower glume 4 mm long, oblong, truncate, hairy, brown, margins incurved; upper glume acute; first lemma 3 mm long; oblong; second lemma 2.5 mm long, awned, epaleate.

*Fl.* September-October

*Distr.* Central and South East Asia. Occasional in grasslands; *PS 19911* Karimala

#### GARNOTIA Brongniart

1. Nodes glabrous; leaves more than 30 cm long ..... **G. elata**  
 1. Nodes bearded; leaves to 20 cm long ..... 2  
 2. Leaves rounded or cordate at base ..... **G. arundinacea**  
 2. Leaves narrowed to the base ..... **G. tenella**

**Garnotia arundinacea** Hook.f., FBI 7: 243. 1896; FPM 1812. 1934; FPL 576. 1990; FKG 409. 1991.

Perennials; culms 40-90 cm tall, robust, geniculate; nodes thickened & bearded. Leaves 10-18 x 1.5-2 cm, ovate-oblong, rounded at base, terminating into a filiform tip, ciliate along the margins; sheath rounded, ligule a membrane. Panicle 5-15 cm, congested, branches angled, scabrid. Spikelets 2.5 x 1 mm, pedicelled; glumes equal, aristate, 3-nerved, scabrid along the nerves; lemma similar to glumes, bifid at tip, awned; awn 7 mm long; palea 2 x 0.5 mm, oblong.

*Fl.* November

*Distr.* Endemic to Southern Western Ghats. Rare in grasslands; *PS 19933* Karimala

**Garnotia elata** (Arn. ex Miq.) Janowski, Feddes Repert. 17: 86. 1921; FKG 410. 1991; FTSR 515. 1996. *Berghausia elata* Arn. ex Miq., Verh. Kon. Ned. Inst. 3: 4. 32. 1851. *Garnotia scoparia* Stapf ex Hook.f., FBI 7: 42. 1896, non Thw. 1864; FPM 1812. 1934. *G. tenuiglumis* Stapf ex Hook.f., FBI 7: 242. 1896.

Perennials; culms 1-1.4 cm high, robust; nodes glabrous. Leaves to 60 x 0.4 cm, linear, channelled, glabrous; sheath keeled; ligule a tuft of hairs. Panicle 40-60 cm long, lax; branches filiform. Spikelets 4 mm long, glabrous; glumes subequal, lanceolate, acute, 3-nerved, lower larger; lemma 2.5 x 1 mm, lanceolate; awn 4-5 mm long; palea 2.5 x 1 mm, hyaline, 2-nerved.

*Fl. & Fr.* October-January

*Distr.* Endemic to Peninsular India. Occasional in grasslands; *PS 19683, 19707* Karimala

**Garnotia tenella** (Arn. ex Miq.) Janowski, Feddes Repert. 17: 86. 1921; FPL 576. 1990; FKG 413. 1991; FTSR 515. 1996. *Berghausia tenella* Arn. ex Miq., Verh. Kon. Ned. Inst. III. 4: 34. 1851. *Garnotia stricta* sensu Hook.f., FBI 7: 243. 1896, non Brongn. 1832; FPM 1812. 1934.

Annuals or perennials; culms 10-50 cm high, tufted; nodes bearded. Leaves 10-18 x 0.2-0.6 cm, lanceolate, scabrid along the margins; sheath rounded, ligule membranous. Panicle 5-30 cm long, effuse, branches angled. Spikelets 3.5 x 1 mm, lanceolate, glabrous; glumes subequal, aristate, 3-nerved; lemma 2.5 x 1 mm, lanceolate, 3-nerved; palea 2 x 0.5 mm, hyaline.

*Fl. & Fr.* October-January

*Distr.* South East Asia and India. Fairly common in grasslands; *PS 19862* Vengoli; 19961 Karimala; 19853 Vengoli

#### HELICTOTRICHON Besser ex Roemer & Schultes

**Helictotrichon virescens** (Nees ex Steud.) Henr. in Blumea 3:425.1940; FKG 351. 1991. *Trisetum virescens* Nees & Steud., Syn. Pl. Glum. 1:226.1854. *Avena aspera* Munro ex Thw., Enum. Pl. Zeyl. 372.1864; FBI 7:277.1896. *Avenastrum asperum* (Munro ex Thw.) Fischer in Gamble, FPM 1802.1934.

Perennials, culms 50-125 cm high, nodes glabrous. Leaves to 20 x 0.5 cm, linear, sparsely villous, sheath villous at apex; panicles to 15 cm long; spikelets 10 x 4 mm, elliptic-oblong, 2 or 3 flowered; lower glume lanceolate, acuminate, 3-nerved; upper oblong-lanceolate, chartaceous, 3-5-nerved; lemmas ovate-lanceolate, notched and awned, 5-7 nerved; paleas oblong, 2-keeled, 2-nerved; keels ciliate on upper half; ovary ovoid, densely hirsute.

*Fl. & Fr.* September-January

*Distr.* India and Sri Lanka. Rare in grasslands; *PS 30837* Karimalagopuram

#### HETEROPOGON Persoon

**Heteropogon contortus** (L.) P. Beauv. ex Roem. & Schult., Syst. Veg. 2: 836. 1817; FPM 1743. 1934; FPL 577. 1990; FKG 112. 1991; FTSR 516. 1996. *Andropogon contortus* L., Sp. Pl. 1045. 1753; FBI 7: 199. 1896.

Densely tufted perennials; culms 25-50 cm high, erect or decumbent; nodes glabrous. Leaves 5-15 x 0.2-0.6 cm, linear-lanceolate, rounded at base, glabrous or sparsely hairy; sheath keeled, ligule a fimbriate membrane. Raceme solitary, terminal. Spikelets dissimilar, paired, sessile and pedicelled. Lower sessile spikelets 8-10 mm long, lanceolate; lower glume many-nerved, winged along the margins, ciliate; upper glume 3-nerved; lower floret empty, upper male; first lemma oblong, hyaline, epaleate; second lemma smaller; stamens 3; anthers 4 mm long. Lower pedicelled spikelets 8 mm long, similar to sessile spikelets; lower glume winged on one side. Upper sessile spikelets 5-8 mm long, oblong; glumes similar, truncate at apex, crustaceous, brown; second lemma forms the hyaline base of the awn, awn 70-80 mm long, twisted each other at ends; ovary oblong; styles 2; stigmas plumose, to 6 mm long.

*Fl. & Fr.* September-December

*Distr.* Tropical and temperate regions of the world. Very common in openings of deciduous forests; *PS 30550* Pandaravarai; *19958* Karimala

#### ICHNANTHUS P. Beauvois

**Ichnanthus vicinus** (F.M. Bail.) Merr., Enum. Philipp. Fl. Pl. 1: 70. 1923; FKG 253. 1991. *Panicum vicinum* F. M. Bail., Syn. Queens. Fl. Suppl. 3: 82. 1890. *Ichnanthus pallens* Hook.f., FBI 7: 60. 1896, non Munro 1861.

Annuals; culms 20-30 cm high, decumbent at base, rooting from lower nodes; nodes glabrous. Leaves 2-7 x 0.8-1.5 cm, ovate, lanceolate, cuneate at base, glabrous; sheath rounded, ciliate along outer margin; ligule membranous, fimbriate. Panicle congested, glabrous. Spikelets similar, 4-5 mm long; lower glume ovate-lanceolate, 5-nerved; upper glume lanceolate, 5-nerved; florets 2; lower male; upper bisexual; first lemma similar to the upper glume; palea oblong, hyaline; second lemma 2 x 1 mm, oblong, crustaceous, shining; palea smooth, crustaceous; ovary ellipsoid; stigma plumose, brown.

*Fl.* August-September

*Distr.* Pantropical. Common in marshy areas; *PS 18902* Anakkalvayal

#### IMPERATA Cyrillo

**Imperata cylindrica** (L.) Raeusch., Nom. Bot. (ed.3) 10. 1797; FKG 114. 1991; FTSR 516. 1996. *Lagurus cylindricus* L., Syst. Nat. (ed.10) 878. 1759. *Imperata koenigii* (Retz.) P. Beauv. var. *major* Nees, Fl. Africa Austr. 90. 1841. *I. cylindrica* (L.) P. Beauv. var. *koenigii* Dur. & Schinz., Consp. Fl. Africa 5: 694. 1894; FPM 1708. 1934. *I. arundinacea* Cyrillo, Pl. Rar. Neap. 2: 26. 1792; FBI 7: 106. 1896.

Perennials; culms 20-150 cm high, tufted; nodes bearded. Leaves 15-70 x 0.8-2 cm, lanceolate, narrowed towards the base, glabrous; sheath rounded, glabrous; ligule membranous. Panicle 30 x 1.5 cm, cylindrical; rachis glabrous. Spikelets 4 x 1 mm, similar, lanceolate, pedicelled; callus with long hairs. Glumes equal, lanceolate, with long silky white hairs on dorsal surface; lower floret empty, upper bisexual; first lemma 2 x 1 mm, oblong, hyaline, epaleate; second lemma 1.5 x 1 mm, hyaline, 3-lobed, paleate.

*Fl.* February

*Distr.* Old world tropics. Common in the sides of vayals and wet areas; *PS 18901, 19807* Anakkalvayal

#### ISACHNE R. Brown

1. Glumes obtuse, smooth; pedicels with glandular bands..... **I. globosa**
1. Glumes acute or acuminate, covered with hairs; pedicels eglandular..... **I. setosa**

**Isachne globosa** (Thunb.) O. Ktze., Rev. Gen. Pl. 2: 778. 1891; FPL 578. 1990; FKG 421. 1991. *Milium globosum* Thunb., Fl. Japan 49. 1784. *Isachne australis* R. Br., Prodr. 1: 196. 1810; FBI 7: 24. 1896. *I. dispar* Hook.f., FBI 7: 26. 1896p.p., non Trin. 1828.

Trailing perennials; culms 30-60 cm high, trailing; nodes glabrous. Leaves 4-10 x 0.2-0.6 cm, ovate-lanceolate, glabrous, base rounded, margin serrulate; sheath glabrous; ligule a tuft of hairs. Panicle 4-10 cm long, branches serrulate. Spikelets 2-2.5 x 1.5-2 mm, globose; glumes similar, broadly ovate; first lemma 2 x 1 mm, obtuse, glabrous; palea 2-nerved; second lemma 1.25 x 1 mm, broadly ovate, obtuse, ciliate along the margin; palea 2-keeled.

*Fl. & Fr.* November to January

*Distr.* Tropical Asia. Fairly common in moist deciduous forests; *PS 19256* Thellikkal

**Isachne setosa** Fischer, Kew Bull. 1932: 247. 1932; FPM 1797. 1934; FKG 425. 1991; FTSR 517. 1996.

Tufted annuals; culms slender, 10-35 cm high; nodes hairy. Leaves 0.7-3 x 0.8 cm, ovate-lanceolate, cordate at base, hairy below; sheath round; ligule a row of hairs. Panicle 3-8 x 1-4 cm; branches smooth. Spikelets 2-2.5 mm long; glumes similar, ovate, acuminate, setose; lower floret empty; first lemma 2 x 1 mm, ovate-oblong, hyaline; palea similar, 2-nerved; second lemma 1 x 1 mm, coriaceous, hirtus; palea ovate, 2-keeled.

*Fl. & Fr.* Throughout the year except the driest months

*Distr.* Endemic to Southern Western Ghats. Occasional in grasslands; *PS 19914* Karimala

#### ISCHAEMUM Linnaeus

- |   |   |
|---|---|
| 1. Upper glume 2-clefted at apex .....  | <b>I. timorense</b>   |
| 1. Upper glume entire .....             | 2   |
| 2. Pedicelled spikelets not awned ..... | <b>I. commutatum</b>  |
| 2. Pedicelled spikelets awned.....      | 3   |
| 3. Leaves tomentose.....                | <b>I. indicum</b> var. <b>indicum</b> subvar. <b>villosum</b> |
| 3. Leaves glabrous.....                 | <b>I. indicum</b> var. <b>indicum</b> subvar. <b>indicum</b>  |

**Ischaemum commutatum** Hack. in DC., Monogr. Phan. 6: 209. 1889; FBI 7: 131. 1896; FPM 1722. 1934; FKG 129. 1991; Sur, JETB 25: 412. 2001.

Tufted perennials; culms 20-40 cm high; nodes glabrous. Leaves 3-8 x 1.5 cm, lanceolate, petiolate, cordate at base, covered with bulbous based hairs; sheath keeled; ligule a fimbriate membrane. Racemes 2-5 cm long; joints and pedicels clavate, ciliate. Sessile spikelets 6 x 2.5 mm; lower glume flat, smooth, two winged at apex; first lemma 5.5 x 1.5 mm; oblong; palea 5 x 1 mm, hyaline; second lemma hyaline; awn 7 mm long. Pedicelled spikelets 5.5 x 2 mm, oblong; lower glume winged along one side; florets 2, lower male, upper empty; lemmas not awned.

*Fl. & Fr.* November-May

*Distr.* Peninsular India and Sri Lanka. Fairly common in moist deciduous forests and plantations; *PS 19252* Thellikkal

**Ischaemum indicum** (Houtt.) Merr. var. **indicum** subvar. **villosum** (Nees) Bor, Grass. Bur. Cey. Ind. Pak. 180. 1960; FBI 138. 1991; FKG 138. 1991; Sur, JETB 25: 419. 2001. *Spodiopogon villosum* Nees in Hook. & Arn., Bot. Beech. Voy. 242. 1838. *Ischaemum ciliare* Retz. var. *villosum* Hack. in DC., Monogr. Phan. 6: 227. 1889; FBI 7: 134. 1896.

Perennials; culms 40-70 cm high; nodes bearded. Leaves 15 x 1 cm, lanceolate, acuminate, thickly pubescent; sheath keeled, glabrous; ligule membranous. Racemes 4-8 cm long; sessile. Spikelets 4-5 mm long; lower glume 2-winged at apex, glabrous; upper glume narrowly winged along the keel; first lemma oblong, 1-nerved; second lemma hyaline; awn 5-9 mm long. Pedicelled spikelets 4 x 2 mm, ovate-lanceolate, similar to lower spikelets.

*Fl. & Fr.* October-February

*Distr.* Peninsular India and Sri Lanka. Fairly common along the sides of streams in moist deciduous forests; *PS 30500* Koorankuzhi

**Ischaemum indicum** (Houtt.) Merr., J. Arnold Arbor. 19: 320. 1938, var. **indicum**, subvar. **indicum**; FTSR 517. 1996; FKG 137. 1991; Sur, JETB 25: 419. 2001. *Phleum indicum* Houtt., Nat. Hist. 3:198,t.90. f.2. 1782. *Ischaemum aristatum* Fischer in Gamble, FPM 1721. 1934, non L. 1753. *I. ciliare* Retz., Obs. Bot. 6: 36. 1791; FBI 7: 133. 1896.

Perennials; culms geniculate or trailing; nodes bearded. Leaves scattered, elliptic-lanceolate, rounded at base; ligule membranous. Racemes paired; rachis & pedicels thinly hairy. Sessile spikelets ovoid; lower glume ovate, two winged at apex, aristate; first lemma oblong, acute, 1-nerved; second lemma cleft to the middle; awn geniculate; stamens 3. Pedicelled spikelets ovoid or lanceolate; lower glume winged along the keel on upper half; florets 2; second lemma awned.

*Fl. & Fr.* September-February

*Distr.* Peninsular India and South East Asia. Occasional in grasslands; *PS 19684* Karimala

**Ischaemum timorense** Kunth, Rev. Gram. 1: 369. 1830; FBI 7136. 1896; FPM 1722. 1934; FPL 580. 1990; FKG 164. 1991; FTSR 518. 1996; Sur, JETB 25: 432. 2001.

Tufted annuals; culms 20-50 cm tall; nodes bearded. Leaves 4-8 x 0.4-0.7 cm, lanceolate, narrowed to the base, glabrous; ligule membranous. Racemes 2-3 cm long. Spikelets similar, 3.5-4 x 2 mm; lower glume 3 x 1.5 mm, ovate, broaden below, bicuspidate at apex, densely hairy; upper glume 3 x 1.5 mm, aristate, thickly hairy; first lemma 1-nerved, hyaline; second lemma cleft above the middle, awned in the sinus. pedicelled spikelets smaller.

*Fl. & Fr.* October-February

*Distr.* Indo-Malesia. Fairly common in grasslands; *PS 19682* Karimala

#### JANSENELLA N. L. Bor

**Jansenella griffithiana** (C. Muell.) Bor, Kew Bull. 10: 98. 1955; FPL 580. 1990; FKG 348. 1991; FTSR 518. 1996. *Danthonia griffithiana* C. Muell., Bot. 2. 14. 347. 1856. *Arundinella avenacea* Munro ex Thw., Enum. Pl. Zeyl. 362. 1864; FBI 7: 69. 1896; FPM 1801. 1934.

Tufted annuals; culms 7-30 cm high, rooting from the lower nodes; nodes glabrous. Leaves 3-7 x 0.5-0.7 cm, lanceolate. Panicles 2-3 cm long; rachis and branches hairy. Spikelets similar, densely packed, 5-7 mm long; lower glume lanceolate, keeled, 3-nerved, keel ciliate; upper glume acuminate, 5-nerved; florets 2; lower empty; upper bisexual; first lemma elliptic, acute cuspidate, 3-nerved; palea oblong, obtuse; second lemma 3-3.5 mm long, oblong, densely ciliate towards the bifid apex, awned in the sinus; awn 9 mm long; palea hairy at apex, 2-keeled.

*Fl. & Fr.* October-January

*Distr.* Indian and Sri Lanka. Occasional in grasslands; *PS 19948* Karimala

#### OCHLANDRA Thwaites

- 1. Leaves 10-15 cm wide; staminal filaments united ..... **O. travancorica**
- 1. Leaves 2-5 cm wide; staminal filaments free ..... **O. scriptoria**

**Ochlandra scriptoria** (Dennst.) Fischer in Gamble, FPM 1863. 1934; FTSR 519. 1996. *Bambusa scriptoria* Dennst., Schluss. Hort. Malab. 31. 1818. *Bheesha rheedei* Kunth, Enum. 1: 434. 1833. 'rheedii'. *Ochlandra rheedei* (Kunth) Benth. & Hook.f. ex Gamble, Ann. Roy. Bot. Gard. (Calcutta) 7: 121, t.107. 1896; FBI 7: 418. 1896.

Rootstock rhizomatous, bunched; culms erect, to 10 m tall, 2-2.5 cm across. Culm sheaths thin, ligule trigonous, auricled at base, hairy inside. Leaves linear-lanceolate, acuminate, to 15 x 1.5 cm; sheath ciliate along margins; ligule with few bristles. Spikelets 2-2.5 cm long. Fertile glume oblong, mucronate; palea convolute-long mucronate. Stamens about 16, anthers 1.5 cm long; filaments 0.5 cm long, free. Lodicules 6-8, linear-oblong, 7 x 1.5 mm. Ovary and style glabrous; stigma 6 or 7, unequal, plumose.

*Fl.* Flowering is not observed

*Distr.* Endemic to Southern Western Ghats (Kerala). Common along the riverine areas; *PS 30721* Kuriarkutty

**Ochlandra travancorica** Benth. var. **travancorica** (Bedd.) Benth. ex Gamble, Ann. Roy. Bot. Gard. (Calcutta) 7: 125. t.111. 1896 & Hook. f., FBI 7: 419. 1896; FPM 1863. 1934. *Bheesha travancorica* Bedd., Fl. t. 324. 1891.

Rootstock rhizomatous, branched; culms to 5 m tall, densely clumped, hollow, covered with culm sheaths. Leaves scattered, 20-40 x 5-10 cm, oblong-lanceolate, base truncate, or cuneate, glabrous; sheaths tubular, mouth with stiff bristles; ligule short. Panicles large, spicate. Spikelets in verticils, 3-9 together, sessile, 5-6 cm long; glumes 2-5, unequal, to 5 cm long, lanceolate, mucronate, smooth; florets one, bisexual; lemmas 5 cm long, elliptic-oblong, muticous; palea membranous, stamens 20-40, filaments monadelphous; style long; stigma 4-6; fruit ovoid, 2-3 x 1.5 cm, beaked, smooth.

*Fl.* Flowering is not observed

*Distr.* Endemic to Southern Western Ghats. Common in evergreen and secondary forests; *PS 30722* Karimala

#### OPLISMENUS P. Beauvois

**Oplismenus compositus** (L.) P. Beauv., Ess. Agrost. 54. 168. 1812; FBI 7: 66. 1896; FPM 1778. 1934; FPL 581. 1990; FKG 257. 1991; FTSR 520. 1996. *Panicum compositum* L., Sp. Pl. 57. 1753.

Annuals; culms 20-70 cm tall, erect or trailing, rooting from lower nodes. Leaves 8-16 x 1-2.5 cm, elliptic, base cuneate, covered with bulbous based hairs; sheath rounded; ligule a fimbriate membrane. Panicle 15-25 cm long; racemes 5-10, 4-6 cm long; rachis triquetrous. Spikelets 4 mm long; lower glume awned; awn 4 mm long; upper glume 7-nerved, awnless; first lemma 3 x 2.5 mm, 9-11-nerved; awnless; palea oblong; second lemma lanceolate, 3-nerved; palea 3 x 0.5 mm, hyaline.

*Fl.* October

*Distr.* Pantropical. Very common in all forest types except evergreen forests; *PS 19196* Vengoli; *19818* Anakkalvayal

#### ORYZA Linnaeus

**Oryza meyeriana** (Zoll. & Mor. ex Steud.) Baill. ssp. **granulata** (Nees & Arn. ex Watt) Taleoka, Bot. Mag. (Tokyo) 75: 460. 1962; FKG 431. 1991. *O. granulata* Nees & Arn. ex Watt, Dic. Econ. Prod. Ind. 5: 500. 1891; FBI 7: 93. 1896. *O. meyeriana* sensu Fischer in Gamble, FPM 1845. 1934.

Perennials; culms 40-90 cm high, loosely tufted or solitary, erect. Leaves 10-25 x 1-2 cm, lanceolate, glabrous; sheath with long hairs at mouth; ligule 1-3 mm long, membranous. Panicle 5-10 cm long, scarcely branched; branches angled, smooth. Spikelets few, 5-6 x 2.5 mm; glumes similar, reduced to very minute scales; lemma 5 x 3.5 mm, broadly ovate, granulate crustaceous; palea 5 x 2 mm, oblong, 3-nerved, margins hyaline; anthers 2.5 mm long.

*Fl. & Fr.* June-January

*Distr.* Indo-Malesia, very common in moist deciduous forests; *PS 19477* Thellikkal

#### PANICUM Linnaeus

1. Lower glumes longer than broad, cuspidate..... **P. notatum**

1. Lower glumes broader than long, obtuse..... **P. sumatrense**

**Panicum notatum** Retz., Obs. Bot. 4: 18. 1786; FKG 267. 1991; FTSR 521. 1996. *P. montanum* Roxb., Fl. Ind. 1: 315. 1820; FBI 7: 53. 1896; FPM 1783. 1934.

Perennials; culms 80-150 cm high; nodes glabrous. Leaves 5-25 x 1-3.5 cm, ovate-oblong, cordate, ciliate; margin of sheath ciliate; ligule a membrane. Panicle 20-30 x 5-20 cm, lax; branches smooth. Spikelets 2.5-3 x 1 mm, ellipsoid, glabrous; glumes almost equal, ovate, 3-

nerved; first lemma similar to upper glume, epaleate; second lemma 2 x 1 mm, coriaceous, shining; palea similar, flat, 2-nerved.

*Fl. & Fr.* June-January

*Distr.* South and South East Asia. Common in open rocky areas of moist deciduous forests; *PS 19194*Vengoli

***Panicum sumatrense*** Roth ex Roem. & Schult., Syst. Veg. 2: 434. 1817; FKG 272. 1991. *P. psilopodium* Trin., Gram. Panic. 217. 1826; FBI 7: 46. 1896; FPM 1782. 1934. *P. psilopodium* Trin., Gram. Panic. 217. 1826, var. *coloratum* Hook.f., FBI 7: 47. 1896. *P. miliare* sensu Hook.f., FBI 7: 46. 1896, non Lam. 1791; FPM 1782. 1934.

Annuals or perennials; culms 20-60 cm high; nodes glabrous. Leaves 30 x 1.5 cm, linear-lanceolate, base rounded, glabrous; ligule a fimbriate membrane. Panicle to 30 cm long, contracted. Spikelets 3 x 1.5 mm, ellipsoid; lower glume 1 x 1.5 mm, broadly ovate, 3-nerved; upper glume 2.5 x 1.5 mm, ovate, 13-nerved; lower floret empty; first lemma similar to upper glume; palea hyaline; second lemma 2 x 1 mm, ovate, coriaceous; palea 2 x 1 mm, coriaceous, margins folded.

*Fl. & Fr.* October-February

*Distr.* Pantropical. Common in open rocky areas of moist deciduous forests; *PS 30717*Vengoli

#### PASPALIDIUM Stapf

***Paspalidium flavidum*** (Retz.) A. Camus in Lecomte, Fl. Gen. Indo-China 7: 419. 1922; FPM 1774. 1934; FPL 583. 1990; FKG 278. 1991; FTSR 521. 1996. *Panicum flavidum* Retz., Obs. Bot. 15. 1786; FBI 7: 28. 1896.

Annuals; culms 20-80 cm high; nodes glabrous. Leaves 5-25 x 0.5-0.8 cm, linear, glabrous; sheath rounded, glabrous; ligule a row of hairs. Racemes 3-10, distantly arranged on a central axis; each 1-1.5 cm long with two rows of spikelets. Spikelet 2.5-3 x 2 mm; ovate, acute; lower glume orbicular, obtuse, 5-nerved; upper glume 1.5 x 2 mm, 7-nerved, acute, florets 2, lower empty or male; upper bisexual; first lemma ovate, acute, 5-nerved; palea oblong, 2-keeled; second lemma ovate, acute, 5-nerved, crustaceous; palea oblong, 2-nerved.

*Fl. & Fr.* July-December

*Distr.* Tropical Asia. Common in open areas of deciduous forests and vayals; *PS 19470* Thunakkadavu

#### PASPALUM Linnaeus

1. Racemes 2; upper glume long, ciliate along the margins.....**P. conjugatum**
1. Racemes 3-5; upper glume not ciliate.....**P. scrobiculatum**

***Paspalum conjugatum*** Berg., Act. Helv. Phys. Math. 7: 129. 1772; FBI 7: 11. 1896; FPM 1772. 1934; FPL 584. 1990; FKG 285. 1991; FTSR 522. 1996.

Annuals or perennials; culms 20-60 cm high, tufted; nodes glabrous. Leaves 5-12 x 0.5-1.2 cm, lanceolate, ciliate along the margins; sheath keeled, glabrous; ligule a membrane. Racemes 2, 10-12 cm long. Spikelets 1.5-2 x 1.2 mm, broadly ovate, acute, in two rows along the raceme; upper glume 1.5 x 1.2 mm, 2-nerved; lower florets empty; first lemma similar to upper glume, ovate, epaleate, hairy along the margins; second lemma 1.5 x 1.2 mm, obtuse, 1-nerved, coriaceous; palea similar to lemma, 2-nerved.

*Fl. & Fr.* June-December

*Distr.* Pantropical. Common in marshy areas; *PS 19500*Anakkalvayal

***Paspalum scrobiculatum*** L., Mant. Pl. 1: 29. 1767; FBI 7: 10. 1896; FPM 1772. 1934; FPL 584. 1990; FKG 287. 1991; FTSR 522. 1996. *P. commersonii* Lam., Encycl. Tabl. 175. t. 43. f. 1. 1791. *P. orbiculare* Forst., Fl. Ins. Aust. Prodr. 7. 1786; FPM 1772. 1934.



Annuals; culms 30-50 cm high, tufted. Leaves 10-25 x 0.5-0.8 cm, lanceolate, glabrous; sheath keeled; ligule membranous. Racemes 3-5 together, 2-8 cm long; rachis flat, smooth. Spikelets 2.5 x 2 mm, obtuse; upper glume orbicular, 3-nerved; lower floret empty; first lemma similar to upper glume, epaleate; second lemma 3-nerved, crustaceous; palea 1.5 x 1.5 mm, lower half expanded and incurved.

*Fl. & Fr.* Throughout the year

*Distr.* India and Pakistan. Common in marshy areas and roadsides; *PS 19468* Thunakkadavu

#### PEROTIS Aiton

**Perotis indica** (L.) O. Ktze., *Rev. Gen. Pl.* 2: 787. 1891; FPM 1814. 1934; FPL 585. 1990; FKG 434. 1991; FTSR 523. 1996. *Anthoxanthum indicum* L., *Sp. Pl.* 28. 1753. *Perotis latifolia* Ait., *Hort. Kew* 1: 85. 1789; FBI 7: 98. 1796.

Tufted perennials; culms 10-30 cm long, creeping and ascending; nodes glabrous. Leaves 2-4 x 0.4-0.8 cm, ovate, acute, cordate at base, margin ciliate; sheath rounded, glabrous; ligule a narrow membrane. Inflorescence a solitary, cylindrical raceme, 8-20 cm long. Spikelets 3 mm long, similar, pedicelled; glumes equal, lanceolate, 1-nerved, ciliate along the margins, awned; awn 8-10 mm long; floret one; lemma 1 mm long, oblong, hyaline; palea lanceolate, 2-nerved.

*Fl. & Fr.* August-December

*Distr.* Indo-Malesia. Occasional in wet rocky areas; *PS 19651* Vengoli

#### POGONATHERUM P. Beauvois

**Pogonatherum crinitum** (Thunb.) Kunth, *Enum. Pl.* 1: 476. 1833; FBI 7: 141. 1896; FKG 176. 1991. *Andropogon crinitum* Thunb., *Fl. Jap.* 40. 1784. *Pogonatherum paniceum* sensu Gamble, FPM 1714. 1934, non Hack. 1906.

Tufted annuals; culms to 30 cm high, erect; nodes glabrous. Leaves 4-5 x 0.4 cm, elliptic-lanceolate, acute at both ends, glabrous; sheath keeled, hairy at the mouth; ligule a fimbriate membrane. Raceme solitary, 2-3 cm long; rachis with long hairs. Spikelets paired; one sessile and one pedicelled. Sessile spikelets 1.5 mm long; glumes awned; awn 2-3 mm long; florets 2; lower empty; upper bisexual; first lemma oblong, obtuse, epaleate; second lemma ovate, acuminate, awned; palea oblong, truncate at apex.

*Fl. & Fr.* November-May

*Distr.* Indian subcontinent and Japan. Fairly common in marshy areas of plantations; *PS 18890* Muthalakkuzhi

#### PSEUDANTHISTIRIA J. D. Hooker

**Pseudanthistiria umbellata** (Hack.) Hook.f., FBI 7: 220. 1896; FPM 1749. 1934; FKG 181. 1991. *Andropogon umbellatus* Hack. in DC., *Monogr. Phan.* 6: 401. 1889.

Creeping or geniculate annuals; culms rooting from lower nodes. Leaves to 5 x 0.5 cm, lanceolate, rounded at base; sheath rounded; ligule a fimbriate membrane. Panicle lax, interrupted by spathes; racemes 2-together. Spikelets dissimilar, paired, one sessile and one pedicelled. Sessile spikelets 5 mm long, oblong, lanceolate, 2 in each raceme; callus hairy; lower glume 5 x 1 mm, oblong, truncate; upper glume 4 x 1 mm, oblong, acute, 3-nerved; lower floret absent; second lemma reduced to form the base of the awn; awn 20-25 mm long. Pedicelled spikelet 5-7 mm long, lanceolate, awnless; floret one, male.

*Fl. & Fr.* October-February

*Distr.* Peninsular India and Sri Lanka. Occasional in grasslands; *PS 19750* Pezha

#### PSEUDOSORGHUM A. Camus

**Pseudosorghum fasciculare** (Roxb.) A. Camus, *Bull. Mus. Hist. Nat. Paris* 26: 662. 1920; FPM 1734. 1934; FKG 182. 1991. *Andropogon fascicularis* Roxb., *Fl. Ind.* 1: 265. 1820; FBI 7: 177. 1896.

Perennials; culms 90-100 cm high, loosely tufted; nodes glabrous. Leaves 15-40 x 0.8-1.2 cm, linear-lanceolate, glabrous; sheath keeled; ligule membranous. Panicle 5-13 cm long, congested. Spikelets dissimilar, sessile spikelets 4-5 mm long, lanceolate; callus hairy; lower glume lanceolate; florets 2; lower floret empty, upper bisexual; first lemma oblong, chartaceous, epaleate; second lemma 2-cleft at apex, awned; awn 14-18 mm long. Pedicelled spikelets 4-5 mm long, lanceolate; floret one, male.

*Fl. & Fr.* October-January

*Distr.* India and Myanmar. Common in marshy areas; *PS 19891* Thellikkal

#### PSEUDOXYTENANTHERA Soderstrom & Ellis

1. Culms erect; mouth of the culm sheath glabrous..... **P. bourdillonii**  
1. Culms scandent; mouth of the culm sheath with a ring of bristles ..... **P. monadelpha**

**Pseudoxynanthera bourdillonii** (Gamble) Naithani, JBNHS 87: 440. 1990; FTSR 524. 1996. *Oxytenanthera bourdillonii* Gamble, Ann. Roy. Bot. Gard. (Calcutta) 7: 76,t.67. 1896; FBI 7: 403. 1896; FPM 1861. 1934.

Robust perennials; culms 3-8 m high, smooth; culm sheath blade to 15 cm long, glabrous. Leaves 15-35 x 2-5 cm, sessile, acute at base, glabrous; margin entire; sheath keeled, glabrous. Spikelets 2.5 cm long, glabrous; lower glume acute; upper glume 10-11 x 6-7 mm, glabrous; florets 3-5, all bisexual; lemmas 20 x 6 mm, glabrous; palea 10-13 x 4 mm, hairy along the keels; staminal tube short; anthers 6-7 mm long, apiculate.

*Fl.* Flowering is not observed

*Distr.* Endemic to Southern Western Ghats (Kerala). Occasional in rocky slopes of evergreen forests; *PS 30720* Thelliyalimattukkal

**Pseudoxynanthera monadelpha** (Thw.) Soderstrom & Ellis, Smithz. Contrib. Bot. 72: 52. 1988. *Dendrocalamus monadelphus* Thw., Enum. Pl. Zeyl. 376. 1864. *Oxytenanthera monadelpha* (Thw.) Alston in Trimen, Handb. Fl. Ceylon 6 (Suppl.) 342. 1931; FPM 1861. 1934.

Culms 5-10 m tall, scandent, smooth; culm sheath glabrous. Culm sheath blade 5-10 x 0.5-1.5 cm, glabrous; base rounded with thick ring of callus and strong bristles. Leaves 20-40 x 2-5 cm, petiolate; sheath glabrous. Spikelets 0.8-1.2 cm long, lanceolate, compressed; glumes 2; lower larger, acute, glabrous; florets 3; lower lemmas sterile, lanceolate, epaleate; upper most one fertile, lanceolate, glabrous; palea oblong, 2-keeled; keels glabrous; staminal tube long; anthers 4-5 mm long.

*Fl.* A few plants flowered during 1999

*Distr.* India and Sri Lanka. Occasional along the margins of evergreen forests at higher altitudes; *PS 19939* Karimala

#### ROTTBOELLIA Linnaeus f.

**Rottboellia cochinchinensis** (Lour.) W. D. Clayton, Kew Bull. 35: 817. 1981; FPL 587. 1990; FKG 183. 1991; FTSR 524. 1996. *Stegosia cochinchinensis* Lour., Fl. Cochinch. 51. 1790. *Rottboellia exaltata* L. f., Suppl. Pl. 114. 1781; FBI 7: 156. 1896; FPM 1759. 1934.

Annuals; culms 50 cm high; nodes glabrous. Leaves 10-25 x 0.8-1 cm, glabrous; sheath keeled, pubescent, ligule a fimbriate membrane. Raceme 1-few, 10-15 cm long, produced into a tail of reduced spikelets; joints crustaceous, hollow. Spikelets dissimilar. Sessile spikelet 3-4 mm long, ovate, seated deeply in the cavities of spike; lower glume crustaceous, 13-nerved; upper glume concave; florets 2; lower male, upper bisexual; lower lemmas 3 x 1 mm; palea 3 x 1.5 mm, ovate, 2-nerved; second lemma 3 x 2 mm, keeled; palea lanceolate, hyaline.

*Fl. & Fr.* November-February.

*Distr.* Paleotropics. Fairly common in the sides of marshy areas; *PS 19623* Vengoli

### SACCHARUM Linnaeus

**Saccharum spontaneum** L., Mant. Pl. 2: 183. 1771; FBI 7: 118. 1896; FPM 1709. 1934; FPL 588. 1990; FKG 185. 1991.

Perennials; culms 100-300 cm, tufted, erect; nodes glabrous. Leaves 30-100 x 1 cm, linear-lanceolate, acuminate, rounded at base, glabrous; sheath rounded; ligule membranous, 3-6 mm long. Panicle to 30 cm long, densely silky hairy. Spikelets similar, paired, covered with white hairs; lower glume oblong, chartaceous; upper glume ovate-lanceolate, chartaceous, keeled, 1-nerved; florets 2; lower empty; upper bisexual; first lemma 2.5 x 1 mm, 3-nerved, epaleate; second lemma linear-lanceolate; palea membranous; stamens 3, free; style basely connated; stigmas 2, plumose.

*Fl. & Fr.* November-May

*Distr.* Old World Tropics. Common in stream banks in moist deciduous forests. *PS 30817* Muthuvarachal

### SACCIOLEPIS Nash

**Sacciolepis indica** (L.) A. Chase, Proc. Biol. Soc. Wash. 21: 8. 1908; FPM 1787. 1934; FPL 588. 1990; FKG 298. 1991; FTSR 525. 1996. *Aira indica* L., Sp. Pl. 1753. *Panicum indicum* L., Mant. Pl. 2: 184. 1771; FBI 7: 41. 1896.

Slender annuals; culms 15-35 cm high, loosely tufted; nodes glabrous. Leaves 5-15 x 0.2-0.5 cm, linear, sparsely hairy; sheath compressed; ligule a membrane. Panicle 1-8 x 0.5-0.7 cm, cylindrical. Spikelets densely packed, 1.5-3.5 mm long, compressed; lower glume 1.5 x 0.5 mm, acute, 5-nerved; upper glume 2 x 1 mm, 9-nerved; lower floret barren; first lemma 1.5 x 1 mm, thinly hairy; second lemma 1.5-2 x 1 mm; palea similar to lemma; anthers 1 mm long.

*Fl. & Fr.* Throughout the year

*Distr.* Tropical Asia, Australia and introduced in to Africa and America. Common in moist deciduous forests; *PS 19091* Amakkundu

### SCHIZOSTACHYUM Nees

**Schizostachyum beddomei** (Fischer) Majumdar in Karthikeyan *et al.*, Fl. Indian Enum. Monocot 281. 1989. *Teniostachyum beddomei* Fischer in Gamble, FPM 1860.1934.

Robust, scandent shrubs; culms to 13 m long, first erect, thin walled; node with a white margin above, culm sheath papery, clothed with brown appressed hairs. Leaves to 15 x 3 cm, oblong-lanceolate, glabrous above, hairy below. Panicle terminal. Caryopsis glabrous, ovoid.

*Fl.* Flowering in not observed

*Distr.* Endemic to Western Ghats. Common along the moist areas of evergreen margins; *PS 30782* Pooppara

### SETARIA P. Beauvois

1. Leaves plicate ..... **S. palmifolia**
1. Leaves not plicate..... 2
2. Panicles cylindrical; bristles in clusters ..... **S. pumila**
2. Panicles not cylindrical..... 3
3. Panicles contracted, narrow; spikelets sessile ..... **S. intermedia**
3. Panicles lax; spikelets pedicelled ..... **S. paniculifera**

**Setaria intermedia** Roem. & Schult., Syst. Veg. 2: 489. 1817; FBI 7: 79. 1896; FPM 1789. 1934; FPL 589. 1990; FKG 306. 1991. *S. tomentosa* (Roxb.) Kunth., Rev. Gram. 1: 47. 1829. *Panicum tomentosum* Roxb., Fl. Ind. 1: 303. 1820.

Trailing or erect annuals; culms 40-50 cm high; nodes glabrous. Leaves 10-2 x 0.3-1 cm, linear, flat, glabrous; ligule a row of hairs. Panicle spiciform, interrupted; bristles 2-6 mm long,

atrorse barbed. Spikelets 2 x 1.5 mm, broadly elliptic; lower glume 1-nerved; upper glume 1.2 x 1 mm, elliptic, obtuse; lower floret empty; first lemma 2 x 1.5 mm, acute, 5-nerved; palea ovate; second lemma 2 x 1.2 mm, ovate, coriaceous; palea faintly rugate.

*Fl. & Fr.* September-January

*Distr.* India, Myanmar and Sri Lanka. Occasional in deciduous forests; *PS 19989* Keerappadi

**Setaria palmifolia** (Koen.) Stapf, J. Linn. Soc. Bot. 42. 186. 1914; FPM 1789. 1935; FPL 590. 1990; FKG 307. 1991; FTSR 525. 1996. *Panicum palmaefolium* Koen., Naturf. 23: 208. 1788. *P. plicatum* Willd., Enum. Pl. 1033. 1809; FBI 7: 55. 1896, p.p. non Lam. 1791.

Robust perennials; culms loosely tufted, 30-100 cm high; nodes glabrous. Leaves 20-50 x 2-5 cm, elliptic, erect, plicately folded, narrowed to the base, thinly pubescent, scabrid along the nerves. Panicle 10-30 cm long, narrow, lax. Spikelets 3 mm long, pedicelled, crowded on small branches; lower glume 1.5 mm across, orbicular, obtuse, 5-nerved; upper glume 2.5 x 1.5 mm, 7-nerved; lower floret barren; first lemma 3 x 1.5 mm; palea oblong; second lemma 2.5 x 1.5 mm, acute; palea ovate, acute.

*Fl. & Fr.* October-December

*Distr.* Paleotropics; introduced in America. Occasional in wet areas of deciduous forests; *PS 19660* Vengoli

**Setaria paniculifera** (Steud.) Fourn. ex Hemsl., Bot. Centr. Amer. Bot. 3: 505. 1855; FKG 308. 1991; FTSR 526. 1996. *Panicum paniculiferum* Steud., Syn. Pl. Glum. 1: 54. 1854.

Perennials; culms few together, 60-200 cm high, robust; nodes sparsely bearded. Leaves 15-40 x 0.5-2.5 cm, linear-elliptic, plicately folded; sheath strongly keeled; ligule a fimbriate membrane. Panicle 15-25 cm long, lax. Spikelets 3 x 1 mm; lower glume ovate, obtuse, 3-nerved; upper glume 2 x 1.5 mm, ovate, obtuse, 7-nerved; lower floret barren; first lemma ovate, 5-nerved, acute; palea lanceolate; second lemma 3 x 1 mm; palea subcoriaceous.

*Fl. & Fr.* July-December

*Distr.* Native of Tropical America; introduced as a fodder. Fairly common in wet rocky areas; *PS 30712* Vengoli

**Setaria pumila** (Poir.) Roem. & Schult., Syst. Veg. 2: 891. 1817; FPL 590. 1990; FKG 309. 1991; FTSR 526. 1996. *Panicum pumilum* Poir. In Lam., Encycl. Suppl. 4: 273. 1816. *Setaria pallidifusca* (Schum.) Stapf & Hubb, Kew Bull. 1930: 259. 1930; FPM 1789. 1934. *S. glauca* Hackel, Bot. Soc. Brot. 3: 135. 1884, non P. Beauv. 1812. *Panicum pallidifusum* Schum., Beskr. Guin. Pl. 58. 1827.

Tufted annuals; culms 10-100 cm high, decumbent or erect; nodes glabrous. Leaves 10-40 x 0.3-0.6 cm, linear, scabrid; sheath keeled, ligule a fimbriate membrane. Panicle 2-20 cm, cylindrical; bristles 5-10 mm long, in clusters; spikelets 2.5 mm long, sessile, acute; lower glume 1 mm long, 3-nerved; upper glume 1.5 mm long, 5-nerved; lower floret barren; first lemma 2.5 mm long, 3-nerved, paleate; second lemma coriaceous, rugose.

*Fl. & Fr.* Throughout the year.

*Distr.* Tropics of the Old World and introduced to North America. Common in degraded forest areas; *PS 19679* Karimala; *19202* Rockpoint; *19504* Orukomban; *19613* Vengoli

#### SPODIOPOGON Trinius

**Spodiopogon rhizophorus** (Steud.) Pilger in Engl. & Prantl, Pflanzenf. 14e:119. 1940. FKG 193. 1991. *Andropogon rhizophorus* Steud., Syn. Pl. Glum. 1:381. 1854. *Spodiopogon albidus* Benth., J. Linn. Soc. Bot. 19:66. 1881; FBI 7:108. 1896; FPM 1710. 1934.

Culms to 1 m tall, erect or geniculate with stilt roots at basal nodes, nodes glabrous. Leaves flaccid, softly hairy, to 20 x 2 cm. Panicle elliptic-oblong, to 12 cm long, densely silky villous; joints flat, densely ciliate along margins. Sessile spikelets oblong-lanceolate, 7 mm long. Awn 5-

6 mm long. Pedicelled spikelets linear-lanceolate, 5 mm long; pedicels flat, 3 mm long, densely ciliate along margins.

*Fl. & Fr.* November-January

*Distr.* Endemic to South West India. Common in moist deciduous forests and road cuttings; *NS 3889* Karimala

#### SPOROBOLUS R. Brown

1. Flowers in solitary racemes..... **S. piliferus**  
1. Flowers in effuse panicles..... **S. indicus** var. **diander**

**Sporobolus indicus** (L.) R. Br. var. **diander** (Retz.) Jovet & Guedes, *Taxon* 22: 163. 1973; FKG 437. 1991. *Agrostis diandra* Retz., *Obs. Bot.* 5: 19. 1789. *Sporobolus diander* (Retz.) P. Beauv., *Ess. Agrost.* 26: 147. 1812; FPM 1817. 1934.

Annuals or perennials; culms 30-80 cm high; nodes glabrous. Leaves 15-40 x 0.2-0.6 cm, linear, glabrous; sheath keeled; ligule a narrow membrane. Panicles 10-30 cm long, lax; axis and branches filiform. Spikelets 1.5 x 0.5 mm, lanceolate, glabrous; lower glume very small, 0.5 x 0.25 mm, hyaline, ovate, obtuse; upper glume hyaline, 1-nerved; lemma 1.5 x 0.5 mm, ovate-lanceolate, nerves not clear; palea 1.5 x 0.7 mm, oblong.

*Fl. & Fr.* Throughout the year

*Distr.* Indo-Malesia to Australia. Common in marshy areas; *PS 19268* Anakkalvayal; *30688* Keerappadi

**Sporobolus piliferus** (Trin.) Kunth, *Enum. Pl.* 1: 211. 1833; FPM 1817. 1934; FPL 591. 1990; FKG 438. 1991; FTSR 527. 1996. *Vilfa pilifera* Trin., *Diss. Bot.* 157. 1824.

Tufted annuals; culms 10-25 cm high; nodes glabrous. Leaves 2-5 x 0.2-0.5 cm, bifarious, lanceolate, base rounded, glabrous or ciliate along the margins; sheath rounded, margins glandular hairy. Raceme narrow, un-branched with many spikelet on all sides. Spikelets 1.5 x 0.5 mm, lanceolate, acute; glumes hyaline; lower glume 1 mm long, narrowly lanceolate, acute; upper glume slightly larger 1-nerved; lemma 1.5 x 1 mm, 3-nerved; palea similar to lemma, 2-nerved.

*Fl. & Fr.* October-December

*Distr.* India, Sri Lanka and East Africa. Occasional in grasslands; *PS 19915* Karimala; *19735* Pezha

#### THEMEDA Forsskal

**Themeda triandra** Forssk., *Fl. Aeg.-Arab.* 178. 1775; FPM 1746. 1934; FPL 591. 1990; FKG 202. 1991; FTSR 527. 1996. *Anthistiria imberbis* Retz., *Obs. Bot.* 3: 11. 1783; FBI 7: 211. 1896.

Densely tufted perennials; culms 30-200 cm high, white or yellowish white. Leaves 10-60 x 0.4-1.2 cm, rounded at base, margins rarely ciliate; sheath sharply keeled, mouth with long bulbous based hairs; ligule 5-8 mm long, coriaceous. Panicle 20-75 cm long; racemes in dense clusters. Involucral spikelets in same or different levels, 7-9 x 2 mm; lower glume 8 mm long, winged along one side; upper glume oblong, 3-nerved. Bisexual spikelets, 6-10 mm long, solitary in a raceme, callus with brown hairs; lower glume 5-9 mm, brown, thinly pubescent; upper glume 6-8 mm long, hirtus; first lemma 3 mm long, oblong, brown; second lemma stipitate, awn 5-9 cm long.

*Fl. & Fr.* November-February

*Distr.* Old World Tropics. Very common in deciduous forests and openings; *PS 19067* Thunakkadavu; *19920* Karimala

#### TRIOGON Roemer & Schultes

1. Lemmas 2-fid..... **T. wightii**  
1. Lemma 4-fid..... **T. bromoides**

**Tripogon bromoides** Roem. & Schult., Syst. Veg. 600. 1817; FPM 1834. 1934; FPL 592. 1990; FKG 399. 1991.

Densely tufted perennials; culms 10-35 cm high; nodes glabrous. Leaves usually basal, 5-30 x 0.1-0.3 cm, linear, base rounded, sparsely hairy above; mouth of sheath with long hairs; ligule a rim only. Raceme 10-30 cm long; spikelets 0.5-1 cm long, oblong, glabrous, sessile; lower glume 1-nerved, keeled; upper glume notched below the apex on one side, 3-nerved. Florets 10-16; lemma 3-4 x 1-2 mm, 4-lobed at apex, 3-awned; one median and two laterals; median one twice the length of laterals; palea 3 x 1 mm, scabrid along the keels

*Fl. & Fr.* November-January

*Distr.* South India and Nepal. Occasional in grasslands; *PS 19678* Karimala

**Tripogon wightii** Hook.f., FBI 7: 286. 1986; FPM 1833. 1934; FTSR 528. 1996.

Perennials, culms tufted, to 15 cm long. Leaves linear, convolute, 10 x 1 mm; sheaths striate. Racemes slender, to 10 cm long. Spikelets oblong, 5 mm long. Lemmas 2-fid, awned from the sinus, awn 5 mm long, minutely barbate. Glumes 2-lobed and mucronulate.

*Fl. & Fr.* September-November

*Distr.* Endemic to Peninsular India. Occasional in grasslands; *NS 5770* Karimala Hills

#### ZENKERIA Trinius

**Zenkeria elegans** Trin., Linnaea 11: 150. 1837; FPM 1805. 1934; FKG 363. 1991; FTSR 528. 1996.

Densely tufted perennials; culms 40-100 cm high, nodes glabrous. Leaves 30-60 x 0.3-0.8 cm, linear-lanceolate, flat, glabrous; margins serrulate, glabrous; sheath keeled, glabrous; ligule a row of hairs. Panicles 20-28 cm long, pyramidal, lax; branches filiform, glabrous. Spikelets 5-6 x 3 mm, pedicelled, glabrous; glumes equal, 3 x 1 mm, lanceolate, 1-nerved; lemma 5 x 1 mm, lanceolate, acuminate, sparsely hairy; palea 3 x 1 mm, 2-nerved, sparsely hairy.

*Fl. & Fr.* June-December

*Distr.* Endemic to Southern Western Ghats. Occasional in grasslands; *NS 5636* Karimala Hills

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