ESTABLISHMENT OF AN ORCHIDARIUM
IN THE INSTITUTE CAMPUS

N. Sasidharan
Muktesh Kumar
V. P. K. Nambrar
C. Renuka

KERALA FOREST RESEARCH INSTITUTE
PEECHI, THRISUR

February 1990
## CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
<th>Page References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abstract</td>
<td>1</td>
<td>r.64.2</td>
</tr>
<tr>
<td>Introduction</td>
<td>2</td>
<td>r.64.3</td>
</tr>
<tr>
<td>Materials and Methods</td>
<td>3</td>
<td>r.64.4</td>
</tr>
<tr>
<td>Orchids of Kerala - An overview</td>
<td>5</td>
<td>r.64.5</td>
</tr>
<tr>
<td>Distribution</td>
<td>5</td>
<td>r.64.6</td>
</tr>
<tr>
<td>Species Maintained in the Orchidarium</td>
<td>6</td>
<td>r.64.7</td>
</tr>
<tr>
<td>Discussion</td>
<td>35</td>
<td>r.64.8</td>
</tr>
<tr>
<td>References</td>
<td>36</td>
<td>r.64.9</td>
</tr>
</tbody>
</table>


ABSTRACT

Nearly 200 species of orchids have been recorded from Kerala, but several of them have a restricted distribution. Urgent steps have become necessary for the protection of orchids, especially the rare and endemic species. Although the best way to conserve a species is to conserve its habitat, this is not always practicable in the case of orchids as each species has its own habitat preferences. In addition to in situ conservation, ex situ conservation is possible through establishment of orchidaria.

An orchidarium was constructed in the institute as per the design obtained from the orchidologist, National Orchidarium, Yercaud, for ex situ conservation and multiplication of indigenous orchids. About one hundred species were collected during the study period and 84 species are maintained in the orchidarium, including some rare and endemic species. Herbarium specimens were also prepared and incorporated into the institute herbarium (KFRI). The specimens were identified with pertinent literature and by comparing with authentic specimens. Suitable planting methods were adopted for growing the orchids in the orchidarium depending on their habit and habitat. In general, epiphytic orchids come well under cultivation. Among the orchids collected, five species are records of occurrence for Kerala.
INTRODUCTION

Orchidaceae, one of the largest families of flowering plants, consists of about 700 genera and 30,000 species and with untold number of hybrids. (Dressler, 1979). The beautiful and fascinating orchid flowers contribute much to floriculture. The remarkable feature that made orchid flowers in cut-flower trade is their keeping qualities. Flowers of most of the cultivated species of *Vanda, Cymbidium, Catleya* etc. easily last for two to eight weeks. But flowers of *Phalaenopsis* sp. are known to keep their freshness upto six months. The ease with which the orchids form hybrids, even multigeneric have proved to be a valuable asset for the unlimited scope for creating new hybrids.

Several Indian orchids have shown dominance of their attractive characters in different crosses. These species have gained global recognition for their ability to transfer their interesting characters in the hybrid offsprings. Indian species that are widely used in hybridization programmes are *Aerides multiflora, Ascocentrum curviflorum, Cymbidium lowianum, Dendrobium nobile, Rhynchostylis retusa, Vanda* spp. *Paphiopedilum* sp., *Phalaenopsis* sp. etc. Besides the attractive flowers, several Indian orchids are known for their medicinal properties. Among the orchids of Kerala, thirteen species are used medicinally (Muktesh Kumar *et al.*, 1987). The economic potential of several other species have not yet been studied. Species like *Aerides crispum, Arundina graminifolia, Rhynchostylis retusa, Vanda tessellata* are grown as ornamental plants along with other exotics and hybrids. Though about 190 species have been recorded from Kerala, some species are known only by their type collections and few are presumed to be extinct. Henry *et al* (1979) published a list of 224 threatened plants of South India, and among them 13 were orchids. Habitat destruction and over exploitation are the main reasons affecting the survival of orchids. The best way to conserve the orchids is to conserve the habitats. But this is not always practical as orchids are found in varied habitats. The other alternative is to establish orchidaria. The orchidarium is meant to provide artificial conditions similar to the orchid habitats and helps in the *ex situ* conservation and their multiplication, besides providing materials for study purposes. It is with these objectives the establishment of an orchidarium in the Institute has been taken up.

Though hybridization was one of the objectives of the project, this work has not been attempted. During the early stage of the project, Tropical Botanical Garden and Research Institute, Trivandrum has taken up studies on hybridization and tissue culture propagation. Besides duplicating the work, the cost involved in establishing the infrastructural facilities for such works was also high. Since then we have limited our studies on the *ex situ* conservation and systematics.
MATERIALS AND METHODS

A checklist of the orchids of Kerala has been compiled from literature and by scanning the herbarium collections. Several collection trips were made for the collection of orchids from different orchid habitats in the forests, while surveying the orchids, data pertaining to occurrence, availability and habitat of individual species were carefully documented. Collection of epiphytic orchids, especially from the evergreen forests was rather difficult due to the enormous height of the trees on which they were found. It is often from the fallen trees or branches, tiny orchids like *Trias stocksii*, *Bulbophyllum tremulum*, *Smithsonia straminea*, *Oberonia* sp. were collected. Herbarium specimens were also prepared when collected in flower or made later when flowered under cultivation. The herbarium specimens were incorporated to the Institute herbarium (KFRI). The specimens were identified with pertinent literature and by comparing with authentic specimens.

*Cultivation of orchids*

Orchids are grouped into epiphytes and terrestrial, depending on their growth habitats. Epiphytes are usually perennial species where majority of terrestrial orchids are annuals. Their plant body is visible above the ground only during the growing seasons. They survive by their underground tubers during the unfavourable seasons. Orchids are usually grown in orchid houses. The orchid houses are meant for providing artificial conditions to the orchids, similar to their natural habitats. In tropical countries, where humidity and temperature need not be controlled always, open orchid house is preferred. These orchid house have provisions for regulating the overhead shade and also to protect the plants from direct sunlight during summer. Usually one portion of the roof is covered with transparent fibre glass to form the "sunny corner", where plants requiring more sunlight are kept. The other portion of the roof is covered with wooden scantlings of 5cm width. Coirmats are provided over the wooden scantlings during summer to reduce the temperature inside. The sides of the orchid house are provided with wiremesh to allow free passage of air. Benches are erected inside to keep the pots and baskets. Our Orchidarium was built as per the design and drawings provided by the Orchidologist, National Orchidarium, Yercaud, Salem.

Orchids are grown in pots, beds, baskets or on wooden blocks depending on the growth habits. The aerial roots of the *Osmunda* and basal stem portion of *Cyathea* and *Alsophila* are well suited for growing epiphytic orchids. But these plants are not common in our forests. We prepared the potting medium for epiphytic orchids with dried coconut husk made into pieces of about 3cm size, broken brick pieces and charcoal in equal proportions.
Choped tree fern fibre roots and compost manure were also added. This poting medium was filled in earthen pots as well as on wooden baskets of convenient sizes made with teak wood. Charred wooden blocks were also used for growing epiphytes, especially species of *Oberonia* and *Dendrobium*. The climbing orchid *Vanilla wightiana* was attached and tied to standing trees in the campus and they established well. The terrestrial orchids were grown in beds and in earthen pots. The tuberous terrestrial orchids were collected along with a ball of earth covering the tubers and planted in pots filled with garden soil and compost. Species like *Arundina graminifolia* and *Calanthe masuca* are growing well in planting beds as well as in pots.

Farmyard manure was applied twice in a year. Foliar spraying of chemical fertilizer (W. P. Ohio solution) was also applied occasionally. Though no insect damage was noticed, some fungal decay was observed during rainy season. The fungal decay could be controlled with the fungicide Bavastin. Watering the orchids has to be done carefully and overwatering the pots should be avoided.
The first systematic account of the orchids of Kerala came to light with the publication of the monumental work of Van Rheede's *Hortus Malabricus* (1678-1693). He described and illustrated 794 plants collected from the erstwhile Malabar and among them 15 were orchids. The contributions of John Lindley (1840, 1852 - 1859) to the taxonomy of orchids resulted in the publication of several new taxa from peninsular India. During the middle of the nineteenth century Wight published *Icones Plantarum Indiae Orientalis* (1840-1853) with excellent illustrations of Peninsular Indian plants, including 169 Orchids. J.D. Hooker in the *Flora of British India* (1888 - 1890) gave an account of the then known orchids of the erstwhile British India. He later described and illustrated 101 Indian orchids including several new taxa in the *Annals of the Royal Botanic Garden Calcutta* (1899). In the later works, Fischer (1928); Blatter and McCann (1931); Fyson (1932); Santapau and Kapadia (1966); Balakrishnan (1964); Rathakrishnan (1971); Saldanha (1974); Joseph and Vajravelu (1974, 1978, 1981) Shetty and Vivekanandan (1978); Abraham and Vatsala (1981) Chandra Bose et al (1981); Joseph (1982); Henry and Swarninathan 1982); Bharghavan and Mohanan (1983); Nair et al (1983). Manilal and Sathishkumar (1983, 1984a. 1984b. 1984c, 1984d, 1984e. 1985) and Sasidharan and Muktesh Kumar (1985) new taxa or new records of occurrence were reported from South India.

Muktesh Kumar and Sasidharan (1986) listed 67 genera with 190 species to occur in Kerala and since then a few more taxa have been added.
Epiphytes dominates with 109 species. The Terrestrial orchids include 4 saprophytes. *Habenaria* with 24 species is the largest genus. *Oberonia* with 17 species is the second largest genus. 38 genera are represented by only one species. Sathish Kumar (1986) estimated that there are 85 species endemic to Western Ghats and of them 15 are restricted to Kerala.
Distribution

Orchids are found in Kerala from sea level to the highest peak of 2,400m altitude (Anamudi. Idukki Dist.) *Acampe praemorsa* is the most common and widely distributed species in the plains. *Vanda spathulata* though restricted, confined to trees of the sea coast. *Habenaria diphylla* and *H. plantaginea* prefer open scrub jungle. The majority of orchids are found in the forests and each forest type has its own composition of orchid flora.

The southern hilltop tropical evergreen forest abodes a good number of epiphytes as well as terestrial orchids. High rainfall and the relatively cool climate coupled with bright sunshine contribute ideal habitat for the growth of epiphytic orchids. The profuse growth of moss on trees is well suited to the growth of small epiphytic orchids. The commonly seen epiphytic orchids are *Sirhookera latifolia*, *S. lanceolata*, *Dendrobium heyneanum*, *D. heterocarpum*, *Eria reticosa*, *Trias stocksii*, *Bulbophyllum tremulum*, *B. fimbriatum*, *Flickingera nodosa*, *Porpax reticluata*, *Oberonia brunoniana*, and *O. santapauli*. The terrestrial orchids are mostly *Calanthe masuca*, *Disperis neilgherrensis*, *Habenaria crinifera*, *Epipogeum roseum*, *Anectochifus elatus* etc.

The westcoast tropical evergreen forests and westcoast semievergreen forests have more or less same orchid flora. The important epiphytic orchids are *Cleisostoma tenuifolium*, *Gastrochilus flabelliformis*, *Cottonia peduncularis*, *Acampe ochracea*, *Dendrobium heyneanum*, *Smithsonia straminea*, *Oberonia brachyphylla* etc. The terrestrial orchids are *Habenaria digitata*, *Tropidia angulosa*, *Nervilia* sp., *Liparis* sp., *Malaxis* sp., *Geodorum densiflorum* etc.

In the Southern moist mixed deciduous forest, trees have a leafless period during the months of January to March and thus the orchids are exposed to bright sunshine. Fire is also very frequent during summer. The common epiphytic orchids are *Cymbidium aloifolium*, *Pholidotta pallida*, *Vandastateacea Rhynchostylis retusa*, *Arides ringens*, *Luisia teretifolia*, *Acampe praemorsa*, *Dendrobium ovatum*, *D. macrostachyum*, *Eria mysorensis*, *Oberonia* sp. etc. The terrestrial orchids are mostly *Habenaria ovalifolia*, *H. plantaginea*, *Geodorum densiflorum*, *Eulophia epidendrea*, *E. nuda*, *Peristylis gooderoides* etc.

In the southern montane wet temperate forests (Sholas) the trees are usually short boled and highly branched spreading type and the canopy is
more or less closed. This type of forest is mostly seen in valleys adjacent to grasslands at altitudes above 1,200 m and has a relatively cool climate. The epiphytic orchids and ferns are common on almost all trees. The frequently seen epiphytic orchids are *Dendrobium nanum*, *D. aqueum*, *Coelogyne nervosa*, *C. mossiae*, *Diplocentrum recurvum* *Bulbophyllum kaitense*. *Oberonia* spp. The ground orchids are relatively few. *Calanthe masuca*, *Anectochilus elatus* and *Cheirostylis flabellata* are often found.

The grasslands abode several terrestrial orchids. Majority of the *Habenaria* are found in the grasslands. *Pecteilis gigantea*, *Spiranthes sinensis*, *Satyrium nepalense*, *Peristylis richardianus*, *Arundina graminifolia* and *Liparis* sp. are frequent. On the exposed rocks and small trees *Dendrobium barbatulum* and *Coelogyne* sp. are common.

Very few orchids are adapted to a wide range of habitats. *Arides ringens* can be seen from almost sea level to 2,200 m elevation. in plantations of indigenous species like Teak *Rhynchostylis retusa* and *Vanda testacea* are very common. On the contrary, plantations of exotic species hardly have any epiphytic orchids
SPECIES MAINTAINED IN THE ORCHIDARIUM

Among the orchids collected, eighty four species are maintained in the orchidarium. These species are enumerated below. The species are arranged in alphabetical sequence as per their correct name. Important synonyms are also given. A brief description of the diagnostic features are provided. Flowering period, data on distribution and occurrence are also given. Place(s) of collections are given for species with restricted distribution.


Robust non pseudobulbous epiphytic herbs. Leaves distichous, lorate. keeled, thickly coriaceous, 2 lobed at apex, lobes rounded. Flowers in racemose branched panicles, axillary. Flowers many, about 1 cm in diameter. Perianth lobes yellow with red transverse stripes. Lip white, saccate and hairy to the base inside; lateral lobes short and recurved; midlobe ovate, acute or rounded undulate with a stout rounded spur.

Flowering : November to January
Distribution : East Himalayas; Bangaladesh, South India and Sri Lanka
Occurrence : Idukki Dist. (Pachakkanam, Pooyamkutty) and Wynad (Chandanathode, Koothuparamba). We collected from Pooyamkutty, Idukki Dist. and from Kuruva Island. Wynad.


Robust non pseudobulbous epiphytic herbs. Leaves thickly coriaceous, unequally bilobed apex, lobes rounded. Flowers in compact racemes clustered at apex. Sepals and petals thick, fleshy, streaked with pink. Lip saccate. creamy yellow, midlobe dilated, lateral lobes deflexed, margins waved.

Flowering : March to May
Distribution : India and Sri Lanka
Occurrence : Very common throughout Kerala


Terrestrial herb with elongated pseudobulbous stem. Leaves few, large with a small plaited petiole. Flowers yellowish white with pink dots in 3-5 flowered lateral racemes. Lateral sepals adnate to the long curved foot of the column forming a large saccate mentum. Lip small, 3-lobed, three longitudinal ribs prominent at the base.

Flowering : March - April
Distribution : South West India and Sri Lanka
Occurrence : Fairly common in the evergreen forests at Silent Valley, Agasthyar mala, Ponmudi and Wynad.


Flowering : May - June
Distribution : India, Burma, Sri Lanka
Occurrence : This species is not common in Kerala. we collected from Wynad.

Epiphytic herb with stout stem. Leaves linear, coriaceous with bilobed apex. Inflorescence from the axils of upper leaves, very often branched. Flowers light pink to deep pink. Lip pale pink with darker pink streaks in the middle, 3-lobed, lobes small with two fleshy calli on the disc.

Flowering : March to July
Distribution : South India and Sri Lanka
Occurrence : Common from sea level to 2000 m elevation


Terrestrial leafy herbs with underground creeping stem, rooting at nodes. Leaves orbicular ovate, dark green with silvery veins. Flowers pink and white in erect spikes. Lip spurred, side lobes small, midlobe with toothed claw, channelled.

Flowering : November to January
Distribution : Endemic to South India
Occurrence : Usually found in the evergreen forests under dense shade at Nelliampathy, Munnar, Bonacaud, Silent Valley etc. Collected from Bonacaud and Nelliampathy.


Terrestrial Plants with rigid woody stem, 1 - 2 m tall. Leaves sheathing, linear lanceolate. Flowers pinkish purple 3.5 - 4 cm across, in terminal racemes. Lip 3-lobed, lateral lobes rounded embracing the column, midlobe subrotund, margins wavy; disc with three fimbriate ridges along the centre.

Flowering : August to December
Distribution : India, Sri Lanka and South East Asia
Vanilla wightiana

Eria pauciflora

Terrestrial tuberous herbs, leaves equally spaced, imbricate with sheathing leaf bases. Flowers 1 cm across, pink in few to many flowered spikes. Lip flabellate, narrowed into a claw at the base, claw ridged puberulous towards the base, margins wavy.

Flowering : August to September
Distribution : South India
Occurrence : Ponmudi, Peermade, Munnar, Nelliampathy


Small epiphytic herb, pseudobulbs ovoid 2 - 2.5 cm long. Leaves linear oblong, 6-8 cm long. Flowers yellow, mottled with red, about 2 cm long, in 6 - 8 flowered umbels. Lip fleshy, yellowish red

Flowering : July to September
Distribution : Endemic to South India
Occurrence : Collected from Munnar

**Bulbophyllum neilgherrense** Wight, l.c. t. 1850. 1851; Fischer in Gamble, Fl. Pres. Madras 1418 (992) 1928.

Robust epiphytic herb, pseudobulbs ovoid, 4-angled, 3-4 cm long, yellowish green, smooth, leaves narrowly elliptic to oblong, 5-15 cm long, narrowed at base. Flowers about 1 cm long, yellowish speckled with brown, in many flowered racemes. Lip purple or orange coloured with two recurved auricles at base.

Flowering : December to January
Distribution : Endemic to South India
Occurrence : Fairly common at altitudes 400-1000 m in evergreen and semi-evergreen forests. Collected from Peechi and Sholayar.

**Bulbophyllum tremulum** Wight lc. t. 1749. 1851; Fischer in Gamble, Fl. pres. Madras 1418. (992) 928.
Small epiphytic herb, pseudobulbs depressed conical, ridged 1.5 cm in diameter, green. Leaves ovate-lanceolate, 2-5 cm long. Flowers 6-10 on slender scapes, much longer than the leaves. Sepals and petals pale yellow, lip linear-oblong, deep purple, fringed with long hairs, basal auricles absent.

Flowering: November to December
Distribution: Endemic to South India
Occurrence: Fairly common in the evergreen forest at Sholayar, Welliempthy, Silent valley, Thekkady, Ponmudi and Peechi.


Terrestrial herbs, leaves oblong-lanceolate, acuminate up to 30 x 10 cm, plaited sheathing, sparsely pubescent. Inflorescence, terminal up to 50 cm long. Flowers usually pale pink with violet lip or white with pale violet lip. Lip 3-lobed equal to or smaller than the sepals, the side lobes are very variable, the midlobe cuneate with a cup in the centre. Spur linear spatulate, longer than the sepals.

Flowering: Almost throughout the year
Distribution: Indomalaysia
Occurrence: Fairly widespread in the evergreen forests at Munnar, Sholayar, Ponmudi etc. Collected from Munnar and Sholayar.


Slender pendulous, epiphytic herbs. Leaves semiterete, linear, straight or falcately curved, obtusely acuminate. Flowers small, Lip spurred, faintly bilobed at apex with a septum inside, which runs longitudinally.

Flowering: September to October
Distribution: South India and Sri Lanka
Occurrence: Fairly widespread in the evergreen forests below 700 m elevations at Wynad. Silent Valley, Sholayar, Thenmala, Pooyamkutty, Edamalayar etc.

Coelogyne breviscapa Lindl., Folia Orch. 4 : 1854; Fischer in Gamble, Fl. Pres. Madras (1012) 1430. 1928; Coelogyne angustifolia Wight, 1c. t. 1641. 1851.
Epiphytic of lithophytic herbs with creeping rhizome, pseudobulbs with dark brown adpressed Scales. Leaves 2, elliptic-lanceolate. Flowers white with yellowish tinged in 4-8 flowered racemes arising from the base of the terminal pseudobulb. Lip 3-lobed, side lobes small, blunt. midlobe broadly obovate, rounded, apiculate or retuse, keels two, wavy.

Flowering : March to May
Distribution : South India and Sri Lanka
Occurrence : Munnar, Silent Valley, Nelliampathy, Wynad. Sholayar etc.

**Coelogyne mossaie** Rolfe, Kew Bull. 156, 1894; Fischer in Gamble, Fl. Pres. Madras 1430 (1000) 1928.

Epiphytic or occasionally lithophytic herb, pseudobulb large, yellow. smoothly angled. Leaves 2, oblong-lanceolate, acute. Flowers white. fragrant, in 3-4 flowered racemes, arising from the top of pseudobulbs. Lip yellowish and reddish in the centre, 3 - lobed, side lobes short, triangular. mid lobe,elliptic, subobtuse, Keels two, entire.

Flowering : February to July.
Distribution : Endemic to South India
Occurrence : Munnar and Silent Valley. Collected from Munnar


Epiphytic or lithophytic herb with greenish yellow, wrinkled and rugose pseudobulbs. Leaves 2, lanceolate to broadly ovate acute. Flowers white with yellowish lip in 3 - 4 flowered racemes, terminal from the top of the young pseudobulbs. Lip 3-lobed, side lobes small, midlobe triangular-lanceolate, acute, keels 3.5 crenulate.

Flowering : April to May
Distribution : Endemic to South India
Occurrence : Munnar, Silent Valley, Sholayar, Agasthyarmala etc.


Epiphytic herb with stout leafy stem. Leaves lorate, unequally 2-lobed at apex. Flowers greenish purple in racemose panicles. upto 30-60 cm long
Lip greenish brown with a golden villous margin, base with 3 calli, disc with a medium pubescent callus, the whole structure resembling a bee.

Flowering : March to May
Distribution : South India and Sri Lanka
Occurrence : Some what common in the evergreen and semievergreen forests below 600 m elevations at Attappady. Nelliampathy. Sholayar. Trichur, Wynad, Thenmala etc.


Stout epiphytic herb, sometimes lithophytic. Pseudobulb not well differentiated. Leaves linear-oblong, obtuse, tip unequally and obtusely 2-lobed, 20-50 cm long. Flowers yellowish red in lax many flowered pendulous racemes upto 30 cm long. Lip 3-lobed, side lobes narrow, midlobe ovate-oblanceolate, decurved, disc with lamellae.

Flowering : March to May
Distribution : India, Sri Lanka and South East Asia
Occurrence : Common in the moist deciduous and semievergreen forests below 700 m elevation.


Robust epiphytic herbs. Pseudobulbs not distinct, ovoid sheathed by leaf bases. Leaves linear oblong, apex notched with 2 unequal rounded lobes, Flowers purple with yellow margins on sepals and petals in 25-35 cm long racemes. Lip shorter than the petals, 3-lobed, side lobes reflexed, yellow with purple streaks and margins crenulate.

Flowering : March to April
Distribution : India and Sri Lanka
Occurrence : Fairly common at Wynad, Kulathupuzha, Pooyamkutty (Idukki) Nelliampathy, Silent Valley etc.

Epiphytic herb with greenish pink ovoid pseudobulbs covered with membraneous sheaths. Leaves elliptic oblong or lanceolate, sheathing at base. Flowers white with pink tinge, in 5-many flowered racemes. Lip broadly obovate. 3-lobed with a broad sinus in between the lobes, side lobes tooth like, midlobe rhomboid ovate, distantly serrulate, disc fleshy broadened and 3-toothed at apex.

Flowering: February to April
Distribution: Endemic to South India
Occurrence: Collected from Munnar


Epiphytic herb with reddish brown elongated stem covered with whitish scales. Leaves ovate-lanceolate, acuminate, leafless at the time of flowering. Flowers 2-3, from the axils of fallen leaves, white. Lip yellowish hairy along the throat, 3-lobed, side lobes small, incurved. midlobe broadly triangular.

Flowering: January to April
Distribution: Endemic to South India
Occurrence: Silent Valley, Munnar etc. Collected from Munnar.


Epiphytic herb with pendulous slender stem, leafy towards the upper portion. Leaves linear, apex oblique. Flowers 2-4 together, yellow with dark red tinged lip. Lip tongue shaped, acute. glabrous, undulate, adnate to the foot of the column.

Flowering: July to September
Distribution: South India, and Sri Lanka
Occurrence: Collected from Agasthiyarmala (Trivandrum)

**Dendrobium barbatulum** Lindl., Gen. Sp. Orch. 84. 1830; Fischer in Gamble, Fl. Pres. Madras 1416 (990) 1928.

Small epiphytic sometimes lithophytic herb. Leaves lanceolate. acute, membraneous. Flowering stem leafless, Flowers white with pink shades in lateral and terminal racemes. Lip 3-lobed, side lobes obtuse midlobe rhomboid
ovate, acute or apiculate, hairy at base, disc grooved, obtuse with yellow hairs.

Flowering: March to May
Distribution: South West India
Occurrence: Ponmudi, Wynad, Nelliampathy, Silent Valley


Epiphytic herb with greenish yellow stem, narrowed at the base. Leaves shed before flowering, oblong lanceolate, sheathing. Flowers white with faint pinkish tinge, in pairs from the upper nodes of stem. Lip yellowish at the throat, hardly lobed, oblong-orbicular, pubescent.

Flowering: April to May
Distribution: India and South East Asia
Occurrence: Silent Valley (Palghat), Chandanathode (Wynad). Collected from Wynad.


Pendulous or erect epiphytic herb, stem narrowed at base, much branched, purplish brown or brownish yellow. Leaves linear-oblong or linear-lanceolate. Flowers small, white in 2-5 flowered racemes. Lip greenish white, obscurely 3-lobed, side lobes indistinct or very narrow, midlob ovate entire, subacute.

Flowering: December to April
Distribution: South and North East India
Occurrence: Common at all forest types at 300-1500 m elevations at Ponmudi, Agastiarmala, Pamba, Peermedu, Munnar, Silent valley, Nelliampathy, Wynad, Sholayar.


Epiphytic herb, stem elongated, brownish yellow, leafless when in flower. Leaves narrowly oblong-lanceolate, oblique at apex. Flowers creamy
yellow with orange-red lip, in clusters of 1-3, from the axils of fallen leaves. Lip ovate-lanceolate acute side lobes obscure, disc pubescent.

Flowering : March to April
Distribution : India, Sri Lanka, South East Asia
Occurrence : Mostly confined to places above 1000 m elevation at Ponmudi, Peermedu, Wynad, Silent Valley, Varadimala (Palghat)


Epiphytic herb with slender laterally compressed stem, leafy when in flower. Leaves linear-lanceolate, acute. Flowers white, small in 4-8 flowered flexuous mostly axillary racemes. Lip 3 lobed, side lobes acute, midlobe rounded, disc with a channelled ridge ending in a fleshy callus.

Flowering : February to July
Distribution : Endemic to South West India
Occurrence : Munnar, Ponmudi, Sholayar, Wynad, Silent Valley etc


Epiphytic herb, stem greenish, leafless when in flowers. Flowers white, actinomorphic, being composed of six equal perianth lobes with no distinct lip as in other species of Dendrobium.

Flowering : February to April
Distribution : Endemic to South West India
Occurrence : Collected from Sholayar


Small erect epiphytic herb with ovoid conical yellowish green pseudobulbs, covered with membraneous sheaths. Leaves elliptic, subcoriaceous. Flowers small, greenish white in 1-3 flowered racemes. Lip obovate, suborbicular curved, 3-lobed, sidelobes white with reddish nerves, midlobe yellowish green, emarginate, fringed with 2 rows of irregularly arranged papillate hairs.

Flowering : September to December
Distribution : Endemic to South West India
Occurrence : Collected from Chandanathode Wynad
**Dendrobium macrostachyum** Lindl., Gen. Sp. Orch. 90. 1830; Wight, lc. t. 1647. 1851; Fischer in Gamble Fl. Pres. Madras 1416 (990) 1928.

Epiphytic herb with elongated, more or less uniformly thickened pendent stem. Leaves mebraneous, linear-lanceolate to ovate-lanceolate, acute. Flowers pale green to yellowish brown, tinged with red, solitary or in clusters of 2-4. Lip ovate-oblong, side lobes small, rounded or absent, midlobe hairy.

Flowering : May to June  
Distribution : India, Sri Lanka  
Occurrence : This species is very common in the forests as well as on the plains below 700 m elevations.

**Dendrobium ovatum** (Willd.) Krazl in Engl., Planzenf 45:17. 1910; Fischer in Gamble, Fl. Pres. Madras 1416 (990). 1928; **Dendrobium barbatulum** auct. non Lindl. 1830; Wight, lc.t 910. 1845.

Epiphytic herb with elongated, terete stem, leafless when in flower. Leaves oblong lanceolate, acute. Flowers creamy white with greenish lip, in terminal and lateral many flowered racemes. Lip flat, side lobes small, obtuse, midlobe large, quadrate oblong, disc with a channelled ridge, surrounded by hairs.

Flowering : January to April  
Distribution : South West India  
Occurrence : Fairly common, especially in Moist deciduous forests below 1000 m elevations.

**Diplocentrum congestum** Wight, lc. t. 1682. 1851; Fischer in Gamble, Fl. Press. Madras 1449(1013). 1928.

Small epiphytic herb with very short stem. Leaves 2-4, linear-oblong, unequally and obtusely 2-lobed at apex. Flowers small pinkish with dark pink streaks, in few to many flowered racemes arising from below the leaves. Lip white deflexed and truncate at apex, disc naked boardened with 2 short divergent spurs at base.

Flowering : April to May  
Distribution : South West India  
Occurrence : Rare in Kerala, collected from Vellanimala Trichur and Achenkovil, Quilon.

Epiphytic herb with discoid pseudobulbs. Leaves sessile, oblong-lanceolate, obtuse, sparsely pubescent or glabrous. Flowers yellowish white, in few flowered racemes. Lip very small, ovate lanceolate falcate.

Flowering : August to September  
Distribution : Endemic to South India  
Occurrence : Fairly widely distributed; Munnar, Silent Valley, Wynad, Agasthiyamala etc.


Epiphytic herb with ovoid conical, brownish red pseudobulbs. Leaves 1-4 terminal on the pseudobulbs, linear to oblong-lanceolate, obtuse or subacute. Flowers white, in many flowered racemes. Lip fleshy with a purple colour at the throat, base with 2 arched ridges.

Flowering : July to September  
Distribution : Endemic to South India  
Occurrence : Very widely distributed in Kerala forests at altitudes between 400-1000 m.

**Eria pauciflora** Wight, l.c. t.1636, 1851; Fischer in Gamble, Fl. Pres. Madras 1425 (996). 1928,

Epiphytic herbs with clavate pseudobulbs, from a creeping root stock. Leaves 2, from the tip of the pseudobulbs, linear-oblong. Flowers 1-3, from the apex of pseudobulbs. Lip cuneately oblong, lobes obscure.

Flowering : August to September  
Distribution : Endemic to South India  
Occurrence : Silent Valley, Munnar


Epiphytic herb with elongated clavate pseudobulbs. Leaves 2-3, oblong lanceolate, acute. Flowers white, tinged with pink, 1 or 2 flowers, terminal on pseudobulbs, between the leaves, the pduncle covered with 2 sheaths. Lip
shorter than the sepals, broadly ovate, side lobes slightly crisped, midlobe puberulous.

Flowering : August to September
Distribution : Endemic to South India
Occurrence : Collected from Munnar and Agasthiyarmala


Small epiphytic herb with depressed globose, green pseudobulbs, enclosed in a reticulate sac. Leaves 2, elliptic or oblong-lanceolate. Flowers white, solitary on the scape emerging from in between the leaves. Lip equal to the sepals, marked with yellow and purple, 3 lobed. Lip equal to the sepals, marked with yellow and purple, 3 lobed, disc with 2 yellow ridges.

Flowering : August to September
Distribution : Endemic to South India
Occurrence : Munnar, Silent Valley, Ponmudi, Agasthiyarmala etc.


Terrestrial herbs with conical smooth, green pseudobulbs. Leaves narrow, linear acuminate, 1-ribbed. Flowers greenish yellow with a white purple streaked lip, in elongated branched racemes, lateral from the pseudobulbs. Side lobes of the lip small, embracing the column, midlobe ovate oblong, margins wrinkled, disc with 5 crested nerves.

Flowering : November to January
Distribution : India, Sri Lanka
Occurrence : Fairly common in the deciduous and semievergreen forests below 500 m elevation. Collected from Peechi.


Terrestrial herb with conical pseudobulbs, stem covered with membranous sheaths. Leaves lanceolate, acuminate. Flowers yellowish-green, in elongated racemose lax flowered panicles. Lip obovate oblong, sidelobes
small, erect, midlobe obovate, rounded at apex, disc with 5 ridges, crested with glochidiate processes.

**Flowering** : October to December  
**Distribution** : Indomalaysia  
**Occurrence** : Collected from Agasthiyarmala


Terrestrial herbs with large horizontal tuberous rootstock, leafless when in flower. Leaves linear-lanceolate, plaited, acuminate, base narrowed into a long sheath. Flowers greenish purple with white to purplish lip in lax flowered racemes from the base of the tubers. Lip ovate-oblong, side lobes rounded, erect, margins crispid, midlobe oblong, bifid crispid, disc with several crenulate veins.

**Flowering** : March to May  
**Distribution** : Indomalaysia  
**Occurrence** : Fairly widely distributed, mostly seen in grasslands at Silent Valley, Wynad, Ponmudi, Sholayar, Nelliampathy, Peechi etc.


Eiphytic or lithophytic herb, rhizome creeping, profusely branched. ending in linear-oblong, fusiform pseudobulbs. Leaves solitary on pseudobulb sessile, ovate-lanceolate. Flowers small, white solitary, sometimes two. axillary. Lip obovate, subuplicate. side lobes erect, spotted with pink! midlobe creamy white speckled with red spots.

**Flowering** : Flowers during most of the months in the year  
**Distribution** : India and Sri Lanka  

Small epiphytic herb with very short stem. Leaves 4-5, falcate, with purple tinges. Flowers small, yellow, with red blotches on sepals and petals in few flowered racemes, lateral from the stem. Lip white saccate, keeled, side lobes obscure, midlobe retuse, finely crenate.

**Flowering**: November to January  
**Distribution**: Endemic to South West India  
**Occurrence**: Collected from Nilambur, Sholayar and Peechi


Terrestrial herbs with tuberous root stock, stem arising laterally from the rootstock. Leaves 2 or 3, elliptic-lanceolate, plicate. Flowers purplish white crowded in decurved racemes. Lip sessile, subpandurate, rounded at apex, emarginate or 2-fid, streaked with purple, disc with a median yellow channelled ridge, ventricose at base.

**Flowering**: March to May  
**Distribution**: Indomalaysia  
**Occurrence**: Fairly common in the moist deciduous and semievergreen forest below 600 m elevation. Collected from Sholayar, Peechi and Wynad.


Terrestrial herb with ovoid tubers. Leaves towards the base of the stem, oblong-lanceolate, narrowed to the base. Flowers white, showy, in few flowered terminal racemes. Lip thrice long as the sepals, 3-lobed, sidelobes cuneiform, outer margins dentate, midlobe 2-lobed.

**Flowering**: August to October  
**Distribution**: South West India and Sri Lanka  
**Occurrence**: Fairly common at Munnar, Silent Valley, Sholayar, Ponmudi etc. Collected from Sholayar, Ponmudi and Peechi.

Terrestrial herbs with ovoid globose tubers. Leaves alternate, ovate oblong, acute or acuminate, sheathing at base. Flowers white in many flowered racemes. Sepals pubescent. Petals 2 partite. Lip 3 lobed from the base, midlobe slightly longer than the side lobes, spur lanceolate, as long as the ovary.

Flowering : July to August
Distribution : South India
Occurrence : Collected from Sholayar


Small terrestrial tuberous herbs with erect stem. Leaves sheathing, ovate to linear. Flowers white in 5-10 flowered spikes. Lip as long as the sepals deflexed, 3 partite, side lobes linear, midlobe broader than the side lobes, spur obtuse as long as or shorter than the ovary.

Flowering : August to November
Distribution : South West India
Occurrence : Collected from Munnar, Silent Valley, Agasthiyarmala


Tuberous terrestrial herb. Leaves about 6, subradical, elliptic lanceolate, acute, sheathing at base. Flowers white, usually 2, in erect scapes. Lip 3 partite to the middle, much longer than the sepals, lateral lobes broader than the sepals, lateral lobes broader than the midlobe, cuneate at apex, midlobe linear, obtuse, spur much longer than the ovary, with a small triangular tigule at the mouth, broadened towards the distal end.

Flowering : August to December
Occurrence : Mostly seen in grasslands. Collected from Ponmudi (Trichur) and Ponmudi (Trivandrum).


Terrestrial tuberous herbs. Leaves cauline, linear-oblong or lanceolate, obtuse or acute. Flowers white, in 2-8 flowered spikes, lateral sepals ovate, acute. Lip as long as the lateral sepals 3 partite, side lobes recurved. crenate, midlobe with a callus on the mouth, spur twice as long as the ovary.
Flowering : August to October
Distribution : Endemic to South India
Occurrence : Munnar, Silent Valley, Ponmudi (Trichur) etc.


Terrestrial herb with irregularly ellipsoid tubers. Leaves 4-6, clustered towards the middle of the stem, elliptic lanceolate or oblanceolate, acute or acuminate. Flower greenish yellow, in many flowered lax spikes. Lip 3 lobed, as long as the sepals, side lobes linear oblong lanceolate, entire or slightly notched at apex, midlobe fleshy, ovate oblong, longitudinally grooved, truncate at apex, spur longer than the ovary some what dilated at apex.

Flowering : August to October
Distribution : South West India
Occurrence : Collected from Peechi.

**Habenaria plantaginea** Lindi., Gen Sp. Orch. 323. 1835; Wight, Ic. t. 1710 1851; Fischer in Gamble, Fl. Pres. Madras 1470 (1027) 1928.

Terrestrial herb with very short stem from oblong tubers. Leaves radical, lying flat to the ground, oblong, acute, narrowed at base into a short sheath. Flowers white, in lax few to many flowered racemes. Lip twice as long as the sepals, flabelliform from a narrow claw, 3 lobed, sidelonges semiovate, sub-acute, entire or crenulate, midlobe narrowly linear, spur slender as long as or little longer than the ovary.

Flowering : August to October
Distribution : India Sri Lanka
Occurrence : Fairly common in the moist deciduous and semievergreen forests below 500 m elevation. Collected from Vellanimala (Trichur) Walayar, Achenkovil and Vazhachal.


Terrestrial herb with hardly swollen stem, 15 - 20 cm long. Leaves ovate or orbicular, membraneous, 5 - veined, base very unequal sided. Flowers dull purple, about 2 cm across in slender racemes. Dorsal sepal linear.
3 - veined with recurved, margins narrowly linear, spreading. Lip orbicular- obovate, recurved, margin crenulate, two large confluent tubercles present at the base.

Flowering : August to September
Distribution : South India and Sri Lanka
Occurrence : Fairly common at Munnar, Nelliampathy, Mozhiyar Sholayar


Terrestrial herb with elongated stem, swollen at the base. Leaves lanceolate, acuminate, leaf base narrowed into a sheath around the stem. Flowers greenish yellow 1.2 cm across in long peduncled racemes. Dorsal sepal oblong, obtuse, 5 - veined with revolute margin; lateral sepals obliquely oblong, 5 - veined. Petals linear - spatulate. Lip cuneatly obovate, crenate towards the apex, faintly trifid, base with 2 - tubercles.

Flowering : July to August
Distribution : India
Occurrence : Collected from Sholayar and Nelliampathy


Terrestrial herb with short stem above the ground. Leaves usually 2, sometimes upto 5, flat and spreading on the ground, sessile, broadly obovate or elliptic, lanceolate, 7-nerved. Flowers greenish in terminal lax racemes. Sepals lanceolate, the dorsal sepal bent backwards with revolute margins. Petals narrowly linear. Lip clawed, transversely oblong orbicular or orbicular reniform, emarginate at apex, minutely denticulate along the margins, 2 conical calli present at the base.

Flowering : June
Distribution : India and Burma
Occurrence : Earlier recorded from North Kanara. We collected from Kuruwa Island, Wynad.

Tufted epiphytic herb with elongated conical pseudobulbs, covered with papery sheaths. Leaves usually 2, sessile jointed, oblanceolate or linear lanceolate, erect, 5-7 nerved. Flowers greenish-yellow 4 mm across in many flowered terminal racemes. Lip orbicular ovate, obscurely 3-lobed, fleshy, thickened callus absent.

Flowering : October to December
Distribution : India to South east Asia
Occurrence : Fairly common in the semievergreen and evergreen forests. Collected from Ponmudi, Sholayar, Peechi, Wynad, Nelliampathy and Silent Valley.


Erect nonpseudobulbous 15-25 cm long terrestrial herbs. Leaves usually 3, ovate or broadly elliptic-lanceolate, acute or slightly acuminate, abruptly narrowed at base, 5-ribbed, membranous. Flowers about 1.5 cm long, pale greenish-yellow or greenish-white in 10-15 cm long terminal lax flowered racemes. Sepals subequal, doral sepal oblong, obtuse, lateral sepals ovate-lanceolate. Petals linear-oblong, narrower than the sepals. Lip obovate, emarginate or truncate with toothed apex, two calli present at the base on either side of the median nerve, disc 5-nerved.

Flowering : May to July
Distribution : South and South East Asia
Occurrence : Earlier recorded from Arunachal Pradesh. We collected from Moozhiyar, Pathanathitta.


Epiphytic pendulous herb with 20-40 cm long stems. Leaves cylindric with a caudate apex. Flowers about 3 cm across in 3-4 flowered racemes, with only one flower open at a time. Sepals subequal, narrowly ovate-oblong, acute, mucronate. Petals narrowly linear oblong, somewhat falcate, entire, green on upper side and faintly purplish below. Lip pale white with purple bloches, obovate-oblong with two small rounded lobes at base, much constructed towards the apex with two divergent upturned oblong orbicular lobes, disc ridged.
Flowering : March to April  
Distribution : South West India  
Occurrence : Earlier known from North Kanara and Decan. Abraham & vatsala (1981) reported from Chandanathode, Wynad. We collected from Sholayar, where it is fairly common.


Small epiphytic herb with 3-10 cm long terete stems. Leaves cylindric, 4-10 cm long, attenuate, acute, sheathing at base. Flowers about 1 cm long, greenish pink in 2-4 flowered extra axillary racemes. Dorsal sepal ovate, obtuse, concave; lateral sepals ovate, acute, concave, keeled towards the apex and mucronate. Lip about 0.5 cm long, concave towards the base, 3-lobed with dark maroon horizontal bands, lateral lobes thin, erect, auricular; midlobe rhomboid.

Flowering : June to July  
Distribution : India, South East Asia, also in China  
Occurrence : One of the widely seen species in the deciduous forest and is found throughout Kerala.


Terrestrial or rarely epiphytic herb. Stem erect, 3-25 cm tall, slightly swollen at the base. Leaves 3-5, sheathing, plicate. ovate lanceolate or broadly obovate or elliptic, 8-10 nerved. Flowers about 4 mm across, yellowish with a purple tinge when young and becoming deep purple with age, in 8-30 cm long, dense or lax flowered racemes. Sepals unequal, linear, 3 nerved. Petals slightly curved. Lip rounded, reniform pectinate except for a small portion in the middle.

Flowering : June to August  
Distribution : India and Sri Lanka  
Occurrence : Fairly common in most of the forest types throughout Kerala. Collected from Wynad. Munnar, Peechi, Ponmudi etc,

**Nervilia aragoana** Gaud. in Freyeinet, Voy. Bot. t. 35. 1826; Fischer in Gamble, Fl. Pres. Madras 1450 (1020) 1928.

Tuberous herb with a single leaf. Tuber subglobose, 1.5-2 cm in diameter white. Leaves appear after the flowering. Leaves lamina orbicular, cor-
date. nerves prominent, up to 18, petiole 8-20 cm long. Flowers 2.5-3 cm long, greenish in few to many flowered lax racemes. Sepals oblong, acute. petals similar to sepals. Lip subsaccate at base, obovate, 3-lobed, lateral lobes erect, midlobe obtuse or subacute irregularly crenate.

Flowering : May to June
Distribution : Indomalaysia
Occurrence : Fairly common in the moist deciduous forest throughout Kerala. Collected from Peechi, Chimmini dam, Neyyar dam etc.


Small tuberous herbs. Tuber globose, 1-1.5 cm across. Leaves lying flat on the ground subsessile, orbicular, cordate. upper surface dull yellowish green with dark purple blotches. Flowers 2.5-3 cm long, greenish yellow. Lip convolute at base, widening above the middle, tip broadly rounded or slightly cleft, obovate oblong, with a thickened yellowish medium ridge.

Flowering : May to June
Distribution : South West India and North East India
Occurrence : Collected from Peechi and Vellanimala, Trichur


Small tuberous herbs. Leaves lying flat on the ground, reniform cordate, green, upper surface hirsute. Flowers solitary, about 2 cm long sepals and petals yellow. Lip 3 lobed, lateral lobes as long as the midlobe, midlobe fimbriate.

Flowering : May to June
Distribution : South India, North West Himalaya and Thailand
Occurrence : Collected from Kuruva Island, Wynad.


A very small epiphytic herb. Leaves brownish yellow, 1-5 cm long and 1 cm wide. Flowers orange red in densely flowered 5-4 cm long scapes. Lip 3-lobed gland dotted; lateral lobes irregularly pectinate. midlobe with a broad or narrow sinus in between, the lobules irregularly denticate.
Flowering: April
Distribution: Endemic to South West India
Occurrence: Collected from Vellanirnala, Trichur and Silent Valley.

Oberonia brunoniana Wight, Ic. t. 1622, 1851; Fischer in Gamble, Fl. Pres. Madras 1406 (984) 1928.

Erect or pendulous epiphytic herbs. Leaves linear oblong, acute falcate or subfalcate. Inflorescence 7-25 cm long, densely flowered. Flowers sub-sessile, reddish. Sepals ovate, acute, sparsely glandular. Petals linear, acute. Lip quadrately oblong, 3-lobed. lateral lobes broadly auricular slightly crenate. midlobe 2 lobulate with a shallow sinus.

Flowering: November to December
Distribution: South West India
Occurrence: Fairly common at altitudes above 500 m at Sholayar. Silent Valley, Ponmudi, Thekkadi, Agasthiyarmala etc.


Erect or occasionally pendulous epiphytes. Leaves broadly ensiform, ovate oblong to oblong-lanceolate. Flowers orange-yellow, in dense flowered 8-20 cm long spikes. Sepals broadly ovate, acute. Petals ovate-elliptic narrower than the sepals. Lip obscurely 3-lobed, margins pectinate erose. midlobe 2 lobulate with a broad sinus in between.

Flowering: November to December
Distribution: Indomalaysia
Occurrence: Reported to occur at Ponmudi. We collected from Peechi.


Epiphytic herb upto 20 cm high Leaves ensiform fleshy. Inflorescence decurved towards the apex, densely flowered. Flowers straw coloured. Sepals ovate, obtuse. Petals as long as the sepals or subequal, narrow, linear-ligulate. Lip 3-lobed, margin irregularly crenulate, gland dotted, sidelonges narrowly auricular, incurved midlobe with sinus between the lobules, sometimes overlapping.
Flowering : December to March
Distribution : South West India
Occurrence : Ponmudi, Silent Valley, Wynad etc.


Flowering : June to July
Distribution : Sri Lanka and South India
Occurrence : Recently reported from Thenmala. We collected from Peechi and Elanad, Trichur.


Slender terrestrial tuberous herb leafless when in flower, tubers elongated often forked. Leaves grasslike, linear acuminate, sheathing towards the base. Flowers about 1.5 cm long, purplish yellow in 2-5 flowered hirsute racemes. Dorsal sepal ovate-oblong, acute. lateral sepals attached to the sides of a very short foot forming a short gibbous mentum. Petals oblanceolate, narrower than the sepals. Lip 3-lobed slightly shorter than the petals, lateral lobes erect, narrowly auricular, midlobe ovate, obtuse at apex, 3-crested lamellate and hirsute on the dorsal surface.

Flowering : December to February
Distribution : Endemic to Kerala and Tamil Nadu
Occurrence : Mostly seen in the grasslands at Ponmudi (Trivandrum), Idukki, Palghat etc. We collected from Ponmudi (Trichur),


Terrestrial tuberous herb, 60-120 cm high, tubers ellipsoid or ovoid stem with 3-4 sheaths at base and leafy upto the inflorescence. Leaves 7-9 ovate oblong or ovate-lanceolate, acute, sheathing at base. Flowers white
with faint green tinge, fragrant in 2-6 flowered racemes. Bracts oblong lanceolate, longer than the ovary and enclosing it. Dorsal sepals ovate rhomboid revolute along the margins. Lateral sepals oblong acute, revolute on the margins. Petals linear oblong acute much narrower than the sepals. Lip flabellate, tripartite, sidelobes truncate, pectinate, midlobe elliptic. Slightly dilated beyond the middle, obtuse spur twice as long as the ovary.

Flowering : August to November
Distribution : Indo Malaysia
Occurrence : Mostly confined to the grasslands at Munnar, Wynad, Idukki, Ponmudi. We collected from Wynad and Munnar.


Terrestrial tuberous herb, upto 50 cm tall, tubers 1-2, oblong. Stem with 3-5 sheaths at base. Leaves 4-6 clustered towards the middle of the stem, ovate or elliptic ovate acute at apex and sheathing at base. Flowers yellowish brown in 10-20 cm long spikes. Bracts lanceolate, longer than the flowers. Dorsal sepal ovate-oblong, obtuse, lateral sepals oblong, oblique at base, papilllose. Lip 3 lobed, midlobe much broader than the side lobes. Spur saccate, ovate globular.

Flowering : July to September
Distribution : South and South East Asia
Occurrence : Fairly common in the Moist deciduous forests, throughout Kerala. We collected from Peechi and Vellanimala. Trichur.


Tuberous herbs, 25-35 cm tall when in flower. Stem with 2-3 tubular sheaths at base. Leaves alternate, ovate-lanceolate or linear-lanceolate, acuminate, sheathing at base. Flowers small, greenish yellow in lax flowered spikes. Bracts lanceolate, acuminate usually longer than the flowers. Dorsal sepals linear lanceolate, narrower than the petals. Petals ovate elliptic to oblanceolate, obtuse. Lip 3 lobed, with a concave claw, side lobes filiform and incurved like horns, midlobe triangular deflexed.

Flowering : August to October
Distribution : South and North East India
Occurrence : A rather common species in the grasslands. We collected from Munnar and Wynad.

Epiphytic herb with short, 2-3 cm long stem. Leaves 2 or 3 oblong, obtuse, coriaceous, margins undulate. Flowers about 2 cm across, creamy yellow, marked with purple, in few flowered racemes. Petals narrower than the sepals. Lip 3 lobed, base saccate, side lobes ridged, truncate, with fleshy appendage inside, midlobe cuneate, tip two lobed, disc fleshy with 2 awned appendage at the base.

Flowering : August to October
Distribution : South and South East Asia
Occurrence : We collected from Sholayar.


Epiphytic herb with crowded pseudobulbous stem, pseudobulbs ovoid, subtetragonal, truncate 3-6 cm long. Leaves one to a pseudobulb, linear lanceolate or oblong lanceolate, plaited acute or obtuse, base tapering, coriaceous. Flowers pinkish white, 6 mm across in many flowered drooping 5-12 cm long racemes, bracts closey imbricating cymbiform, orbicular cuspidate. Dorsal sepal broadly ovate, obtuse, lateral sepals, ovate cymbiform. ridged or keeled dorsally connate at the base. Petals linear. Lip panduriform, saccate between the lateral lobes, midlobe and lobules rounded.

Flowering : June to August
Distribution : Indo Malaysia
Occurrence : A very common species in the forests below 1000m elevation, throughout Kerala. We collected from Peechi, Kulathupuzha and Nilambur.


Tufted leafy epiphytic herb with slender stems Leaves small, distichous, equitant, laterally compressed, coriaceous. Flowers small, white with a purple tinge, in short few flowered terminal recurved 2.5-3.5 cm long racemes. Dorsal
sepal broadly lanceolate ovate, acute; lateral sepals lanceolate, one half of the sepals are adhering to the foot of the column forming a spur like mentum. Petals obovate. Lip oblong, lanceolate, obtuse, 3-veined, lateral lobes obscure.

Flowering : October to November
Distribution : India and Sri Lanka
Occurrence : Collected from Chandanathode, Wynad


Epiphytic herb with spirally arranged ovoid pseudobulbs. Stem short covered with sheathing bracts and bases of leaves. Leaves distichous. oblong elliptic to lanceolate, narrowed into sheathing petiole. Flowers pale greenish yellow, 0.5 cm across, in short panicles. Dorsal sepal ovate, acute. Lateral sepals broadly ovate, apex recurved, oblique at base. Petals linear oblanceolate narrower than the sepals. Lip 3 lobed with an erect median ridge at the base, side lobes erect, obtuse, midlobe oblong suborbicular, crenulata.

Flowering : August to September
Distribution : Throughout the tropics
Occurrence : Fairly common in all forest types. We collected from Sholayar and Silent Valley.


Small epiphytes or sometimes lithophytic herb with discoid pseudobulbs, covered with sheaths with reticulate nerves. Stem very small, sheathed, sheaths light brown, mebraneous, broadly oblong or suborbicular, gland dotted. Leaves at the time of flowering, sessile broadly oblong or obovate, very small, both surfaces minutely papillate. Flowers deep red, very shortly pedicellate. solitary, arising from below the pseudobulb. Sepals united to form a subcampanulate tube, saccate at base and 3-lobed at apex. Petals small, reaching the cavity of the calyx tube. Lip small, tongue like.

Flowering : April to May
Distribution : South West India
Occurrence : Ponmudi, Silent valley, Thekkady. We collected from Silent Valley.

Stout non pseudobulbous epiphytic herb, stem 5-25 cm long. Leaves linear, strap shaped, unequally lobed at apex, coriaceous. Flowers tinged with violet pink, 1.5-2 cm broad, in stout compact 20-30 cm long drooping axillary racemes. Dorsal sepal ovate or ovate-oblong; lateral sepals obliquely and broadly ovate. Petals similar to sepals. Lip 3 lobed, clawed, claw deflexed, deeply saccate; lateral lobes obscure, midlobe elongated, inflexed, cuneiform.

Flowering : May to June
Distribution : Indo Malaysia
Occurrence : Fairly widely distributed often frequent in teak plantations.


Erect leafy herb with oblong tubers and fleshy root. Leaves fleshy elliptic or ovate lanceolate acute, base broad and sheathing. Flowers pink, 1 cm broad. in 7-9 cm long terminal spikes. Dorsal sepal oblong-lanceolate obtuse, recurved ciliolate. Petals oblanceolate, obtuse. Lip cupular, crenulate strongly keeled at back with two parallel spurs arched on either sides of the ovary.

Flowering : August to December
Distribution : Indomalaysia
Occurrence : Mostly confined to the grasslands at Munnar, Ponmudi, Agasthiarmala, Peermedu etc. We collected from Agasthiarmala and Munnar.


Epiphytic herb with thick roots. Leaves broadly oblong, apex rounded, shortly petiolate. Flowers 3-4 mm across, yellowish with purple stripes, in 5-14 cm long axillary panicles. The sepals and petals inflexed. Lip boat shaped, epichile continuous with hypochile.

Flowering : July to December
Distribution : South West India
Occurrence : Fairly common in the evergreen and semi-evergreen forests at Silent Valley. Sholayar, Ponrnudi etc. Collected from Sholayar and Silent Valley.

Epiphytic herb. Leaves 2-3, narrowly oblong, often mottled with purple, unequal sided at base. Flowers about 1 cm across, yellow with purple spots, in many flowered racemes arising from the base of the leaves. Sepals and petals subequal, obovate-oblong, rounded. Lip white, flushed with pink, 3-lobed. lateral lobes erect, midlobe entire, rounded, spur broadly conical.

Flowering : May  
Distribution : South West India  
Occurrence : This species was reported earlier from Karnataka and Maharashtra. Our collection from Nelliampathy is a record for Kerala


Flowering : April to May  
Distribution : South India  
Occurrence : Earlier reported from Karnataka. Now known to occur at several places in Kerala. We have collected from Vellanimala and Palapally of Trichur Dist.


Small epiphytic herbs with creeping rhizome. Pseudobulbs globose, bearing a solitary leaf. Leaves elliptic, acute, 1-nerved, coriaceous. Flowers about 1 cm across, arising from the base of the pseudobulb. solitary, orange with red dots. Sepals subequal, ovate oblong mucronate, faintly 7 nerved. Dorsal sepal concave petals narrowly linear oblong, acute, 1 nerved, gland dotted. Lip mobile on the apex of the column foot, deflexed, oblong, tuberculate on the upper surface, rounded.

Flowering : January  
Distribution : South West India  
Occurrence : Earlier reported from Maharashtra. Now known from Karnataka and also from several places in Kerala. We have collected from Peechi and Sholayar.

Stout epiphyte with 30-60 cm long non pseudobulbous stem. Leaves strap shaped, obtusely keeled, coriaceous, distichous. Flowers 5 cm across, greyish blue, buff red or yellow tessellated, in 4-10 flowered 15-2-cm long racemes. Dorsal sepal obovate, faintly trifid. lateral sepals, obovate, obtuse many veined, wavy. Petals obovate obtuse or subacute, margins wavy, Lip funnel shaped, 3-lobed, lateral lobes erect, obliquely oblong. midlobe panduri-form, constricted below the bifid apex, disc with fleshy curved ridges. spur short, conical.

Flowering : September to October
Distribution : India and Sri Lanka
Occurrence : Mostly seen in the deciduous forests. We collected from Marayur.


Epiphyte with stout non pseudobulbous 10-15 cm long stem. Leaves linear, lorate, distichous, unequally lobed or toothed at apex, coriaceous and Keeled. Flowers about 1.8 cm across, yellow with purple or pink lip, in erect many flowered, 6-15 cm long racemes. Sepals similar, obovate spathulater incurved at apex. Petals spathulate, concave, narrowed at base. Lip sessile, 3-lobed, lateral lobes oblong, obtuse, erect; midlobe subquadrate, recurved, dilated at apex, crenulate. disc with two fleshy ridges; spur narrow, funnel shaped.

Flowering : March to April
Distribution : India and Sri Lanka
Occurrence : Fairly common in the Deciduous forest at low elevation.


Climbing aphyllous plants with succulent green stem. Flowers about 3 cm long, pale yellow, in axillary, 3-7 flowered racemes. Sepals and petals oblong-lanceolate. Lip inserted at the base of the column, embracing and fusing with it by a convolute claw and dilating into a trumpet shaped limb with recurved margins, apex triangular acute, disc with 2 broad papillate ridges.

Flowering : March to May
Distribution : South India
Occurrence : Though Henry et al. (1978) treated it as an endagered species, we have collected it from Kulathupuzha, Sholayar, Ezhimala etc. It is fairly common. It established well under cultivation.
DISCUSSION

Bordered by the Western Ghats, Kerala is endowed with a luxurient vegetation, rich in species. Angiosperm forms the principal group of plant community, Orchidaceae with about 200 species is the 3rd dominant family. Though about 200 species have been recorded from Kerala, some of them are very rare and are known only by their type collections. The repeated efforts to relocate species like *Acampe congesta, Bulbophyllum nodosum, Chrysoglossum halbergii, Liparis elata* etc. were not successful and it is presumed that these species have become extinct. This necessitates intensive field exploration to locate the species that are presumably in danger of extinction and conservation strategies are to be adopted to protect them.

Field studies indicate that, forests at Munnar, Peermade, Ponmudi, Silent Valley, Wynad, Nelliampathy and Agastiarmala have a fair representation of orchids. During the study period over one hundred species were collected and at present 84 species are maintained in the orchidarium. Effort will be continued to collect the other species viz. *Smithsonia maculata, Dendrobium mabelae, Pomatocalpa mannii, Dendrobium lawianum* and *Liparis wrayii* are collected for the first time from Kerala. In general, epiphytic species come up well under cultivation. Tiny terrestrial orchids like *Spiranthes sinensis* and *Liparis wightiana* survived only for a few months under cultivation. The grasslands abode several terrestrial orchids and many of them are endemic.
REFERENCE CITED


