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KFRI PALMETUM

(Final report of the project KFRI 444/04 – Strengthening and enriching the Palmetum)

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PROJECT PROPOSAL

Project No.	KFRI 444/04
Title	Strengthening and enriching the Palmetum
Investigator	Dr. C. Renuka
Objective	To strengthen and enrich the Palmetum
Duration	April 2004-March 2008
Funding Agency	KFRI Plan Grants

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EXOTIC PALMS

Abstract

KFRI Palmetum has 95 species under 47 genera. Of them 49 species under 16 genera are indigenous ones and 46 under 33 genera are exotics. Data sheet for the species contains description with identifying features, origin of the scientific name of the plant, common and local names, distribution, silvicultural characters, flowering condition in the Palmetum, uses of the palm if any, source of the plant and year of planting in the Palmetum and photographs. Lay out maps of the Palmetum along with the list of palms are also given.

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INTRODUCTION

Palms are woody monocotyledons coming under the family Arecaceae (Palmae). They form a vital component of the forest ecosystem. With their graceful architecture, palms often dominate the landscape of tropical habitats, providing many of the essentials for human life. Palms have been managed by the local inhabitants for food, fodder, handicrafts, thatch and construction material. Because of their aesthetic value, palms are cultivated for both indoor and outdoor decoration.

There are about 2600 species of palms under 200 genera (Uhl and Dransfield, 1987) in the world. In India 100 species under 21 genera occur in the three major geographical regions viz., Peninsular India, North eastern India and Andaman and Nicobar Islands. A small number of palms occur elsewhere also in India, particularly in the Gangetic plains and in the lower hill valleys of north India. In addition to indigenous species, several exotic palms have become naturalized as cultivated ornamentals.

The increasing demands on the world's natural resources pose a serious threat to palm biodiversity. The two main threats are over-exploitation and habitat destruction. Species, whose habitat range is limited to a small area are most at risk. Palm population in the wild is decreasing. Habitat destruction poses a more permanent and widespread threat to palm in the tropical forests. Even localized human activity may be threatening since many species of palms are limited in number or are found in restricted habitats. Many palms are threatened because of their constant and increasing utilization (Davis, 1985; Davis and Johnson, 1987; Padmanabhan and Sudersan, 1988; Renuka, 1996, 2001). More recently, the collection of seed for sale to nurseries and palm growers has assumed greater significance.

Although conservation and sustainable utilization of this resource assumes great importance, conservation attempts have not received significant world-wide attention. A total of 230 palms are considered to be highly threatened. A Palmetum with live collections of indigenous and exotic palms serves as a facility for educating the public about the need for conservation of palms.

The KFRI Palmetum contains 95 species of palms under 47 genera. Of these, 49 are indigenous palms and 46 are exotic species. The exotic species include those which are commonly seen in Indian parks, gardens and along avenues.

In the report, data sheets are provided for each species. The report is divided into two main sections, indigenous palms and exotic palms. For each species a description is given along with identifying features and is supplemented with photos. The origin of the scientific name of the plant, common and local names, distribution, flowering and fruiting period (for indigenous palms only) silvicultural characters, flowering condition in the Palmetum, and uses of the palm if any, are provided. Lay out maps of the Palmetum along with a list of species are also given.

DATA SHEETS ON PALMS IN KFRI PALMETUM

INDIGENOUS PALMS

Areca catechu L.

(The generic name is from the Malayalam name for the fruit of the palm, *Adekka* . The specific name is from a Malayan name, *Caccu* used for the palm).

Common names: Arecanut palm, Betel nut palm

Local names: Kavungu, Kamuku

This is characteristically a very tall, slender, solitary palm with a crown shaft and a small crowded crown of semi-erect pinnate leaves. Stem is erect, about 10 m long and 15 cm in diameter near base; basal portion of the stem sometimes turns to dull grey. Leaves have a rather short petiole. Inflorescence is produced below the crownshaft and it opens after detachment of a large, green bract; flower branches light green to deep green; and the ultimate flower bearing branches are slender; flower clusters filling into depressions of the branch; male flowers numerous, lemon yellow in colour, mostly in pairs and closely packed at the distal part, faintly odorous; female flowers much larger than males, mostly proximal, ripe fruits ovoid, 4 cm x 3 cm; orange to scarlet coloured, endosperm deeply ruminate.

Distribution: Tropical Asia. In India, occurring naturally in Andaman islands. Cultivated in the mainland in India.

Flowering and Fruiting: Throughout the year.

Year of flowering in the Palmetum: Not flowered.

Silvicultural characters: Fresh seed geminates one to three months from sowing Seedlings grow rapidly in good soil and prefer full sunlight.

***Uses*:** Seed is used as masticatory along with betel leaves. Mature stem is used in local construction work. Leaf sheaths are used in a commercial scale to produce plates, bowls etc.

***Note*:** Seedlings procured locally and planted in the Palmetum during the year 2003.

Habit *Leaf sheath*

Young plant *Fruit*

Areca catechu

Areca triandra Roxb. ex Buch.-Ham.

(The generic name is from the Malayalam name for the fruit of the arecanut palm, *Adakka*. The specific name shows that the flower has three anthers).

Common names: Nil

Local names: Nil

The palm forms dense clump of pale green stems and deep green pinnate fronds. Stem very slender with about 3 cm in diameter at base, 2-3 m high, distinctly annulate. Leaf is 3-5 m long, arching with terminal leaflets joined. Inflorescence arises below the crown shaft, to 40 cm long when unopened and bears unisexual flowers of both sexes. Flowers have a strong lemon odour. Fruits are an additional decorative feature being orange- red when ripe.

***Distribution*:** India, South East Asia

Flowering*:** February-June**.** ***Fruiting: September-November.

***Year of flowering in the Palmetum*:** 2007

***Silvicultural characters*:** This is a graceful cluster forming species commonly grown in gardens. Fresh seeds germinate within one to three months of sowing. Plant needs partial shade when young. Deep rich organic soils and plenty of water ensure fast growth and an attractive appearance.

***Uses*:** Cultivated as an ornamental palm. Tribals of Andaman & Nicobar Islands use the nuts as masticatory.

***Note*:** Seedlings procured from Bhavana Nursery, Cherthala and planted during the year 2003.

Habit

Inflorescence

Areca triandra

Arenga wightii Griff.

(Generic name is from the Javanese name *aren,* used for a palm of this genus. The specific name is after the famous Botanist, Robert Wight).

Common names: Nil

Local name: Kattuthengu

This palm commonly grows in the evergreen forests of the Western Ghats. It is a clustering palm. Stem grows up to a height of 10 m and a diameter of 30 cm. The stem is densely clothed with fibrous remains of leaf sheaths. The pinnate leaves are 4-7 m long and the leaflets are dark green above and white beneath, with two auricles at the base and small teeth and lobes along the margins. The leaflets spread in almost a flat plane on either side of the rachis. Inflorescences are produced among the leaves; flower branches are simple and pendulous, to 110 cm long, flowers are arranged in triads, 2 lateral males and one central female flower. Fruits are nearly round, bluish green to black when ripe.

***Distribution*:** Peninsular India, Western Ghats.

Flowering & Fruiting: The palm flowers once in its lifetime. Several inflorescences are produced from apex downwards and when the last inflorescence matures, the palm dies.

***Year of flowering in the Palmetum*:** Not yet flowered

Silvicultural characters : A shade loving palm. It prefers well drained soil. Seeds are slow to geminate and the germination percentage also is very low, 60%. The fruits contain Calcium oxalate crystals and should be handled with care.

***Uses*:** The hill tribals tap the palm for toddy. Leaves are used as thatching material. Fruits, after dehusking and boiling, are consumed. The starch from the pith of the stem which is collected before flowering is said to be highly medicinal. Tribals use this against backache.

***Note*:** Seedlings collected from the natural forests at Nelliampathy and planted in the Palmetum during 2002.

Habit *Leaf*

Fruit *Leaf tip*

Arenga wightii

Bentinckia condapanna Berry

(The generic name is after William Henry Cavendish Bentick, Governor General of the East Indies during 1774-1839. The specific name comes from its local name, *Condapana*. *Conda* is the word used to describe a characteristic, rather casual hair style, commonly worn by women of South India. The similarity between the 'conda' hair style and the just opened inflorescence of the palm is striking even from a distance. *Pana* means palm).

Common names: Lord Bentinck's Palm

Local names: Condapana, Kanakamuku, Kattukamuku, Varei kamuku, Kanthakamuku, Parapakku.

This is a solitary, unarmed, pinnate leaved palm. Stem is slender, ringed and reaches up to 10 m in height and about 15 cm in diameter. Leaves are 1-1.5 m long, somewhat arching to spreading, becoming pendulous, neatly abscising. The thick and tubular leaf sheaths form a conspicuous crown shaft. Leaflets are in 30-40 pairs, 60 x 2.5-4 cm, basal leaflets sometimes united, tips bifid with small brown scales on both surfaces. Inflorescence is produced below the leaves and is completely covered with two violet coloured bracts. Fruit bright chocolate coloured when ripe, 1.3-1.5 cm in diameter, seed shining brown, conspicuously grooved.

***Distribution*:** This palm is endemic to the southern parts of the Western Ghats. It occurs in the evergreen forests at 1000-1400 m elevation, generally found in less accessible, steep, rocky slopes.

Flowering*:** September. ***Fruiting: December

Year of flowering: Not started flowering

***Silvicultural characters* :** Plants require well drained soil in an open area. Propagation is through seeds. Each fruit contains a single seed. The germination and survival percentages are very poor, 10-20%. Very slow growing in the seedling stage. It is a light demander and requires full sunlight in the later stages.

***Uses*:** Not much known for its utility. The terminal bud is edible.

***Note*:** Seeds collected from the natural forests at Uppupara, Idukki Dist. and two year old seedlings were out planted in 2005.

Habit *Fruit*

Seedling

Bentinckia condapanna

Bentinckia nicobarica (Kurz) Becc.

(The species is from the Nicobar islands, hence the specific name).

Common names: Nil

Local names: Nil

This is a solitary, pinnate leaved palm. Stem distinctly annulate, to 20 m long, to 40 cm in diameter near base; crownshaft cylindrical, green, about 1 m long. Leaves ascending to arching, about 2.5 m long; leaflets closely packed, laterally jointed in younger plants, terminal leaflets jointed. Inflorescence is produced below the crown shaft, flower branches greenish yellow; female flower light brown in colour. Ripe fruits are nearly globose and deep brown in colour.

***Distribution*:** The palm is endemic to Nicobar islands.

Flowering: April-September. ***Fruiting*:** November-March.

***Year of flowering*:** Not yet flowered

***Silvicultural characters* :** It is reported to be cold sensitive and is susceptible to draught.

Seeds germinate within two to four months and once established is fast growing.

Uses: This species can be grown as avenue trees along the path ways, driveways etc.

***Note*:** Seeds collected from the natural forests at Great Nicobar and one year old seedlings were planted in 2007.

Habit *Inflorescence*

Fruit *Seedling*

Bentinckia nicobarica

Borassus flabellifer L.

(From the Greek *borassos*, an immature inflorescence of the date palm, *flabellifer* means bearing fans).

Common name: Palmyra palm

Local name: Karimpana

This is a solitary, fan leaved palm. Male and female plants are separate. Stem attains 10-30 m height and 60 cm diameter, deep grey or black in colour with annular leaf scars. Persistent leaf bases are seen in young trees. Leaves rigid, crown more or less round with evenly projecting leaves; leaf base split at base. Inflorescence is produced among the leaves. Male inflorescence is with stout cylindric branches while female inflorescence is sparingly branched. Fruits globose, 15-20 cm in diameter, deep brown turning black when ripe. Fruit contain one to three large seeds surrounded by a layer of juicy and edible endosperm.

Distribution: Tropical and Sub tropical Asia.

Flowering**:** March-April. ***Fruiting***: July-September.

Year of flowering: Not started flowering

Silvicultural characters : The seeds are best sown in their permanent position in the garden because, once germinated, the seedlings are firmly anchored to the ground and it is difficult to take them out without damage. The species is a light demander and very sensitive to cold. It needs excellent drainage. Seeds take two to six months to germinate.

Uses: The palmyra palm is best known for its multifarious products and uses. The oldest known use of this palm is probably the use of its leaves for writing purposes. Besides, other products like edible fruits, toddy and jaggery have been known from time immemorial. Several kinds of fibres are extracted out of this palm, especially from the leaf base. The leaves and trunks are used in local construction. Leaves are used for making a variety of fancy items. All parts of the palm are used as fuel.

Note**:** Seeds collected from a natural population at Perinthalmanna and the seeds were planted in the Palmetum during the year 2003.

Habit *Seedling*

Young plant *Leaf*

Borassus flabellifer

Calamus andamanicus Kurz

(The generic name is from the Greek *calamos*, a reed, in reference to the slender stem of the palm. The specific name denotes that the palm is from Andaman Islands).

Common names: Rattan, Cane.

***Local name*:** Mota beth

This is a solitary, large diameter rattan. Male and female plants are separate. Stem is about 8 cm in diameter with sheaths and to 4.5 cm without sheaths, straw yellow in colour when exposed. Leaf is 4 m long and cirrate. Leaf sheath is slightly pale yellow, turning reddish-brown, thick woody, with minute bristly like spines, arranged in comb-like narrow crests, mouth of the sheath with longer spines. Petiole is very robust, with small spines on the margins. Two types of inflorescences are known from this species, erect and pendulous. Fruit 1.4 x 0.9 cm, brown with dark-brown border, scales slightly channeled, endosperm not ruminate.

***Distribution*:** India (Andaman & Nicobar Islands). Endemic. In evergreen forests upto 260 m.

Flowering: June - July. ***Fruiting***: April - May.

Year of flowering: 2006

Silvicultural characters : Seeds take about one year for germination. 1-2 year old seedlings can be outplanted. The plant requires partial shade in the seedling stage.

Uses: Extensively used in furniture industry; leaves are used for thatching. This is one of the most exploited rattan species from Andamans.

***Note*:** Seeds collected from the natural forests at South Andamans and one year old seedlings were planted during 2002.

Habit *Leaf*

Male inflorescence ***Fruit***

Calamus andamanicus

Calamus baratangensis Renuka & Vijayakumaran

(The species is originally described from the Baratang island of S. Andamans, hence the specific name).

Common names: Rattan, Cane.

Local names: Malay beth, Razi beth

This is a clustering, medium diameter rattan. Stem is about 2 cm in diameter with sheaths, 1.2 cm without sheaths. Leaf is without cirrus. Leaf sheath is with knee, green, sometimes glabrous, spines when present brownish black, flat. The dark green leaflets are regularly arranged, gradually becoming smaller towards the tip. Inflorescence is long flagellate. Fruit ovoid, 1.25 x 0.9 cm. Mature fruit is grey white in colour turning to light violet on ripening. Endosperm not ruminate.

Distribution: India (Andamans). Endemic. Very common in Baratang island of South Andamans.

Flowering: November – December. ***Fruiting***: April - May.

Year of flowering: Not flowered

Silvicultural characters : Seeds germinate within two months. 1-2 year old seedlings can be out planted. The plant requires partial shade in the seedling stage.

Uses: Used in furniture industry and for tying rafts.

***Note*:** Seeds collected from the natural populations at Baratang island, South Andamans and one year old seedlings were planted during the year 2003.

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Habit

Leaf sheath

Calamus baratangensis

Calamus brandisii Becc. *ex*. Becc. & Hook. f.

(Specific name is after Sir D. Brandis, who discovered the species).

Common names: Rattan, Cane.

Local name: Cheruchural, Vanthal

This is a clustering, slender rattan. Stem is about 1.5 cm in diameter with sheaths, to 0.8 cm without sheaths. Leaf is 1 m long; leaf sheath is green with minute bristle like spines; mouth of the sheath is provided with longer spines up to 4 cm long; knee present. Leaflets are grouped. Male and female inflorescences are long and flagellate. Fruits are ovate, 1.8 x 0.8 cm, covering scales are slightly channeled in the middle and are brown with dark brown border.

***Distribution*:** India (Tamil Nadu, Kerala). Endemic. In evergreen forests between 1000 - 1500 m asl.

Flowering: October - December. ***Fruiting***: March -May.

Year of flowering: Not started flowering.

Silvicultural characters : Seeds are produced in smaller quantities when compared to other rattans. The number of flowering plants in the population also is very low. Mature seeds germinate within 6 months. Seedlings prefer partial shade for better growth.

***Uses*:** Excellent small diameter cane, extensively used in furniture and handicraft industries.

Note. Two seedlings procured from TBGRI and planted in 2007.

Habit *Seedling*

Leaf *Fruit*

Calamus brandisii

Calamus delessertianus Becc.

(The species was established based on a specimen from the Herbrium Delessert, hence the specific name).

Common names: Rattan, Cane.

Local names: Pachachural, Ottamoodan.

Solitary, medium diameter rattan. Stem at base is about 3 cm in diameter with sheaths, 5-6 cm at the apex, 2-2.5 cm without sheaths. Leaves is about 1.5 to 2 m long with leaflets regularly arranged along the rachis; veins ciliated on the upper surface; cilia to 1.5 cm long, black tipped, leaf margin spinulose; leaf sheath is green with bulbous based spines. Female inflorescence is rather large, partial inflorescence to 30 cm long, arising erect at first and then spreading. Fruit is globose, 1.5 cm in diameter, distinctly stalked, scales straw-yellow, spirally arranged and deeply channelled in the middle.

***Distribution*:** India (Western Ghats). Endemic. In evergreen forests between 700 to 1000 m asl

Flowering: August –September**.** ***Fruiting***: April-May.

Year of flowering: Flowered during January 2008

Silvicultural characters: Partial shade is required in the seedling stages.

Uses: Used for making baskets, furniture etc.

***Note*:** Seeds collected from the natural forests at Nelliampathy . One year old seedlings were planted out during the year 2002.

Habit *Leaf sheath*

Leaf *Fruit*

Calamus delessertianus

Calamus dransfieldii Renuka

(The specific name is after Dr. J. Dransfield, the palm specialist in the Royal Botanic Garden at Kew).

Common names: Rattan, Cane.

Local names: Nil

Solitary, moderate sized rattan. Stem with sheaths about 3.5 cm in diameter, without sheaths about 2.5 cm. Leaves to 2 m long; leaf sheath pale green, sparingly spiny with bulbous based spines; knee conspicuous; leaflets pale green, regularly rranged, about 45 x 2 cm, veins ciliate on both surfaces, cilia to 2 cm long. Inflorescence long, flagellate, partial inflorescence to 9 cm long.

Distribution: India (Kerala). Endemic. Evergreen forests at 300 m, Dhoni hills, Palghat.

Flowering: November – December. ***Fruiting***: July - August.

Year of flowering: 2001

Silvicultural characters: Partial shade is required in the younger stages.

***Uses*:** A good large diameter cane. Can be used in furniture industry. But only very limited number of plants are available in the natural forests.

***Note*:** Seedlings collected from the natural forests at Dhoni and planted during 2002.

Habit *Stem*

Fruit *Leafsheath*

Calamus dransfieldii

Calamus gamblei Becc. *ex* Becc. & Hook. f.

(The specific name is after J.S. Gamble who described the species).

Common names: Rattan, Cane.

Local names: Pachachural, Tannikodi, Narikodi, Bhima betha, Hasiru betha

This is a clustering, moderate sized rattan. Stem is about 2.5 cm in diameter with sheaths and1.5 cm without sheaths. Leaf is about 1.2 m long with leaflets arranged regularly on the rachis, leaf sheath is green, armed with bulbous based spines; knee present. Inflorescence is about 3 m long, partial inflorescence to 90 cm long. Fruit is 2 cm in diameter, spherical or slightly tapering at the base, short stalked, scales deeply channelled, pale yellow, shiny.

Distribution: India (Tamil Nadu, Kerala, Karnataka). Endemic to South Western Ghats. Evergreen forests above 700 m, rarely seen at lower altitudes.

Flowering: December - January. ***Fruiting***: May - June.

Year of flowering: Not started flowering

Silvicultural characters: Germination percentage of the seeds is low, about 50%. Survival percentage also is very poor. Partial shade is required in the younger stages.

***Uses*:** Used in furniture industry and for basket making

***Note*:** Seeds collected from the natural forests at Peerumerdu, Idukki Dist. One year old seedlings were planted in 2002.

Habit

Fruit

Leafsheath

Calamus gamblei

Calamus guruba Buch. – Ham. *ex* Mart.

Common names: Rattan, Cane.

Local names: Nil

This is a cluster forming, slender rattan. Stem is about 2.5 cm in diameter with sheaths, 1.5 cm without sheaths. Leaves ecirrate, to 120 cm long, leaf sheath with prominent knee, flagellum 2.5 m long, armed with subulate spines: leaflets numerous, equidistant, alternate to opposite, linear, green on both sides. Male and female inflorescence flagelliform, 2-3 m long. Fruit rounded, to 7 mm in diameter.

Distribution: India (West Bengal, Assam, Meghalaya), Bangladesh, Thailand, Myanmar. A cane growing profusely in low altitudes, preferably in marshy areas. In the Chittagang hill tracts of Bangladesh this cane was found to grow in association with *Licuala peltata* (Basu, 1992).

Flowering: November - December. ***Fruiting***: April - May.

Source:

Age of the plant: 7 years

Year of flowering: Not flowered

Silvicultural characters: Partial shade is necessary in the initial stages of the growth.

Uses: This cane is used extensively in furniture industry.

***Note*:** Seeds collected from the natural forests in Assam.One year oid seedlings were planted in 2002.

Habit

Leafsheath

Calamus guruba

Calamus hookerianus Becc.

(Specific name is after J. D. Hooker, 19th C. English botanist)

Common names: Rattan, Cane.

Local names: Velichural, Vanthal, Kakkachural, Chenthakara, Nagathali

A clustering, moderate sized rattan. Stem with sheaths measures about 4 cm in diameter, without sheaths to 2.5 cm. Leaf is 2 m long with regularly arranged leaflets. The brownish green leaf sheath is densely armed with triangular spines interspersed with numerous smaller spines and abundant brown tomentum; mouth of the sheath is provided with long papery spines to 18 cm long; knee sometimes present, not conspicuous. Inflorescence is about 5 m long, partial inflorescence to 75 cm long. Fruit measures about 1 x 0.8 cm, subglobose, scales are yellowish brown with a dark brown border.

***Distribution*:** India (Tamil Nadu, Kerala). Endemic to the Western Ghats. Evergreen forests up to 1000 m.

Flowering: July-August. ***Fruiting***: April-May.

Year of flowering: 2006

Silvicultural characters: Germination percentage of the seeds is very high, about 95 %. Seedlings require partial shade.

***Uses*:** A good medium diameter cane, extensively used in furniture industry and basket making.

***Note*:** Seeds collected from the natural forests at Nelliampathy. One year old seedlings were planted in 2002.

Habit *Sheath*

Inflorescence *Fruit*

Calamus hookerianus

Calamus karnatakensis Renuka & Lakshmana

(The species was reported from Karnataka State of India, hence the specific name).

Common names: Rattan, Cane.

Local names: Handi betha

A clustering, medium diameter rattan. Stem is about 3 cm in diameter with sheaths,

1.5 cm without sheaths. Leaf is 1.5 m long with regularly arranged leaflets. Mature leaf sheath is yellowish in the upper part and greenish brown or greenish yellow in the lower part, densely armed with spines, mouth of the sheath is with longer spines ; young sheath is provided with brown tomentum. Inflorescence is long flagellate. Fruit is globose, 8 mm across, scales are yellow with chestnut brown border turning to light violet when ripe.

Distribution: India (Karnataka, Kerala, Goa). Evergreen forests between 530-1200m.

Flowering: July- August. ***Fruiting***: April - May.

Year of flowering: Not started flowering

Silvicultural characters: Seedlings require partial shade for growth.

Uses: A good medium diameter cane, used in the furniture industry.

***Note*:** Seeds collected from the natural forests at Thalakkaaveri in Karnataka state. One year old seedlings were planted in 2003.

Habit *Leaf sheath*

Young plant

Calamus karnatakensis

Calamus lakshmanae Renuka

(The specific name is after Mr. A.C. Lakshmana IFS, former State Forest Secretary to Government, Karnataka, in appreciation of his dedicated work in canes in Karnataka forests).

Common names: Rattan, Cane.

Local name: Halu betha

This is a clustering, medium diameter rattan. Stem with sheaths measures to 2.5 cm in diameter, without sheaths to 1 cm. Leaf is 1.5 m long with regularly arranged leaflets; leaf sheath yellowish green to green, densely armed with yellowish spines which are bulbous based and pointing horizontally or upwards, knee present. Inflorescence flagellate. Fruit is ovate, 1 x 0.7 cm, with bright green scales when young, channelled along the middle.

***Distribution*:** India (Karnataka, Kerala). Endemic. Evergreen forests at about 85 m msl.

Flowering: September-October. ***Fruiting***: April - May.

Source: ***Age of the plant***: 7 years

Year of flowering: Not started flowering

Silvicultural characters: Mature seeds germinate within two months. Germination percentage is about 80. Seedlings require partial shade.

Uses: A good cane used in furniture industry.

***Note*:** Seedlings procured from the forest nursery at Makkut, Karnataka and planted in the Palmetum in 2002.

Habit

Leaf sheath *Leaf*

Calamus lakshmanae

Calamus longisetus Griff.

(The mid vein of the leaflets is provided with very long bristles, usually up to 3cm long, on the under surface, hence the specific name.)

Common names: Rattan, Cane.

Local names: Nil

A clustering, large diameter rattan. Stem measures 4.5 cm in diameter with sheaths, and 3 cm without sheaths. Leaf is 2.5m long with pale green sheath which is fearfully armed with flat, black, downwardly pointed spines arranged in whorls, knee present. Leaflets are grouped and midrib is provided with a row of cilia at the lower side, cilia 2 cm long. Inflorescence is flagellate. Fruit is ovoid, 3 x 2.7 cm, scales are mottled like a leopards skin.

Distribution: India (South Andamans), Myanmar, Bangladesh, Thailand, Malay Peninsula.

Flowering: November - December. ***Fruiting***: April - May.

Year of flowering: 2006

Silvicultural characters: Seeds start to germinate within two months. Seedlings need partial shade in the initial stages.

Uses: Used in furniture industry and for basket making. The tribal people of Andaman islands use the leaves for thatching. Fruits are edible.

***Note*:** Seeds collected from the natural forests at South Andamans and one year old seedlings were planted in 2002.

Habit *Fruit*

Leaf *Leaf sheath*

Calamus longisetus

Calamus metzianus Schlt.

(Named after Metz, whose authentic specimen is kept in the Berlin Herbarium)

Common names: Rattan, Cane.

Local name: Odiyan chural

This is a clustering, small diameter rattan. Stem is about 2 cm in diameter with sheaths, and to 1 cm without sheaths. Leaf is 1 m long with regularly arranged leaflets getting smaller towards the tip; leaf sheath is pale green, densely armed with triangular, yellowish spines intermingled with numerous small spines; knee conspicuous;. Inflorescence is 2 m long, partial inflorescence is about 25 cm long. Fruit is ovoid, scales are light yellow coloured with white border and brown apex and channelled in the middle.

***Distribution*:** India (Tamil Nadu, Kerala, Karnataka).

Flowering: November-January. ***Fruiting***: May-June.

Year of flowering: Not flowered

Silvicultural characters: Seeds germinate within two weeks and germination percentage is 90-95. Seedlings require partial shade.

Uses: It is one of the small diameter canes of South India but unlike others its cane is very weak and breaks easily and is therefore unsuitable for furniture work. It has some local uses like rough basket making. Fruits are edible.

***Note*:** Seeds collected from the natural forests at Pattakarimbu, Nilambur. One year old seedlings were planted in 2002.

Habit *Fruit*

Leafs sheath *Leaf*

Calamus metzianus

Calamus nagbettai Fernandez & Dey

(Specific name is based on the local name *Nagabetha*).

Common names: Rattan, Cane.

Local name: Nagabetha

This is a clustering, large diameter rattan. Stem is about 4.5 cm in diameter with sheaths and to 3 cm without sheaths, often marked with black patches at the basal portion. Leaves are cirrate when mature, with regular leaflets, juvenile leaves brown in colour,. Leaf sheath is yellowish green to green, lower half densely armed with grouped, narrow, triangular, black spines, intermingled with bristle-like spines; upper portion of the sheath with few spines, mouth of the sheath is provided with long spines to 4 cm long. Young sheaths are covered with brown tomentum; knee not prominent. Inflorescence is non flagellate, partial inflorescence to 70 cm long. Fruit measures about 1.6 x 0.9 cm, ovoid, scales are brown with a thin, dark brown margin and deeply channelled in the middle.

Distribution: India (Karnataka, Kerala). Evergreen forests at about 450 m asl. Occur mainly in Subrahmanya forests in Karnataka.

Flowering: December - January. ***Fruiting***: May-June.

Year of flowering: Not flowered

Silvicultural characters: Seedlings prefer shade.

Uses: A very robust cane, not available in sufficient quantities. This cane is considered to be very sacred and is worshiped in many households.

***Note*:** Seeds collected from Subrahmanya forests at Karnataka. One year old seedlings were planted in 2002.

Habit

Leaf *Leafsheath*

Calamus nagbettai

Calamus palustris Griff.

(The specific name is from the Greek word *palustris* which means 'of the marshes')

Common names: Rattan, Cane.

Local name: Dunda beth

A solitary, medium diameter rattan. Stem is about 2.5 cm in diameter with sheaths, 1.5 cm, without sheaths. Leaf is cirrate with grouped leaflets, each leaflet measuring 45 x 6 cm. Leaf sheath is pale green, with horizontal green markings and armed with broad based, flat, deflexed spines; knee prominent. The petiole is very short in mature leaves. Inflorescence flagellate. Fruit is ovoid, 1.5 x 1 cm; scales straw coloured with a channel in the middle.

Distribution: India (Andaman islands), Myanmar, Thailand. Seen in the evergreen forests.

Flowering: October -November. ***Fruiting***: April - May.

Year of flowering: 2006

Silvicultural characters: Seedlings prefer partial shade.

Uses: Used in furniture industry. Also used for making walking sticks and lathies.

***Note*:** Seeds collected from the natural forests at South Andamans. One year old seedlings were planted in 2002.

Habit

Fruit

Leafsheath

Calamus palustris

Calamus prasinus Lakshmana & Renuka

(Specific name is due to the bright green colour of the young fruit).

Common names: Rattan, Cane.

Local name: Onti betha

This is a solitary, high climbing rattan. Stem measures 3 cm in diameter with sheaths and 1.2 cm without sheaths. Leaf is with shiny green leaflets having shallow linear pits underneath. Leaf sheath is pale green and densely armed with spines; knee conspicuous. Petiole and rachis when cut exudes milky latex. Fruit is globose with yellow, shinny, deeply channelled scales. Scales are bright green when young

Distribution: India (Karnataka). Endemic. Evergreen forests at about 530 m. asl

Flowering: November-December. ***Fruiting***: May-June.

Year of flowering: Not flowered.

Silvicultural characters: Seedlings prefer partial shade.

Uses*:* A good quality cane, used in furniture industry.

Note**:** Seedlings procured from the forest nursery at Makkut, Karnataka. One year old seedlings were planted in 2003.

Habit

Leafsheath

Calamus prasinus

Calamus pseudotenuis Becc. *ex* Becc. & Hook. f.

(pseudo = false. Beccari named the species as *pseudotenuis* because of its similarity with *C. tenuis*).

Common names: Rattan, Cane.

Local names: Nil

A clustering, moderate sized rattan. Stem with sheaths measures up to 3.5 cm in diameter, and without sheaths to 2.5 cm. Leaf is 1.6 m long with regularly arranged leaflets; leaf sheath yellowish green and armed with about 3.5 cm long, yellow, needle like spines pointing to different directions. Brown tomentum is seen in between the spines. Mouth of the sheath is provided with 3 or 4 longer spines of 6 cm length. Petiole and rachis also are armed with 3 cm long spines. Inflorescence is about 3 m long; partial inflorescence to 70 cm long. Fruit is sub ovoid, 1.5 x 0.8 cm, and scales are greenish yellow with a dark brown border.

Distribution: India (Karnataka, Kerala, Tamil Nadu), Sri Lanka. Generally found 750 m asl in the W. Ghats.

Flowering: October – November. ***Fruiting***: April – June

Year of flowering: Not started flowering.

Silvicultural characters: Needs partial shade in the seedling stage.

Uses: The cane is used in the furniture industry and for basket making.

***Note*:** Seeds collected from the natural forests at Nelliampathy. One year old seedlings were planted in 2002.

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Habit

Seedling

Calamus pseudotenuis

Calamus shendurunii Anto, Renuka et Sreekumar

(This species was collected from Shenduruny Valley, S. Kerala, India, hence the specific name).

Common names: Rattan, Cane.

Local names: Nil

A clustering, medium diameter rattan. Stem with sheaths measures up to 2 cm and without sheaths to 1.5 cm in diameter. Leaf with regularly arranged leaflets, apical leaflets basally united; leaf sheath dark green, shining with few bulbous based, black tipped spines. Knee conspicuous, devoid of spines. Inflorescence is flagellate. Fruit is

1 x 1.8 cm, covered with pale green, shiny scales which are shallowly channelled in the middle.

Distribution: India (Kerala). Endemic to Shendurini Valley.

Flowering: September- October. ***Fruiting***: May- June

Year of flowering: Not flowered

Silvicultural characters: Seedlings require partial shade.

Uses: Good quality cane, but not available in plenty.

***Note*:** Seedlings procured from TBGRI and planted in 2007

Habit *Seedling*

Calamus shendurunii

Calamus stoloniferus Renuka

(The specific name is due to the presence of stolon, which is not a common feature in *Calamus*).

Common names: Rattan, Cane.

Local name: Jeddu betha

This is a clustering, medium diameter rattan, producing stolons from which new shoots are developed.. Stem with sheaths measures 3 cm in diameter and without sheaths, 1.2 cm. Leaf is 1.75m long; leaflets 45 x 3.5 cm, 3-5 veined, seedling leaflets are wider, the terminal pair confluent basally, apical 5-6 leaflets are crowded together. Leaf sheath is green, sparingly spiny; knee is devoid of spines. Inflorescence is flagellate. Fruit is spherical, 1 cm in diameter; scales are yellow with brown border and not channelled.

Distribution: India (Karnataka). Endemic. Evergreen forests at about 85 m. asl

Flowering: November - December. ***Fruiting***: March - April.

Source:

Age of the plant: 6 years

Year of flowering: Not flowered

Silvicultural characters: Require partial shade in the seedling stage.

Uses: A good quality cane, but not available in sufficient quantities.

***Note*:** Seeds collected from the natural forests at Makkut, Karnataka. One year old seedlings were planted in 2003.

Habit

Leaf

Calamus stoloniferus

Calamus tenuis Roxb.

(The specific name is due to the slender stem. *Tenuis* = thin, slender).

Common names: Rattan, Cane.

Local names: Nil

A cluster forming, medium diameter rattan. Stem is 2.5 cm in diameter with sheaths, and 1.5 cm without sheaths. Leaf is about 1m long with regular leaflets; leaf sheath is green with oblique white patches, sparingly armed with black spines which are solitary or grouped; knee is prominent. Inflorescence is flagellate. Fruit is broadly ovoid, 1.4 x 1 cm; scales grey white on ripening and with a dark brown border towards the apex, channelled in the middle.

Distribution: India (Common in the moist damp areas and paddy fields at Tripura and North Bengal), Myanmar, Bangladesh, South Vietnam.

Flowering: September to October. ***Fruiting***: April - May.

Year of flowering: Not flowered

Silvicultural characters: The fruits germinate within a month. Even though seedlings need partial shade for the initial growth, mature plant thrives well in the open condition.

Uses: Good quality cane, used in furniture industry. The shoot tip (palm heart) is edible.

***Note*:** Seeds procured from Wild Life Research Institute, Dehra Dun and one year old seedlings were planted in 2006.

Habit

Calamus tenuis

Calamus thwaitesii Becc. & Hook. f.

(Named after Thwaites, the British botanist).

Common names: Rattan, Cane.

Local names: Thadiyan chural, Panni chural, Vandichural, Handi betha, Thadi perambu, Perappanakku.

This is the thickest cane available in the Western Ghats. It is very robust and clump forming. Stem measures 6 cm in diameter with sheaths and 3.5 cm without sheaths. Leaf is about 3 m long; leaflets usually grouped and spinulose along the margins. Leaf sheath is yellow and is densely armed with black spines, arising from a raised rim-like surface, the largest is 3 x 0.7 cm, flat; smaller spines are scattered in between; knee absent; petiole and rachis are yellowish, armed with black spines grouped and arranged into oblique whorls. Inflorescence is about 6 m long, partial inflorescence about 70 cm long. Fruit is ovoid, 2 x 1.3 cm, scales are yellow with deep brown margins and with median grooves.

Distribution: India (Kerala, Tamil Nadu, Karnataka, Goa, Maharashtra), Sri Lanka. Evergreen, semi-evergreen and moist deciduous forests, between 75 – 900 m.

Flowering: November – January. ***Fruiting***: February – May.

Year of flowering: Not flowered

Silvicultural characters: Germination percentage is about 90. Seedlings are very slow growing and require partial shade.

Uses: One of the best quality canes used in furniture industry.

***Note*:** Seeds collected from natural forests at Vazhachal, Kerala and one year old seedlings were planted in 2002.

Habit *Leafsheath*

Leaf *Fruit*

Calamus thwaitesii

Calamus travancoricus Bedd. *ex* Becc. & Hook. f.

(The species was collected from the then Travancore (S. Kerala), hence the specific name).

Common names: Rattan, Cane.

Local names : Arichural, Kiri betha.

This is the slender most cane in the Western Ghats. Stem is only 0.8 cm in diameter with sheaths and 0.4 cm without sheaths. Leaf is about 45 cm long; leaflets are grouped with 2-5 leaflets in each group, each leaflet measuring 18x 1.5 cm. All the leaflets are arranged in one plane. Leaf sheath is green, armed with small spines of 0.5 cm length, mouth of the sheath is with slightly longer spines. Inflorescence is about 1 m long, partial inflorescence 10-12 cm long. Fruit is 1 cm across, globose, scales straw yellow with a dark brown border.

Distribution: India (Kerala, Tamil Nadu, Karnataka). Endemic.

Flowering: October-November. ***Fruiting***: May-June.

Year of flowering: Not flowered

Silvicultural characters: Seedlings require partial shade.

Uses: A very good quality cane. Used in furniture as well as handicraft industries.

***Note*:** Seeds collected from the natural forests at Arienkavu, Kerala. One year old seedlings were planted in 2002.

Young plant

Young Fruit

Leaf sheath

Calamus travancoricus

Calamus vattayila Renuka

(Specific name is based on the local name of the plant, *Vattayila*).

Common names: Rattan, Cane.

***Local name* :** Vattayila , Mani perambu, Devaru betha

This is a single stemmed, moderate sized rattan. At apex stem is 5 cm in diameter with sheaths and at base 2.5 cm, without sheaths 1.8 cm. Leaf is 1 m long; leaflets alternate, about 40 x 10 cm. The shape of the leaflet is similar to that of a reed. The local name 'vattayila' comes from the shape of the leaflet. Leaf sheath is dark green and sparingly spiny; spines generally pointing upwards. Inflorescence is 1 m long; partial inflorescence to 40 cm long; getting shorter towards the tip of the inflorescence. Fruits are produced in heavy bunches; a single fruit measures about 2.5 x 0.8 cm, oblong, scales chestnut brown coloured.

Distribution: India (Kerala, Karnataka, Tamil Nadu). Evergreen forests between 200 to 750 m, very sporadic.

Flowering: September - October. ***Fruiting***: April - May.

Year of flowering: Not flowered.

Silvicultural characters: seedlings require partial shade.

Uses: A good quality cane used in furniture industry, but not available in required quantities.

***Note*:** Seeds collected from natural forests at Nelliampathy, Kerala and one year old seedlings were planted in 2002.

Habit

Male inflorescence

Fruit

Leaf

Calamus vattayila

Calamus viminalis Willd.

(The specific name originates from the latin word, *viminalis* = used for basketry).

Common names: Rattan, Cane.

Local name: Jungli beth

Clustering, medium diameter rattan. Stem is 3 cm in diameter with sheath and 1.3 cm without sheaths. Leaf is 1 m long. Leaflets are grouped and oriented in different directions. Younger leaf sheaths are covered with a white powder; mature sheath is green and sparingly armed with spines; knee present. Inflorescence flagellate. Fruit globose, 0.9 cm across, scales on the mature fruits are grey white in colour and deeply channelled.

Distribution: India (Andaman Islands, West Bengal, Bihar, Orissa, Andhra Pradesh, Sikkim, Tripura), Bangladesh, Myanmar, Thailand, Malay Peninsula, Java.

Flowering: November - December. ***Fruiting***: April - May.

Year of flowering: 2006

Silvicultural characters: Germination is about 90 %. Seedlings require partial shade.

***Uses*:** Used in furniture industry; ripened fruits are edible.

***Note*:** Seeds collected from South Andamans and one year old seedlings were planted in 2002.

Habit *Leaf*

Leaf sheath *Fruit*

Calamus viminalis

Caryota mitis Lour.

(The generic name is from the Greek *caryon* = a nut. The specific name denotes its unarmed nature).

Common name: Clustered fishtail palm.

Local names: Nil

A clump forming palm. The stem is about 5 m tall, with persistent , grayish leaf bases. The stems are closely placed in the cluster producing a very crowded appearance. Each stem is monocarpic and dies when fruits mature which is replaced by new basal suckers. Leaves 3 m long, bipinnate; leaflets irregularly wedge shaped. Jagged and toothed at margins; leaf sheath and petiole covered with thick layer of felt. The first formed inflorescence is from the axil of the terminal leaflet. The remaining inflorescences are produced from apex downwards. Inflorescence is about 90 cm long, flower branches spirally disposed, flowers in triads of two males and a central female. Fruits red, 1.2 cm in diameter, inner fleshy portion highly irritating to the skin due to the presence of calcium oxalate needle like crystals.

Distribution: S E China to Indochina and Malaysia

Flowering & Fruiting: The palm flowers once in its life time and dies once the fruits on the lower most inflorescence, which is the youngest, mature.

Year of flowering: Not flowered

Silvicultural characters: Fresh seeds germinate within four to six months after sowing. Since the fruits contain calcium oxalate crystals, they should be handled with care. A well drained rich soil is required for faster growth. They will tolerate full sunlight even from the seedling stage. The palm can be propagated by division of suckers also.

***Uses*:** Young specimens make excellent indoor plants.

***Note*:** Two Seedlings procured from BSI, Calcutta and planted in 2007.

Habit *Fruit*

Seedling *Young plant*

Caryota mitis

Caryota urens L.

(Specific name denotes the stinging nature of the fruits).

Common name : Fish tail palm

Local names : Aanapana, Chundapana, Olattipana

The palm is solitary and the most distinctive feature is the bipinnate fronds with unusually shaped leaflets. The species is monocarpic, the plants dying after fruiting. Stem is 16-20 m high and to 60 cm in diameter, grey, leaf scars annular. Leaves 3-4 m long, with bright green and shiny leaflets one margin of which is sharply and irregularly toothed and the other produced into a tail; leafsheath triangular, eroding opposite the petiole into a mass of strong black fibres. Inflorescence carries unisexual flowers of both sexes. The first formed inflorescence is from the axil of the terminal leaflet. The remaining inflorescences are produced from apex downwards. Inflorescence branches are simple, very long, pendulous, level topped resembling a huge docked horse tail. Fruit globose, 1.8-2 cm in diameter, red at maturity, the fleshy part is with irritant needle like crystals.

Distribution: India, Myanmar, Sri Lanka, Malaysia

Flowering & ***Fruiting***: The palm flowers once in its life time and dies once the fruits on the lower most inflorescence, which is the youngest, mature.

Year of flowering*:* Not started flowering

Silvicultural characters**:** Since the fruits contain calcium oxalate crystals, they should be handled with care. Germination percentage is about 90 and once established the palm is fast growing. They will tolerate sun and require deep rich soil for good growth. Fresh seeds germinate within 2- 6 months after sowing. The palm is very fast growing.

Uses: The palm is useful for toddy tapping, brush fibre and to a lesser extent, for edible starch and forage.

Note**:** Seeds collected from a natural population at Thrissur, Kerala and planted in 2002.

Habit *Stem*

Inflorescence *Leaf*

Caryota urens

Cocos nucifera L.

(The genus name is from the Portuguese for monkey; an apparent reference to facial markings on the nut. The specific name means 'bearing nuts').

Common name: Coconut palm

Local name: Thengu

Solitary, unarmed palm. Stem is erect or inclined, irregularly ringed, attains a height of 30 m and a diameter of 50 –70 cm. Leaf is pinnate, borne in a terminal crown, 5-7 m long, arching and drooping. Leaf sheath is heavy, semi woody and form thick nets along the margins; mid nerve is prominent on upper side of the leaflet. Inflorescence is produced among the leaves and when young enclosed in a large woody bract. The simple flower branches are stiff, borne on short axis and bears unisexual flowers of both sexes; female flowers basal, very large, globose to conical. Fruits large, about 30 cm long, 1-seeded with 3 pores near the base; which is covered with a dense layer of fibres; the edible endosperm is homogenous, white, surrounding transparent homogenous fluid.

Distribution: C. Malesia to S.W. Pacific, widely introduced elsewhere. Naturally occurring in Andaman Islands. Grows mostly near the sea coasts.

Flowering & fruiting: Almost round the year.

Year of flowering: Not flowered.

Silvicultural characters: Seeds take five to six months to germinate. After the production of two leaves, the seedling can be transplanted. The palm needs full sunlight and grows best in coastal areas. Coconut will also grow in warm inland areas.

Uses: One of the most useful palms. Almost every part of the palm is utilized. The major uses are as the mature coconut, tender coconut, copra, coconut oil and oil cake. The toddy extracted from this palm also is used extensively. Leaves are used for thatching. The mature stem is used for making furniture, doorframes and handicraft items.

***Note*:** Seedlings procured locally and planted in 2002.

Habit

Young plant

Fruit

Cocos nucifera

Corypha umbraculifera L.

(The generic name is from the Greek *coryphe* – summit or hill top, probably a reference to the spectacular terminal inflorescence. The open inflorescence looks like an open umbrella, hence the specific name).

Common name: Talipot palm

Local name: Kudapana

This is a huge, solitary, monocarpic palm with dark grey stem with distinct leaf scars. Stem 10-15 m long and to 90 cm in diameter, leaf base persistent from middle to upper part of the stem. Leaves costapalmate, very large, about 5m across, divided to the middle into 80-100 segments; leaf sheath is having a triangular cleft below the petiole; petiole is about 3 m long and massive. Inflorescence is produced terminally. Flowering plants are an impressive sight with a terminal inflorescence of more than 6m high and bearing millions of tiny cream coloured flowers. Fruits take about 12 months to mature. Ripe fruits are pale green, globose, 3 cm in diameter.

Distribution: Peninsular India, Sri Lanka.

Flowering & ***Fruiting***: The palm flowers once in its life time when 30-40 years old.

Year of flowering: Not flowered

Silvicultural characters*:* The seeds are best sown in their permanent position in the garden because, once germinated, the seedlings are firmly anchored to the ground and it is difficult to take them out without damage. The palm is very slow growing. Once established, plants are very hardy and can tolerate adverse climatic conditions.

Uses: Stem pith is edible. Prior to flowering the palm stores large quantity of reserve metabolites as starch in the trunk, which is finally utilized for the development of a massive terminal inflorescence. This starch is extracted from the trunks after felling before flowering. The starch is similar to sago . This is also used for feeding the ducks. Leaves are used for thatching. Tender leaves are used for making umbrella, hats, mats, etc. Leaves have long been used for the preparation of writing materials. Stem fibres are very strong and are used for making ropes. Basal section of the stem is used for making a musical instrument – Drum – by the tribals of Sri Lanka. The hard endosperm of the seed is ivory-like and used for making buttons and beads.

***Note*:** Seeds collected from Malappurm district, Kerala and sown in the Palmetum in 2004.

Seedling *Inflorescence*

Stem *Leaf base*

Corypha umbraculifera

Corypha utan Lam.

(Specific name is after a native name for the palm).

Common name: Buri palm

Local names: Nil

This is a huge, solitary, monocarpic palm with distinct spiral markings on the stem. Stem 10-15 m long and to 90 cm in diameter, leaf base persistent from middle to upper part of the stem. Leaves costapalmate, very large, about 5m across, divided to the middle into 80-100 segments; leaf sheath is having a triangular cleft below the petiole. Petiole is about 3 m long and massive. Inflorescence is produced terminally and the flowers are bisexual. Fruits take about 12 months to mature. After fruiting the palm die.

Distribution: India, S E Asia, New Guinea, Australia

Flowering & ***Fruiting***: The palm flowers once in its life time when 30-40 years old.

Year of flowering: Not flowered

Silvicultural characters : The palm grows well near water courses. Easy to grow in tropical conditions.

***Note*:** Seeds collected from Andamans by Dr. M. Ramesh and one year old seedlings were planted in 2008.

Seedling

Corypha utan

Daemonorops kurzianus Becc.

(The generic name is from the Greek *daimon* = evil spirit, *rhops* = a shrub, in reference to the spiny nature of the palm. The specific name is after W.S. Kurz, German botanist. He was the Curator of the Herbarium at Kolkata).

Common names: Rattan, Cane.

Local name: Sanka beth

A clustering, large diameter rattan. Stem measures up to 5-6 cm in diameter with sheaths and 4 cm without sheath. Leaf is 3 m long, cirrate and with regularly arranged leaflets. Leaf sheath is yellowish green and densely armed with brown, triangular spines. Mouth of the sheath is with long papery spines, knee is prominent. Inflorescence is erect and covered by spiny bract. Fruit is globose, 2 cm across, scales are orange yellow with dark border on ripening and deeply channelled in middle.

Distribution: India (South Andamans). Common species in the evergreen forest.

Flowering: November-December. ***Fruiting***: April-June.

Year of flowering: Not flowered

Silvicultural characters: Germination percentage is very low, about 50%. Seedlings are very slow growing.

Uses: Extensively used in furniture industry.

***Note*:** Seeds collected from the natural forests at South Andamans and one year old seedlings were planted in 2002.

Habit

Daemonorops kurzianus

Daemonorops manii Becc.

(The specific name is after E. H. Man who collected the species from Andamans).

Common names: Rattan, Cane.

Local names:Nil

This is a clustering, medium diameter rattan. Stem with leaf sheaths measures up to 3 cm in diameter, without sheaths, 1.5 cm. Leaf is 3 m long, cirrate with regularly arranged leaflets. Leaf sheath is light yellow, armed with black, flat, triangular spines; knee is prominent. Inflorescence is erect, 30 cm long, outermost bract is with black spines, the flower bearing axis is very rigid and zig-zig in shape. Fruit is spherical, 1.5 cm across with brown, channelled scales.

Distribution: India (South Andamans)

Flowering: October- November. ***Fruiting***: April – June

Year of flowering: Not flowered.

***Silvicultural characters*:** Needs partial shade in the seedling stage.

Uses*:* Leaves are used for thatching.

***Note*:** Seeds collected from the forests at Wright Myo, S. Andamans. One year old seedlings were planted in 2002.

Habit

Daemonorops manii

Daemonorops rarispinosus Renuka and Vijayakumaran

(The leaf sheath is without much spines, hence the specific name).

Common names: Rattan, Cane.

Local names: Nil

A clustering, medium diameter rattan. Stem is about 2.5 cm in diameter with sheaths and 2 cm without sheaths. Leaf is 1m long, cirrate and with regular leaflets. Leaf sheath is light yellow with a prominent knee and sparingly armed with downwardly directed spines. Inflorescence is erect, 40 cm long and covered by spiny bract. Fruit is globose, 1.3 cm in diameter and covered with golden yellow, channelled scales.

Distribution :India (Little Andamans). Endemic.

Flowering: October-November. ***Fruiting***: April-June.

Year of flowering: Not flowered.

Silvicultural characters: Needs partial shade in the seedling stage.

Uses: Used in furniture industry and also for making 'lathies'.

***Note*:** Seeds collected **f**rom the natural forests at Little Andamans. One year old Seedlings were planted in 2002.

Habit

Daemonorops rarispinosus

Korthalsia laciniosa (Griff.) Mart.

(The generic name is after P.W. Korthals, Dutch botanist.)

Common names: Rattan, Cane.

Local name : Lal beth

Clustering, medium diameter rattan. Stem branching. With sheaths 2.1 cm in diameter, without sheaths, 1.7 cm. Leaf cirrate. Sheath brown or red with very few spines, disintegrating into fibres; petiole very short; leaflets 22 x 12 cm. equidistant, cuneate –rhomboid, irregularly toothed, dark green above, pale below. Inflorescence very long, flower bearing branches densely tomentose. Fruit widely depressed ovate, 2 x 1.5 cm, orange red.

Distribution :India (Andaman & Nicobar).

Flowering: October - November. ***Fruiting***: April-June.

Year of flowering: Not flowered.

Silvicultural characters: Needs partial shade in the seedling stage.

Uses: Used in furniture industry

***Note*:** Seeds collected from the natural forests at South Andamans. One year old seedlings were planted in 2002.

Habit *Leafsheath*

Cirrus

Korthalsia laciniosa

Korthalsia rogersii Becc.

(The specific name is after C. G. Rogers who collected the species originally from Andamans).

Common names: Rattan, Cane.

Local names: Nil

Clustering, very small diameter rattan. Stem with sheaths 1cm in diameter and without sheaths, 0.7 cm. Leaf cirrate, sheath light green, sparingly armed with spines,covered with brown indumentum; leaflets 13 x6.5 cm cuneate-rhomboid, irregularly toothed. Dark green above and pale below. Inflorescence 15 cm long. Fruit obovoid, 1.8 x 1.5 cm, scales light yellow with reddish brown margin.

Distribution: India (Andamans). endemic

Flowering: October-November. ***Fruiting***: April-June.

Year of flowering: Not flowered.

Silvicultural characters: Needs partial shade in the seedling stage.

Uses: Not much used.

***Note*:** One year old seedlings were procured from TBGRI, Thiruvananthapuram and planted in 2007.

Young plant

Korthalsia rogersii

Licuala spinosa Wurmb.

(The generic name is from the Moluccan name, *leko wala.* Specific name is due to its spiny petiole).

Common name: Mangrove fan palm

***Local name*:** Jungli selai

A cluster forming species. Stem is slender, 2-3 m long and 6-9 cm in diameter, leaf scars prominent on the stem. Leaves orbicular to reniform, dark green, divided into 18-20 narrow radiating segments. These are narrowly wedge shaped, pleated, the central blade longest and broadest. Inflorescence produced in between leaves, Arching out, longer than the leaves, to 3.5 m long. Ripe fruits ovoid, 5-7 mm long, deep red in colour.

Distribution: India (Andaman islands), S E Asia

Flowering: September-December. ***Fruiting***: May – June.

Year of flowering: Not flowered.

Silvicultural characters: Plants tolerate exposure to sun from an early age. They are relatively fast growing.

Uses: Excellent for home gardens. Leaves are used for thatch.

***Note*:** Seeds collected from the populations of South Andamans and one year old seedlings were planted in 2002.

Habit

Licula spinosa

Nypa fruticans Wurmb.

(The generic name is from the Malay name, *nipah.* Specific name is due its shrubby nature).

Common names: Nipah, Mangrove palm

Local names: Nil

This is a true mangrove palm. Stem is forking, prostrate or subterranean. Leaves are pinnate, 6-7 m long, erect with uppermost part arching. A unique inflorescence arises among and bears unisexual flowers of both sexes; males crowded in catkin like structures the females aggregated in a dense rounded head. Fruits are crowded in a globose mass 2-4 angled.

Distribution: Indo Malaysia, Philippines, N.E. Australia, India(West Bengal, Andaman & Nicobar islands), Bengladesh.

Flowering: September-November. ***Fruiting***: May-June

Year of flowering: Not flowered

Silvicultural characters. The seeds which germinate in the head before shedding, float and are distributed by ocean currents. Seedlings can be readily established under suitable conditions.

Uses: Fruits are edible.

***Note*:** Two seedlings were procured from the Theosophical Society, Adayar, Chennai and planted in 2003. Later on seeds were collected from S. Andamans and one year old seedlings were planted in 2007.

Habit

Inflorescence

Nypa fruticans

Phoenix loureiroi Kunth.

(The generic name originates from the Greek name for the date palm. The specific name is after Joao Loureiro, 18th C. Portugese Naturalist).

Common names: Nil

Local names: Nil

This is a solitary or clustering, dwarf palm. Stem is 2-3 m high, closely packed with more or less spirally arranged persistent leaf bases. Leaves 1.2 –1.5 m long; basal leaf lets 4 farious, apical bifarious, light green with silver indumentum flexible, upper leaflets 23 cm long, middle ones 35 cm long1.5 – 2 cm broad at middle, leaflets arranged at a distance of 3 – 5.5 cm along the rachis. Inflorescence is produced among the leaves. Flower bearing branches unbranched, and arranged in groups in a spiral. Fruit orange-red to black. Endosperm homogeneous.

Distribution: India to S. China and Philippines

Flowering: December ***Fruiting***: February

Year of flowering: Not flowered

Silvicultural characters: Very hardy, sun loving palm. Seeds germinate within one – three months.

Uses: The leaves are used for making brooms

***Note*:** Seeds collected from the Grasslands of Peerumedu and one year seedlings were transplanted in 2005.

Habit

Phoenix loureiri

Phoenix loureiroi Kunth. var. ***pedunculata***(Griff.) Govaerts

Common names: Nil

Local names: Nil

This is a solitary or clustering, dwarf palm. Stem is 2-3 m high, closely packed with more or less spirally arranged persistent leaf bases. Root suckers develop frequently. Leaves 0.9 – 1.3 m long, leaflets grouped, 4 farious, 19-20 x 1-1.5 cm, margin of the young leaflets with white fibres, leaf lets arranged at a distance of 1-3 cm. Inflorescence is produced among the leaves, peduncle1-1.5 m long. Flower bearing branches unbranched, and arranged in groups in a spiral. Fruit orange-red to black. Endosperm homogeneous.

Distribution: India (Assam, Nagaland, Bihar, Himachal Pradesh, W. Ghats, Orissa, Andhra Pradesh).

Flowering: January-March. ***Fruiting***: October-December.

Year of flowering: Not flowered

Silvicultural characters: Very hardy, sun loving palm. Seeds germinate within one – three months.

Uses: The leaves are used for making brooms.

***Note*:** Seedlings procured from Bhavana nursery, Cherthala and planted in 2002.

Habit

Phoenix loureiroi

Phoenix pusilla Gaertn.

(Specific name denotes the small size of the plant).

Common names:

Local names:

Solitary or clustering palm. Stem 6 m high and covered with persistent leaf bases vertically oriented on trunk. Leaves 1.5 m long, leaflets stiff with very sharp needle like apices, arranged at a distance of 2-5 cm, 16.5-20 x 1.5-2 cm, grouped into 4, basal leaflets spiny, not grouped, arranged in one or more planes of orientation; leaf sheath with fibres. Inflorescence erect, produced in between the leaves, axis 45 cm long, rachillae 10-16 cm long. Fruit red to purple, become dark brown on ripening, moderately fleshy and sweet. Endosperm homogeneous.

Distribution*:* India (Eastern Ghats of Tamil Nadu and southern region of Kerala), Sri Lanka.

Flowering*:* January. ***Fruiting****:* April-May.

Year of flowering: 2006

Silvicultural characters: Very hardy, sun loving palm. Seeds germinate within one – three months.

Uses: Leaflets are used to make mats. Fruits are edible.

***Note*:** Seedlings procured from Bhavana nursery, Cherthala and planted in 2002.

Habit

Fruit

Phoenix pusilla

Phoenix sylvestris (L.) Roxb.

(Specific name denotes the habitat, the forests).

Common names: Wild date palm, Sugar date palm.

Local names: Kattu inthal.

Stem solitary, erect, to 18 m long, covered with compact leaf bases. Leaves about 5 m long, lower leaves arching; leaf sheath with fibres; petiole short, with spines along the margins; petiolar spines stiff, to 8 cm long, sharply pointed; leaflets stiff, sharply pointed at tips,4 farious; 18-37 x 1.5-2.5 cm, young leaflets with brownish leathery outgrowth at margins. Inflorescence is produced among the leaves, about 40 cm lon. Fruit about 3 x 1.5 cm, deep brown when ripe.

Distribution: Pakistan to C. Himalaya, E. India to Bangladesh

Flowering: December – January. ***Fruiting***: April - June

Year of flowering: Not flowered.

Silvicultural characters: This palm requires a sunny position and well drained soil. A very fast growing palm. Seeds usually take two to three months to germinate.

***Uses*:** Toddy is extracted from the inflorescence. Jaggery also is produced from the sap. Brooms are made out of the leaves. Leaves are woven to make baskets and mats. Stem is used as fuel.

***Note*:** Seedlings procured from Bhavana nursery, Cherthala and planted in 2002.

Habit

Phoenix sylvestris

Pinanga dicksonii (Roxb.) Blume

(The generic name is from the Malayan *pinang*, a palm. The specific name is after James Dickson, 18th C. British botanist).

Common names: Nil

Local names: Kattu kamuku, Kana kamuku.

A slender, stoloniferous, palm. Stem may be solitary or clumping, erect, to 6 m long, 3-12 cm in diameter, without well developed crown shaft. Leaf is pinnate, forked, about 1.7 m long; 2.5-7 cm broad, sessile, light green, with numerous parallel veins, broadly linear and uppermost leaflets confluent. Inflorescence is produced from below the leaves, peduncle is about 4-10 cm long; flower branches 4-5, simple, rigid, compressed, densely covered with flower clusters; flowers are arranged in triads of two males and central female, male flowers pinkish. Fruits are oblong, dry, fibrous and measures about 1.5-2 x 1 cm.

Distribution: India (W.Ghats). Endemic.

Flowering: August-September. ***Fruiting***: February-March.

Year of flowering: Not flowered

Silvicultural characters: This is a shade loving palm. Can be propagated through seeds as well as suckers.

Uses: Stem, although slender, is used for making fences and for walking sticks. Leaves are used for thatching locally.

***Note*:** Suckers collected from forest areas of Nilambur and planted in 2002.

Young plant

Pinanga dicksonii

Plectocomia himalayana Griff.

(Generic name is from the Greek, *Plectocomia*= plaited hair referring to the bracts of the inflorescence. The species was originally collected from eastern Himalayas, hence the specific name).

Common names: Nil

Local names: Nil

A clump forming rattan. Stem with leaf sheaths to 4 cm in diameter. Leaf cirrate, leaflets 60 x 7.5 cm, green on both sides. Primary flower branches 1–1.5 m long. Primary bracts tubular, obliquely truncate with triangular appendages on one side, tomentose at base. Fruits not wooly outside, 1.5 cm in diameter.

Distribution: India (Sikkim, West Bengal, Arunachal Pradesh). Endemic.

Flowering: Not known ***Fruiting***: May

Year of flowering: Not flowered

Silvicultural characters: Require shade in the early stages. Very slow growing.

Uses: Canes are soft and therefore unsuitable for furniture making. Tribal people use long canes for tying fences and for making baskets.

***Note*:** Seeds collected from the forests of Arunachal Pradesh and one year old seedlings were planted in 2004.

Habit

Plectocomia assamica

Wallichia densiflora Mart.

(Generic name is after Nathaniel Wallich. Specific name is because of its densely clustered flowers).

Common names: Nil

Local names: Nil

A clump forming bushy palm. Stem slender, covered with leaf sheaths. Leaves to 3 m long, arching from base; basal leaf lets oblong, in groups of 2-3 leaflets on each side of the rachis, deep green upper, whitish belowmiddle leaflets linear-oblong, terminal leaflets jointed. Male inflorescence axillary; female inflorescence terminal. Male flowers are yellow and female flowers are purplish. Fruit oblong, 16 x 18 mm, dull purple in colour.

Distribution: Nepal, Bhutan, India (North eastern states), Bangladesh, Myanmar, China.

Flowering & Fruiting: The palm flowers only once in its life time. The inflorescences are produced in a basipetal order, the lower most maturing last when the palm dies.

Year of flowering: Not flowered.

Silvicultural characters: A shade loving palm. Grows well in moist places.

***Note*:** Seeds collected from the forests of Mizoram. One year old seedlings were planted in 2004.

Young plant

Wallichia densiflora

Wallichia disticha T. Anderson

(The specific name denotes the arrangement of the leaves in two vertical rows).

Common names: Nil

Local names: Nil

Solitary, sometimes suckering palm. This palm is distinguished by the unusual distichous arrangement of leaves and petioles. They project in two vertical rows on diametrically opposite sides of the trunk. This creates a striking effect of a flat tree. Stem is erect, to 5 m long, 20-30 cm in diameter near base; leaves ascending from the stem, to 2.5 m long; leaf sheath is semi woody, extremely fibrous at margins, with conspicuous black bristles on the inner side; leaflets linear, notched at margins, bluish green in colour, 60-90 cm long, arranged in groups on rachis, each deflected to different plane; terminal leaflets broadly 3 lobed. The inflorescences are produced among the leaves. Fruit oblong, reddish brown when ripe, 2-2.2 cm x 1.5 cm.

Distribution: India (Sikkim Himalaya), Bangladesh, Bhutan, Myanmar.

Flowering & Fruiting: The palm flowers only once in its life time. The inflorescences are produced in a basipetal order, the lower most maturing last when the palm dies.

Year of flowering: Not started flowering

Silvicultural characters: Seeds strict to germinate within two months and continue to germinate to twelve months after sowing. The fruit pulp contains irritant crystals and hence should be handled with care. Seedlings are fairly sensitive to cold weather.

Uses*:* The core of the stem contains starch and consumed largely by the tribals of Arunachal Pradesh.

Note**:** Seedlings procured from Bhavana nursery, Cherthala and planted in 2002.

Habit

Leaf

Wallichia disticha

EXOTIC PALMS

Acoelorrhaphe wrightii (Griseb. & H. Wendel.) H. Wendel. ex Becc.

(Generic name originates form the Greek, *a-* without*, coelos-* hollow, *raphe* – seam; the seeds lack an impressed seam. The specific name is after Charles Wright, 19th C American botanist).

Common names: Silver saw palmetto, Paurotis palm, Everglades palm

Local names: Nil

This is a monotypic genus. A clump forming palm. Stem slender, with persistent leaf bases. Leaves are palmate. The most distinctive feature is the silvery fan leaves. A few trunks may dominate the clump and are surrounded by a dense growth of suckers. The inflorescences arise among the leaves and bear bisexual flowers.

Distribution: S. Florida, Caribbean, Mexico to Colombia

Year of flowering: Not started flowering.

Silvicultural characters: In its original locality, the palm grows in brackish swamps. This is a sun loving species and will tolerate full sun when quite small. Plants grown in dry situations are very slow growing. Can be propagated from suckers. Seed are very small and germinates within two to three months if sown fresh.

***Note*:** Seedlings procured from Bhavana nursery, Cherthala and planted in 2006.

Habit

Acoelorrhaphe wrightii

Aiphanes horrida (Jacq.) Burret

(Generic name is from the Greek, *aiphanes* = jagged, torn, in reference to the leaflet tips. Specific name is based on the thorny nature).

Common name: Ruffle palm

***Local names*:** Nil

This is a solitary, slender palm. Stem is highly prickly outside, dull grey in colour, about 5 m long and 5 cm in diameter. Leaves are pinnate and leaf sheath is triangular. The slender petiole along with the sheath is covered with black needle like spines. Leaflets are grouped, fish-tail like in shape, bright green above and slightly whitish below and are spiny on nerves. The ruffled appearance of the leaflets produces a very graceful effect.

Inflorescence is produced among the leaves and bears flowers of both sexes. Fruits are cherry- red in colour.

Distribution: N. & W. Madagascar

Silvicultural characters: Seedling needs partial shade. Fully grown plants can tolerate full sunlight. It needs plenty of water during dry months.

Uses: Fruits are reported to be edible.

Note: Seedling procured from Sarathchand nursery, Thiruvananthapuram and planted in 2007.

Habit *Young plant*

Inflorescence *Fruit*

Aiphanes horrida

Arenga engleri Becc.

(After H. G. A. Engler, German Botanist)

Common name: Formosa palm

Local names: Nil

A clump forming palm that rarely grows more than 3 m tall. It has long and graceful pinnate leaves which are partially twisted. The leaflets are dark green above and silvery white below. Inflorescence is produced among the leaves and the flowers are yellow. The mature fruit is red to violet in colour.

Distribution: Taiwan

Year of flowering: Not flowered

Silvicultural characters: This is a shade loving palm. Good drainage is necessary. Propagation is through seeds which germinate slowly and erratically taking up to two years to germinate.

Note: Seedlings procured from Athmanilayam nursery, Thiruvananthapuram and planted in 2005.

Habit

Arenga engleri

Arenga hookeriana (Becc.) Whitmore

(Generic name is from the Javanese name *aren,* used for a palm of this genus. Specific name is after J. D. Hooker, 19th C. English botanist)

Common name: Nil

***Local names*:** Nil

Clump forming palm. Stem is short, 0.5m tall, very slender and cane-like. The leaves may be simple or pinnate with a few leaflets. The leaflets are characteristically shaped like the blade of a paddle but with lobed and sharply toothed margins. They are bright green and shiny on the upper surface and silvery beneath. Inflorescence are held erect and produced from the nodes. Globular fruits are subtended by a persistent calyx.

***Distribution*:** Peninsular Thailand to N. Peninsular Malaysia

Year of flowering: Not flowered

***Silvicultural characters* :** A shade loving palm.

Note: Seedlings procured from Sarathchand Nursery, Thiruvananthapuram and planted in 2005.

Habit

Arenga hookeriana

Bismarckia nobilis Hildebr. & H.Wendl.

(Generic name is after Prince Otto Von Bismark, first German Chancellor.The specific name denotes the palm's stately appearance).

Common name: Bismarck palm

***Local names*:** Nil

A dioecious palm, the male and female plants being separate. Trunk is solitary and unarmed. Leaves are costapalmate. The palm is prized for its heavy crown of blue- green leaves. The woody petiole is covered with a waxy, wooly material. The petiole splits at the base where it is attached to the trunk. Inflorescences arise among the leaves and bears unisexual flowers.

***Distribution*:** N.& W. Madagascar. Monotypic genus endemic to Madagascar.

Year of flowering: Not flowered.

Silvicultural characters: Fresh seed germinates readily. Each fruit contains a single seed. The palm is fast growing in cultivation and it requires well drained soil and full sunlight.

***Uses*:** The stem and leaves are used for construction purposes

Note: Seedlings procured from Bhavana Nursery, Cherthala and planted in 2002.

Habit

Bismarckia nobilis

Brahea edulis H. Wendl. ex S. Watson

(Generic name is after Tycho Brahe, the 17th C. Danish astronomer.The fruit is edible, hence the specific name).

Common name: Guadalupe palm

***Local names*:** Nil

This is a solitary, palmate leaved palm. Stem to 10m x 40cm bearing a large crown of heavy green leaves. The inflorescence is very large and arises among the leaves and flowers are bisexual. The fruits are small and are produced in great quantities, 25-35 mm across, black in colour. The palm is well known for its tasty fruits.

***Distribution*:** Guadalupe, Mexico.

Year of flowering: Not flowered

Silvicultural characters: Young plants, which are generally very slow growing, tolerate exposure to sun, but well drained soils are essential for success. Fresh seeds germinate within 2-12 months of sowing.

Uses: The fruits are edible. The leaves are used for thatching.

Note: Seedlings procured from Bhavana Nursery, Cherthala and planted in 2002.

Young plant

Brahea edulis

Calamus peregrinus Furtado

(The generic name is from the Greek *calamos*, a reed, in reference to the slender stem of the palm. Specific name is from Latin, *perigrinus* = foreign or of the country side. The allusion is not understood here).

Common name: Nil

Local name: Thailand - nguay

Solitary, large diameter rattan. Stem with sheaths to 35 mm in diameter and without sheaths, 20 mm. Leaves ecirrate,4-5 m long; knee well developed; ocrea short, blackish. Cut surface exudes yellow sap. Fruit orange red when mature.

***Distribution*:** Peninsular Malaysia and Thailand.

Year of flowering: Not flowered

Silvicultural characters: Seeds germinate within two months after sowing. Needs partial shade in the seedling stage.

***Uses*:** Good quality cane used in furniture industry.

***Note*:** Seeds obtained from Thailand. This was originally planted in the Canetum of KFRI. Seeds were collected from this and planted in the Palmetum in 2006.

Habit

Leaf sheath *Fruit*

Calamus peregrinus

Calamus tetradactylus Hance

(Specific name denotes the arrangement of leaf lets in groups of four).

Common name: Nil

Local name : China- Baiteng. Generally known as white rattan through out southern China

Clustering, slender rattan. Stem with sheaths to 12 mm in diameter, without sheath 5-8mm.Leaf to 80 cm long; leaf sheath dull green, armed with scattered spines,; petiole very short in adult leaves; leaflets generally arranged in groups of four, the uppermost 4-6 in a group, 15 x 3cm, dark green armed with bristles along the margin. Inflorescence to 1m long Fruit rounded, 7-10mm in diameter. Scales whitish yellow.

***Distribution*:** China. Endemic.

Year of flowering: Not flowered.

Silvicultural characters: Seeds germinate within 15-25 days from sowing. The development of the seedling is very slow, the first leaf appears after 2-3 months.

***Uses*:** Good quality small diameter rattan used in handicrafts and furniture industry.

Note: Seeds obtained from China during the establishment of the Canetum. Suckers were collected from the mother plant and planted in the Palmetum in 2006.

Habit

Calamus tetradactylus

Carpentaria acuminata (H. Wendl. & Drude) Becc.

(The generic name is after P. de Carpentier, former Governor- General of the Dutch East Indies. The specific name denotes the tapering leaflets.)

Common name: Carpentaria palm.

***Local names*:** Nil

A solitary, unarmed palm. Stem is slender, grey with a crown shaft. The inflorescence arises below the leaves and bears unisexual flowers of both sexes. The fruits are bright scarlet.

***Distribution*:** N. Australia

Year of flowering: Not flowered.

Silvicultural characters: Fresh seeds germinate within two to four months from sowing.

It is a fast growing species with highly ornamental appearance. Plants require well drained soil and an abundance of water during dry season in the younger stages. Seedlings need partial shade for better growth.

Note : Seedlings procured from Bhavana nursery, Cherthala and planted in 2002.

Habit

Carpentaria acuminata

Chamaedorea elegans Mart**.**

(The generic name is of Greek origin**.** Chamai = on the ground, dorea = a gift. Refer to the small stature of the plants. Specific name denotes the elegant stature of the plant).

Common name: Good luck palm.

***Local names*:** Nil

This slender dwarf palm is very popular for indoor decoration. Plants have a solitary, woody slender trunk which may grow to 3m tall with numerous closely spaced growth rings. Leaves are pinnate, dark green and ascend in an upright to spreading crown. The leaf sheaths frequently have a prominent white margin. The inflorescence arises below the leaves and carries unisexual flowers. The fruit, which are about 5mm long, are black when ripe, contrasting with the orange coloured rachilla.

***Distribution*:** Mexico to Guatemala

Year of flowering: January, 2006

Silvicultural characters: This palm can be grown in a cool, shady place.

Uses: A very good indoor palm.

Note : Seedling procured from plant nursery at Pattikkad, Thrissur and planted in 2003.

Habit

Inflorescence

Chamaedorea elegans

Chamaedorea metallica O. F. Cook ex H. E. Moore

(Specific name denotes that the leaves have a metallic sheen)

Common name: Metallic palm

***Local names*:** Nil

The slender, solitary trunk which has prominent nodes and white spots grows to about 1m tall and bears aerial roots at intervals along its length. The leaves are dark blue-green with a metallic sheen. They are usually held obliquely erect and vary from being simple and more or less heart shaped with a deep apical notch, to variously pinnately divided. The inflorescence is produced in between the leaves and bear unisexual flowers. The flowers are orange in colour and the fruits are black, when ripe. This is a much preferred indoor palm.

***Distribution*:** Mexico (Veracruz, Oaxaca)

Year of flowering: June 2006

Silvicultural characters: This palm likes a cool, shady situation with plenty of water.

***Note*:** Seedlings procured from Bhavana nursery, Cherthala and planted in 2002.

Habit

Chamaedorea metallica

Chambeyronia lepidota H.E.Moore

(The genus name is after Captain Charles Chambeyron, 19th C. French naval commander. Specific name denotes its small, scurfy scales).

Common name: Nil

Local names: Nil

A solitary, unarmed palm with a well developed crown shaft and a spreading crown of pinnate leaves. The lowest leaflets are reduced to ribbons. The inflorescence arises below the crown shaft and bears unisexual flowers of both sexes.

***Distribution*:** New Caledonia

Year of flowering: Not flowered.

Silvicultural characters: This palm needs warm, humid conditions, well drained loamy soil and abundant water. Fresh seed germinates readily. Each fruit contains a single seed.

***Uses*:** A highly ornamental palm.

***Note*:** Seedlings procured from Bhavana nursery, Cherthala and planted in 2003.

Habit

Chambeyronia lepidota

Chuniophoenix hainanensis Burret, Notizbl**.**

(Generic name is after W.Y. Chun and *phoenix*, a palm. The specific name denotes its locality).

Common name: Nil

Local names: Nil

Small, unarmed, clustering palm. The slender stem is about 3m tall and is prominently ringed. The leaves are palmate. The leaves lack a hastula and the blades are irregularly divided into groups of folded segments, dull green on both surfaces. Inflorescence arises among the leaves and has unusual, slender, spidery rachillae which bear creamy flowers. Mature fruits are scarlet and measures about 2-2.5 cm across.

***Distribution*:** SE. China to Hainan

Year of flowering: Not flowered

Silvicultural characters: Plants have best appearance in a sheltered location but will tolerate some exposure to sun. Fresh seeds germinate readily two to four months after sowing. Seedlings establish quite quickly.

***Note*:** Seedlings procured from Bhavana nursery, Cherthala and planted in 2002.

Habit

Chuniophoenix hainanensis

Cocothrinax sp.

(Generic name is from the Greek *Cocos* = grain, berry and *Thrinax,* another genus of the palm).

Common name: Nil

Local names: Nil

A solitary palm. Trunk covered with numerous fibres. Leaves are palmate. The inflorescence arises among the leaves and bears bisexual flowers. The species is not yet identified.

Year of flowering: Not flowered

Note: Seedlings procured from Bhavana nursery, Cherthala and planted in 2002.

Habit

Cocothrinax sp.

Cyrtostachys renda Blume

(Generic name is from the Greek, *Cyrtos* = arched, *Stachys* = a spike in reference to the arched inflorescence. *Renda* is a native name)

Common name: Sealing wax palm

Local name: Red palm

Clustered, unarmed, pinnate leaved palm with a prominent crown shaft. The brilliant, glossy, scarlet leaf sheaths and petiole with contrasting dark green leaves make this one of the most sought after ornamental palm. The slender stem grows up to 10m tall. The inflorescence arises below the leaves and bears unisexual flowers of both sexes.

***Distribution*:** Thailand to W. Malesia

Year of flowering: Not flowered

Silvicultural characters: Plants will grow in shade or in full light and require plenty of water. Seeds should be sown soon after collection as they lose their viability rapidly. Germination usually takes place within two months of sowing. The plants are very sensitive to cold climate.

***Note*:** Seedlings procured from Bhavana nursery, Cherthala and planted in 2002.

Habit *Leafsheath*

Cyrtostachys renda

Dypsis decaryi (Jum.) Beentje & J. Dransf.

(The origin of generic name is not very clear, perhaps from the Greek, *dyptein* = to dip or dive. Specific name is after R. Decary, the original collector).

Common name: Triangle palm

Local names: Nil

A spectacular and distinctive palm which can be readily recognized by the prominent three-sided trunk, with pinnate leaves arranged in three rows. The leaves are held stiffly erect, drooping only at the tips. The lowermost leaflets are developed into filamentous extensions which hang to the ground. The chalky-white colour of the trunk and the grey leaflets add to the character of this most unusual palm. The inflorescence arises among the leaves and bears unisexual flowers of both sexes.

***Distribution*:** SE. Madagascar

Year of flowering: Not flowered

Silvicultural characters: Fresh seeds germinate within a month or two of sowing. They require a partially shaded position. The palm is fast growing.

***Note*:** Seedlings procured from Bhavana nursery, Cherthala and planted in 2002.

Habit

Dypsis decaryi

Dypsis lastelliana *Beentje & J. Dransf.*

(Specific name is after m. de Lastelle)

Common name: Nil

Local names: Nil

A tall, solitary palm. Stem to 20m tall and 40 cm in diameter. Crown shaft is very distinct, reddish brown in colour, covered with thick hairs. The leaves are pinnate, stiff, with dark green leaflets. The rachis of young plants is pinkish. The inflorescence arises below the crown shaft. Fruit obovoid, greenish brown about 20 x 12 mm when mature.

***Distribution*:N**. Madagascar. Occurs from sea level to 1000m altitude.

Year of flowering: Not flowered

Silvicultural characters: Fresh seeds germinate within one month of sowing.

***Note*:** Seedlings procured from Bhavana nursery, Cherthala and planted in 2002.

Habit

Dypsis lastelliana

Dypsis lutescens (H.Wendl.) Beentje & J. Dransf.

(Specific name refer to the yellow tinge on the leaves, petiole and stem).

Common Names: Yellow palm, Areca palm, Golden cane palm.

Local names: Nil

Clump forming, slender stemmed, unarmed palm. The stem grows up to 10 m tall and each is topped with a crown of curved, yellowish-green pinnate leaves. Crown shaft is distinct. The inflorescence arises among the leaves and bears unisexual flowers of both sexes.

***Distribution*:** E. Madagascar

Year of flowering: Not flowered.

***Silvicultural characters*:** The yellow colour is prominent when grown in full sunlight. Plants are cold sensitive when young. Seeds germinate within 4-5 months of sowing. : Prefers a sunny position in rich well drained soils.

***Note*:** Seedlings procured from Bhavana nursery, Cherthala and planted in 2002.

Habit

Dypsis lutescens

Elaeis guineensis Jacq.

(The generic name is from the Greek *elaia*, for the olive tree and the specific name denotes its original locality, Guinea).

Common name: Oil palm

Local names: Nil

This is a solitary, robust palm.. Stem reaches up to 10 m in height and 40-60 cm in diameter. Leaves pinnate, steeply arching, about 6 m long. Leaflets are arranged in four ranks and the basal leaflets are reduced to spines. Inflorescence arises among the leaves. Male and female inflorescences are separate; male flowers are arranged in cylindrical branches; female inflorescences are robust, partially hidden in leaf bases. Ripe fruits are deep purple in colour turning to black and slightly angular due to compression.

Distribution: Tropical Africa. Widely cultivated elsewhere.

Flowering and fruiting*:* Through out the year

Year of flowering: Flowered during November 2006.

Silvicultural characters: Oil palm is easy to grow and adaptable to most of the soil types. They prefer full sun light. Single plants are capable of producing fertile seeds. Seeds take three to six months to germinate. Pre soaking in hot water or cracking the seed coat help in early germination.

Uses: This species is cultivated for extracting the palm oil.

***Note*:** Seedlings procured from oil Palm nursery at Anchal, Thiruvananthapuram and planted in 2004.

Habit

Inflorescence

Elaeis guineensis

Howea forsteriana (C. Moore & F. Muell.) Becc.

(Generic name is after Lord Howe island and specific name is after William Forster, New South Wales Senator)

Common name: Nil

Local names: Nil

Medium sized, slender, solitary palm. The leaves are pinnate and it lacks a crown shaft. The simple unbranched inflorescence arises among the leaves and bears unisexual flowers of both sexes. It is reported that seeds take 4-5 years to mature and it is difficult to judge when it is ripe as they change the colour slowly.

***Distribution*:** Endemic to Lord Howe Island.

***Year of flowering*:** Not flowered

Silvicultural characters: Seeds take three or four years to mature. Fresh seed geminates erratically with seedlings appearing sporadically over one to three years. Plants grow very well in coastal areas and they tolerate direct sun after five years of growth. It needs shade in the younger stages.

***Note*:** Seedlings procured from Bhavana nursery, Cherthala and planted in 2002.

Habit

Howea forsteriana

Hyophorbe lagenicaulis (L. H. Bailey) H. E. Moore

The Genus name is from Greek, *hys* = pig, *phorbe* = food, in reference to the fruit being eaten by pigs. The specific name denotes the flask shaped stem.

Common name: Bottle palm

Local names: Nil

Solitary unarmed palms with a bottle shaped stem. The dark green pinnate leaves are stiff and have a characteristic prominent twist. The number of leaves will be usually four to six at one time. There is a prominent crown shaft. Developing inflorescence is held erect from the base of the crown shaft and resembles horns.

***Distribution*:** Mauritius. Although once common, it is now greatly endangered.

Year of flowering: Not flowered

Silvicultural characters: They are readily propagated from seeds which usually germinate within six to eight months. Grows very well in coastal areas and will tolerate considerable exposure to salt- laden winds. Plants tolerate full sunlight and are very slow growing.

***Note*:** Seedlings procured from Bhavana nursery, Cherthala and planted in 2002.

Habit

Hyophorbe lagenicaulis

Hyphaene thebaica(L.) Mart.

(From the Greek, *hyphaino,* to entwine, weave, in reference to the fibres in the fruit. Specific name is after the locality, Thebes).

Common name: African Doum palm

Local names: Nil

This palm is renowned for its regularly forking trunk each branch ending in a small crown of leaves. The leaves are costapalmate; petioles have thick black spines along the margin. Fruit is pear shaped, orange to brown when ripe. Fruit is edible.

***Distribution*:** W. Tropical Africa to Egypt and Arabia

Year of flowering: Not flowered

Silvicultural characters:

***Note*:** Seedling procured from BSI, Kolkata and planted in 2007.

Habit *Fruit*

Male inflorescence *Seedling*

Hyphaene thebaica

Latania lontaroides (Gaertn.) H. E. Moore

(Latania is derived from the native name of the palm. The specific name is because of the plant's similarity to the genus *Lontarus*).

Common name: Red latan palm

Local names: Nil

Robust, solitary, unarmed palms. Leaves are palmate and the leaf bases are prominently split. The leaf lamina is very large. Inflorescence arises among the leaves and bears unisexual flowers. Young plants of this palm have a striking red colouration in the leaves and often also have bright red petioles. Older palms have grayish green leaves with red coloured veins. The leaves also have a very prominently pointed hastula. The inflorescence is produced among the leaves and bears unisexual flowers.

***Distribution*:** It is a native of the Mascarene island of the Réunion where it is now reduced to a few isolated individuals.

Year of flowering: Not flowered

Silvicultural characters: Each fruit contains one to three seeds. Seeds germinate within two to four months. Seedlings are fast growing. The plant is a light demander and requires well drained soil.

***Note*:** Seedlings procured from Bhavana nursery, Cherthala and planted in 2003. Two seedlings were obtained from BSI, Kolkata which were planted in 2007.

Young plant

Fruit

Latania lontaroides

Latania verschaffeltii Lem.

(The specific name is after Ambrose Colletto Alexandre Verschaffelt, 19th C Belgian Nurseryman).

Common name: Yellow latan palm

Local names: Nil

Robust, solitary palm. The leaves are palmate and green. In mature plants the leaf bases and the petiole are covered with a dense, white wool which adheres strongly. In young palms the petiole and veins have an yellowish tinge. The leaves have a short, blunt hastula which is quite different from that of other species.

***Distribution*:** Rodrigues (Mascarene island)

Year of flowering: Not flowered

***Silvicultural characters*:** The palm grows very well in open areas and requires a well drained soil.

Note: Seedling procured from Bhavana nursery, Cherthala and planted in 2002.

Habit

Latania verschaffeltii

Licuala grandis H. Wendl.

(Generic name is from the Moluccan name, *leko wala.* Specific name denotes the large size of the leaves).

Common name: Nil

Local names: Nil

Solitary, unarmed palm with palmate leaf. The leaves are entire, dark green and glossy. The circular, pleated leaves are up to 1m across and have notched margins. The inflorescence arises among the leaves and bears bisexual flowers. The mature fruits are deep red in colour. The round leaves and long inflorescences with deep red fruits are the favoured decorative features.

***Distribution*:** Santa Cruz Island to Vanuatu

Year of flowering: 2005

Silvicultural characters: A highly ornamental palm. This palm is a shade lover and is usually slow growing. Established plants may tolerate considerable exposure to sunshine. Fresh seeds germinate readily.

***Note*:** Seedling procured from Bhavana nursery, Cherthala and planted in 2002.

Habit

Licuala grandis

Livistona chinensis (Jacq.) R. Br. ex Mart.

(Generic name is after Baron of Livingston. The species is from China, hence the specific name).

Common name: Chinese fan palm

Local names: Nil

A solitary, slender palm. Leaves are palmate. Leaf blade is deeply segmented, tip of the segments deeply forked with two pendulous tips which form a fringe around the leaf. The slender petiole has spines on the margins. Inflorescence is produced in between the leaves. Flowers are bisexual. Ripe fruits are bluish green when ripe.

***Distribution*:** S. China to Vietnam, Temp. E. Asia

Year of flowering: Not flowered

Silvicultural characters: Seed germinates within one or two months. This palm is tolerant to poor soil. This will grow well under full sunlight as well as under semi shade.

***Note*:** Seeds collected from the garden at Peechi Dam site and planted in 2006.

Habit *Seedling*

Livistona chinensis

Livistona mariae F. Muell.

(The specific name is after Maria, Duchess of Edinburgh).

Common name : Central Australian cabbage palm

Local names: Nil

Solitary, tall, unarmed palm. The leaves are palmate. Young plants have attractive reddish leaves. The inflorescence arises among the leaves and bears bisexual flowers.

***Distribution*:** S. Northern Territory to W. Queensland.

Year of flowering: Not flowered

Silvicultural characters: Seed germinates within one or two months. The plant is very slow growing. Excellent palms for avenue planting.

***Note*:** Seedlings collected from Bhavana nursery, Cherthala and planted in 2002.

Habit

Livistona mariae

Livistona rotundifolia (Lam.) Mart.

(Specific name denotes its round leaves)

Common name: Footstool palm

Local names: Nil

Solitary, tall, unarmed palm. The leaves are palmate. The leaves of young plants are round with a glassy appearance. Young leaves are only shallowly divided and have softly drooping tips. The inflorescence arises among the leaves and bears bisexual flowers. The fruits are reddish turning to dark violet.

***Distribution*:** South & Central Malesia

Year of flowering: Not flowered.

Silvicultural characters: Seed germinates within one or two months. The plant is very slow growing. Excellent palms for avenue planting. If planted in shady areas the plants will retain the juvenile leaves much longer.

***Note*:** Seedlings procured form Bhavana nursery, Cherthala and planted in 2002.

Habit

Stem

Livistona rotundifolia

Livistona saribus (Lour.) Merr. ex A. Chev.

(The specific name is from the Moluccan Name).

Common name: Taraw palm

Local names: Nil

A solitary, tall palm of about 25m in height. The leaves are palmate with deeply segmented green leaves. The petiole is orange to red in colour and has large, very prominent spines along the margins. The inflorescence is produced among the leaves. The fruits are produced in large clusters and are of brilliant blue in colour.

***Distribution*:** SE. China to Indo-China and Philippines

Year of flowering: Not flowered

Silvicultural characters: Seed germinates within one or two months. Young plants need protection from light.

***Note*:** Seedlings procured form Bhavana nursery, Cherthala and planted in 2002.

Habit

Livistona saribus

Phoenicophorium borsigianum (K. Koch.) Stuntz.

(The generic name is from the Greek *phorios* = stolen, and *phonex*, a palm alluding to the theft of a plant of this palm from Kew garden. The specific name is after Latanier Feuille Borsig, German Horticulturist).

Common name: Nil

Local names: Nil

Solitary palm. Stem is covered with spines when young. Leaves are simple, arching, margins deeply indented, pinnately nerved, about 1-2m long, 1m broad, tip of the leaf forked, bright green above, orange green below, veins yellowish. The petioles are very spiny when young, but become smooth with age. Inflorescence is produced among the leaves and bears unisexual flowers of both sexes. Mature fruit is orange red in colour.

Distribution: Seychelles. Endemic

Year of flowering: Not flowered

Silvicultural characters: Seeds are slow and erratic to germinate. The palm is slow growing and demands warm, shady, moist conditions.

Note: Seedlings procured form Athmanilayam, Thiruvananthapuram and planted in 2005.

Habit

Phoenicophorium borsigianum

Phoenix roebelenii O'Brien

(Specific name is after Carl Robelen, the original collector who discovered the species in Laos).

Common name: Pigmy date palm

Local names: Nil

A solitary, dwarf palm. Stem up to 2 m in height with persistent leaf bases on the upper part; leaf scars on the stem slightly swollen and conspicuous. Leaves delicate looking in young plant. 80 cm long, leaf sheath light brown in colour; leaf lets soft, light green, bifarious in rachis; petiolar spines soft, dark green, powdery coated. Fruits ovoid, about 1 cm long, reddish in colour.

Distribution: China to Indo- China

Year of flowering: Not flowered.

Silvicultural characters: This palm will grow in both sunny and in shady positions.

Uses: A very popular ornamental palm. The fruit is edible.

Note: Seedlings procured form Bhavana nursery, Cherthala and planted in 2002.

Habit

Phoenix roebelenii

Pritchardia pacifica Seem. & H. Wendl.

(The generic name is after W.T. Pritchard, 19th C. British official in Polynesia. The specific name shows that it is from the Pacific).

***Common name*:** Fiji fan palm

Local names: Nil

A solitary palm with smooth stem. The leaves of young plants are especially impressive, the blades being up to 1.8m long and nearly as wide, deeply plaited, and have a brown , hairy surface. Inflorescence is produced among the leaves and they are much shorter than the leaves. Ripe fruits are black.

***Distribution*:** Tonga (Eua)

***Year of flowering*:** Not flowered

***Silvicultural characters*:** Fresh seeds germinate readily, usually within two to five months of sowing. Each fruit contains a single seed. Very slow growing. They need well drained soil as well as a partially shaded location. It is an excellent palm for coastal districts.

Note: Seedlings procured form Bhavana nursery, Cherthala and planted in 2002.

Habit

Pritchardia pacifica

Pseudophoenix sargentii H.Wendl. ex Sarg.

(Generic name is from the Greek, *pseudo*= false; *phoenix* = a palm. The specific name is after Charles S. Sargent, original collector).

Common name: Cherry palm

Local names: Nil

Solitary, unarmed palm with a tapered trunk. The crown is sparse, consisting of few pinnate, arching leaves. Leaflets are stiff which are dark green above and grey or silvery beneath. The inflorescence arises among the leaves. Dense clusters of bright red fruits are held erect and are an attractive feature.

***Distribution*:** S. Florida to Caribbean, SE. Mexico to Belize. Essentially a coastal species.

Year of flowering: Not flowered

Silvicultural characters: Plants tolerate salt water inundation. Excellent drainage is essential as also full sunlight. The seeds float when dry and is dispersed by ocean currents in its natural locality. Each fruit contains one to three seeds. The fruit contains oxalate raphides and may cause a burning sensation if handled excessively. Plants are slow growing.

***Note*:** Seedlings procured form Bhavana nursery, Cherthala and planted in 2002.

Habit

Pseudophoenix sargentii

Ptychosperma elegans (R. Br.) Blume

(The generic name is from the Greek *Ptychos* = wrinkled, folded; *sperma* = seed. The specific name denotes its graceful appearance).

Common name: Solitaire palm

Local names: Nil

A tall solitary palm. Stem is very slender, about 7 m long and 7-10 m in diameter. The leaves are pinnate, 6-8 in number and dark green in colour. The leaflets have an uneven , jagged apex. Inflorescence is branched and is produced below the crown shaft and bears white, fragrant, unisexual flowers of both sexes. Fruits are bright red in colour when mature.

Distribution: N. Northern Territory to Queensland, Australia.

Year of flowering: 2006

Silvicultural characters: Fresh seeds germinate within three to five months of sowing. Each fruit contains a single seed. Plants are fast growing and highly responsive to fertilizers and regular watering. The plants demands high light intensity, good drainage and abundance of water.

***Note*:** Seedlings procured form Bhavana nursery, Cherthala and planted in 2002.

Habit

Fruit

Ptychosperma elegans

Ptychosperma macarthurii (H. Wendl. ex H. J. Veitch) H. Wendl. ex Hook. f.

(The specific name is after Sir W. MacArthur of New South Wales, Australia).

Common name: MacArthur palm

Local names: Nil

A cluster forming, slender palm. Mature stem 5-7 m long and 6-8 cm in diameter. Leaves are pinnate and 7-8 per crown. Leaflets are bright green on the upper side and dull green lower in a shady position and yellowish green when exposed to sunlight and with an uneven and jagged apex. Terminal leaflet is broad and jointed. Inflorescences are produced below the crown shaft. Ripe fruits are yellow to bright red.

***Distribution*:** New Guinea to N. Australia

***Year of flowering*:** 2007.

***Silvicultural characters*:** It is valued for its dense clumping habit and the arching fronds. Fresh seeds germinate within three to five months of sowing. Each fruit contains a single seed. Plants are fast growing and respond strongly to nitrogenous fertilizers.

Note: Seedling supplied by Dr. J. K. Sharma, the former Director, KFRI and planted in the Palmetum in 2002.

Habit

Inflorescence

Ptychosperma macarthurii

Ptychosperma waitianum Essig

(Specific name is after Lucita Wait, a palm enthusiast).

Common name: Nil

Local names: Nil

A small, solitary palm. Stem up to 5m tall. Leaves are less than 1m long and spread in a graceful crown. Leaves bright green, wedge shaped and clustered at both ends. The flowers are very distinctive, being deep red and densely scaly. Fruit black, fleshy, 2 cm long.

***Distribution*:** S E New Guinea.

Year of flowering: Not flowered

Silvicultural characters: A shade loving palm in the younger stages. Good drainage and plenty of water are required.

***Note*:** Seedlings procured from TBGRI, Thiruvananthapuram and planted in 2007.

Young plant

Ptychosperma waitianum

Ravenea rivularis Jum. & H. Perrier

(The generic name is after Louis Ravene, French consular official. The specific name denotes that the species is growing near streams).

Common name*:* Majestic palm

Local names: Nil

Solitary, unarmed, pinnate leaved palm. There are male and female plants. Stem to 30 m tall, whitish. Young plants have a crown of arching, bright green fronds. Young leaves have a whitish appearance and the rachis and petioles are covered with cottony fibres. In older plants mature leaves are drooping. The inflorescence is much branched and arises among the leaves and bear unisexual flowers. Fruits are 7-8 mm across, globose, red in colour.

***Distribution*:** S. W. Madagascar

Year of flowering: Not flowered.

Silvicultural characters: The plants is native to Madagascar were it grows near streams and swamps. Fresh seeds germinate two to four months after sowing.

***Note*:** Seedlings procured from Bhavana nursery, Cherthala and planted in 2002.

Habit

Ravenea rivularis.

Rhapis excelsa (Thunb.) Henry

(The generic name is from the Greek *rhapis* = a needle, an apparent reference to the leaf segments. The specific name denotes the high or lofty nature of the plant).

Common name: Lady palm

Local names: Nil

A clump forming palmate leaved palm. Male and female plants are separate. Stem is slender, cane-like, deep green in colour, covered with woven brown fibre. Leaves are few, about 5-10 per plant. Leaves are divided into narrow segments. Petiole is very slender, unarmed and 30-40cm long. Inflorescence is much branched, produced among the leaves and bears bisexual flowers.

***Distribution*:** S. China to N. Vietnam. Grow as understorey palms in relatively dry forests.

Year of flowering: Not flowered.

Silvicultural characters: Plants grow well under partial shade. Propagation is through division of clumps. As a potted plant for interior decoration it is unsurpassed and will remain in the same container for years without repotting

***Note*:** Seedlings procured from Bhavana nursery, Cherthala and planted in 2002.

Habit

Inflorescence

Rhapis excelsa

Roystonea regia (Kunth) O. F. Cook

(The generic name is after General Roy Stone. The specific name denotes its royal stature).

Common name: Royal palm

Local names: Nil

A solitary palm. Stem is about 20 m long, smooth, grey in colour and is with a bulging usually in the middle or anywhere along the stem. Leaves are pinnate, spreading to all directions; leaflets are arranged in four rows. Inflorescence is produced below the crown shaft and bear unisexual flowers of both sexes. Fruits brown to dark purple when ripe.

***Distribution*:** S. Florida, NC. & SE. Mexico to C. America, Caribbean

Year of flowering: Not flowered

Silvicultural characters: Fresh seeds germinate within one to four months of sowing. A very good ornamental palm frequently used for avenue planting.

***Note*:** Seedlings procured from Bhavana nursery, Cherthala and planted in 2002.

Habit

Roystonea regia

Sabal mauritiiformis (H. Karst.) Griseb. & H. Wendl.

(Generic name is probably from an American native name. Specific name is because of its resemblance to a Mauritia palm).

Common name: Nil

Local names: Nil

Solitary, unarmed palm. Stem slender, about 20cm in diameter, grey-brown. Leaves slightly costapalmate. Each leaf has numerous slender segments (2 m long) which are united in groups of 2-3, with long, deeply lobed apex of each segment often drooping. The erect to arching inflorescence extends beyond the leaves. Fruits are black, spherical to pear shaped and 1 cm across.

***Distribution*:** Central and south America – Trinidad.

Year of flowering: Not flowered

Silvicultural characters: Fresh seeds germinate readily. Seedlings are slow growing.

Note: Seedlings procured from TBGRI, Thiruvananthapuram and planted in 2007.

Seedling

Sabal mauritiiformis

Sabal palmetto (Walter) Lodd. ex Schult. & Schult. f.

(The specific name is due to its small stature).

Common name: Palmetto palm

Local names: Nil

Solitary, unarmed palms. Stem up to 20 m tall and 35 cm in diameter. Leaves are costapalmate and thread bearing. with unarmed petioles and split bases. The leaf segments are joined for about on third of their length and the apex is deeply notched.

The inflorescence arises among the leaves and bears bisexual flowers. The fruits are black when mature.

***Distribution*:** South east U.S.A. to W. Cuba

Year of flowering: Not flowered

Silvicultural characters: Fresh seeds germinate readily. Seedlings are slow growing. This palm will grow in a wide variety of habitats. It is a light demander and succeeds very well in sandy soil, tolerating brackish water inundation. Plants are fast growing.

***Note*:** Seedlings procured from Bhavana nursery, Cherthala and planted in 2002.

Habit

Sabal palmetto

Salacca zalacca (Gaertn.) Voss

(The generic and specific names are from the Malay native name, *salac).*

Common Name: Salak

Local names: Nil

A rosette forming, stemless palm. Leaves are pinnate with armed petiole and rachis. Leaflets are whitish below and are arranged in one plane with vacant spaces in between. Terminal leaflets are joined. Most of the above ground parts are covered with numerous sharp spines. Inflorescence is produced among the leaves. Rachillae are cylindrical and catkin like. Fruits flattened above with three seeds within a thick layer of white sweet pulp which is edible.

***Distribution*:** S. Sumatera to S W. Jawa,

Year of flowering: November 2006

Silvicultural characters: Plants need plenty of water and tolerate full sunlight from very young stages. The sucker can be severed from the mother plant and planted out.

Uses: Fruits are edible.

Note: Seeds collected from Indonesia by dr. K. C. Chacko and planted at KFRI. Suckers were collected from this and planted in the Palmetum in 2002

Habit

Inflorescence

Salacca zalacca

Serenoa repens (W. Bartram) Small

(The generic name is after Sereno Watson, 19th C American Botanist. The stem is creeping, hence the specific name).

Common name: Saw Palmetto

Local names: Nil

The stem is branching and generally subterranean, sometimes emergent and reaching to

3 m tall. The leaves are palmate and are held stiffly erect. Petioles are armed with spines. Inflorescence is produced among the leaves and bear bisexual flowers.

***Distribution*:** South east U.S.A.

Year of flowering: Not flowered

Silvicultural characters: This plant is adaptable to a range of soils and climates. Suckers can be divided from the mother plant but sucker should be very small. Seeds germinate three to six months after sowing. Each fruit contains a single seed.

***Note*:** Seedlings procured from Bhavana nursery, Cherthala and planted in 2002.

Habit

Serenoa repens

Syagrus romanzoffiana (Cham.) Glassman

(The generic name is an early Latin name for a palm used by Pliny. The specific name is after Count N. P. Romansoff, a Russian nobleman).

Common name: Queen palm

Local names: Nil

This is a solitary palm. Stem is grey, smooth and about 15 m long and 40 cm in diameter. Leaves are pinnate and are arching. Crown shaft is absent. Petiole is expanded at base and set in fibrous mat. Leaf lets are clustered and droop from the middle portion of the leaf. Inflorescence is produced among the leaves and bears unisexual flowers of both sexes. Ripe fruits are orange – yellow in colour.

***Distribution*:** Brazil to N. E. Argentina

Year of flowering: Not flowered.

Silvicultural characters: This palm will thrive both in inland areas and in the coastal zone. The palm is fast growing and especially responsive to nitrogenous fertilizers. Large plants can be shifted readily, often with little setback. The species is widely used in landscaping. The palm has a couple of draw backs, notably the retention of untidy dead fronds.

***Note*:** Seedlings procured from Bhavana nursery, Cherthala and planted in 2003.

Habit

Syagrus romanzoffiana

Syagrus schizophylla (Mart.) Glassman

(Specific name is due to the split nature of the leaves or leaflets).

Common name: Arikury palm

Local names: Nil

A solitary palm. Leaves are pinnate. The most conspicuous feature is the long, black leaf bases which cover the trunk. Leaf bases are very spiny near the base. Petioles aare very slender and with a slight twist.

Distribution**:** Brazil

Year of flowering: Not flowered.

Silvicultural characters**:** Seeds germinate within two months of sowing. Needs protection from direct sunlight during seedling stage.

Note**:** Seedlings procured from Bhavana nursery, Cherthala and planted in 2002.

Habit

Inflorescence

Syagrus schizophylla

Washingtonia robusta H. Wendl.

(Generic name is after George Washington, first president of the USA. Specific name denotes its robust nature).

Common name: Cotton palm, Washington palm, Mexican fan palm.

Local names: Nil

Solitary, tall growing palm. Stem thicker at base. Leaves palmate, bright green, with red-brown basal sheath. Inflorescences are produced among the leaves and often extend beyond the conopy and bear bisexual flowers.

***Distribution*:** Mexico

Year of flowering: Not flowered.

***Silvicultural characters*:** Fresh seeds germinate two to four months after sowing A very hardy and adaptable palm.

Note: Seedlings procured from Athmanilayam nursery, Thiruvananthapuram and planted in 2007.

Habit

Washingtonia robusta

Wodyetia bifurcata A. K. Irvine

(The generic name is after Wodyeti, last male Melville Range Aborigine. Specific name means twice forked, in reference to the leaves and fibres on the fruit).

***Common name*:** Foxtail palm

Local names: Nil

It is a solitary, unarmed pinnate leaved palm with a prominent crownshaft. The leaflets present a densely plumose appearance. The inflorescence arises at the base of the crownshaft and bears unisexual flowers of both sexes.

Distribution: N. Queensland, Australia.

Year of flowering: Not flowered.

Silvicultural characters: This palm is reported to be adaptable to a range of soils. Single plants are capable of producing fertile seeds. Fresh seeds germinate two to three months from sowing and continue to germinate to twelve months. The palm is a light demander.

***Note*:** Seedlings procured from Bhavana nursery, Cherthalaand planted in 2003.

Habit

Wodyetia bifurcata

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1 *Acoelorrhaphe wrightii*
2 *Aiphanes horrida*
3 *Areca catechu*
4 *Areca triandra*
5 *Arenga engleri*
6 *Arenga hookeriana*
7 *Arenga wightii*
8 *Bentinckia condapanna*
9 *Bentinckia nicobarica*
10 *Bismarckia nobilis*
11 *Borassus flabellifer*
12 *Brahea edulis*
13 *Calamus andamanicus*
14 *Calamus baratangensis*
15 *Calamus brandisii*
16 *Calamus delessertianus*
17 *Calamus dransfieldii*
18 *Calamus gamblei*
19 *Calamus guruba*
20 *Calamus hookerianus*
21 *Calamus karnatakensis*
22 *Calamus lakshmanae*
23 *Calamus longisetus*
24 *Calamus metzianus*
25 *Calamus nagbettai*
26 *Calamus palustris*
27 *Calamus peregrinus*
28 *Calamus prasinus*
29 *Calamus pseudotenuis*
30 *Calamus shendurunii*
31 *Calamus stoloniferus*
32 *Calamus tenuis*
33 *Calamus tetradactylus*
34 *Calamus thwaitesii*
35 *Calamus travancoricus*
36 *Calamus vattayila*
37 *Calamus viminalis*
38 *Carpentaria acuminata*
39 *Caryota mitis*
40 *Caryota urens*
41 *Chamaedorea elegans*
42 *Chamaedorea metallica*
43 *Chambeyronia lepidota*
44 *Chuniophoenix hainanensis*
45 *Cocos nucifera*
46 *Cocothrinax sp.*
47 *Corypha umbraculifera*
48 *Corypha utan*
49 *Cyrtostachys renda*
50 *Daemonorops kurzianus*
51 *Daemonorops manii*
52 *Daemonorops rarispinosus*
53 *Dypsis decaryi*
54 *Dypsis lastelliana*
55 *Dypsis lutescens*
56 *Elaeis guineensis*
57 *Howea forsteriana*
58 *Hyophorbe lagenicaulis*
59 *Hyphaene thebaica*
60 *Korthalsia laciniosa*
61 *Korthalsia rogersii*
62 *Latania lontaroides*
63 *Latania verschaffeltii*
64 *Licuala grandis*
65 *Licuala spinosa*
66 *Livistona chinensis*
67 *Livistona mariae*
68 *Livistona rotundifolia*
69 *Livistona saribus*
70 *Nypa fruticans*
71 *Phoenicophorium borsigianum*
72 *Phoenix loureiri*
73 *Phoenix pusilla*
74 *Phoenix roebelenii*
75 *Phoenix sylvestris*
76 *Pinanga dicksonii*
77 *Plectocomia assamica*
78 *Pritchardia pacifica*
79 *Pseudophoenix sargentii*
80 *Ptychosperma elegans*
81 *Ptychosperma macarthurii*
82 *Ptychosperma waitianum*
83 *Ravenea rivularis.*
84 *Rhapis excelsa*
85 *Roystonea regia*
86 *Sabal mauritiiformis*
87 *Sabal palmetto*
88 *Salacca zalacca*
89 *Serenoa repens*
90 *Syagrus romanzoffiana*
91 *Syagrus schizophylla*
92 *Wallichia densiflora*
93 *Wallichia disticha*
94 *Washingtonia robusta*
95 *Wodyetia bifurcata*