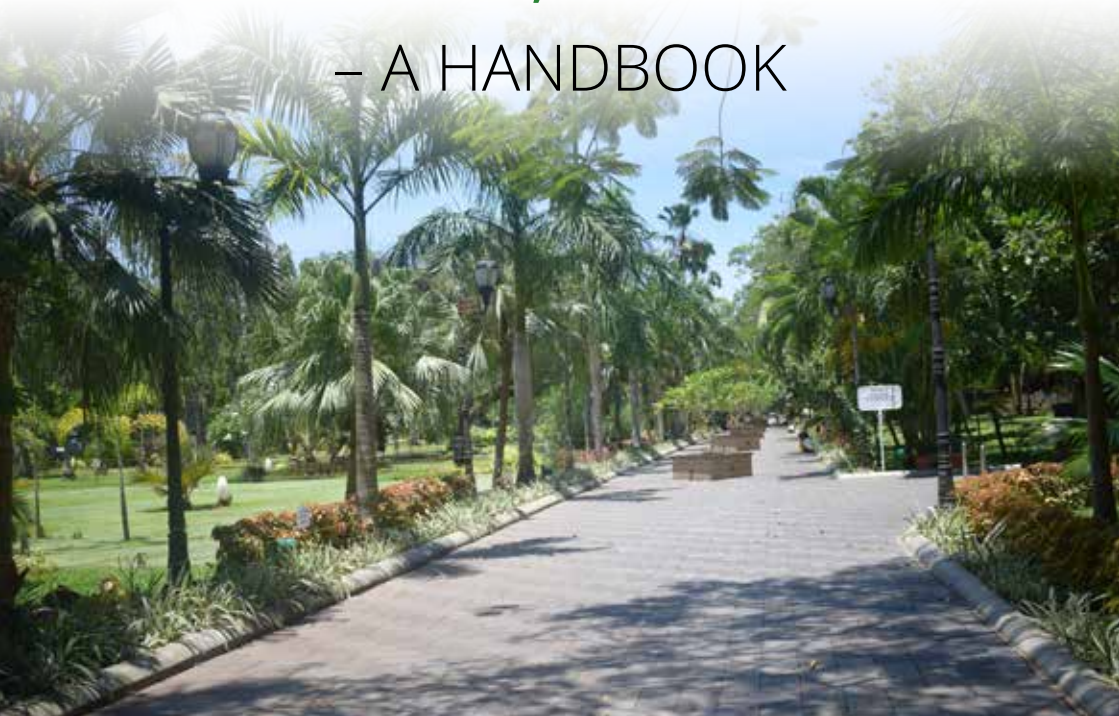




Kochi Municipal Corporation

Trees of Subhash Chandra Bose Park Kochi, Kerala

– A HANDBOOK



Prepared under



Project Implemented by





Message from Mayor

We have immense pleasure in bringing out a hand book of trees of Subhash Chandra Bose Park, which I hope would be highly beneficial for both common people as well as students and teachers. Subhash Chandra Bose Park in Kochi is one of the most prominent green public spaces in Kerala, with rich and diverse floral wealth and needs to be preserved and protected for us as well as posterity. As part of Integrated Sub-national actions for biodiversity supporting implementation of National Biodiversity Strategy and Action Plan (INTERACT - Bio) project implemented by ICLEI – Local Governments for Sustainability, South Asia and supported by the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU), Germany, through International Climate Initiative (IKI) and Ministry of Environment, Forest and Climate Change (MoEFCC), Government of India, we have a mission for conservation and management of urban biodiversity of Kochi. This hand book is also a part of that mission. I wish to express my appreciation to all the efforts behind this hand book.



Soumini Jain
Mayor, Kochi

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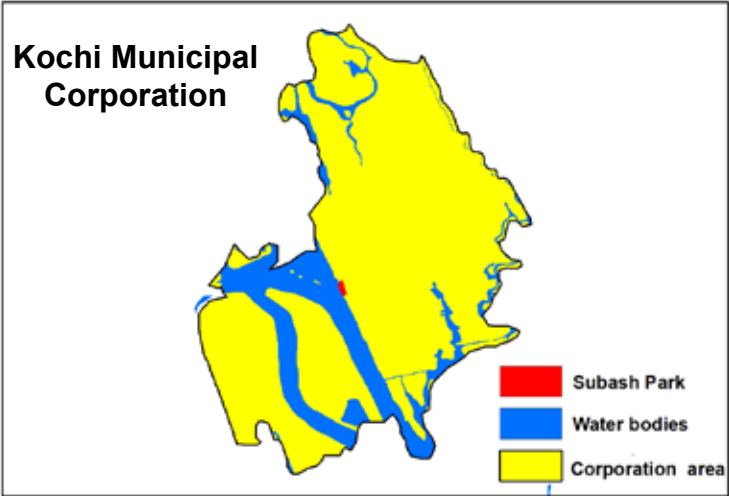
Introduction

Spread over an area of 11.5 acres, the Subhash Chandra Bose Park or Subhash Park, as it is popularly known, is owned and maintained by the Kochi Municipal Corporation. Situated at Park Avenue, facing the harbor and backwaters Subhash Park is one of the most valuable public spaces in the city of Kochi. The park is a popular destination among the tourists as well as the residents of Kochi. Like other green spaces in cities, Subhash Park also provides a multitude of ecosystem services which together help to improve the quality of urban life in Kochi.

The Park is also rich in biodiversity, which is exemplified from the fact that it has more than 50 species of trees. The Park is also rich in herb and shrub diversity. The rich floral diversity in the Park ensures a rich insect and avifaunal diversity as well.

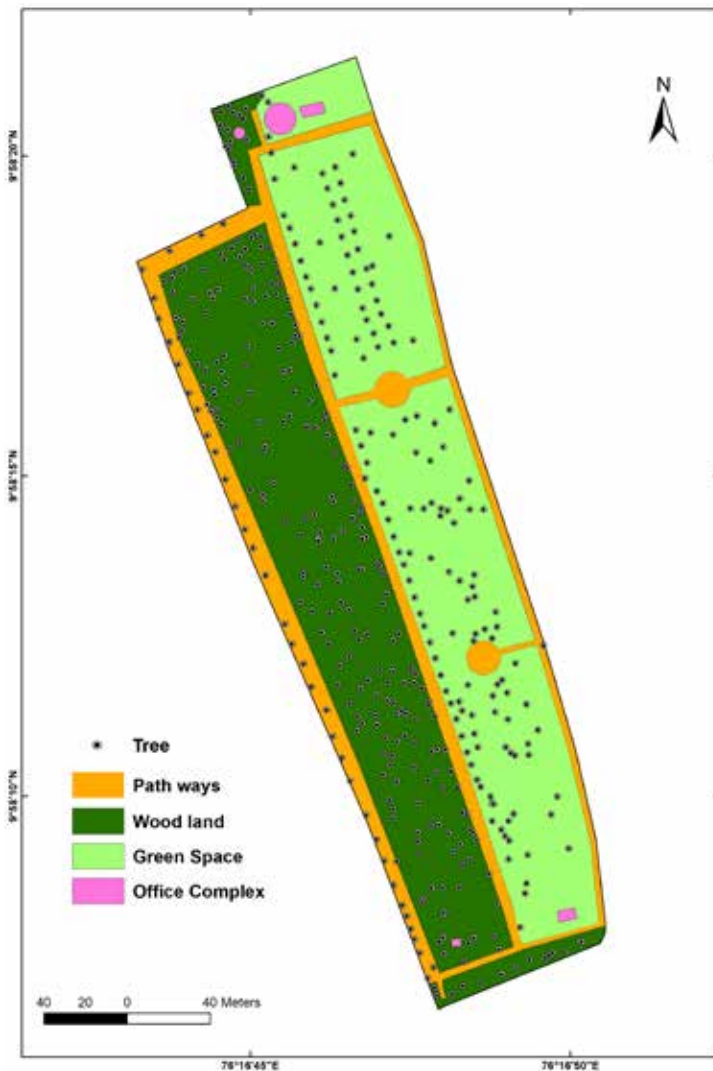
This handbook is an attempt to familiarize the visitors with the tree diversity of the Park. Apart from photographs and details about the trees, the handbook also includes maps which detail the tree distribution, family wise distribution of the trees, tree distribution based on place of origin, along with a map of the features in the Park.

Subhash Park, Kochi, Location Map

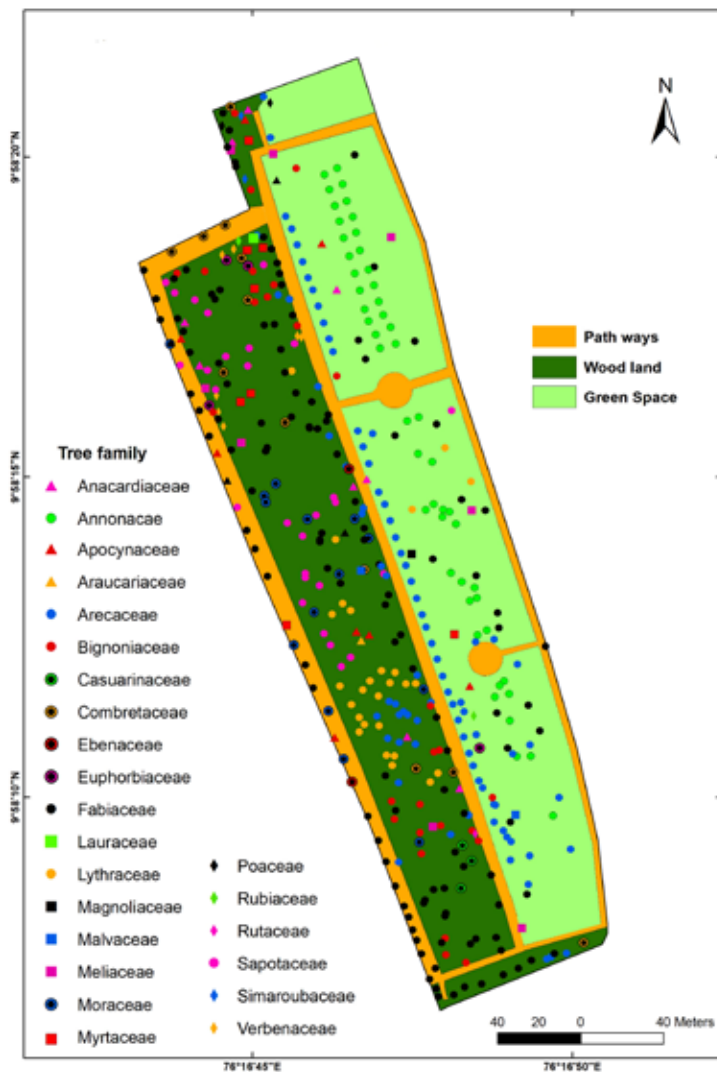




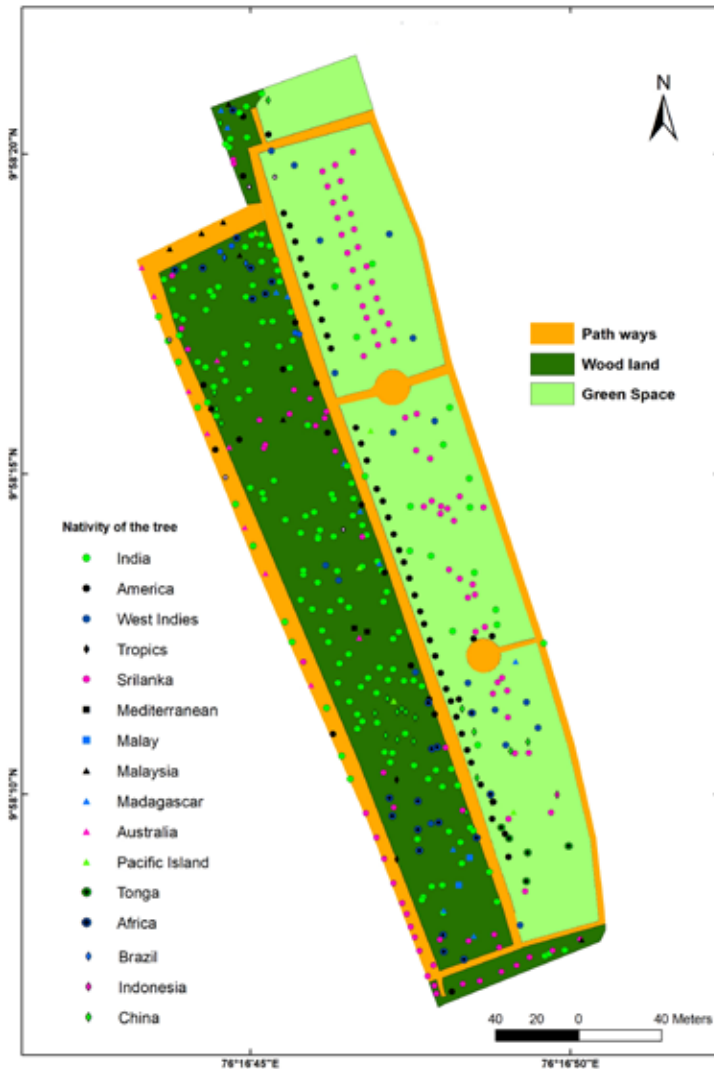
Tree Distribution Map



Tree Distribution Map based on Family



Tree Distribution Map based on Origin



Tree Distribution Map based on Indigeneity



Adenanthera pavonina

Common name	Red bead tree
Local name	Manchadi
Family	Fabaceae
Flowering season	January - September
Fruiting season	January - September
Distribution	Sri Lanka, North East India, Myanmar, Thailand, Malaysia and China

Description: *Adenanthera pavonina* is a deciduous tree, 6-15 m tall, having up to 45 cm diameter. Leaves bipinnate; 2-6 opposite pairs of pinnae, each with 8-21 leaflets on short stalks; alternate leaflets 2-2.5 x 3 cm, oval-oblong, with an asymmetric base and blunt apex, dull green on topside and blue-green underside; leaves turn yellow with age. Flowers borne in narrow spike like racemes, 12-15 cm long, at branch ends; flowers small, creamy yellow, fragrant; each flower star shaped with 5 petals, connate at the base, and having 10 prominent stamen-bearing anthers tipped with minute glands¹.

Uses and properties: Cooked seeds are edible; may require boiling to neutralize toxicity. Young leaves are eaten as a vegetable. The wood is used for bridge and household construction (beams, posts, joists and rafters), flooring, paving blocks and vehicle bodies. It may also be suitable for furniture, and turnery. The red dye from this tree has been used for dyeing clothes and by the Brahmins of India for marking the forehead. The plant also has medicinal value, and is used against rheumatism and gout. Pulverized wood mixed with water is taken orally for migraines and headaches; and dysentery, diarrhoea and tonsillitis are treated with a bark and leaf decoction².



Ailanthus excelsa

Common name	Tree of heaven
Local name	Matti
Family	Simaroubaceae
Flowering season	December - July
Fruiting season	December - July
Distribution	India and Sri Lanka

Description: *Ailanthus excelsa* are fast-growing deciduous tree, upto 25-45 m tall, with spreading branches and large (40-100 cm) pinnate leaves with long pointed leaflets, the terminal leaflet normally present, and the basal pairs of leaflets often lobed at their bases. The small yellow to greenish flowers are borne on branched panicles. They turn reddish later in the year and eventually brown. They stay on the tree for a long time; the male flowers have a strong odour³.

Uses and properties: Bark anthelmintic, febrifuge, expectorant and antispasmodic; used in asthma and bronchitis, also in dysentery. The powder from the resin of this plant mixed with curd is used as an astringent in diarrhea and dysentery. Bark is useful in cold and cough, in fever, postnatal complaint. Leaf-decoction and infusion is used for rheumatism in many parts of India. Decoction of barks and leaves have been used as a tonic after debility and labour pain⁴.



Albizia saman

Common name	Rain Tree
Local name	Mazhamaram
Family	Fabaceae
Flowering season	March and May
Fruiting season	March and May
Distribution	Native of Central and South America, has been widely introduced in South and South East Asia, as well as the Pacific Islands, including Hawaii.

Description: *Albizia saman* is a conspicuous, semi-deciduous tree that can attain a height of 60 m and diameter of 40 m, crown dense, spreading sometimes 30 m across; bole short, usually crooked, often with huge, widely spreading branches from low down. Leaves are bipinnately compound, 15-40 cm long, velvety, with a circular gland at the base and usually between each of the pinnae. Flowers are white below, pink above, solitary or in small clusters in the leaf axils or clustered at the ends of shoots, forming subglobose heads, central flower different from the others, the heads on stalks 5-8 cm long; whole inflorescence finely hairy. Pods are more or less straight with conspicuously thickened edges, black or green and set in brownish pulp. The most widely used common name for the species is rain tree, from the belief that the tree produces rain at night⁵.

Uses and properties: The pods are eatable. It contains a sticky, sweet- flavoured pulp. A fruit drink is also made from the pulp. Plant has medicinal value. Its inner bark and fresh leaves are used for treatment for diarrhoea, while a brew of small sections of the bark used in case of stomach-ache. A crude aqueous or alcoholic extract of the leaves is observed to have an inhibiting effect on *Mycobacterium tuberculosis*. The plant is wood highly prized for carvings, furniture and panelling. The wood is used in boat building. The beautiful, high-quality wood is used for interior trim, crafts, boxes, veneer, plywood and general construction⁶.



Araucaria heterophylla

Common name	Araucaria, Norfolk Island pine
Local name	X-mas tree
Family	Araucariaceae
Flowering season	Non-flowering
Fruiting season	March and May
Distribution	Endemic to Norfolk Island, a small island in the Pacific Ocean between Australia, New Zealand and New Caledonia.

Description: This large evergreen tree has a single upright trunk, tiered branching habit, and a narrow pyramidal or columnar shape. Eventually reaching a height of about 80 feet, the tree possesses a rapid growth rate, especially in its native habitat, but is likely to be much smaller when grown elsewhere. The young leaves are awl-shaped, 1-1.5 cm long, about 1 mm thick at the base on young trees, and incurved, 5-10 mm long and variably 2-4 mm broad on older trees. The thickest, scale-like leaves on coning branches are in the upper crown. The cones are squat globose, 10-12 cm long and 12-14 cm diameter, and take about 18 months to mature. They disintegrate at maturity to release the nut-like edible seeds. The scientific name *heterophylla* ("different leaves") is derived from the variation in the leaves between young and adult plants⁷.

Uses and properties: The plant is classified as 'Vulnerable' in the IUCN Red List of Threatened Species. It often has an attractive pyramidal form (like a fir or spruce tree) when small, but quickly grows too tall for most residential sites. The plant can survive as a house plant for a long time if not overwatered. The wood is soft. It was at one time heavily exploited for construction. A high quality wood, good for turning, it is used extensively by craftspeople in Hawaii. Seeds can be eaten raw or cooked⁸.



Artocarpus hirsutus

Common name	Wild jack
Local name	Anjili
Family	Moraceae
Flowering season	December - March
Fruiting season	December - March
Distribution	They are evergreen and deciduous trees growing in the southern regions of India.

Description: Kerala's own fruit locally called Anjili Chakka (*Artocarpus hirsutus*) belongs to the Moraceae family. Aini (Anjili) is a tall evergreen tree, generally 20-25 m in height and up to 5 m in girth. Leaves are simple, alternate; stipules to 4 cm long, lateral, densely tawny strigose; petiole 10-30 mm long, stout, hirsute; lamina 13-25 x 7.5-15 cm, broadly ovate, obovate or elliptic, base acute, obtuse or round, apex subacute or very shortly acuminate. Flowers unisexual, minute, yellowish-green; male in axillary, pendulous, narrowly cylindric spikes upto 15 cm long; tepals 2, united below; stamen 1; anther exserted, ovate, bracteoles chaffy; female flowers in axillary ovoid spikes; perianth tubular, confluent below with the receptacle; ovary superior, straight, ovule pendulous; style exserted; stigma undivided. Fruit a sorosis 6-7.5 cm across, globose or ovoid, echinate, yellow when ripe, the spines cylindric, straight, hispid, perforate at the apex for filiform style; seeds 16-18 mm long, ovoid, white⁹.

Uses and properties: Fruits are sweet, edible, bright yellow, ovoid or globose covered with spines, seeds ovoid and white. These are usually used as an ingredient in snacks. Ripe fruits are cooling in nature and aphrodisiac. Bark has properties to cure ulcers, diarrhea and pimples. Roasted seeds powder mixed with honey is used for the treatment of asthma. Oil from these fruits can be used for the treatment of skin diseases. For the extraction of oil, anjili seeds are boiled in water for 15 minutes. Once it cools, water with these seeds are kept for a day. The oil appears on the surface can be collected and applied on the skin for the treatment of various skin ailments¹⁰.



Azadirachta indica

Common name	Neem
Local name	Aryaveppu
Family	Meliaceae
Flowering season	February - September
Fruiting season	February - September
Distribution	Indo - Malaysia

Description: Neem is an attractive broad-leaved, evergreen tree which can grow up to 30m tall and 2.5m in girth. The trunk is usually straight and 30-80 cm in diameter. Leaves are alternate, crowded near the end of branches, simply pinnate, 20- 40 cm long, exstipulate, light green, with 2 pairs of glands at the base, otherwise glabrous; petiole 2-7 cm long, subglabrous; rachis channelled above; leaflets 8-19, very short petioluled. Inflorescence is an axillary, many-flowered thyrus, up to 30 cm long; bracts minute and caducous; flowers bisexual or male on same tree, actinomorphic, small, pentamerous, white or pale yellow. Fruit is 1 (maximum 2)-seeded drupe, ellipsoidal, 1-2 cm long, greenish, greenishyellow to yellow or purple¹¹.



Uses and properties: Neem plays a vital role in various problems associated with human health. It has been extensively used in Ayurveda, Unani and Homoeopathic medicine and has become a centre of attraction of modern medicine. Seeds have insecticidal and medicinal properties due to which they have been used for thousands of years in pest control, cosmetics, and medicines. Leaves are used to treat chickenpox and warts by directly applying to the skin in a paste form or by bathing in water with neem leaves. In order to increase immunity of the body, neem leaves are also taken internally in the form of neem capsules or made into a tea. Neem bark and roots also have medicinal properties. Bark and roots in powdered form are also used to control fleas and ticks on pets.

Bauhinia racemosa

Common name	Bidi Leaf
Local name	Mandaram
Family	Fabaceae
Flowering season	February - May
Fruiting season	February - May
Distribution	India and Sri Lanka

Description: *Bauhinia racemosa* is a small, crooked tree with drooping branches, growing up to 3-5 m tall. Leaves are typical *Bauhinia* like, shaped like cow's hooves. They are broader than long, 2-5 X 3-6 cm. The leaves are used for making bidis. Small flowers are borne in loose racemes, 5-10 cm long. Flowers are about 1 cm, greenish white. Petal are 5, narrow lanceolate, stamens 10. Pods 13 to 25 cms by 1.8-2.5 cms in size, generally curved, swollen, rigid. Seeds are 12 to 20, glabrous, dark reddish brown or black, compressed, 8mm long¹².

Use and properties: In parts of Western India, this tree is known under the name of Apta; it is one of the best known of our wild trees, at least among smokers, for the leaves of this tree are used in Western India as wrappers for the popular bidis or country cigarettes. The stem bark of the plant is an astringent and is used in the treatment of headache, fever, skin diseases and in tumors. In Ayurveda the bark is useful for the treatment of malaria, dysentery and diarrhea. The bark and leaves are sweetish and acrid, refrigerant, antipyretic, astringent, vermifugal, cure biliousness, urinary discharges, thirst headache, quartan fever, vatta, anal fistula, tuberculous glands, skin diseases, throat troubles, tumors, diseases of the blood, good in chronic dysentery and diarrhea. The fibre is used to stitch wounds. A decoction of leaves is used to allay headache in India¹³.



Caesalpinia coriaria

Common name	Dividivi plant
Local name	Dividivi
Family	Fabaceae
Flowering season	September - March
Fruiting season	September - March
Distribution	Native of the West Indies and Central America

Description: *Caesalpinia coriaria* is a large shrub or small tree, stem unarmed, grows up to 30ft tall. Its shape is very contorted in its native exposed coastal sites. In other environments it grows into a low dome shape with a clear sub canopy space. Leaves are double-compound, with 5-10 pairs of side-stalks, each with 15-25 pairs of leaflets. The individual leaflets are 7 mm long and 2 mm broad. The tree flowers during the warm weather, but the flowers are not very showy. They are yellow in color. The fruit is a twisted pod 5 cm long. It is the national tree of Curaçao and is very popular in Aruba where it is also called “watapana”. On these islands this tree is never straight because of the coastal winds¹⁴.



Use and properties: The greatest value of *Caesalpinia coriaria* in the past has been as a source of high quality tannin from the pods, traded internationally as ‘dividivi’. The pods are also useful as dry season fodder and therefore the trees are often left uncut in farmers’ fields. The wood is very hard and is a good quality fuel but the species is very slow-growing¹⁵.

Caesalpinia sappan

Common name	Sappan wood
Local name	Chappangam
Family	Fabaceae
Flowering season	August - December
Fruiting season	August - December
Distribution	Indo-Malaysia

Description: *Caesalpinia sappan* is a small to medium-sized, shrubby tree, 4-8 m tall; trunk up to 14 cm in diameter. Leaves are stipulate, bipinnate, alternate, 20-45 cm long, 10-20 cm broad, with 8-16 pairs of up to 20 cm long pinnae; pinnae with prickles at the base and with 10-20 pairs of oblong, 10-20 mm x 6-10 mm long, subsessile leaflets, very oblique at base, rounded to emarginated at apex. Flower is in terminal panicles and racemes pubescent. Fruit is a dehiscent pod, glabrous, thick, flattened, obliquely oblong, prominently beaked, woody, polished-brown, 7-10 cm x 3-4 cm, 2-3 seeded¹⁶.

Use and properties: The tree is the source of the commercial redwood or Brazil wood which is used for inlaying work, cabinet making, violin bows and for walking sticks. The heartwood yields a valuable red crystalline dye - brazilin, used on cotton, silk and wool fabrics. A decoction of the wood is a powerful emmenagogue and, because of its tannic and gallic acids, is an astringent used in mild cases of dysentery and diarrhoea. It is also given internally for certain skin ailments. It is given as a tonic to women after confinement and to relieve vomiting of blood. It is one of the ingredients in a mixture prescribed for malaria¹⁷.



Caryota urens

Common name	Elephant palm
Local name	Aanapana
Family	Arecaceae
Flowering season	January - April
Fruiting season	January - April
Distribution	Indo-Malaysia

Description: *Caryota urens* is an unarmed, hapaxanthic, solitary or clustered, medium-sized palm up to 20 m tall. The bipinnate leaves are triangular in shape, bright to deep green, 3.5 m long, and held on 60 cm long petioles. The obdeltoid pinnae are 30 cm long with a pointed edge and a jagged edge¹⁸. The 3 m long inflorescences emerge at each leaf node, from top to bottom, producing pendent clusters of white, unisexual flowers. The fruit matures to a round, 1 cm (0.39 in) drupe, red in color with one seed¹⁹.

Use and properties: A primary product of *Caryota urens* in rural communities is the sugar substitute called kitul honey or jaggery; juice from the flowers is concentrated in large, wide-mouthed vessels on an open fire to prepare a viscous, golden syrup with a delicious flavour. In Sri Lanka, leaves of *Caryota urens* are traditionally used as a 'delicacy fodder' for domesticated elephants; in areas where the trees are not tapped, they are cut down to feed elephants. A porridge prepared from *Caryota urens* flour is prescribed by local physicians to treat gastric ulcers, migraine headaches, snake-bite poisoning and rheumatic swellings. The root is used for tooth ailments, the bark and seed to treat boils, and the tender flowers for promoting hair growth²⁰. The mature wood is strong, heavy, durable and used as monoliths in modern house.



Cassia fistula

Common name	Golden shower, Amaltas
Local name	Kanikonna
Family	Fabaceae
Flowering season	February - September
Fruiting season	February - September
Distribution	Indo-Malaysia

Description: *Cassia fistula* is a golden shower medium sized tree. Its growth is fast up to 10-20 meter high. Leaves of this tree are deciduous, long and pinnate. Three to eight leaves are combined to form a cluster and each leaflet is about 7-21 cm long and 5-9 cm broad. This tree produces pendulous racemes long flowers with five yellow equal sized petals. Fruit of this tree is a legume with pungent smell serving several seeds inside. Wood of this tree is very stable and durable²¹.

Use and properties: *Cassia fistula* is grown as ornamental plant in garden but it may also be grown as fire wood and medicinal plant. The plant has liver protecting, inflammation reducing, cough suppressing, wound healing, anti-microbial and constipation curing properties. All parts of tree viz. roots, bark, leaves, fruits are used. The fruit pulp is used as a medicine for curing constipation. The fruit pulp is consumed in the evening after meals in dose of 5-10 grams to get relief from intestinal worms and constipation. This also gives relief in indigestion, abdominal gas and strengthens intestine. The leaves are also laxative. For curing constipation, tender leaves are cooked and eaten as leafy vegetables. The leaves are rubbed on skin in case of severe itching. The decoction is given to treat fever, inflammation and bacterial infections²².



Casuarina equisetifolia

Common name	Australian pine
Local name	Kattadi
Family	Casuarinaceae
Flowering season	July
Fruiting season	July
Distribution	Burma and Vietnam throughout Malesia east to French Polynesia, New Caledonia, and Vanuatu, and south into Australia ²³ .

Description: *Casuarina equisetifolia* is an evergreen tree to 46 m tall, usually with single trunk and open, irregular crown. Bark is reddish brown to gray, rough, brittle and peels. Branchlets pine-needle-like, grayish green, jointed, thin (< 1 mm wide), 10-20 cm long, minutely ridged, hairy in furrows. Leaves reduced to tiny scales, 6-8 in whorls encircling joints of branchlets. Flowers unisexual (monoecious), inconspicuous, female in small axillary clusters, male in small terminal spikes. Fruit a tiny, 1-seeded, winged nutlet (samara), formed in woody cone-like clusters (fruiting heads), these brown, to 2 cm long and 1.3 cm wide²⁴.

Use and properties: The plant is grown as ornamental along streets and seashores. Since it is salt tolerant and grows in sand, the plant is used to control erosion along coastlines, estuaries, riverbanks and waterways. The wood is used to produce paper pulp using neutral sulphate and semi-chemical processes, and as a raw material for rayon fibres. The bark contains 6-18% tannin and has been used extensively in Madagascar for tanning purposes. The plant roots contain the actinorhizal symbiont *Frankia* enable *Casuarina equisetifolia* to fix atmospheric nitrogen. These root nodules can be prolific. The roots also possess proteoid and forms association with vesicular arbuscular mycorrhizae. Root extracts are also used for the treatment of dysentery, diarrhoea and stomach-ache. The fresh bark is astringent. It is used in the treatment of dysentery.



Cinnamomum verum

Common name	Cinnamon
Local name	Karuvapatta
Family	Lauraceae
Flowering season	March - April
Fruiting season	March - April
Distribution	India, Sri Lanka

Description: This tree when fully grown can reach up to a height of 6m and occasionally there are trees that even grow to 12m. The trunk is stout, about 30-60 cm in diameter and when matured it is covered with a thick grey bark. The branches of this tree are naturally low set and very bushy. The leaf apice is acute and its base rounded to acute. The matured leaves measure about 7-10 cm long and 3-5 cm wide. The leaves are deep green in color with 3 conspicuous longitudinal veins. The young leaves of the flush are reddish in color which later turns to lighter green and then finally to its deep green in colour²⁵.

Use and properties: *Cinnamomum verum* possesses antifungal and antibacterial properties. The volatile oil has antiviral and hypotensive activity whilst the bark is used for dyspepsia, flatulence, dysentery, bronchitis and gangrene of the lungs. The bruised bark is steamed and used externally as a fomentation on boils and abscesses. The oil is a useful application for acute and chronic rheumatism. Cinnamon is also given for cramps of stomach, toothache and paralysis of the tongue and used in massive doses in the treatment of cancer. The bark oil is used in meat and fast-food seasoning, sauces and pickles, baked goods, confectionery and cola-type drinks. The leaf oil is also used as a flavouring agent for seasonings and savoury snacks.



Citharexylum spinosum

Common name	Fiddlewood
Local name	Parijatham
Family	Verbenaceae
Flowering season	April - September
Fruiting season	April - September
Distribution	Native of West Indies; introduced and naturalised in many other countries

Description: *Citharexylum spinosum* is an evergreen tree up to 50 feet tall. The plant has narrow leaves which are up to 8 inches long, smooth and oval or oblong, coarse-toothed or entire, pointed at the tip, and are opposite or in groups of three. Flowers on *C. spinosum* are functionally unisexual and the trees are dioecious. The fruits are globose, 0.25 in (0.60cm) in diameter, immaturesly red or orange and purplish to black when ripe. The leaves turn a browish gold colour between February and May²⁶.

Use and properties: *Citharexylum spinosum* is cultivated as a street tree and is a popular ornamental in many tropical and subtropical regions. The leaves turn orange prior to dropping, which is part of the reason for its appeal. The tree is also attractive because of its fragrant white flowers. People in the Carribean use the wood of *Citharexylum spinosum* to make stringed instruments and cabinets²⁷. The tree is widely planted over much of island of O'ahu and Maui. It was previously thought to stay where it was planted, but has since been found invaded into adjacent land in Ha'iku, kihei and Lahaina.



Citrus pennivesiculata

Common name	Gajanimma
Local name	Naragam
Family	Rutaceae
Flowering season	February - September
Fruiting season	February - September
Distribution	Tropical Asia

Description: It is a vigorous hardy, medium to large thorny tree, more or less confined to South India. Leaves are medium thick, shiny, petioles with medium sized wings. Flowers are purple, not scented. Fruits large, mamillate, less warty, pulp greenish yellow, juice sacks having opaque dot, arranged in herringbone fashion²⁸.

Use and properties: The fruit is used as a souring agent like lemons in south Indian dishes. Gajanimma rind has an aroma something similar to *Eucalyptus* or ginger. These are therefore also used for pickling in south India. Gajanimma was tried as a rootstock for citrus fruits but the combination did not turn out to be successful. It is susceptible to gummosis²⁹.



Cocos nucifera

Common name	Coconut
Local name	Thengu
Family	Arecaceae
Flowering season	Throughout the year
Fruiting season	Throughout the year
Distribution	Tropics

Description: *Cocos nucifera* trees have a smooth, columnar, light grey-brown trunk, with a mean diameter of 30-40 cm at breast height, and topped with a terminal crown of leaves. Tall selections may attain a height of 24-30 m; dwarf selections also exist. Leaves are pinnate, feather shaped, 4-7m long and 1-1.5 m wide at the broadest part. Inflorescence consists of female and male axillary flowers. Flowers are small; light yellow, in clusters that emerge from canoe-shaped sheaths among the leaves. Fruit is roughly ovoid, up to 5 cm long and 3 cm wide, composed of a thick, fibrous husk surrounding a somewhat spherical nut with a hard, brittle, hairy shell³⁰.

Use and properties: Unopened flowers of *Cocos nucifera* are protected by sheath, often used to fashion shoes, caps, even a kind of pressed helmet for soldiers. Opened flowers provide a good honey for bees. Nut has a husk, which is a mass of packed fibers called coir, which can be woven into strong twine or rope, and is used for padding mattresses, upholstery and life-preservers. Fiber resistant to sea water and is used for cables and rigging on ships, for making mats, rugs, bags, brooms, brushes, and olive oil filters in Italy and Greece; also used for fires and mosquito smudges. If nut is allowed to germinate, cavity fills with a spongy mass called 'bread' which is eaten raw or toasted in shell over fire. When nuts are cut open and dried, meat becomes copra, which is processed for oil, rich in glycerine and used to make soaps, shampoos, shaving creams, toothpaste lotions, lubricants, hydraulic fluid, paints, synthetic rubber, plastics, margarine, and in ice cream³¹.



Crescentia cujete

Common name	Beggars bowl, Calabash tree
Local name	Thiruvattakkai
Family	Bignoniaceae
Flowering season	Throughout the year
Fruiting season	Throughout the year
Distribution	Native to the tropical and subtropical regions of America

Description: *Crescentia cujete* is an evergreen tree reaching 20 to 30 feet in height with a broad, irregular crown composed of long, spreading branches clothed in 2- to 6-inch-long bright green leaves, which create moderate shade beneath the tree. The tree is most outstanding in the landscape for its year-round production of flowers and fruit, both of which are unusual. The 2-inch-wide flowers are yellow/green with red or purple veins, cup-shaped, and appear to emerge directly from the branches. These are followed by the emergence of the large, round fruit, 5 to 12 inches in diameter, with a smooth, hard shell, which hang directly beneath the branches³².



Use and properties: The part of the tree that is used is the fruit. Its active ingredients have not yet been defined. Its uses are mainly in phytopharmaceuticals. The extract of the fruit is effective in the treatment of fever. It is also used in treatment of respiratory diseases such as bronchitis, whooping cough and asthma. In traditional medicine vermifuge properties are attributed to it. *Crescentia cujete* is also frequently cultivated as an ornamental. The ripe fruits, once dry and clean inside, are used as containers to hold water. When the dry, clean fruits are cut in half, they have a variety of domestic uses, especially as containers to store salt and tortillas. They are valued in the manufacture of handicrafts and musical instruments. Fresh seeds are ground and mixed with water to make a refreshing drink. The drink has a sweet and pleasant taste³³.

Cyrtostachys renda

Common name	Red Sealing Wax Palm
Local name	Chuvanna pana
Family	Arecaceae
Flowering season	Throughout the year
Fruiting season	Throughout the year
Distribution	Native of Indonesia, Malaysia, Thailand and Sumatra

Description: *Cyrtostachys renda* is a slender multi-stemmed, slow-growing, clustering palm tree. It can grow to 16 metres tall. It has a scarlet to bright red colored crownshaft and leaf sheath, making it distinct from all other species of Arecaceae. The plant's stipe grows up to 10 centimetres in diameter. Its petioles grow up to 15 centimetres long and have pinnate leaves have about 50 pairs of pinnae. The plant's fruits are ovoid, 1.4 centimetres in diameter, green, turning to a dark bluish-black when ripe³⁴.

Use and properties: *Cyrtostachys renda* is generally grown for its brightly colored and unusual foliage and it is considered as a plant in high demand for gardening and landscaping. It also has some limited traditional uses such as for flooring materials, roof thatching, and for making darts in Pahang and elsewhere in Malaysia. Some rural communities in Sumatra harvest the plant for palm hearts³⁵.



Delonix regia

Common name	Gul Mohur, Flamboyant
Local name	Poomaram
Family	Fabiaceae
Flowering season	February - July
Fruiting season	February - July
Distribution	Native of Madagascar

Description: *Delonix regia* is a medium-sized, fast growing deciduous tree. Sometimes, roots close to the trunk are exposed to provide additional support to the trunk. These are called 'butresses'. The leaves are compound and feather-like (twice-divided or bipinnate). Each leaf is made of between 10 and 25 pairs of pinnae, with each pinna having 16-30 oppositely arranged leaflets. Flowers are arranged in loose terminal clusters, are large (~10 cm across) and bright red (or orange) in colour³⁶. The fruit is a legume - also known as pod, long (30-70 cm), strap-shaped and flattened, containing up to 50 seeds each.

Use and properties: *Delonix regia* mainly valued for its seeds, leaves, shade and ornamental value. The plant seeds yield 18 to 27.5 % fatty oil known as the "pangam" or "karanga" oil of commerce. Its main use is in tanning industry. The oil and its "karjan" possess insecticidal and anti- bacterial properties. The oil also finds use in soap- making, illuminating and pharmaceutical preparations. The oil cake is good fertiliser. The seed cake can also be used in poultry ration to substitute black "til" component of ration. The seed is carminative, purifies and enriches the blood and is used in cases of inflammation, "ear ache" and chest complaint. The wood is employed locally for agricultural implements; handles for carpentry tools, combs etc. Principle use is as fuel, the calorific value of wood being 4600 kcal/kg³⁷.



Diospyros buxifoli

Local name	Malamuringa
Family	Ebenaceae
Flowering season	March - May
Fruiting season	March - May
Distribution	Indo - Malaysia

Description: *Diospyros buxifoli* grows up to 30 metres tall. Inflorescences bear up to five flowers. The fruits are ellipsoid, up to 1.6 cm long. Leaves are simple, alternate, distichous; petiole 0.1 cm, subsessile; elliptic or elliptic-ovate, acute at both ends, chartaceous, yellowish silky hairy throughout when young, glabrous when mature, drying dark brown above pale brown beneath. Flowers unisexual, dioecious; male flowers 1-4 together in small subsessile axillary cyme; female flowers solitary, axillary, subsessile. The specific epithet *buxifolia* is from the Latin, referring to the leaves' resemblance to those of the genus *Buxus*. The wood is valued as a type of ebony. It is harvested from the wild for local use and for trade³⁸.

Use and properties: The heartwood is heavy, very hard and brittle. It is used for poles and posts³⁹.



Dypsis lutescens

Common name	Yellow Palm, Golden cane palm
Family	Arecaceae
Flowering season	Throughout the year
Fruiting season	Throughout the year
Distribution	Native of Madagascar

Description: *Dypsis lutescens* can grow up to 20 ft tall, although it is usually smaller. Six to eight leaves on long petioles (leaf stems) arise from the main trunk and gracefully arch outward and downward. Each leaf has about 80-100 leaflets which are arranged on the leaf stem in a shallow. The common name derives from the beautiful golden yellow color of the petioles. The yellow flowers are borne in branches about 3 ft long that emerge from the tops of the stems. The fruits are about 1 inch in diameter and are yellow to purple⁴⁰.

Use and properties: Because of its dense and clustering growth habit, golden cane palm primarily is used as a shrub, hedge or screen in subtropical or tropical landscapes. It is also used as bare wall or fence. It also can be used as a specimen palm to show of its golden canes, especially if older leaves are pruned. In cooler climates, golden cane palm is commonly used in interior design to add a tropical touch⁴¹.



Ficus auriculata

Common name	Giant Indian Fig, Elephant Ear Fig, Roxburgh Fig
Local name	Atthi
Family	Moraceae
Flowering season	November - February
Fruiting season	November - February
Distribution	The Himalayas, from Nepal to NE India, Burma, S. China, Indo-China and Malaya, at altitudes of 1000-2100 m.

Description: *Ficus auriculata* is a perennial evergreen shrub or small tree that grows up to 12 m high. Leaves are ovate, alternative arranged and very large (30-40 cm). They start off being red then turn to green. Fruits are pear-shaped and reddish-brown, hanging on peduncles 2.5 cm or longer. Fruits appear on thin branches emerging from the trunk or from the roots. The fruits are edible and are used to make jams, juices and curries in India. In Vietnam, unripe fruits are also used in salads. Leaves are used as fodder for ruminants⁴².

Use and properties: The fruits can be eaten raw or cooked. The large figs are edible and are used in the preparation of jam, juice and curries. The latex from the stems is applied to cuts and wounds. The roasted fruit is used in the treatment of diarrhoea and dysentery. The tree is planted in erosion control programmes. The leaves are used as plates⁴³.



Ficus benghalensis

Common name	Banyan tree
Local name	Peraal
Family	Moraceae
Flowering season	May - August
Fruiting season	May - August
Distribution	India, Sri Lanka and Pakistan

Description: *Ficus benghalensis* grows 70 feet tall or more with abundant aerial roots that produce many massive prop roots that significantly extend the width of the tree. Abundant surface roots. Leaves are ovate-cordate, entire at margins, rounded at apex, 8 – 20 × 6 – 15 cm, coriaceous, glarous above, finepubescent beneath, 3 – 5-veined at base; lateral veins 4 – 6 pairs; petioles stout, 1 – 5 cm long, with a broad smooth greasy gland at apex, ventrally compressed, hairy. Inflorescence a hypanthodium, in axillary pairs, sessile, globose, 1.5 – 2 cm, hairy, subtended by 3 minutely hairy bracts, green, turning red on ripening. Flowers minute, 3 kinds: male, female and gall; male flowers numerous, near the ostiole of fig, pedicellate; tepals 3; stamen 1; female flowers sessile; gall flowers pedicellate, with a developing insect. Fruit an achene, globose-ellipsoid, creamish-brown⁴⁴.



Use and properties: According to Ayurveda, it is an astringent; useful in treatment of biliousness, ulcers, erysipelas, vomiting, vaginal complains, fever, inflammations, leprosy. According to Unani system of medicine, its latex is aphrodisiac, tonic, vulnerary, maturant, lessens inflammations; useful in piles, nose-diseases, gonorrhoea. The aerial root is styptic, useful in syphilis, biliousness, dysentery, inflammation of liver etc. It is planted for soil conservation. Timber is used for well-curbs, furniture etc. It is also suitable for paper pulp⁴⁵.

Ficus benjamina

Common name	Weeping Fig, Benjamin Fig
Local name	Vellal
Family	Moraceae
Flowering season	July - December
Fruiting season	July - December
Distribution	India and South China to Solomon Islands

Description: *Ficus benjamina* is an ever green, epiphytic, fast growing tree which can attend a height of 15-30 m. The leaves are ovate-elliptical, thin leathery texture, obscure venation, glossy green surface. Mostly 2.5 -4.0 inches long and 1.25-1.8 inches wide. New leaves are distinctly yellow, turning dark green. Base of the leaves are slightly narrow while petiole is slender, smooth, and slightly channeled above. Fruit is axillary, sessile, mostly paired, globular to slightly oblong, about 0.3 inch in diameter. It is green at first, becomes bright scarlet to almost black at maturity⁴⁶.

Use and properties: The tree is harvested from the wild for local use as a medicine and source of fibre and a low quality wood. The bark of the root is useful in treatment of wounds and bruises. The juice of the bark has a reputation in the Philippines for curing liver diseases. It is very ornamental, being widely cultivated in the tropics and subtropics and used as an avenue and shade-providing tree. The wood is of low quality, but is used for temporary constructions, mouldings, interior work, cladding, drawer etc⁴⁷.



Ficus racemosa

Common name	Gular Fig, Cluster Fig
Local name	Atthi-al
Family	Moraceae
Flowering season	February - May
Fruiting season	February - May
Distribution	Indo-Malaysia, Southern China, Southeast Asia, Indonesia, Australia

Description: *Ficus racemosa* is a large deciduous, upward branching cauliflorous tree. Tree can grow 60-70 feet tall, with irregular crown. It has an extensive buttressed trunk but no aerial, strangling or prop roots. Leaves are simple, alternate, stipules 12-18 mm long, entire, or slightly undulate, thin, glossy and smooth, or very sparsely pubescent. Flowers are unisexual, closed by 5-6 apical bractsmale, a long-styled female and a short-styled female flower, often called the gall flower⁴⁸. The flowers are pollinated by very small wasps that crawl through the opening in search of a suitable place to reproduce (lay eggs)⁴⁹.

Use and properties: Fruits can be eaten raw or cooked. Unripe fruits are pickled and used in soups. The fruit can be dried and ground into a flour then eaten with sugar and milk. The leaves are eaten as vegetable. The roots can be cut to provide a liquid that can be drunk as water. Plant has medicinal value. Its leaves are used in the treatment of diarrhoea and fruits are astringent. It is used in the treatment of haematuria, menorrhagia, and haemoptysis. The tree is also used in agro forestry and as a shade tree in coffee plantations⁵⁰.



Ficus religiosa

Common name	Peepal tree, Sacred Fig
Local name	Arayal
Family	Moraceae
Flowering season	November - February
Fruiting season	November - February
Distribution	Indian subcontinent, Myanmar, Thailand, Vietnam

Description: *Ficus religiosa* is an evergreen or deciduous tree, 20 m tall and 1.5-2 m width irregularly-shaped, with wide-spreading branches and without aerial roots from the branches.

Leaves are alternate, spirally arranged and broadly ovate, glossy, coriaceous (leathery), dark green leaves, 10-18 by 7.5-10 cm, with unusual tail-like tips, pink when young, stipulate, base-cordate. Petioles is slender and 7.5- 10 cm long. Galls are on leaves. Flowers axillary sessile,unisexual. Figs in pairs, rounded, flat-topped green, to 1.5 cm across, axillary, sessile, smooth, ripening to purple with red dots, basal bracts 3 and broad⁵¹.

Use and properties: Leaves are lopped as fodder for elephants, camels, goats and cattle; having about 10-14% crude protein. Silage prepared from the tree is palatable and digestible. The ripe fruit is cooling and relieves foul taste, thirst, biliousness, diseases of blood and heart; it is a laxative and helps digestion. It is used for medicinal purposes, such as toothaches. Dried fruit cure asthma; seeds are useful in urinary discharge; young bark is an astringent. The species is mostly planted near Buddhist temples as it is referred to as sacred in India. Hindus associate the tree with fertility in women. It is also an important host to lac insects⁵².



Lagerstroemia speciosa

Common name	Banaba, Pride of India
Local name	Manimaruthu
Family	Lythraceae
Flowering season	March - November
Fruiting season	March - November
Distribution	Indo- Malaysia, Cambodia, China, Indonesia, Philippines, Thailand, Vietnam

Description: *Lagerstroemia speciosa* is a deciduous or semi-deciduous small to medium-sized or rarely large tree up to 40 m tall. Leaves are opposite, distichous, simple, entire, stipules minute or absent. Flowers are axillary or terminal panicle, often showy, calyx funnel or bell shaped, 6 lobed, petals often 6, inserted near the mouth of the calyx tube, white to pink or purple, clawed, wrinkled. Fruit is a large woody capsule on the persistent calyx⁵³.

Use and properties: The leaves of *Lagerstroemia speciosa* and other parts are used widely in the Philippines, Taiwan, and Japan as a tea preparation. A decoction of the bark is used against diarrhoea and abdominal pains. A leaf poultice is used to relieve malarial fever and is applied on cracked feet. A preparation from dried leaves, known as banaba, is widely used in the Philippines to treat diabetes and urinary problems⁵⁴.



Madhuca neriifolia

Common name	Illipe Butter Tree
Local name	Iluppa
Family	Sapotaceae
Flowering season	October - January
Fruiting season	October - January
Distribution	India, Sri-Lanka

Description: *Madhuca neriifolia* is a small tree with a dark brown bark and glabrous young parts; leaves are simple, alternate, stipulate, numerous, scattered on short petioles, 10—17.5 cm long, oblong-linear, tapering to base, often apiculate, glabrous, rather thin, venation pellucid, stipules filiform, brown persistent. Flowers are regular, bisexual in clusters of about 6 from axils of leaves, pedicels about 2.5 cm long, erect or deflexed, glabrous; sepals 4 in two pairs, outer pair enclosing the inner, segments oval-lanceolate, acute, inner sepals silky hairy; petals 6, fused into a campanulate tube, lobes oblong, obtuse, silky outside, twisted; stamens 12 in one tier, sessile, very acute; ovary superior, 6-locular with a solitary ovule in eachloculus, style much exerted and persistent; fruit a linear-ovoid, beaked berry 2.5—3.7 cm long; seed solitary, 2.5 cm long, linear-ovoid, compressed, acute at both ends, shining, pale brown, hilum along the whole length of one side



Use and properties: The bark, root, heartwood and the oil extracted from the seeds of this tree is applied on wounds and sores caused by bears⁵⁵.

Mangifera indica

Common name	Mango tree
Local name	Mavu
Family	Anacardiaceae
Flowering season	January - May
Fruiting season	January - May
Distribution	Indo-Malaysia

Description: *Mangifera indica* is an evergreen tree with a height of 30 m, bark 2-2.5 cm blaze yellow; exudation yellowish, gummy. Mango tree is long lived, known to be 250-300 years with fruits. Leaves of this tree are linear - oblong, lanceolate - elliptical, pointed from both sides and arranged on branches in spiral pattern and have soothing aroma. Red, yellow and green colored flowers occurs in panicles about 3000 in number. Fruit of this plant is large drupe, but differ in shape and size. Yellowish green ripen fruits contains yellow thick pulp with single seed. Seed is oblong, solitary and covered by hard covering⁵⁶.

Use and properties: *Mangifera indica* is cultivated for the fruit, which can be eaten in 3 distinct ways, depending largely on the cultivar: unripe, ripe (the common way to enjoy mango throughout the world), and processed. It is an important honey plant, secreting large quantities of nectar. The heartwood is used for many purposes, including indoor construction, meat-chopping blocks, furniture, carpentry, flooring, boxes, crates and boat building (canoes and dugouts). The plant also has medicinal value. Seeds are used to treat stubborn colds and coughs, obstinate diarrhoea and bleeding piles. The bark is astringent, homeostatic and antirheumatic⁵⁷.



Millingtonia hortensis

Common name	Indian Cork Tree, Tree Jasmine
Local name	Akasaveppu
Family	Bignoniaceae
Flowering season	March – August and October - December
Fruiting season	March – August and October - December
Distribution	South East Asia and Malaysia

Description: *Millingtonia hortensis* grows to height between 18 and 25 metres and has a spread of 7 to 11 metres. It is a versatile tree which can grow in various soil types and climate with a preference for moist climate. The tree is evergreen and has an elongated pyramidal stem. The soft, yellowish-white wood is brittle and can break under strong gusts of wind. The leaf is imparipinnate and resembles that of neem. The white flowers come as large panicles which emit a pleasant fragrance. They are bisexual and zygomorphic. The bell-shaped sepals of the flower have five small lobes. The flower has four stamens with parallel anthers unlike in most other plants of this family where the anthers are divergent. The corolla is a long tube with five lobes. The fruit is a smooth flat capsule and is partitioned into two. It contains broad-winged seeds. The fruits are fed on by birds which aid in seed dispersal⁵⁸.

Use and Property: *Millingtonia hortensis* is considered ornamental and the pleasant fragrance of the flowers renders it ideal as a garden tree. The wood is also used as timber and the bark is used as an inferior substitute for cork⁵⁸. The leaves of *Millingtonia hortensis* are used as antipyretic, sinusitis, cholagogue and tonic in folklore medicine.



Mimusops elengi

Common name	Asian bullet wood, Spanish Cherry
Local name	Elanji
Family	Sapotaceae
Flowering season	December - August
Fruiting season	December - August
Distribution	Andamans, Martaban, Tenasserim, Burma and Western Ghats

Description: *Mimusops elengi* is an evergreen tree with a dense, rounded, spreading crown; it usually grows from 15 - 30 metres tall, exceptionally to 40 metres. It can be up to 100cm in diameter, with buttresses either absent or up to 2 metres high. The leaves are glossy and are dark green when old with 6.3 - 10 cm in long and 3.2 - 5 cm in wide. Leaves are variable, elliptic, oblong or oblanceolate, short or long acuminate, margin undulate, closely but faintly veined. Petioles 1.2-2.5 cm. Fruit is a berry, ovoid, 2.5 cm long with. It turns yellow and it tastes astringent and sweet. Fruits occur in rainy season, when ripe containing 1, rarely 2 seeds. Seeds are grayish brown, solitary, ovoid, compressed, shining⁶⁰.



Use and Property: The bark, flowers, fruits, and seeds are used in ayurvedic medicine and are purported to be astringent, cooling, anthelmintic, tonic, and febrifuge. It is mainly used for dental ailments such as bleeding gums, pyorrhea, dental caries, and loose teeth. The edible fruit is softly hairy becoming smooth, ovoid, bright red-orange when ripe. The wood is a luxurious wood that is extremely hard, strong and tough, and rich deep red in color. The heart wood is sharply defined from the sapwood. It can be worked on easily and takes a beautiful polish⁶¹.

Nerium oleander

Common name	Oleander
Local name	Arali
Family	Apocynaceae
Flowering season	November - May
Fruiting season	November - May
Distribution	From Mediterranean through Persia, Afghanistan to West Himalayas

Description: *Nerium oleander* is a small evergreen tree with 2–5 m in height and distributed in different geographical and ecological places. This plant originated in the Mediterranean region and Indo-Pakistan subcontinent. *Nerium oleander* is a drought-tolerant plant and belongs to the family Apocynaceae. The leaves are 5 to 20 cm long, acuminate or acute, shortly petiolate, narrow, with a coriaceous dark-green blade. Flowers are produced in terminal cluster about 5 cm in diameter with five petals and different colours vary from lilac, salmon, carmine, deep to pale pink, purple, copper, apricot, orange, white and yellow. The fruit consists of a narrow follicle of 7.5 to 17.5 cm long and opens to disperse fluffy seeds. This plant can be propagated by seed and shows great variability in seedling populations⁶².



Use and Property: *Nerium oleander* is widely grown as an ornamental plant in tropical, subtropical and temperate regions due to its profuse flowering which are long lasting along with their moderate hardiness. It is used for screens, hedging along highways, planting along beaches. It is able to form attractive small trees by leaving just a few stems. In Northern regions it may be grown as an indoor or patio plant. Beside these all, the plant showed antibacterial, antimicrobial, anti-inflammatory, antinociceptive and antitumor activity⁶³.

Peltophorum pterocarpum

Common name	Copper pod Tree
Local name	Charakonna
Family	Fabiaceae
Flowering season	Throughout the year
Fruiting season	Throughout the year
Distribution	Native of Sri Lanka, Andaman, Malaysia Peninsula

Description: *Peltophorum pterocarpum* is a deciduous tree usually reaching a height of 15-24 m, although it may attain 50 m and a diameter of 50 -100 cm. Bark smooth, grey; crown dense, spreading. Leaves large, 30-60 cm long, with 8-10 pairs of pinnae each bearing 1020 pairs of oblong leaflets 0.8-2.5 cm long with oblique bases. Flowers orange-yellow, each about 2.5 cm in diameter, fragrant, particularly at night; inflorescence brown-tomentose, panicles terminal with rust-coloured buds. Fruits 1-4 seeded pods, flat, thin, winged, 5-10 cm long, dark red when ripe, then turning black. The plant has a deep root system. The specific epithet 'pterocarpum' alludes to its winged seed⁶⁴.

Use and Property: The bark of *Peltophorum pterocarpum* has been an important component of the dark or black 'soga' dye in Java, used for batik work. It is also used for tanning leather, and preserving and dyeing fishing nets. The plant also has medicinal value and is used as an astringent to cure or relieve intestinal disorders after pain at childbirth, sprains, bruises and swelling or as a lotion for eye troubles, muscular pains and sores. It is also used for gargles and tooth powders. The heart wood is used locally for light construction purposes, cabinet making, sawn or hewn building timbers, woodware, woodcarving and marquetry⁶⁵.



Phyllanthus acidus

Common name	Star Gooseberry
Local name	Arinelli
Family	Euphorbiaceae
Flowering season	December - August
Fruiting season	December - August
Distribution	Probably native of Brazil

Description: *Phyllanthus acidus* is a small tree, 2 to 9 m high. The tree's dense and bushy crown is composed of thickish, tough main branches, at the end of which are clusters of deciduous, greenish, 15-to-30-cm long branchlets. The branchlets bear alternate leaves that are ovate or lanceolate in form, with short petioles and pointed ends. The leaves are 2-7.5 cm long and thin, they are green and smooth on the upperside and blue-green on the underside. In general, the tree very much looks like the bilimbi tree. The flowers can be male, female or hermaphrodite. They are small and pinkish and appear in clusters in 5-to-12.5-cm long panicles. Flowers are formed at leafless parts of the main branches, at the upper part of the tree. The fruits are numerous, oblate, with 6 to 8 ribs, and densely clustered. They are pale yellow or white, waxy, crisp and juicy, and very sour. 4 to 6 seeds are contained in a stone at the center of each fruit⁶⁶.

Use and Property: The fruit is edible and used as pickle and also to make vinegar. The wood is fairly hard, strong, tough and durable if seasoned. It is used for utensils and other small objects. The latex is credited with emetic and purgative activity. In Indonesia the bark is heated with coconut oil and spread on eruptions on feet and hands. An infusion of the root is taken to alleviate asthma in Java. In Borneo, roots are used in the treatment of psoriasis of the feet. A leaf decoction is applied to urticaria, a decoction of the bark is used to treat bronchial asthma in Philippines. The fruit is used as a laxative in Myanmar. In India, the fruits are taken as a liver tonic to enrich the blood⁶⁷.



Phyllanthus emblica

Common name	Indian gooseberry
Local name	Nelli
Family	Euphorbiaceae
Flowering season	July - February
Fruiting season	July - February
Distribution	Throughout the tropics

Description: *Phyllanthus emblica* is a small to medium sized deciduous tree, 8-18 meters height with thin light grey bark exfoliating in small thin irregular flakes, leaves are simple, subsessile, closely set along the branchlets, light green having the appearance of pinnate leaves; flowers are greenish yellow, in axillary fascicles, unisexual, males numerous on short slender pedicels, females few, subsessile, ovary 3-celled; fruits globose, fleshy, pale yellow with six obscure vertical furrows enclosing six trigonous seeds in 2-seeded 3 crustaceous cocci⁶⁸.

Use and Property: The fruits are sour, astringent, bitter, acrid, sweet, cooling, anodyne, ophthalmic, carminative, digestive, stomachic, laxative, alterant, aphrodisiac, rejuvenative, diuretic, antipyretic and tonic. They are useful in vitiated conditions of tridosha, diabetes, cough, asthma, bronchitis, cephalalgia, ophthalmopathy, dyspepsia, colic, flatulence, hyperacidity, peptic ulcer, erysipelas, skin diseases, leprosy, haematogenesis, inflammations, anemia, emaciation, hepatopathy, jaundice, strangury, diarrhoea, dysentery, hemorrhages, leucorrhoea, menorrhagia, cardiac disorders, intermittent fevers and greyiness of hair⁶⁹.



Plumeria obtusa

Common name	White champa, White Frangipani
Local name	Velutharali
Family	Apocynaceae
Flowering season	December - June
Fruiting season	December - June
Distribution	Central America, from Mexico to Panama

Description: *Plumeria obtusa* is a small tree ranging in height from 1-6 m, with widely spaced thick succulent branches that are often covered with “knobby” protuberances. The leaves are clustered near the tips of the branches. They are large, 6-22 cm long, 2-7 cm wide, and have a characteristic obovate shape and the tip of the leaf is rounded, rather than pointed as it is in other species. The leaves are dark and leathery and tend to be shiny on the upper surface with conspicuous parallel secondary veins that run from the midvein to the margins of the leaves. The flowers of this species are borne in clusters that form at the ends of the branches on a long thick stalk. Each inflorescence contains many white flowers with a small yellow center. Flowers contain five petals that are fused at the base in a short funnel-shaped tube which gradually widens as the lobes of the petals are spread out. The fruit of this species is a dry follicle which splits along one side to release the winged seeds⁷⁰.

Use and Property: This tree is commonly used as an ornamental, grown for its flowers. In Cambodia the flowers are used to make necklaces and in offerings to the deities. In traditional medicine used in that country, a decoction of the bark is given in varying doses as a purgative or as a remedy against oedemas⁷¹.



Plumeria pudica

Common name	Fiddle Leaf Plumeria, Bridal bouquet
Local name	
Family	Apocynaceae
Flowering season	August - March
Fruiting season	August - March
Distribution	Native of Panama, Colombia and Venezuela

Description: *Plumeria pudica* is a small tree which usually has one or two slender trunks that branch close to the ground forming a dense slightly spreading crown. Leaves are dark green and unique fiddle-shaped, or spoon-shaped. Large clusters of bright white 3 inch flowers with small yellow centers cover this tree as a beautiful bouquet, hence the common name. The flowers are not fragrant. The plant looks attractive even when it is not flowering, because of its beautiful leaves⁷². The flower petals of a *Plumeria pudica* are similar to those of *Plumeria obtusa*. They are more rounded than *Plumeria rubra*, creating a more rounded flower, however they do not arch backwards like that of *Plumeria obtusa*⁷³.

Use and Property: This plant is commonly used as an ornamental, grown for its flowers.



Plumeria rubra

Common name	Pagoda tree
Local name	Ezhachembakam
Family	Apocynaceae
Flowering season	November - April
Fruiting season	November - April
Distribution	Tropical America

Description: *Plumeria rubra* is well-known for its intensely fragrant, lovely, spiral-shaped, reddish blooms which appear at branch tips from June through November. The tree itself is rather unusual in appearance; the 12 to 20inch-long, coarse, deciduous leaves cluster only at the tips of the rough, blunt, sausage-like, thick, grey-green branches. Branches are upright and rather crowded on the trunk forming a vase or umbrella shape with age. They are rather soft and brittle and can break but are usually sturdy unless they are mechanically hit or disturbed. The crown loses its leaves for a short time during the winter displaying the coarse-textured, stubby branches. A milky sap is exuded from the branches when they are bruised or punctured⁷⁴. *Plumeria rubra* come in many colours, from white to cream to yellow, even oranges, pinks (both pale and hot pink), reds and even deep cerise.

Use and Property: *Plumeria rubra* contains a number of medically active constituents and has been shown to be uterine stimulant, antifungal, antibacterial, antitumor, antiviral, analgesic, antispasmodic, and hypoglycaemic. The plant contains fulvoplumierin, which has antibiotic activity and inhibits the growth of *Mycobacterium tuberculosis*. The bark is abortifacient and purgative. The juice of the bark is considered an effective treatment for gonorrhoea and venereal sores. The scraped bark is used to treat scabies and wounds from poisonous fish. The milky juice is used to treat boils and rheumatic pain. It is also applied to remove worms or germs from wounds. It is used to treat the pain of toothache. The flowers are used to scent coconut oil⁷⁵.



Polyalthia longifolia

Common name	Cemetery tree
Local name	Aranamaram
Family	Annonaceae
Flowering season	March - August
Fruiting season	March - August
Distribution	Native India and Sri Lanka and It is introduced to many tropical countries

Description: *Polyalthia longifolia* is an evergreen tree, upto 13m tall. Leaves are coppery brown, lanceolate, 21.5-30.0 cm x 3.7-5.6 cm, tapering to a fine point, margins undulate, glossy above, glabrous on both sides (juvenile leaves tomentose). Flowers are delicate pale green with wavy petals. The flowers last for a short period, usually two to three weeks and are not conspicuous due to their color. Sepals are ovate-triangular, outside it is tomentulose but inside glabrous. Petals are greenish yellow, narrowly triangular-lanceolate. Stamens are; connectives apically convex. Carpels are 20-25 in number with one ovule per carpel; stigmas are sessile. Fruits are borne in clusters of 10-20, usually ovoid in shape. Initially fruits are green in color but turns purple or black when ripe. Seeds are pale brown, ovoid, with a longitudinal groove⁷⁶.



Use and Property: The leaves are used for ornamental decoration during festivals. The tree is a main attraction in gardens throughout India. The tree can be cut into various shapes and maintained in required sizes. In past, the flexible, straight and light-weight trunks were used in the making of masts for sailing ships. That is why the tree is also known as the Mast Tree. Today, the tree is mostly used for manufacturing small articles such as pencils, boxes, matchsticks, etc⁷⁷. The wood is tough and flexible, moderately hard but not very durable. In south India, it is used for making drums. In China, it is used for matches.

Pongamia pinnata

Common name	Indian beech tree
Local name	Ungu
Family	Fabaceae
Flowering season	April - December
Fruiting season	April - December
Distribution	Indo - Malaysia

Description: *Pongamia pinnata* is a medium-sized evergreen or briefly deciduous, glabrous tree 15-25 m high, with straight or crooked trunk 50-80 cm or more in diameter and broad crown of spreading or drooping branches. Leaves are alternate, imparipinnate with long slender leafstalk, hairless, pinkish-red when young, glossy dark green above and dull green with prominent veins beneath when mature⁷⁸. Flowers are bisexual, purplish-white, 15-18 mm long, in lax axillary racemes, axis pubescent; bracts small; petals 5, clawed; standard suborbicular with curved folds above the claw; wings obliquely oblong, slightly adnate above the claws to the obtuse keel petals which are joined near the tip; stamens 10, monadelphous, the vexillary stamen free below and above; anthers uniform. Fruit a pod, 4-5 cm x 2-2.5 cm, obliquely oblong, flat, thick, pointed at both ends, indehiscent, slightly falcate; seed one, reniform⁷⁹.



Use and Property: It is a multipurpose tree and valued for its oil and also supplies dyestuff, wood, fuel, insect repellent, medicine and various other commodities. The seed oil is given as a stomachic and cholagogue in the treatment of dyspepsia and cases of sluggish liver. It is used externally as a liniment for rubbing on skin diseases and rheumatic joints. It has been shown to be effective in enhancing the pigmentation of skin affected by leucoderma or scabies. This species is one of the few nitrogen-fixing trees to produce seeds containing oil, and these are collected in vast amounts in India for commercial processing of industrial uses⁸⁰.

Pritchardia pacifica

Common name	Fiji fan palm
Local name	
Family	Arecaceae
Flowering season	Throughout the year
Fruiting season	Throughout the year
Distribution	Native of Tonga Island

Description: *Pritchardia pacifica* reaches a height of 15 metres, with a smooth, grayish tan trunk 10 inches in diameter. The 20–30 leaves are 4 feet wide and equally long, held on petioles 4 feet in length. The large, flat and rounded leaves are divided 1/4-1/3 into many stiff-tipped segments. The inflorescences are composed of 1-4 panicles, shorter than or equalling the petioles in length. The panicles are branched to 2 orders, with glabrous rachillae. The flowers are followed by small, shiny dark brown to purplish black, spherical fruits, 0.4 inches in diameter. *Pritchardia pacifica* is considered a host for a plant disease called Lethal Yellowing that is found in the Florida, Puerto Rico, and Guam⁸¹.

Use and Property: The strikingly beautiful *Pritchardia pacifica* is excellent as a garden or landscape ornamental specimen. Town and city planners just love planting them along road median, byways and highways, or mass-plant them at roundabouts. Being slow-growing and of medium height, Fiji Fan Palm can be planted in a large container or tub to provide a lovely tropical setting outdoors and indoors⁸².



Psidium guajava

Common name	Guava
Local name	Pera
Family	Myrtaceae
Flowering season	March - June
Fruiting season	March - June
Distribution	Colombia, Mexico, Peru, United States of America

Description: *Psidium guajava* is a small evergreen tree, generally 3-10 m high, many branches. Leaves are opposite, simple; stipules absent, petiole short, 3-10 mm long; blade oblong to elliptic, 5-15 cm x 4-6 cm, apex obtuse to bluntly acuminate, base rounded to subcuneate. Inflorescence is axillary, 1- to 3-flowered, pedicels about 2 cm long, bracts 2, linear. Calyx splitting irregularly into 2-4 lobes, whitish and sparsely hairy within; petals 4-5, white, linear-ovate 2 cm long, delicate; stamens numerous, filaments pale white, about 12 mm long, erect or spreading, anther straw coloured; ovary inferior, ovules numerous, style about 10 cm long, stigma green, capitate. Fruit an ovoid or pear-shaped berry, 4-12 cm long, weighing up to 500 g; skin yellow when ripe, sometimes flushed with red; pulp juicy, creamywhite⁸³.



Use and Property: The whole fruit is edible; flavour varies from very acidic to sweet with the best fruit being both sweet and mildly acid. The trunk is used for making tool handles, fence posts and in carpentry and turnery. All parts of the young fruit are astringent. Guava exhibits antibacterial action against intestinal pathogens such as *Staphylococcus*. The dried ripe fruits are recommended as a remedy for dysentery, while the leaves and fruits are used as a cure for diarrhoea. Oil contains bisabolene and flavinoides that exhibit anti-inflammatory properties. A decoction of the leaves or bark is taken externally as a lotion for skin complaints, ringworm, wounds, and ulcers. Water from soaking the fruit is good to treat diabetes. The leaves are made into a cataplasm; cooked, they are given to horses with strangle⁸⁴.

Quassia amara

Common name	Amargo
Local name	Quassia
Family	Simaroubaceae
Flowering season	January - November
Fruiting season	January - November
Distribution	Native of Tropical America

Description: *Quassia amara* is native to Brazil, is a small forest tree, typically with a leaning stem, sometimes multiply-stemmed. Leaves are alternate, compound, with 3-5 leaflets, one terminal and the remaining in opposing pairs. The rachis between the leaflets is conspicuously winged. The leaves and bark have an unpleasant bitter flavor if chewed, hence the local name. The species name *amara* also means bitter. The flowers are produced in a panicle 15-25 cm long, each flower 2.5-3.5 cm long, bright red on the outside, and white inside. They are tubes with a narrow mouth, somewhat wider at the base. The fruit consists of 4-5 berries held together in a red receptacle; the fruits themselves are green, then turn black when maturing early in the dry season⁸⁵.



Use and Property: All parts of the plant contain the bitter principle called quassamarin. This has a range of medical properties including antileukaemic, antitumor, astringent, digestive, febrifuge, laxative, tonic and vermifuge. Quassamarin has been shown to stimulate the secretion of gastric juices, increase the appetite and aid digestion. It has been used successfully in the treatment of anorexia nervosa and is also used in the treatment of malaria and fevers. A decoction of the inner bark is used to treat colds. A decoction of the wood is used in lotions as a wash for persistent venereal ulcers. A decoction of the bark and leaves is used as a wash to rid the skin of external parasites such as agouti lice and as a treatment for measles and smallpox⁸⁶.

Acacia auriculiformis

Common name	Darwin Black Wattle
Local name	Acacia
Family	Fabiaceae
Flowering season	Throughout the year
Fruiting season	Throughout the year
Distribution	Native of Tropical Australia

Description: *Acacia auriculiformis*

is an evergreen tree, 20 m tall, bark gray-white, smooth. Tree branches are pendulous; branchlets angular, glabrous, with conspicuous lenticels. Phyllodes falcate-oblong, 10–20 cm × 1.5–4 cm, conspicuous main veins 3 or 4, both ends attenuate. Spikes 1 to several, fasciculate, axillary or terminal, 3.5 cm – 8 cm. Flowers orange-yellow. Calyx 0.5 mm – 1 mm, shallowly dentate. Petals oblong, 1.5–2 mm. Filaments 2.5–4 mm. Ovary densely puberulent. Legume contorted when mature, 5–8 cm × 0.8–1.2 cm, valves woody.

Use and Property: This plant is raised as an ornamental plant, as a shade tree and it is also raised on plantations for fuelwood throughout southeast Asia, Oceania and in Sudan. Its wood is good for making paper, furniture and tools. It contains tannin useful in animal hide tanning. In India, its wood and charcoal are widely used for fuel. Gum from the tree is sold commercially, but it is said not to be as useful as gum arabic. The tree is used to make an analgesic by indigenous Australians. Extracts of *Acacia auriculiformis* heartwood inhibit fungi that attack wood.



Roystonea regia

Common name	Royal Palm
Local name	Kuppi pana
Family	Arecaceae
Flowering season	Throughout the year
Fruiting season	Throughout the year
Distribution	Native of Central and South America

Description: *Roystonea regia* can reach 15 to 34.5 m in height and 61 cm in diameter. The stout, smooth trunk is not always straight, and many short air roots are attached at the base. The upper trunk is encased in a green column of leaf sheaths 1 to 3 m long. The pinnate leaves have short petioles and a sheath and blade 2.4 to 3.7 m long. Flowers develop from buds formed on the trunk below the leaves. Plant has male and female flowers on the same panicle with male flowers of each tree opening and falling before the female flowers to prevent self-fertilization. The male flowers have three minute, broad sepals, three bluntpointed petals measuring 6.4 mm long, six to nine stamens. The smaller female flowers have three small, broad sepals and a tubular corolla. They also bear six sterile stamens and a pistil with three styles⁸⁷. Root

nodules containing *Rhizobium* bacteria have been found on *Roystonea regia* trees in India.

Use and Property: *Roystonea regia* has been planted throughout the tropics and subtropics as an ornamental. The seed is used as a source of oil and for livestock feed. Leaves are used for thatching and the wood for construction. The roots are used as a diuretic, and for that reason they are added to tifey, a Haitian drink, by Cubans of Haitian origin. They are also used as a treatment for diabetes. Fibres extracted from the leaf sheath of *Roystonea regia* have been found to be comparable with sisal and banana fibres, but lower in density, making it a potentially useful source for the use in lightweight composite materials. An extract from *Roystonea regia* fruit known as D-004 reduces benign prostate hyperplasia (BPH) in rodents. D-004, is a mixture of fatty acids, is being studied as a potential alternative to finasteride for the treatment of BPH⁸⁸.



Saraca asoca

Common name	Sita Asoka tree
Local name	Ashokam
Family	Fabaceae
Flowering season	February - August
Fruiting season	February - August
Distribution	India and Myanmar

Description: *Saraca asoca* is an erect tree, small and evergreen, with a smooth, grey-brown bark. The crown is compact and shapely. Leaves are abruptly pinnate, with few pairs of leaflets. Inflorescence are corymbose panicles axillary or terminal. Flowers are yellowish to deep red, with short pedicels. Calyx is tubular, lobes 4. Petals absent. Stamens are usually 7, filaments long, filiform, anthers versatile, dehiscing longitudinally. Ovary is compressed, oblong, ovules few to more than 10; style filiform; stigma terminal, capitate. Fruit is legume compressed, oblong, slightly curved and oblique, leathery to rather woody. Seeds are 1–8, compressed, obovate-orbicular, ex-albuminous⁸⁹.

Use and Property: *Saraca asoca* has been traditionally used in Indian system medicine for treatment of uterine, genital ailments and other reproductive disorders in women, fever, pain and inflammation. The bark from *Saraca asoca* reported to have a stimulating effect on the endometrial and ovarian tissues. It is also used in cases of uterine bleeding, irregular menstrual cycles and infertility. Decoction of bark used in dysentery treatment. Leaves possess blood-purifying properties and also used for stomach-ache relief. The paste of leaves are applied on the skin to get relief from skin diseases. The dried flowers are used in diabetes and haemorrhagic dysentery and seeds are used for curing bone fractures, strangury and vesical calculi. The seed helps in bone strengthening and the ash of plant is good for external application in rheumatoid arthritis⁹⁰.



Spathodea campanulata

Common name	African tulip tree
Local name	Spathodia
Family	Bignoniaceae
Flowering season	November - March
Fruiting season	November - March
Distribution	Native Tropical Africa

Description: *Spathodea campanulata* is a large upright tree with glossy deep green pinnate leaves and glorious orange scarlet flowers. It may grow to 80 ft on an ideal site, but most specimens are much smaller. The tree has a stout, tapering, somewhat buttressed trunk covered in warty light gray bark. The lateral branches are short and thick. The 1-2 ft long opposite leaves, which emerge a bronzy color, are massed at the ends of the branches. They are composed of 5-19 deeply veined oval leaflets. The horn shaped velvety olive buds appear in upturned whorls at the branch tips. They are followed by 5-10 in green brown fingerlike pods pointing upwards and outwards above the foliage. Each of these pods contains about 500 tissue papery seeds. The tree flowers in spurts all through the growing season, but peak bloom is usually in the spring⁹¹.



Use and Property: The tree is harvested from the wild for food, medicines and various commodities that are used locally. It is planted in reforestation schemes, for soil conservation and as a plantation crop for the production of plywood in the Philippines. A very ornamental tree, the flowers bloom with great profusion, and at that time the tree can be seen from great distances. It is widely cultivated in the tropics in large gardens, parks etc. The plant has many medicinal uses, both where it is native and introduced. Extracts of the bark, leaves and flowers are used to treat malaria, HIV, diabetes mellitus, oedema, dysentery, constipation, gastrointestinal disorders, ulcers, skin diseases, wounds, fever, urethral inflammation, liver complaints and as a poison antidote. It may be effective as a malaria prophylactic and in the control of Aedes mosquitoes⁹².

Swietenia mahagoni

Common name	Mahogany
Local name	Mahogani
Family	Meliaceae
Flowering season	April - November
Fruiting season	April - November
Distribution	Native of West Indies and Central America

Description: *Swietenia mahagoni* is a tall tree, up to 30 m high, with a short, buttressing base, up to 1 m in diameter and a large, spherical crown, many heavy branches and dense shade. The bark is smooth grey on young trees, turning to scaly dark reddish-brown on large trees. The tree is deciduous in areas where it is subject to drought. Leaves are even, pinnate, 10-18 cm long, and bearing 4-10 pairs of leaflets that are shiny, dark green, lance-shaped, 2.5-5 cm long by 0.7-2 cm broad. Flowers are greenish-yellow, 6-8 mm across, in axillary panicles; panicles glabrous, shorter than the leaves. The light brown seed capsule stands upright, about 6-10 cm long by 4-5 cm diameter, with 5 valves splitting upward from the base⁹³.



Use and Property: *Swietenia mahagoni* was the original mahogany in commercial trade and was exported from Hispaniola in the 16th century. The heartwood is highly resistant to decay and insect attack, performing better than all other mahoganies in the international market. The tree is also known for its medicinal value. The bark is considered an astringent and is taken orally as a decoction for diarrhoea, as a source of vitamins and iron, and as a medicine to induce haemorrhage. When the bark is steeped to a red liquid, it is taken to clear blood, increase appetite, and restore strength in cases of tuberculosis⁹⁴.

Syzygium cumini

Common name	Black plum, Java Plum
Local name	Njaval
Family	Myrtaceae
Flowering season	December - April
Fruiting season	December - April
Distribution	Indo-Malaysia

Description: *Syzygium cumini* is a medium-sized tree 10-30 m high, with a straight to crooked, short, stout trunk, 40-100 cm in diameter. Crown is irregular or globular with many branches. Bark up to 2.5 cm thick, brown or dark grey, fairly smooth. Leaves are entire with narrow transparent margin, 7-18 cm long, 3-9 cm broad, opposite, thick, coriaceous, glabrous, broadly obovate, elliptic or elliptic-oblong. Flower clusters on old twigs at the back of leaves, 5-6 cm long and wide, with many paired stout forks at nearly right angles, end flower opening first; flowers white or pink, many, small, about 7 mm long, slightly fragrant, nearly stalkless, with cuplike, conical, light green base, calyx with 4 white, rounded, concave petals, more than 2 mm long, united into a cap; stamens many, long; pistil with inferior ovary; ovules numerous, tiny and stout; style white, 6-7 mm long. Fruits ovoid-oblong or elliptical berries, numerous, crowded in clusters, almost stalkless along twigs at the back of leaves; often curved, green at first, turning pink and then finally purple-black⁹⁵.

Use and Property: Ripe fruit is usually eaten fresh; it is juicy, almost odourless, with a pleasant, slightly bitter, astringent taste. Flowers are rich in nectar and yield high-quality honey. The reddish-grey or reddish-brown heartwood is fine grained and is utilized in exterior joinery and carpentry. Fruits are used to make wine, which is produced in vast quantities in the Philippines. The seeds and bark are well known in the Far East for the treatment of dysentery and in control of hyperglycaemia and glycosuria in diabetic patients. The astringent bark may be used as a gargle. Fruits are used as a relief for colic, while the wood yields a sulphate pulp that has medicinal uses⁹⁶.



Tectona grandis

Common name	Teak
Local name	Thekku
Family	Verbenaceae
Flowering season	May - January
Fruiting season	May - January
Distribution	South and South East Asia

Description: *Tectona grandis* is a large, deciduous tree reaching over 30 m in height in favourable conditions. Crown open with many small branches. Bark is brown, distinctly fibrous with shallow, longitudinal fissures. The very large, 4-sided leaves are shed for 3-4 months during the later half of the dry season, leaving the branchlets bare. Shiny above, hairy below, vein network clear, about 30 x 20 cm but young leaves up to 1 m long. Flowers small, about 8 mm across, mauve to white and arranged in large, flowering heads, about 45 cm long; found on the topmost branches in the unshaded part of the crown. Fruit is a drupe with 4 chambers; round, hard and woody, enclosed in an inflated, bladder-like covering⁹⁷.



Use and Property: Teakwood has been used in the manufacture of charcoal and as fuelwood. Being classified as very resistant to teredo activity, the wood is excellent timber for bridge building and other construction in contact with water such as docks, quays, piers and floodgates in fresh water. In house building, teakwood is particularly suitable for interior and exterior joinery (windows, solid panel doors and framing) and is used for floors exposed to light to moderate pedestrian traffic. It is also used quite extensively for garden furniture. In traditional medicine, a wood powder paste has been used against bilious headaches and swellings and internally against dermatitis or as a vermifuge⁹⁸.

Terminalia bellirica

Common name	Beheda nut tree
Local name	Thani
Family	Combretaceae
Flowering season	December - January
Fruiting season	December - January
Distribution	Bangladesh, Bhutan, Cambodia, China, Indonesia, Laos, Malaysia, Nepal, Pakistan, Sri Lanka, Thailand, Vietnam

Description: *Terminalia bellirica* is a tall tree, with characteristic bark, 12-50 m tall. Leaves are alternately arranged or fascicled at the end of branches, elliptic or elliptic obovate, leathery, dotted, entire. Leaf tip is narrow- pointed or rounded. Leaves are 8-20 cm long, 7.5-15 cm wide, on stalks 2.15 cm long. Flowers arise in spikes in leaf axils, 5-15 cm long. Flowers are greenish yellow, 5-6 mm across, stalkless, upper flowers of the spike are male, lower flowers are bisexual. Stamens are 3-4 mm long. Fruit is obovoid 1.5-2.5 cm in diameter, covered with minute pale pubescence, stone very thick, indistinctly 5 angled⁹⁹.

Use and Property: The tree yields a good-quality firewood and charcoal. The leaves are highly valued and extensively used as fodder. The fruit produces tannins and dyes used for leather tanning, dyeing of clothes, matting and inks. The wood is steeped in water to make it more durable then used for making boxes, furniture and construction. The fruit rind (pericarp) is astringent, laxative, anthelmintic, pungent, germicidal and antipyretic. It is applied in a diverse range of conditions including cough, tuberculosis, eye diseases, anti-HIV-1, dyspepsia, diarrhoea, dysentery, inflammation of the small intestine, biliousness, flatulence, liver disease, leprosy, cleanse the blood and promote hair growth in the Ayurvedic drug. Fruit extracts have anti-bacterial activity against *Micrococcus pyogenes* and *Escherichia coli*¹⁰⁰.



Terminalia catappa

Common name	Indian almond tree
Local name	Badam
Family	Combretaceae
Flowering season	March - January
Fruiting season	March - January
Distribution	Malaysia to North Australia and Polynesia

Description: *Terminalia catappa* is a tall deciduous and erect tree reaching 15-25 m, trunk 1-1.5 m in diameter, often buttressed at the base. Whorls of nearly horizontal, slightly ascending branches spaced 1-2 m apart in tiers, or storeys, up the trunk. Leaves alternate obovate with short petioles, spirally clustered at the branch tips, 15-36 cm long, 8-24 cm wide, dark green above, paler beneath, leathery and glossy. Flowers slightly fetid, greenish-white, very small, with no petals but 10-12 conspicuous stamens, arranged in several slender spikes 15-25 cm long in the leaf axils. The majority of the flowers are male and borne towards the apex, while a few hermaphroditic ones appear below. Some spikes have only male flowers. Fruit is hard, green-red, rounded and flattened, egg-shaped, with 2 ridges but no wings, 2.5 x 3-6 cm long, yellow or reddish when ripe¹⁰¹.

Use and Property: The kernel can be eaten raw or roasted and has an almond like taste. Sun-dried kernels yield 34-54% of a bland, yellow, semi-drying oil that is edible but becomes turbid on standing. The oil is mainly used in cooking. The foliage is used as a feed for silkworms and other animal feeds. Bark, leaves, roots and fruit are all important sources of tannin with the astringent bark containing 9- 23% tannin. The leaves, crushed with *Dacrydium elatum* and rhizomes of *Cyperus rotundus*, are combined to treat dysentery. The red leaves act as a vermifuge, while the sap of young leaves, cooked with oil from the kernel, is used to treat leprosy. Leaves may be rubbed on breasts to cure pain or, when heated, may be applied to numb parts of the body¹⁰².



Terminalia arjuna

Common name	White Murdah
Local name	Neermaruthu
Family	Combretaceae
Flowering season	November - June
Fruiting season	November - June
Distribution	Bangladesh, Bhutan, Cambodia, China, Indonesia, Laos, Malaysia, Nepal, Pakistan, Sri Lanka, Thailand, Vietnam

Description: *Terminalia arjuna* is evergreen trees, to 30 m, bole often buttressed; bark 6-8 mm thick, surface pinkish-grey, smooth, flaking off in thin layers; blaze pink; exudation red, gummy; branchlets drooping. Leaves are simple, opposite to alternate, estipulate; petiole 5-15 mm long, stout, grooved above, glabrous; oblong, elliptic, oblong-ovate or oblong-obovate, base round, pinnate, arched towards the margin, prominent, intercostae reticulate, prominent. Flowers are bisexual, dull yellow, 2-3 mm across, in short axillary spikes; calyx tube 0.5-2 x 1-1.5 mm, constricted above the ovary, pubescent; lobes 5, cream, stamens 10, in 2 rows, subulate, exserted; anthers small; ovary inferior, pubescent. Fruit a drupe, 6 x 3 cm, oblong, 5-7 winged; wings equal, lines on the wings oblique and curving upwards, apex notched; seed one¹⁰³.



Use and Property: The arjuna was introduced into Ayurveda as a treatment for heart disease by Vagbhata (c. 7th century CE). It is traditionally prepared as a milk decoction. In the *Ashtāṅga Hridayam*, but was also mentioned in many ancient Indian vedas, and was a known practice for thousands of years, passed down by tradition, before Vagbhata mentioned it in his writings. Vagbhata mentions arjuna in the treatment of wounds, hemorrhages and ulcers, applied topically as a powder. The Arjuna plant (lat. *Terminalia arjuna*) has traditionally been used to treat heart disease for centuries.

Wrightia tinctoria

Common name	Pala indigo
Local name	Dhandapla
Family	Apocynaceae
Flowering season	February - November
Fruiting season	February - November
Distribution	Australia, India, Myanmar, Nepal, Vietnam

Description: *Wrightia tinctoria* is a small to medium-size deciduous tree, 18 m tall and to 20 cm diameter with green marks on the stem and producing milky-white resin. The bark is smooth, somewhat corky and pale grey. Leaves are large up to 10 cm long by 5 cm wide, simple, opposite, decussate and glabrous (sometimes puberulous beneath). Young leaves are bluish with reddish nerves. Flowers white, fragrant, 1-5 cm long, arranged in lax dichasial cymes (5 cm long). Fruit a green follicle, 0.5 cm in diameter by up to 50 cm long, pendulous pairs and coherent only at the tip. Seed is linear, pointed at the ends, 1.2 -1.8 mm long, light yellowish-grey, crowned with a tuft of white silky hairs¹⁰⁴.

Use and Property: The timber is high in quality, valuable, small, and white. The white wood, which is very fine, is used for turnery, carving, toy making, matchboxes, small boxes and furniture. The leaves, flowers, fruits and roots are a sources of indigo-yielding glucoside, which produces a blue dye or indigolike dye. The juice from fresh unripe fruits is used for coagulating milk. The seeds are said to be aphrodisiac and anthelmintic. The leaves are used to relieve toothache when chewed with salt. In Nepal, the milky juice is used to stop bleeding. Also the leaves and roots are pounded in water for treatment of fever. The seeds yield deep red, semi-drying oil, which has medicinal value. In Indian traditional medicine, the bark and leaves are used to treat psoriasis, stomach pains, toothache, and dysentery. The pods contain floss, which is used for stuffing cushions. The cream-coloured latex has a rubber content varying from 2 to 28% that can be exploited commercially¹⁰⁵.



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