

Calophyllum inophyllum

poon, beach calophyllum

LOCAL NAMES

Bengali (sultanachampa,punnang,kathchampa); Burmese (ph'ông,ponnyet); English (oil nut tree,beauty leaf,Borneo mahogany,dilo oil tree,alexandrian laurel); Filipino (bitaog,palo maria); Hindi (surpunka,pinnai,undi,surpan,sultanachampa,polanga); Javanese (njemplung); Malay (bentagor bunga,penaga pudek,pegana laut); Sanskrit (punnaga,nagachampa); Sinhala (domba); Swahili (mtondoo,mtomondo); Tamil (punnai,punnagam,pinnay); Thai (saraphee neen,naowakan,krathing); Trade name (poon,beach calophyllum); Vietnamese (c[aa]y m[uf]u)

BOTANIC DESCRIPTION

Calophyllum inophyllum is a medium-sized tree up to 25 m tall, sometimes as large as 35 m, with sticky latex either clear or opaque and white, cream or yellow; bole usually twisted or leaning, up to 150 cm in diameter, without buttresses. Outer bark often with characteristic diamond to boat-shaped fissures becoming confluent with age, smooth, often with a yellowish or ochre tint, inner bark usually thick, soft, firm, fibrous and laminated, pink to red, darkening to brownish on exposure. Crown evenly conical to narrowly hemispherical; twigs 4-angled and rounded, with plump terminal buds 4-9 mm long.

Leaves elliptical, thick, smooth and polished, ovate, obovate or oblong (min. 5.5) 8-20 (max. 23) cm long, rounded to cuneate at base, rounded, retuse or subacute at apex with latex canals that are usually less prominent; stipules absent.

Inflorescence axillary, racemose, usually unbranched but occasionally with 3-flowered branches, 5-15 (max. 30)-flowered. Flowers usually bisexual but sometimes functionally unisexual, sweetly scented, with perianth of 8 (max. 13) petals in several whorls, usually whitish; petals 4; stamens numerous, yellow, grouped in 4 bundles, anthers changing from deep yellow through khaki to brown. Only the hermaphroditic flower has an ovary, a bright pink ball that is left at the end of the stem when the petals drop.

Fruit a spherical to ovoid drupe, 25-50 mm long, with a thin, compact outer layer, greyish-green in colour and smooth skinned. Stone with a hard layer and often with a spongy layer, containing a single seed. Seed with large cotyledons and radicle pointing to the base of the fruit.

The generic name comes from the Greek words 'kalos'-beautiful and 'phullon'-leaf, meaning beautiful-leafed and the specific epithet is derived from the Greek words 'is'-fibre and 'phullon'-leaf, alluding to the pronounced veins on the underside of the leaves.

BIOLOGY

The bisexual flowers are pollinated by insects such as bees. The flowering and fruiting periods vary. In India, the flowers appear in May-June and sometimes again in November. It has been suggested that apomixis may occur in *Calophyllum*, resulting in polyembryony. Trees often bear fruit throughout the year. The fruit is dispersed by sea currents and by fruit bats. Hybridization may occur with *C. inophyllum* as one of the parents.

L.

Guttiferae



Calophyllum inophyllum leaves and fruit (Zhou Guangyi)



Shade tree in park (Rafael T. Cadiz)



Leaves at Kalepolepo Kihei Maui, Hawaii (Forest and Kim Starr)

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L.

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ECOLOGY

C. inophyllum is essentially a littoral tree of the tropics, occurring above the high-tide mark along sea coasts of northern Australia and extending throughout Southeast Asia and southern India. It is common on sandy beaches of the seashore but is sometimes found inland on sandy soils.

It generally grows on the detritus brought down by rivers and on the sand and shingles banked up by wind and waves. The soil is generally dry at the surface, but the water table is usually only a few decimetres down, although the water it taps is often brackish. It is also found higher up the rivers along river margins.

The tree demands light; temperatures where it grows are moderated by the proximity of the sea and by the breezes. The sandy soil, exposed situation, radiation of heat from the sand, and salt-laden winds make the habitat pronouncedly xerophytic. *C. inophyllum* is sensitive to frost and fire.

BIOPHYSICAL LIMITS

Altitude: 0-500 m, Mean annual temperature: 7-18 to 37-48 deg. C, Mean annual rainfall: 750-5000 mm

Soil type: *C. inophyllum* grows best on deep soil near the coast and will thrive on pure sand.

DOCUMENTED SPECIES DISTRIBUTION

Native: Australia, Cambodia, Cook Islands, Fiji, French Polynesia, India, Indonesia, Japan, Kiribati, Laos, Madagascar, Malaysia, Marshall Islands, Myanmar, New Caledonia, Norfolk Island, Papua New Guinea, Philippines, Reunion, Samoa, Solomon Islands, Sri Lanka, Taiwan, Province of China, Thailand, Tonga, Vanuatu, Vietnam

Exotic: Djibouti, Eritrea, Ethiopia, Kenya, Nigeria, Somalia, Tanzania, Uganda, United States of America



The map above shows countries where the species has been planted. It does neither suggest that the species can be planted in every ecological zone within that country, nor that the species can not be planted in other countries than those depicted. Since some tree species are invasive, you need to follow biosafety procedures that apply to your planting site.

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PRODUCTS

Food: The fruit is edible; usually it is pickled but care must be taken with it, as it contains toxins.

Timber: The timber is generally slightly heavier, stronger and more durable than that of other *Calophyllum* species. The wood is often fine textured, and the grain is more interlocked. Sapwood is yellow-brown with a pink tinge and is well defined from the heartwood, which is red-brown, pink-brown or orange-brown. The density is 560-800 kg/cubic m at 15% mc, with an energy value of about 19 100 kJ/kg.

C. inophyllum is a good general-purpose timber. In several regions, the wood is much sought after for masts, spars, bridgework and scaffolding because of the tall, slender form of the poles. Being close-grained and durable, the wood is used for boat building, railway sleepers, veneer and plywood; being of a rich reddish-brown, it is excellent for cabinet making. The wood is used for light construction, flooring, moulding, joinery, wooden pallets, diving boards, cartwheels and axles, musical instruments and blowpipes.

Tannin or dyestuff: Tannins are commonly present, especially in the bark (11.9%) but often also in the leaves. A decoction of the bark is sometimes used to toughen and dye fishing nets. The seed oil and the latex have occasionally been used in dyeing batik cloth in Java.

Lipids: The kernels yield 50-73% of a bluish-yellow to dark green viscous oil, known as domba oil, or pinnai oil, or dilo oil. It has a disagreeable taste or odour, as it contains some resinous material that can easily be removed by refining. The concentration of resinous substances in the oil varies from 10 to 30%; it may therefore be used as a varnish. Domba oil is of excellent quality for soap manufacture; it is also used as an illuminant and in local medicine. The main compounds of the seed oil are oleic, linoleic, stearic and palmitic acid. Mixed with resin of *Vateria indica*, the oil is used for caulking boats.

Poison: The leaves, containing saponin and hydrocyanic acid, are poisonous to fish. The latex is rich in complex coumarin derivatives, some of which are piscicidal, while others are insecticidal. A considerable variety of xanthenes is found in the wood and bark. One of the xanthenes, called jacareubin, is nearly always present in *Calophyllum* but is extremely rare outside this genus.

Medicine: Oil extracted from the fruit is employed as a remedy for rheumatism, ulcers and skin diseases. Bark is said to be an astringent. A decoction of the bark and latex is used medicinally: internally against diarrhoea and after childbirth, externally against skin and eye diseases and rheumatism. Leaves, flowers and seeds are sometimes also used in local medicine.

SERVICES

Shade or shelter: The tree is planted for shade and for reforestation and afforestation. It also acts as an efficient shore protector in most places.

Soil improver: Remains of the pressed seeds (oil cake) can probably be used as a manure.

Ornamental: Although slow growing, *C. inophyllum* is a popular tree for roadside and avenue planting in India. It is a handsome ornamental, the young foliage being crimson and the flowers scented.

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TREE MANAGEMENT

The tree is said to be brittle and liable to damage by wind. In Zanzibar, it is planted on coral areas, where it grows at about 90 cm of height a year after initial establishment, which is very slow; frequent weeding is necessary until the crop is established. In plantation trials in Indonesia, the spacing of seedlings is usually 2 x 3 m. The species coppices moderately. The selective cutting system and removal of undesirable trees can enhance natural regeneration.

GERMPLASM MANAGEMENT

Seed storage behaviour is recalcitrant; the seeds are very oily, quickly losing their germinative power. There are up to 200 seeds/kg.

PESTS AND DISEASES

Leaves and young shoots are susceptible to attack by various insects. The fungus *Fomes dochmii* causes brown cuboidal rot in the plant. A fungus identified as *Trichocoma* spp. has been found to attack and kill trees in India.

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FURTHER READING

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SUGGESTED CITATION

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