

Calophyllum inophyllum L.

Taxonomy and nomenclature

Family: Clusiaceae (Guttiferae)

Synonyms: *Balsamaria inophyllum* (L.) Lour.

Vernacular/common names: Alexandrian laurel, Borneo mahogany, beauty leaf (Eng.); Ponyal (Bangladesh); nyamplung, dingkaran (Indonesia); polanga, pinnai (India); ponnyet, p'hông (Myanmar); bintangor laut, penaga laut (Malaysia); tamanu, dilo, kamani, portia tree, rekich (Pacific Islands); palo maria, bitaog (Philippines); krathing, saraphee naea, naowakan (Thailand); beach calophyllum, poon (trade names).

Distribution and habitat

The species has been planted widely throughout the tropics and it is uncertain from where it originates. It is believed to be indigenous to India, Malaysia, Indonesia and the Philippines. It grows in areas with 1000-5000 mm rain per year at altitudes from 0-200 m. It is essentially a coastal species that grows on sandy beaches and, to a lesser extent, along river margins further inland. It is highly tolerant to strong winds, salt spray and brackish water tables. The trees are sensitive to frost and fire.



1, fruits; 2, flowering branch; Copyright: PROSEA Foundation

Uses

Produces a decorative timber used for cabinetwork, parquet flooring, construction purposes, musical instruments, veneers, plywood, canoes and boats. It is durable, particularly under water and resistant to termite attack. Wood density is 560-800 kg/m³ at 15% moisture content. The attractive leaves, fragrant flow-

ers and pleasing form has made it a popular ornamental and it may be planted more as an urban street tree than for other uses. The wind and salt tolerance makes it suitable for sand dune stabilisation. Oil (tamanu oil, pinnay oil or domba oil) extracted from the seeds is used in medicine, for lighting and a number of other purposes. The oil appears to accelerate wound healing and give healthy skin, and the market for tamanu oil in the cosmetic industry is growing. The fruits are used for human consumption although they are reported to be slightly toxic.

Botanical description

Medium-sized tree, normally up to 25 m tall, occasionally reaching up to 35 m and with diameter up to 150 cm. The bole is without buttresses; it is usually twisted or leaning especially on wind-exposed sites. It has sticky latex that is either clear or white to yellowish. Bark often with characteristic diamond-shaped fissures. Leaves oval, up to 20 cm long, leathery and shiny dark green. The flowers are white, about 25 mm wide and fragrant, borne in inflorescences with 4-15 flowers.

Fruit and seed description

The fruit is a round drupe, 2-4 cm in diameter. The single, large seed is surrounded by a shell (endocarp) and a thin, 3-5 mm layer of pulp. The fruit is at first pinkish-green later turning bright green and when ripe, it turns dark grey-brown and wrinkled. There are 100-200 seeds/kg.

Flowering and fruiting habit

The tree can flower and bear fruit all year round, but generally in the Philippines flowering occurs from March to August. For flowers opening in May-June, fruits will mature in August. In Tamil Nadu and Mysore (India) flowers usually appear in the cold season and fruits ripen in March. In Kerala, flowers appear in March-April and fruits ripen in May-June, although both flowers and fruits can be found at other times of the year. In Orissa, there are two seasons, with flowering during May-June and October-November. In the Andaman Islands, the tree will flower profusely during the rainy season and, to a lesser extent, at other times of the year, with fruiting from June to August. The flowers are pollinated by bees and other insects, and fruits are dispersed by sea currents and fruit bats.

Harvest

When the fruits have turned from green to a dark colour the seeds inside are mature. The fruits do not open to release the seeds. Collection is best done from the ground after natural fruitfall but the fruits can also be picked individually or by shaking or lopping off branches with pruning poles. During transport the fruits should be packed in open bags and protected from direct sun.

Processing and handling

Because of high moisture content the fruits should be dried in the shade. It is not known how well the seed responds to drying to low moisture content.



Mature fruits. One fruit has been cracked open showing the seed inside. Photo: F. Laure



Calophyllum inophyllum L. tree. Photo from Hawaiian Plants, 5th World Network.

Storage and viability

The seeds are reported to have short viability but it is uncertain whether it is due to the high oil content or because the seeds are recalcitrant. Normally seed can be stored for up to one year, after that viability will drop.

Dormancy and pretreatment

The hard endocarp that surrounds the seed restricts germination. It is relatively easy to extract the seeds by gently tapping the endocarps with a wooden stick or by cracking with e.g. a pair of pliers. Extraction of the seeds shortens the germination time considerably as well as improves the germination percentage. In one study, seeds with intact shells germinated after 57 days compared with 38 days for seeds with cracked shells and 22 days if the shell was completely removed. Before sowing the seeds should be soaked in water for 12-24 hours.

Sowing and germination

If the seeds have been extracted, germination is normally high, more than 90%, and can be sown directly into containers. 1-2 months after sowing the seedlings are moved into full sunlight where they are hardened for a further four months before planting in the field. Direct seeding is also possible, sowing depth should be about 2.5 cm and spacing of 2x2 m. Following outplanting, weeding should be done at least twice a year. As natural regeneration is abundant, planting wildings is another option for regeneration. The wildings have hard, thick leaves and have a high survival rate.

Selected readings

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Troup, R.S. and H.B. Joshi, 1983. *Troup's The Silviculture of Indian Trees. Vol IV. Leguminosae.* Delhi, India.

Vozzo, J. (ed.) 2002. *Tropical Tree Seed Manual.* USDA, Forest Service.

THIS NOTE WAS PREPARED IN COLLABORATION WITH INDONESIA FOREST SEED PROJECT

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