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# MANGROVES OF THE NORTHERN TERRITORY, AUSTRALIA:

## *IDENTIFICATION and TRADITIONAL USE*

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**EXTRACT: *Xylocarpus* (pp. 148–152)**

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## ***Xylocarpus***

## **MELIACEAE**

**DERIVATION:** The Greek 'xylo' means woody and 'carpus' means fruit, in reference to the woody fruit, that are characteristic of the genus.

A genus of three tropical old-world species, two are considered mangroves and occur in tidal areas of the NT. The third species, which is not a mangrove, does not occur in Australia.

**DESCRIPTION:** Trees, deciduous, monoecious, with pneumatophores. Leaves compound, spirally arranged, paripinnate; leaflets 2–3 pairs, entire, glabrous. Inflorescence in short axillary thyrses. Flowers unisexual with strongly developed vestiges of opposite sex. Calyx 4-lobed, valvate. Corolla lobes 4, free. Staminal filaments fused into shortly 8-fid tube, anthers or antherodes alternate with segments. Disc fleshy, enveloping ovary; ovary ovoid, superior, 4-locular, ovules 3–4(–6) per locule, placentation axile; style short; stigma capitate, orbicular, 1.5 mm diameter. Capsule subspherical, coriaceous, woody, 4-valved, dehiscence tardy. Seeds 8–20, tetrahedral or pyramidal, margins angular, testa corky with inlaid fibres.

### **KEY TO SPECIES:**

1. Bark longitudinally fissured, light brown; pneumatophores conical; fruit less than 10 cm diameter ..... *X. moluccensis*
1. Bark irregularly fissured, flaky, red brown; pneumatophores meandering, vertical plates; fruit more than 15 cm diameter ..... *X. granatum*

## ***Xylocarpus granatum* J.König**

## **Cannonball Mangrove**

**DERIVATION:** The Latin 'granatum' means having many seeds, in reference to the many seeded fruit of this species.

**DESCRIPTION:** Tree, spreading and often poorly formed, to 8 m high; bark red-brown, irregularly fissured, flaky; pneumatophores meandering vertical plates. Leaves 15 cm long; petiole 5 cm long; leaflet lamina broadly elliptic 3.5–6 x 7–11 cm, not distinctly bifacial, apex obtuse, base cuneate; petiolule robust, 9 mm long. Inflorescence 4–7 cm long, 8–20-flowered; pedicels 4–6 mm long. Calyx 2 mm long. Corolla lobes spreading, broadly elliptic, 5 x 2 mm, apex obtuse. Staminal tube urceolate, 5 mm long, segments 1 mm long, acuminate; anthers 1 mm long, dorsifixed, adnate to tube rim. Capsule 15–23 cm diameter, flattened-globose. Seeds 8–18, 7–9 cm long.

**HABITAT:** *Xylocarpus granatum* is confined to mangrove formations that receive a strong flow of freshwater on a perennial basis. Soft, fine-grained soils are preferred; associates include *Rhizophora apiculata*, *Lumnitzera littorea* and *Dalbergia candenatensis*.

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**DISTRIBUTION:** *Xylocarpus granatum* is a rare component of NT mangrove areas, collections exist from Melville Island, Cobourg Peninsula and north-east Arnhem Land. A further population is reported from Groote Eylandt (Specht 1958, Levitt 1981), though no collections have been located. This species is also recorded from Western Australia and Queensland; extra-Australian occurrences include the old world tropics from East Africa throughout Malesia to Tonga.

**DISTINCTIVE FEATURES:** Tree with meandering vertical plate-like pneumatophores, bark reddish and flaky, fruit cannonball-like to 20 cm diameter.

**ETHNOBOTANY:** Rirratjingu people use the attractive pale pink timber for ornamental carvings (Yunupingu et al. 1995). Iwaidja speakers consider the timber to be of the highest quality, it is used to make stems for long-stemmed smoking pipes, decorative boxes and furniture (Blake et al. 1998).

**Recorded Aboriginal language names**

Gukawu (Rirratjingu)

Walmu (Yolngu Matha)

Waalmu (Djambarrpuynngu)

Alagugu (Iwaidja)

In the Philippines the timber is used for construction, tannin is extracted from the bark and wood and dye from the wood is used for fishing nets, ropes and other textiles (Jara 1987). In China the timber is used to make furniture, especially for bride's dowries, and musical instruments (Chang & Peng 1987). In Fiji the timber is used to make fence posts, beams and poles, it is also used as firewood (Pillai 1987).

In Vietnam the timber is used for carving decorative statues (Hong & San 1993). Oil extracted from the fruit is used to fuel lanterns in Thailand, in Indonesia this oil is mixed with flour and used to make face masks and to treat pimples, it is also used as a mosquito repellent and to treat insect bites and dysenteric fever (Mastaller 1997).

**NOTES:** *Xylocarpus granatum*, like the more common *X. moluccensis*, exhibits a great deal of leaf variation (see notes under that species).

Phenology appears to be similar to *X. moluccensis* but copious field data is lacking. Seed of *X. granatum* is adapted to water dispersal in a similar fashion to the seed of *X. moluccensis*. Flowers of *X. moluccensis* are strongly scented, and produce nectar from the disc, this would suggest insect pollination, but no field observations have been made.

*Xylocarpus granatum* usually exists towards the freshwater end of tidal waterways. However, one tree from the Fort Dundas area, Melville Island, was found on a sandy beach at the high tide limit. A small, perennial, freshwater soak near the base of the tree provided the freshwater input that this species requires for survival. This tree perished in the period between 1990 and 1995 (Wightman pers. obs).

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***Xylocarpus moluccensis*** (Lam.) M.Roem.

**Mangrove Cedar**

**DERIVATION:** The Latin 'moluccensis', pertains to the Moluccas, the Spice Islands of eastern Indonesia where this species is common, and possibly where type material of this name was collected.

**DESCRIPTION:** Tree, columnar to 15 m; bark light brown, peeling in longitudinal flakes; pneumatophores conical, robust. Leaves to 20 cm long; leaflet lamina bifacial, elliptic, 4.5–12 x 2–7.5 cm, apex acute to obtuse, base cuneate; petiolule stout, 2–4 mm long. Inflorescence 4–6.5 cm long, 9–35 flowered; pedicels 6–10 mm long. Calyx 2 mm long. Corolla lobes spreading, 5 x 2 mm, broadly elliptic, apex obtuse. Staminal tube urceolate, 5 mm long, segments 1 mm long, acuminate; anthers 1 mm long, dorsifixed, adnate to tube rim. Capsule 5–10 cm diameter, orbicular. Seeds 5–10, 4–6.5 cm long, corky.

**HABITAT:** *Xylocarpus moluccensis* is regularly found in forests fringing tidal waterways, at the rear of coastal mangals and in swales behind coastal dunes. Substrates include sands and muds, freshwater input for some part of the year is preferred. Associates include *Bruguiera parviflora*, *Rhizophora stylosa* and *Diospyros littorea*.

**DISTRIBUTION:** *Xylocarpus moluccensis* is common and widespread around the entire NT coastline, though less common on the west coast. Also found in Western Australia and Queensland. Extra-Australian occurrences include tropical Asia from India, Indochina, Thailand and throughout Malaysia.

**DISTINCTIVE FEATURES:** Tree with stout, conical pneumatophores, bark light brown, fissured, fruit ball-like, to 10 cm diameter.

**ETHNOBOTANY:** Anindilyakwa people use *X. moluccensis* for canoe repairs and consider it a good shade tree (Levitt 1981). Yolngu people crush the inner bark in water and drink the liquid for any illness (Scarlett et al. 1982).

Iwaidja speakers used the trunks of large straight trees to make dugout canoes (Blake et al. 1998). The Tiwi name refers directly to the stout conical pneumatophores (Puruntatameri et al. 2001).

**Recorded Aboriginal language names**

Gukawu (Yolngu matha)  
Alagugu (Iwaidja)

Pupwurrupwani (Tiwi)  
Kirlakanku (Yanyuwa)

Watson (1928) reports Malaysians using *Xylocarpus* spp for timber, firewood, as a source of lighting oil and hair oil, while a decoction of bark was used to treat cholera. New Guineans extract a dye (Percival & Womersley 1975). In the Philippines the timber is used for construction, the roots for carving and the bark to treat diarrhoea (Jara 1987). In Indonesia *Xylocarpus* spp. bark is used to treat diarrhoea and coughs (Soegiarto & Soemodihardjo 1987); in Sumba, Indonesia (Astuti et al. 2001) *X. moluccensis* wood is the considered the best to make

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planks for boat building, while the leaves are added to bath water to 'freshen' the bather.

In Fiji the timber is used to make fence posts, beams and poles, it is also used as firewood (Pillai 1987). In Vietnam the durable, fine-textured timber is used for making wooden wares and decorative statues (Hong & San 1993). The bark from *Xylocarpus* spp. is used as a febrifuge and in the treatment of dysentery (Hong & San 1993).

**NOTES:** Leaflets of *X. moluccensis* are extremely variable in size and texture, from small (4.5–2.0 cm), thin leaflets to large (12 x 6.5 cm), succulent leaflets. Leaf fall occurs in the mid dry season (June–July), new leaves may be seen from August to September. Flowers are produced during June and July. Fruit mature during November–December. Pollinators of *X. moluccensis* are insects, probably native bees (Tomlinson 1986), though field observations in the NT are lacking.

During the period of leaf fall *X. moluccensis* is very distinctive due to the pale orange and yellow canopies which are particularly obvious from the air.

The corky testa of *X. moluccensis* seed allows it to remain afloat for more than two months, and Guppy (1906) noted the propensity of seed to germinate while afloat. Seeds are often found amongst drift at the high tide mark; however, many are rendered infertile because of insect attack (Wightman pers. obs.).

The timber of *X. moluccensis* is attractive and hard-wearing.

The correct name for this species has been confused. In the past both *X. australasicus* Ridley and *X. mekongensis* Pierre have been used in the NT. In the first edition of this book (Wightman 1989), *X. mekongensis* was used. However, recent work by Mabberley et al. (1995) has relegated both these names to synonymy under the name *X. moluccensis*.

Further confusion has existed over the number of species of *Xylocarpus* present in the NT, and this appears to have arisen due to the misinterpretation of the different bark types exhibited by juveniles and adults of *X. moluccensis*.

References: Blake 1954, Pennington & Styles 1975, Mabberley et al. 1995.

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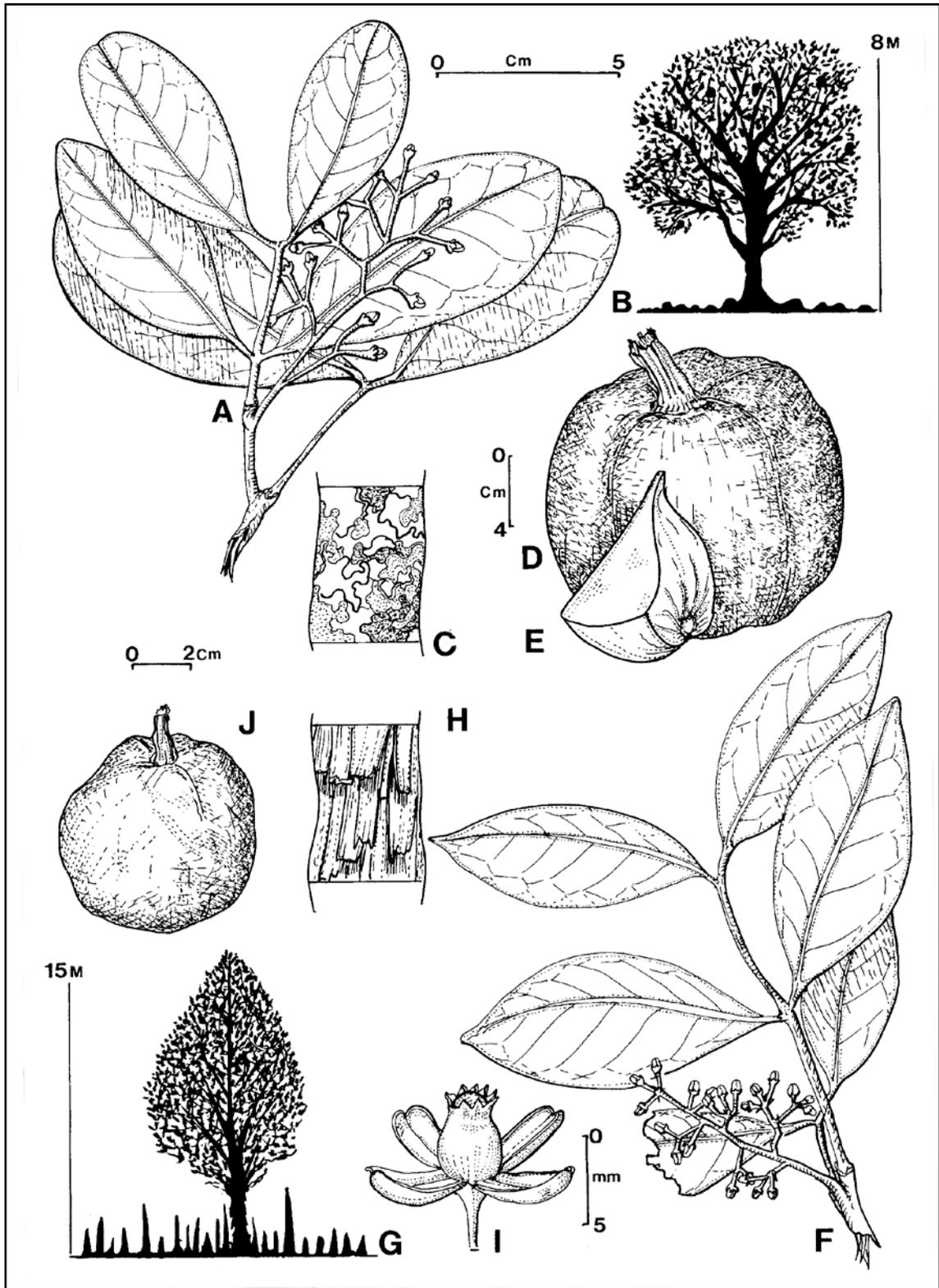


Figure 42. *Xylocarpus*. A–E, *X. granatum*. A, flowering branch; B, habit; C, bark; D, fruit; E, carpel (A–E, G. Wightman 405 & C. Dunlop, DNA). F–J, *X. moluccensis*. F, flowering branch; G, habit; H, bark; I, flower; J, fruit (F–J, G. Wightman 686, DNA).