
MANGROVES OF THE NORTHERN TERRITORY, AUSTRALIA:

IDENTIFICATION and TRADITIONAL USE

Glenn Wightman

Ethnobiology Project, Parks and Wildlife Service
Department of Natural Resources, Environment and the Arts
PO Box 496, Palmerston NT 0831, Australia



Northern Territory Government



Principal Illustrator

Milton Andrews

NORTHERN TERRITORY BOTANICAL BULLETIN No. 31

EXTRACT: *Excoecaria* (pp. 92–96)

Prepared for online viewing and download by the Department of Land Resource Management, 2015

DEPARTMENT OF NATURAL RESOURCES, ENVIRONMENT & THE ARTS
and GREENING AUSTRALIA NT

DARWIN 2006

Excoecaria**EUPHORBIACEAE**

DERIVATION: The Latin 'excaecare' means to blind and is a reference to the white latex, characteristic of this genus, which is reputed to cause blindness.

A genus of about 40 species, distributed through tropical Asia, western Pacific and Africa. Four species occur in Australia, three species in the NT, two inhabit mangrove communities.

DESCRIPTION: Small trees or shrubs, usually single stemmed, glabrous, dioecious, with copious white sap. Leaves simple, alternate, entire, petiolate, bearing 2 glands at leaf base. Stipules minute. Inflorescence axillary, spicate. Flowers arranged spirally, sessile, subtended by a 2 x 1 mm, broad, blunt bract and 2 smaller, lanceolate bracteoles. Glands 3–4, in groups at end of bracteoles. Tepals 3. Male flowers: stamens 3; anthers bilocular, obcordate, versatile, longitudinally dehiscent; pistilode absent. Female flowers: ovary superior, 3-locular, locules uniovular; style short; stigmas 3, curved, persistent. Capsule 3-lobed. Seeds 3, subglobose, brown.

KEY TO SPECIES:

1. Leaf margin often serrate, apex acuminate, petiole more than 18 mm long..... *E. agallocha*
1. Leaf margin entire, apex blunt, petiole less than 17 mm long *E. ovalis*

Excoecaria agallocha* L.*Milky Mangrove**

DERIVATION: The name *agallocha* is possibly a reference to this species resemblance to *Aquilaria agallocha* (now *Aquilaria malaccensis*) of Asia, which is used in the production of incense.

DESCRIPTION: Tree to 7 m, occasionally to 15 m; bark grey, smooth, pustular (rough in larger specimens); roots often knotted and lenticellate above ground surface. Leaves ovate or elliptic, 6.5–10.5 x 3.5–5.2 cm, apex acuminate, base cuneate, margin serrate; petiole 1.8–3.0 cm. Male inflorescence to 11 cm long, diffuse. Tepals narrowly ovate, 1 x 0.5 mm. Anthers 1.0 mm long, filament 2.0 mm long. Glands between stamens and inflorescence axis subglobular, sessile, 0.5 mm long. Female inflorescence to 3 cm long. Stigma lobes 3 mm long. Infructescence: pedicel to 6 mm long; peduncle to 16 mm long. Capsule 14 mm diameter, becoming brown. Seeds dark brown, streaked, 5 mm diameter.

HABITAT: *Excoecaria agallocha* prefers sandy substrates that receive significant freshwater input for at least part of the dry season. It is commonly found at the landward margin of mangals, in swales and occasionally above the high tide mark.

DISTRIBUTION: *Excoecaria agallocha* is known from the northern and eastern coasts of the NT. It has not been recorded west of Bathurst Island and has not been recorded on the mainland west of Cobourg Peninsula. This species also occurs in Queensland and New South Wales; extra-Australian distribution includes much of the Asian tropics, and the Pacific.

DISTINCTIVE FEATURES: Tree with white sap, leaf margin serrate (toothed).

ETHNOBOTANY: Anindilyakwa people observe that the flowers are a source of nectar for bees, and that the timber makes good firewood and also floats for hunting marine turtles. They also believe the white sap will cause blindness if it gets in the eyes (Levitt 1981), as do the Rirratjingu, Djambarrpuynu and Nunggubuyu people and Iwaidja speakers (Galpagalpa et al. 1984, Heath 1980, Yunupingu et al. 1995, Blake et al. 1998).

Rirratjingu people use the timber for carvings (Yunupingu et al. 1995) and Iwaidja speakers use the straight stems to make spear shafts (Blake et al. 1998).

Irgul Point (as spelt on the Croker 1:100,000 map sheet 5475), is based on the Iwaidja name for this point, which is in turn based on the fact that there is a large population of *Excoecaria*, yirrgul, at this site.

Recorded Aboriginal language names

Dugudugu (Nunggubuyu)	Ngarrawu, Gunhirr (Djambarrpuynu)
Ngarrawu (Yolngu Matha)	Mambilyingarra (Anindilyakwa)
Yirrgul (Iwaidja)	Gunirr (Rirratjingu)
Wibi (Yanyuwa)	

Maiden (1889) noted the timber being useful for carving by Aboriginal people. In Thailand this species is used as firewood, fishing stakes and poles for foundation pilings (Aksornkoae 1987). In the Philippines the sap is regarded as being irritant and toxic, it is used as fish poison and applied to the tips of arrowheads, and it is also used as medication for toothache (Jara 1987). The leaves are used to treat epilepsy in Indonesia (Soegiarto & Soemodihardjo 1987), though the sap is considered dangerous (Astuti et al. 2002).

In Fiji it is used as a medicine to treat leprosy (Pillai 1987). In Vietnam the yellow-white fine-textured timber is used for toys (Hong & San 1993); the roots can be used as fish poison. The lateral roots can be used as cork (Hong & San 1993). In Malaysia, toothache and swelling are treated with the roots of *Excoecaria agallocha* (Watson 1928). In Bangladesh, about half of the national paper production originates from *Excoecaria agallocha* and *Heritiera fomes* (Mastaller 1997).

NOTES: *Excoecaria agallocha* produces flowers from October to February and fruit from December to March. Leaf fall (partial or complete) occurs around November–December and new leaves are produced from December to February. New foliage has a varnished appearance and is bifacial.

Excoecaria ovalis* Endl.*Milky Mangrove**

DERIVATION: The Latin 'ovalis' means oval or elliptic, and refers to the leaf shape of this species.

DESCRIPTION: Shrub or small tree to 4 m; bark grey, smooth, with horizontal fissures and lenticels; roots occasionally knotted and lenticellate above soil surface. Leaves obovate or elliptic, 3.0–7.5 x 1.8–5.5 cm, apex blunt, base cuneate, margin entire; petiole 0.5–1.7 cm. Male inflorescence to 4 cm long, crowded. Tepals lanceolate, 1 x 0.2 mm. Anthers 0.7 mm long; filament 1.5 mm long. Glands between stamens and inflorescence axis vestigial. Female inflorescence up to 3 cm long, few-flowered, stigma lobes 2 mm long. Capsule 1.0 cm diameter, brown. Seeds light brown, mottled, 3 mm diameter.

HABITAT: *Excoecaria ovalis* colonises sand and mud substrates, and is capable of withstanding highly saline conditions. It forms stands with *Avicennia marina* on highly saline sites along tidal waterways. *Excoecaria ovalis* also occurs around mudflats and in coastal mangals. Other common associates include *Lumnitzera racemosa* and *Ceriops tagal*.

DISTRIBUTION: *Excoecaria ovalis* is widespread and common around the entire NT coastline. This species also occurs in Western Australia and possibly Queensland; it is apparently an Australian endemic.

DISTINCTIVE FEATURES: Small tree or shrub with white sap, leaf margin entire (not toothed).

ETHNOBOTANY: Djambarrpuyngu people consider the white sap to be toxic and can cause swelling of the skin (Wightman & Smith 1989). Iwaidja speakers also consider the sap to be dangerous, especially to the eyes, and use the straight stems to make spear shafts (Blake et al. 1995).

Ngaliwurru and Jaminjung people consider the white sap to be dangerous, especially if it gets in your eye (Wightman, unpublished research notes). The name they use, mammurru or marlmun refer to mangroves in general.

Recorded Aboriginal language names

Ngarrawu (Djambarrpuyngu)

Artama (Tiwi)

Yirrgul (Iwaidja)

Mammurru, Marlmun (Jaminjung, Ngaliwurru)

Lassak and McCarthy (1984) report the latex being used to treat chronic diseases such as leprosy, and also marine stings, while a decoction of bark is used for body pains and sickness.

NOTES: *Excoecaria ovalis* flowers from October to December and fruits from December to February. Leaf fall occurs before flowers are produced and new foliage production generally coincides with flowering.

New leaves are not varnished or bifacial, but may be shallowly serrulate.

Pollination by insects is suspected because of the presence of nectar producing glands (at the end of the bracts, below the flowers) and the sticky pollen. Bees are the chief pollinators (Tomlinson 1986).

TAXONOMY: *Excoecaria agallocha* was described by Linnaeus in 1759 (Systema Naturae ed. 10(2): 1288), while *E. ovalis* was described by Stephan Endlicher in 1833 (Prodromus Florae Norfolkicae: 83) from material collected by Ferdinand Bauer in the Gulf of Carpentaria in 1803.

Jean Mueller (Muell. Arg.) reduced this species to a variety of *E. agallocha* in 1866 (in de Candolle's Prodromus 15(2): 1221). Later still in 1980, H. K. Airy Shaw placed the name in synonymy under *E. agallocha* (Kew Bulletin 35(3): 631) declining to recognise it at any subspecific level.

Examination of *Excoecaria* material from NT mangals indicates two morphological distinct taxa are present, and that the name *E. ovalis* Endl. should be applied to the Australian endemic taxon, initially collected by Bauer. Mueller also collected this taxon, from the Gulf of Carpentaria in 1855–6. The sheet housed in MEL bears the name '*Excoecaria sphaerosperma* F. Muell' in Mueller's hand writing. However, this name was never formally published.

Taxonomic research by Maguire and Saenger (2000) using leaf morphology and rDNA sequence data have suggested that *E. ovalis* and *E. agallocha* are genetically distinct, and that *E. ovalis* is genetically uniform across its range. Following examination of herbarium specimens collected from the NT, Duke (2006) was of the opinion that although differences exist between taxa, *E. ovalis* is better treated as a variety of *E. agallocha*. In this treatment the taxa are treated as distinct species.

References: Maguire & Saenger 2000, Duke 2006.

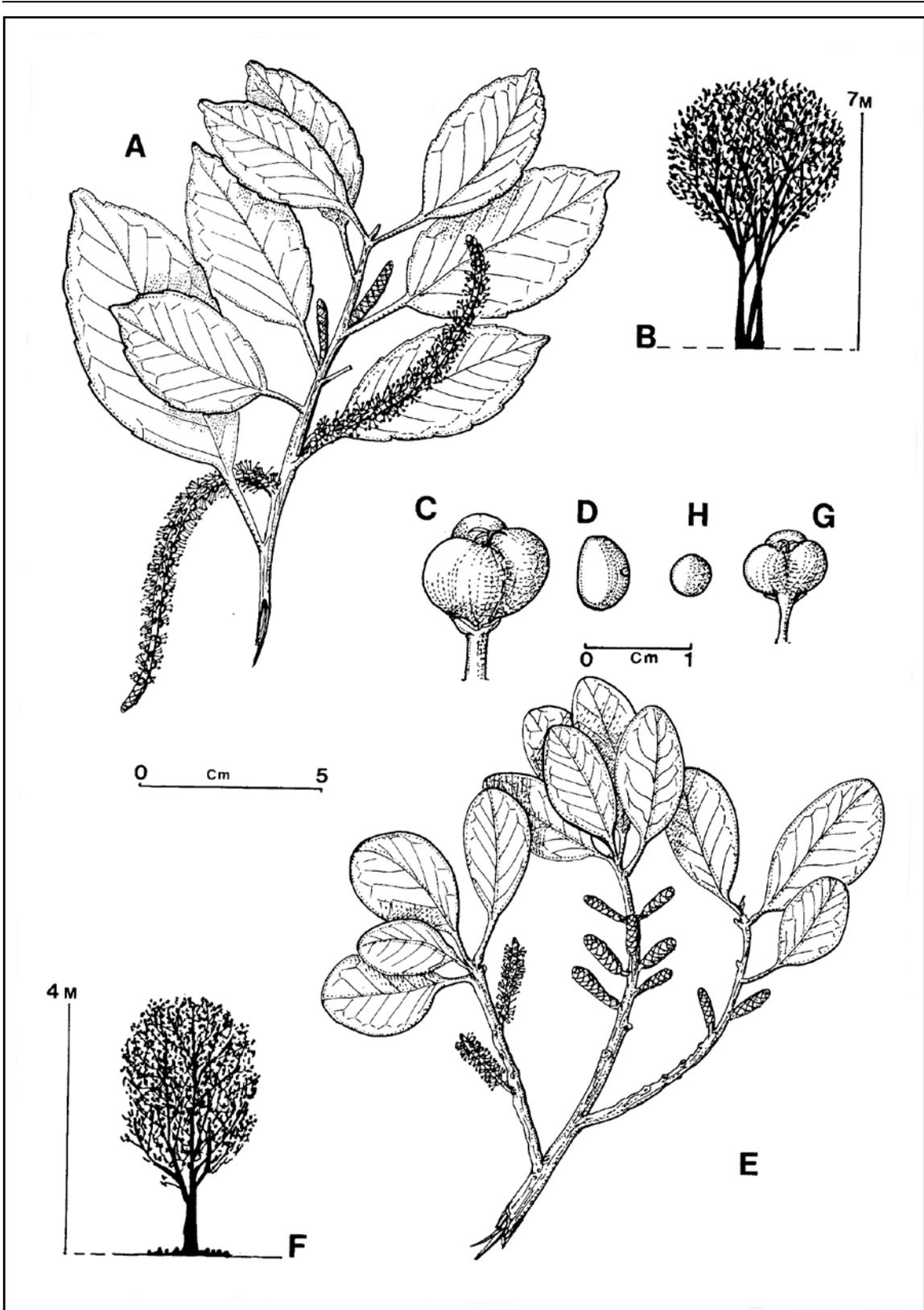


Figure 26. *Excoecaria*. A–D, *E. agallocha*. A, flowering branch; B, habit; C, fruit; D, seed (A–D, G. Wightman 969 and G. Wightman 978, DNA). E–H, *E. ovalis*. E, flowering branch; F, habit; G, fruit, H, seed (E–H, G. Wightman 823 and N. Byrnes 2386, DNA).