
MANGROVES OF THE NORTHERN TERRITORY, AUSTRALIA:

IDENTIFICATION and TRADITIONAL USE

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NORTHERN TERRITORY BOTANICAL BULLETIN No. 31

EXTRACT: *Ceriops* (pp. 71–76)

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

Ceriops

RHIZOPHORACEAE

DERIVATION: From the Greek 'ceras' meaning horn, and '-opsis' meaning appearance, in reference to the horn-like appearance of the developing hypocotyl as it emerges from the fruit.

A genus of three species, occurring on tropical coasts of the Indian and Pacific oceans, all species occur in NT mangrove communities.

DESCRIPTION: Shrub or small tree to 8 m; viviparous; stem base flanged. Leaves decussate, simple, entire, glabrous, elliptic to obovate. Stipules lanceolate. Inflorescence a 3–many-flowered, head-like to densely cymose; bracteoles 2, base connate, apex ovate. Calyx lobes (4–) 5 (–6), ovate, acute. Petals (4–) 5 (–6), each embracing 2 stamens, involute. Stamens (8–) 10 (–12), anthers 4-locular. Ovary half-inferior, 3-locular, 2 ovules per locule. Style terete, simple; stigma simple or 3-lobed. Fruit ovoid, calyx lobes persistent, spreading. Hypocotyl narrowly clavate, terete or angular.

KEY TO SPECIES:

1. Petal apex fringed; peduncle short, erect, stout *C. decandra*
1. Petal apex with 3 clavate bristles; peduncle long, pendulous, slender 2
2. Hypocotyl 4–15 cm long, smooth *C. australis*
2. Hypocotyl 18–30 cm long, ribbed *C. tagal*

***Ceriops australis* (C.T.White) Ballment, T.J.Sm. & J.A.Stoddart** **Smooth-fruited Spur Mangrove**

DERIVATION: From the Latin 'australis' meaning southern and in reference to the distribution in the southern hemisphere.

DESCRIPTION: Small tree or shrub to 8 m; bark grey (occasionally brown), stem smooth, flaky at base. Leaf lamina obovate-elliptic, 5.5–10 x 2.0–3.4 cm, apex obtuse to emarginate, base cuneate, margins often involute; petiole 15–25 mm; stipule 8–15 mm. Inflorescence a 5–10-flowered, axillary, resinous, pendulous cyme; peduncle slender, 10–20 mm; pedicel 1–2 mm. Calyx lobes lanceolate-ovate, 4 mm long, apex acute. Petals oblong, 4 mm long, one group of coiled hairs on margins $\frac{1}{3}$ to the petal base, apex with 3 clavate 0.5 mm long bristles. Staminal filaments 3 mm long; anthers 1 mm long. Style 3.5 mm long; stigma simple. Fruit 8–13 mm long, calyx lobes persistent, usually not reflexed. Hypocotyl terete, 4.0–15.0 cm long.

HABITAT: *Ceriops australis* often forms dense shrublands toward the landward edge of tidal forests, in areas inundated by high spring tides. These stands may

be monospecific or a mixed association of *Avicennia marina*, *Excoecaria ovalis* and *Lumnitzera racemosa*. Associations with *Bruguiera parviflora* and *B. exaristata* may also be formed in tidal forests bordering tidal waterways. *Ceriops australis* prefers clay substrates, and may occasionally co-exist with *C. decandra*.

DISTRIBUTION: *Ceriops australis* is widespread and common around the entire NT coastline. *Ceriops australis* also occurs in Western Australia and Queensland; extra-Australian distribution is uncertain, but appears to be restricted to New Guinea.

DISTINCTIVE FEATURES: Shrub or small tree flanged stem base and grey bark; peduncle slender; petals 3-lobed; fruit 8–15 mm long; hypocotyl 4–15 cm long, terete (not ridged).

ETHNOBOTANY: Yolngu people from Yirrkala use an infusion of the wood or ashes of *C. australis* to heal sores and infections (pers. obs).

Some Aboriginal groups eat the large sweet mangrove worms (*Bactronophorus thoracites*) found in the timber of this species, for example Kunwinjku (Altman 1981), while other groups consider them to be ‘cheeky’ and inedible, for example Tiwi (Puruntatameri et al. 2001) and Rirratjingu (Wightman pers. obs.).

However, Tiwi people make a medicinal soup from the small cheeky worms (*Bankia australis*). While the worms cause throat irritation and coughing if eaten raw, when they have been boiled for 20 minutes they form a thick, milky soup. This soup is slowly taken in small amounts, often with a teaspoon, to cure coughing and throat irritation (Puruntatameri et al. 2001).

Tiwi people and Iwaidja speakers make spear shafts from the straight stems of suitably sized plants (Puruntatameri et al. 2001, Blake et al. 1997).

Recorded Aboriginal language names

Anarra (Nunggubuyu)	Anuma (Anindilyakwa)
Manbulu (Kunwinjku)	Yulumuru (Yolngu Matha)
Ngayawida (Rirratjingu)	Marrakali (Tiwi)
Gundabad (Iwaidja)	Mimil (Limilngan)

Bardi Aboriginals from the Kimberley use the wood to make fishing boomerangs and spears and a red-pink dye is extracted from the bark (Smith & Kalotas 1985). Malaysians use a decoction of bark in obstetrical and haemorrhage cases, obtain dye from the wood and bark and consider the timber useful due to its longevity when immersed in seawater (Watson 1928).

NOTES: *Ceriops australis* has been considered to be a variety of *Ceriops tagal*, but Ballment et al. (1988) demonstrated significant genetic differences between the two species using biochemical methods, suggesting that specific status is warranted. Both co-occur in several areas in the NT, and in Arnhem Land and on

Melville Island some intermediates have been observed (C.R. Sheue pers. comm. 2005).

It can be very difficult to differentiate *C. australis* and *C. tagal* unless mature fruit and preferably hypocotyls are present. In fact, with sterile specimens it is difficult to differentiate between the three species of *Ceriops*. However, some broad generalisations can be made for Northern Territory populations.

Generally *Ceriops decandra* has broader leaves with the margins slightly or not inrolled at all, and the leaves are also often characteristically scalloped by insect attack. *C. australis* and *C. tagal* usually have narrower leaves with distinctly inrolled margins and are only occasionally attacked by insects.

It is more difficult to make generalisations about the vegetative differences between *Ceriops australis* and *C. tagal*. However, in NT populations *C. tagal* generally has elliptic leaves that are narrower than the mostly obovate leaves of *C. australis*. Further, the midrib of the underleaf of *C. tagal* is more often slightly ribbed, while for *C. australis* the underleaf midrib is more often distinctly raised (these characters are best observed with a microscope or hand lens). The relative petiole length of *C. australis* is usually longer, generally reaching $\frac{1}{3}$ or more of the length of the leaf blade, while *C. tagal* are shorter, usually less than $\frac{1}{4}$ of the leaf blade length.

***Ceriops decandra* (Griff.) Ding Hou Rib-fruited Spur Mangrove**

DERIVATION: From the Latin 'dec' meaning ten, and 'andra' meaning male, in reference to the ten anthers possessed by this species.

DESCRIPTION: Small tree or shrub to 5 m; bark brown (rarely grey or cream), smooth to flaky. Leaf lamina elliptic-oblong, 3.0–9.8 x 3.3–4.3 cm, slightly bifacial, apex obtuse or emarginate, base cuneate; petiole 0.7–2.0 cm; stipules lanceolate, 1.4–2.2 cm. Inflorescence a 2–4-flowered, axillary, head-like condensed cyme; peduncle 5–8 x 3–4 mm, stout, angular; flowers sessile. Calyx lobes ovate 2.5 x 1.5 mm, acute, erect. Petals ovate, 2 mm long, apex blunt, divided, with a fringe of 0.75 mm long hairs, petal base with marginal hairs. Staminal filaments 1.5 mm long; anthers 1.0 mm. Style 1.0 mm long; stigma minutely 4-lobed. Fruit ovoid-conical, 1.5–1.8 cm long, fruit base distinctly rounded, calyx lobes erect or ascending. Hypocotyl 9–17 cm long, strongly ridged, sulcate, generally held erect or upright.

HABITAT: *Ceriops decandra* may occur scattered throughout tidal forests, but more commonly toward the landward margins of tidal waterways. Associated species include *Rhizophora* spp., *Bruguiera* spp., *Camptostemon schultzei* and *Avicennia marina*. Sand or mud substrates are preferred.

DISTRIBUTION: *Ceriops decandra* is widespread across the northern coastline, but is not a common component of mangrove vegetation. It has not been recorded on the western or eastern NT coasts. *Ceriops decandra* also occurs in

Queensland. Extra-Australian occurrences range from India to New Guinea and the Solomon Islands.

ETHNOBOTANY: In Vietnam the hard durable wood is used for keels on boats and for building pigsties (Hong & San 1993). The lower half of the hypocotyl is used as fishing line float in Sumba, Indonesia (Astuti et al. 2001).

DISTINCTIVE FEATURES: Shrub or small tree with flanged base and brown bark; peduncle stout; petals fringed; fruit 15–18 mm long; hypocotyl 9–17 cm long, ridged.

NOTES: *Ceriops decandra* can be distinguished from *C. australis* and *C. tagal* by a number of fertile morphological characters (Table 6). Leaf shape and size of *C. decandra* is variable depending on the light and water regimes experienced by individual plants. Refer to the notes under *Ceriops australis* for further discussion of *Ceriops* characters that allow identification.

***Ceriops tagal* (Perr.) C.B.Rob. Long-fruited Spur Mangrove**

DERIVATION: The derivation of tagal is uncertain, but it may relate to the Tagal cultural group of the Philippines.

DESCRIPTION: Small tree or shrub to 6 m; bark grey (occasionally brown), stem smooth, flaky at base. Leaf lamina obovate-elliptic, 5.5–10 x 2.0–3.4 cm, apex obtuse to emarginate, base cuneate, margins often involute; petiole 15–25 mm; stipule 15–20 mm. Inflorescence a 5–10-flowered axillary, resinous, pendulous cyme; peduncle slender, 10–20 mm; pedicel 1–2 mm. Calyx lobes 5, lanceolate-ovate, 4 mm long, base 2 mm wide, apex acute. Petals oblong, 4 mm long, margins cohering via marginal hairs, apex with 3 clavate 0.5 mm bristles. Staminal filaments 3 mm long; anthers 1 mm long. Style 3.5 mm long; stigma simple. Fruit 15–25 mm long, calyx lobes persistent, reflexed. Hypocotyl angular, 18–30 cm long.

HABITAT: *Ceriops tagal* occurs in the landward zones of mangroves on a variety of substrates. It most commonly occurs with *Lumnitzera racemosa*, *Avicennia marina* and *Excoecaria ovalis*. *C. tagal* generally occurs as individual plants, though it may occasionally occur in small stands.

DISTRIBUTION: *Ceriops tagal* is sporadically distributed along the north coast of the NT, mainly on Melville Island, Cobourg Peninsula and in northern Arnhem Land. *Ceriops tagal* also occurs in Queensland. Extra-Australian distribution is uncertain due to a previous lack of discrimination between this species and *C. australis*, but appears to occur from eastern Africa to the western Pacific.

DISTINCTIVE FEATURES: Shrub or small tree with flanged stem base and grey bark; peduncle slender; petal apex with 3 bristles; fruit 15–25 mm long; hypocotyl 18–30 cm long, ridged.

ETHNOBOTANY: Tiwi people use the bark as medicine. The outer bark is softened by hitting the trunk hard with an axe or a stick. The sticky, red inner bark is then boiled in water and the resulting reddish liquid is allowed to cool and then used as an external wash to treat scabies. It is a very effective medicine and can be used for other skin problems but is most effective for scabies (Puruntatameri et al. 2001)

In the past the timber from stems of young plants was used to make throwing sticks for hunting magpie geese (Puruntatameri et al. 2001). The small cheeky mangrove worm (*Bankia australis*) obtained from the wood is used medicinally by Tiwi people as described under *Ceriops australis*.

Recorded Aboriginal language names

Ma-wamambarra (Yanyuwa)

Marrakali (Tiwi)

It is highly likely that many of the uses of *Ceriops australis* may also be attributed to *Ceriops tagal*.

In the Philippines this species is used for timber, to colour rice, to make wine, and to treat obstetric and haemorrhagic conditions (Jara 1987). In Vietnam *Ceriops* spp. bark is used widely as a source of tannin (Hong & San 1993); the young hypocotyl is eaten in times of hardship and a decoction is used as a quinine substitute to treat malaria. The timber is used for building houses and making fish drying racks, the bark is used as fish poison and to obtain a red dye, and the twigs are used to treat broken bones in Sumba, Indonesia (Astuti et al. 2001).

GENUS NOTES: The table below outlines the major differences between the three *Ceriops* species, also refer to the discussion in the notes section for *C. australis*.

Table 6: Comparison of distinguishing characters within *Ceriops*.

<i>Ceriops decandra</i>	<i>Ceriops australis</i>	<i>Ceriops tagal</i>
Leaf elliptic-oblong	Leaf obovate	Leaf elliptic
Bark brownish	Bark whitish grey	Bark whitish grey
Petals fringed	Petals with 3 bristles	Petals with 3 bristles
Fruit base round	Fruit base flat	Fruit base flat
Peduncle short, stout	Peduncle long, slender	Peduncle long, slender
Fruit calyx lobes erect	Fruit calyx lobes ± erect	Fruit calyx lobes reflexed
Hypocotyl 9–17 cm	Hypocotyl 4–15 cm	Hypocotyl 18–30 cm
Hypocotyl ridged	Hypocotyl smooth	Hypocotyl ridged
Hypocotyl held erect	Hypocotyl downward	Hypocotyl downward
Fruit 15–18 mm long	Fruit < 13 mm long	Fruit > 15 mm long
Stipules 14–22 mm long	Stipule < 15 mm long	Stipule > 15 mm long

References: Ding Hou 1958, McCusker 1984, Ballment et al. 1988, C.R. Sheue pers. comm. 2005.

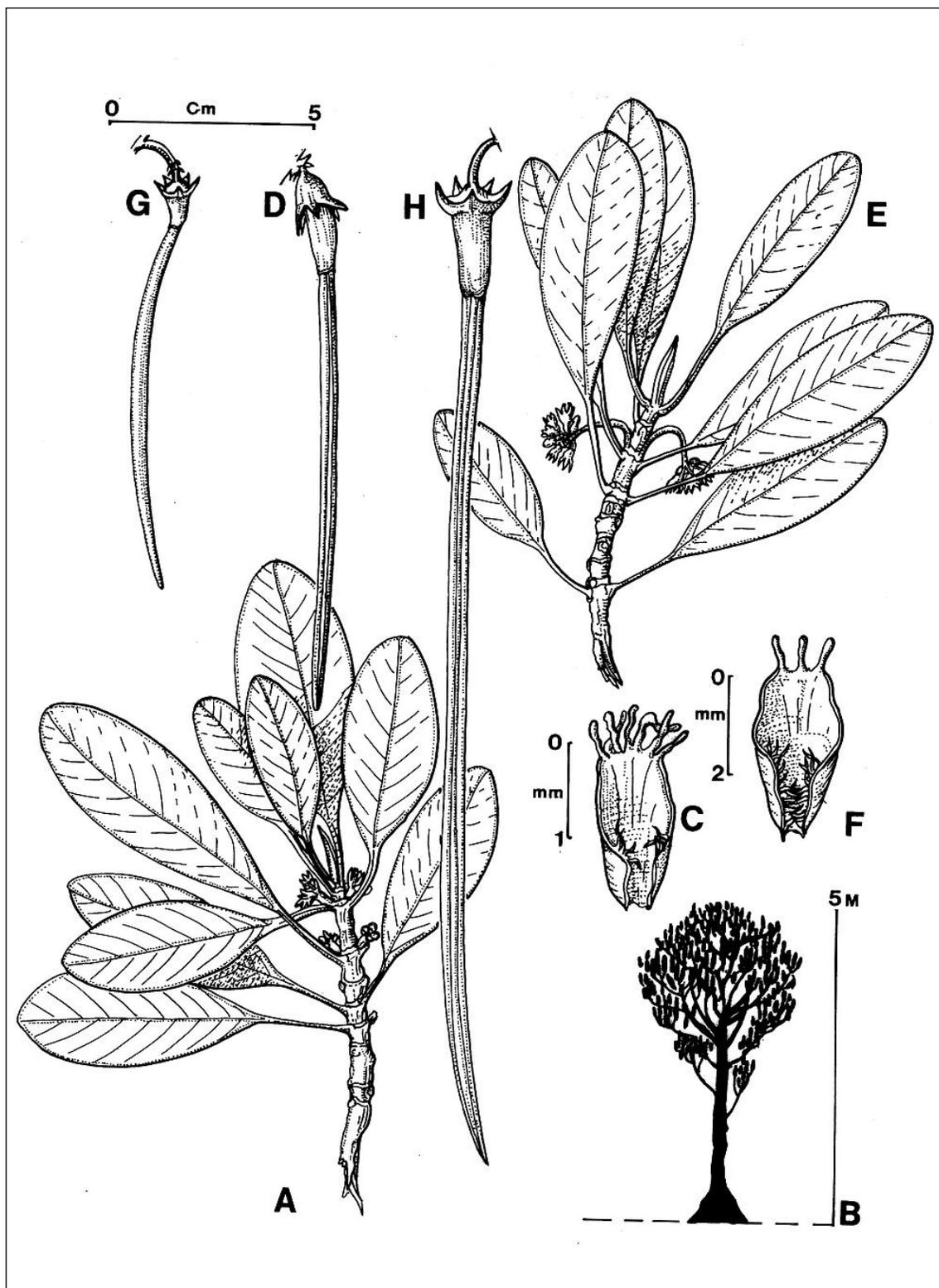


Figure 19. *Ceriops*. A–D, *C. decandra*. A, flowering branch; B, habit; C, petal; D, fruit and hypocotyl (A–D, G. Wightman 704 & G. Wightman 931, DNA). E–G, *C. australis*; E, flowering branch; F, petal; G, fruit and hypocotyl (E–G, G. Wightman 207 & G. Wightman 506, DNA). H, *C. tagal*. H, fruit and hypocotyl (H, G. Wightman 786, DNA).