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CERATOPHYLLACEAE

P.S. Short

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CERATOPHYLLACEAE

P.S. Short

Aquatic, perennial, usually free-floating *herbs* with branching stems. *Leaves* in whorls of 6–10, sessile, dichotomously dissected into filiform, often toothed, segments. *Flowers* inconspicuous, axillary, single or several per node, unisexual and with male and female usually at different nodes, male flowers more or less sessile, female flowers sometimes shortly pedicellate. *Perianth* of 8–13 segments in a single whorl, connate at the base. *Petals* absent. *Male flowers* with *c.* 10–30 stamens in several whorls on a flat or slightly domed receptacle; filaments short or absent; anthers 2-loculate and with the connective prolonged into a pair of points, at maturity the anthers detaching and floating to the surface and dehiscing longitudinally. *Female flowers* lacking staminodes, gynoecium of a single superior, sessile carpel which tapers into a single long style; ovule solitary, pendulous. *Fruit* an indehiscent, hard achene with a terminal spine (persistent style), basal spines and marginal wings may be present. *Seeds* with a straight embryo, endosperm lacking.

A monogeneric family, with the genus *Ceratophyllum* found on all continents except Antarctica. Following Cronquist (1981) the family is placed in the Nymphaeales with Cabombaceae and Nymphaeaceae but molecular studies indicate that it is positioned near the basal angiosperms. Fossil fruit similar to *Ceratophyllum* have been described from south-east Australia from deposits 112–121 million years old, while *c.* 15 million-year-old specimens undoubtedly referable to the family are known from China (Wang *et al.* 2005).

Taxonomic references: Cronquist (1981); Les (1985, 1993); Wilmot-Deer (1985); Short (2000); Wang *et al.* (2005).

CERATOPHYLLUM L.

C. demersum L.

C. muricatum Chamisso

Herbs free-floating or loosely attached to sediment; branches to *c.* 60 cm long. *Leaves* whorled, 1.5–3.5 cm long, mostly (1) 2–3 (4) times dichotomous, the filiform or more or less cylindrical segments with a few to many, variously conspicuous marginal teeth. *Fruit* dark brown, always with a terminal spine (persistent style), basal spines absent or 2; terminal spine 1–3 mm long, straight, smooth; basal spines 1.5–3 mm long, smooth, straight or curved; margins of body not too conspicuously winged and sometimes the wing forming spine-like projections; fruit body more or less smooth to conspicuously muricate. *Flowering & fruiting*: possibly throughout the year. **Hornwort.**

Fig. 1 (Clark 2231; Clark 2258; Leach 2856); Pl. 1 (cultivated).

Ceratophyllum is widespread in Australia (W.A., N.T., Qld, N.S.W., Vic.). In the N.T. it only occurs in the Top End between the Victoria River and Arafura Swamp and is common in springs, billabongs and rivers and their associated floodplains.

Ceratophyllum demersum

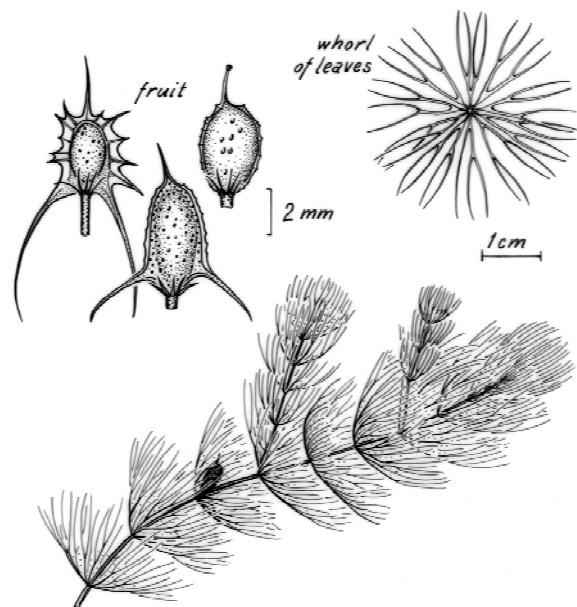


Fig. 1

Les (1993, and his papers cited therein) recognised six species but, following examination of specimens in DNA a single polymorphic species, with no infraspecific taxa, was recognised by Short (2000) and this concept is here maintained.

Several entities can be distinguished in the N.T. by differences in fruit, and perhaps leaf morphology, but the constancy and status of each is unclear.

Les (1985) discussed some of the problems encountered in delimiting taxa, importantly noting that reproduction is primarily by vegetative fragmentation and that within clones sexual reproduction is normally autogamous.

The fruit of three entities represented by specimens in DNA are illustrated (Fig. 1). Their characteristics and distribution are as follows:

- Fruit lacking basal spines, with a very narrow and dissected wing, surfaces with few, scattered, small tubercles. Leaves commonly 3 times dichotomous. Known from a single collection from the Milingimbi floodplain.
- Fruit not or barely winged, with 2 basal spines, surfaces with scattered and variably prominent tubercles. Leaves 2 or 3 times dichotomous. Collected from Arafura Swamp and the main channel of the Reynolds River. A single collection from the Reynolds River seems to be a mixed gathering, containing material of this entity, plus material similar to the following entity but having shorter, curved basal spines.
- Fruit with 2 basal spines, wings prominent and with spine-like projections, surfaces with a few scattered tubercles. Leaves are 2 or 3 times dichotomous. Known from Baralil Creek and from Bulls Run Creek, Tipperary Station.

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Pl. 1 *Ceratophyllum demersum* (Photo: B.M. Stuckey)