

AUSTRALIAN BIOLOGICAL RESOURCES STUDY



FLOODPLAIN FLORA

A flora of the coastal floodplains
of the Northern Territory, Australia

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Extract: Isoetaceae

VASCULAR PLANTS

FERN ALLIES (LYCOPODIOPHYTA)

The Division Lycopodiophyta consists of epiphytic or terrestrial, homosporous, vascular plants that reproduce by spores which occur in sporangia in the axils of modified leaves. It is one of several Divisions which, together, are commonly referred to as Fern Allies. On the floodplains these are represented by the genus *Isoetes*.

ISOETACEAE

Plants aquatic or amphibious, with a swollen corm. *Roots* dichotomously branched. *Leaves* simple, ligulate, crowded into a tuft at the apex of the corm, basally dilated and with most leaves acting as sporophylls. *Sporangia* solitary, of two types (megaspore and microspore) and borne in the basal cavity formed on the inner surface of the leaves. *Spores* of two types (megaspores and microspores), smooth or sculptured.

A family containing perhaps two genera, *Isoetes* and *Stylites*, with only the former in Australia. *Stylites* Amstutz (2 spp.) is a South American genus differing from *Isoetes* (upon which the brief family description is based) by having elongate stems and unbranched roots. It is not always recognised as a distinct genus.

Taxonomic references: Andrews (1990), Chinnock (1998).

ISOETES L.

Perennial or annual, grass-like *plants*, the corm 2–5-lobed, the roots arising from between the lobes and forked towards the tips. *Leaves* mostly sporophyllous, spirally arranged, erect, filiform or linear but with dilated bases, 1-veined. *Sporangia* naked or partly or wholly covered by a velum; spores released by decay of sporangial walls. *Megaspore* borne on outer leaves; megaspores c. 0.3–0.5 mm diam., white or grey, ornamented. *Microspore* borne on inner leaves; microspores minute. *Quillworts*.

A widespread genus of c. 100 species, with 15 recognised in Australia. Three species in NT and all recorded for the Top End.

Megaspore contain almost spherical, nucleate and mostly fertile megaspores and also enucleate, infertile megaspores. The latter are variably flattened and triangular in outline. Dumbbell-shaped megaspores may also occur. Only fertile, almost spherical megaspores are referred to in the following account. The distal face is the large, half-spheroid part of the spore, the proximal faces are the three, somewhat triangular faces.

Taxonomic references: Marsden (1976a, 1976b), Chinnock (1998).

- 1 Fertile megaspores with similar ornamentation on all faces, large tubercles absent; velum covering the sporangium..... **I. muelleri**
- 1: Fertile megaspores with different ornamentation on distal and proximal faces, at least proximal faces with large tubercles; velum absent or covering no more than 15% of the sporangium..... 2
- 2 Distal face of fertile megaspore with numerous large tubercles..... **I. coromandelina**
- 2: Distal face of fertile megaspore with broad wavy ridges..... **I. cristata**

I. coromandelina L.f. subsp. **macrotuberculata** C.R.Marsden

Aquatic or amphibious *plants*; corm usually 2- or 3-lobed. *Leaves* 10–60 per plant, erect, flexible, 15–80 cm long, 0.5–2 mm diam., bright green, mostly subtriangular in transverse section but basally dilated; base to 20 mm wide, with broad membranous wings. *Sporangia* orbicular or obovate, 7–12 mm long; velum absent. *Fertile megaspores* 0.4–0.5 mm diam., white when dry, grey when wet; proximal faces usually with one large tubercle, sometimes a few large and several smaller tubercles present; distal face with numerous large tubercles. *Fertile plants*: Feb.–July. Fig. 7.

Confined to northern Australia (WA, NT, Qld) and widespread in the Top End. Grows on the margins of seasonal swamps, in seepage areas, in ephemeral streams and, less commonly, on floodplains. Frequently on sand. Known localities in NT include Elcho Island (edge of *Melaleuca* swamp at Wurrmalmirr Creek), Berrimah, Survey Creek, Tortilla Flats, Winmurra Billabong and seasonal swamps associated with the Daly and East Alligator rivers.

The only other subspecies, subsp. *coromandelina*, occurs on the Indian subcontinent. It differs in having smaller tubercles on the megaspores.

I. cristata C.R.Marsden & Chinnock

Amphibious *plants*; corm 2-lobed. *Leaves* to c. 65 per plant, erect-patent, flexible, 6–10 cm long, 0.8–1.5 mm diam., bright green; base narrowly winged, translucent. *Sporangia* elliptic, 2.5–4 mm long; velum covering 5–15% of the sporangium. *Fertile megaspores* to c. 0.45 mm diam., drying white or grey; proximal faces with 1 or sometimes 2 or 3 very large tubercles; distal face with broad wavy ridges. *Fertile plants*: c. May.

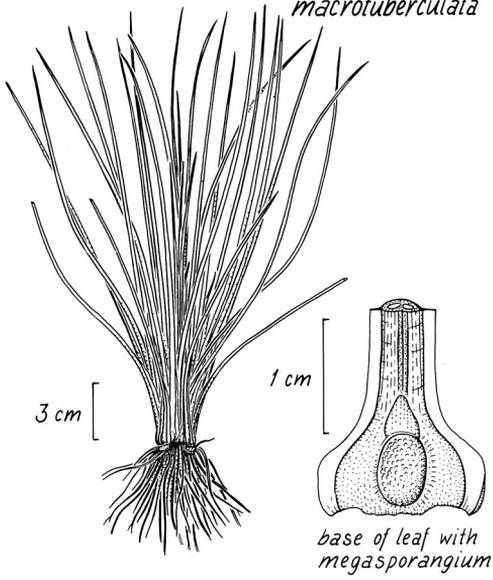
Only known from the type collection gathered near Jimmys Creek, NT. Plants were growing in 15 cm deep water in a *Lophostemon lactifluus*-*Asteromyrtus symphyocarpa* swamp.

I. muelleri A.Braun

Amphibious or aquatic *plants*; corm 2- or 3-lobed. *Leaves* 5–25 per plant, erect or slightly recurved, 3–12 cm long, c. 1.5 mm diam., dark green; base c. 4 mm wide, white. *Sporangia* spheroidal or ellipsoidal, 2.5–6 mm long; velum covering the sporangium. *Fertile megaspores* 0.4–0.5 mm diam., drying grey; all faces similarly ornamented with small ridges which may or may not be confluent. *Fertile plants*: Mar.–Apr.

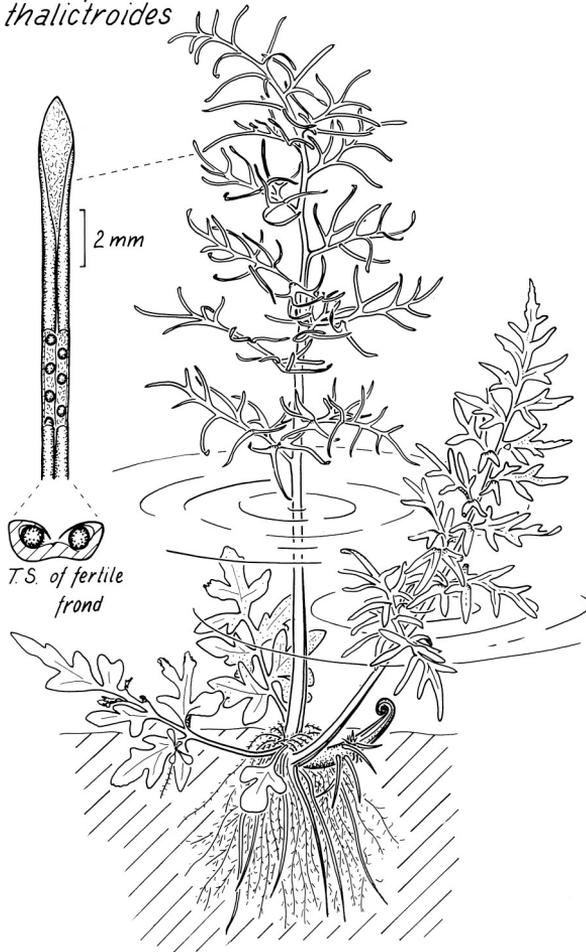
Australia (all States). A highly polymorphic species in a broad range of habitats, from ephemeral pools in arid regions to alpine tarns. In NT mostly collected from arid regions. This description applies to the two known collections gathered in the Top End from Mt Brockman and Mt Gilruth. At the former locality plants were growing in c. 20 cm deep water in a creek on the sandstone massif. At the latter location they were growing in wet sandy soil shaded by overhanging sandstone.

Isoetes coromandelina subsp.
macrotuberculata



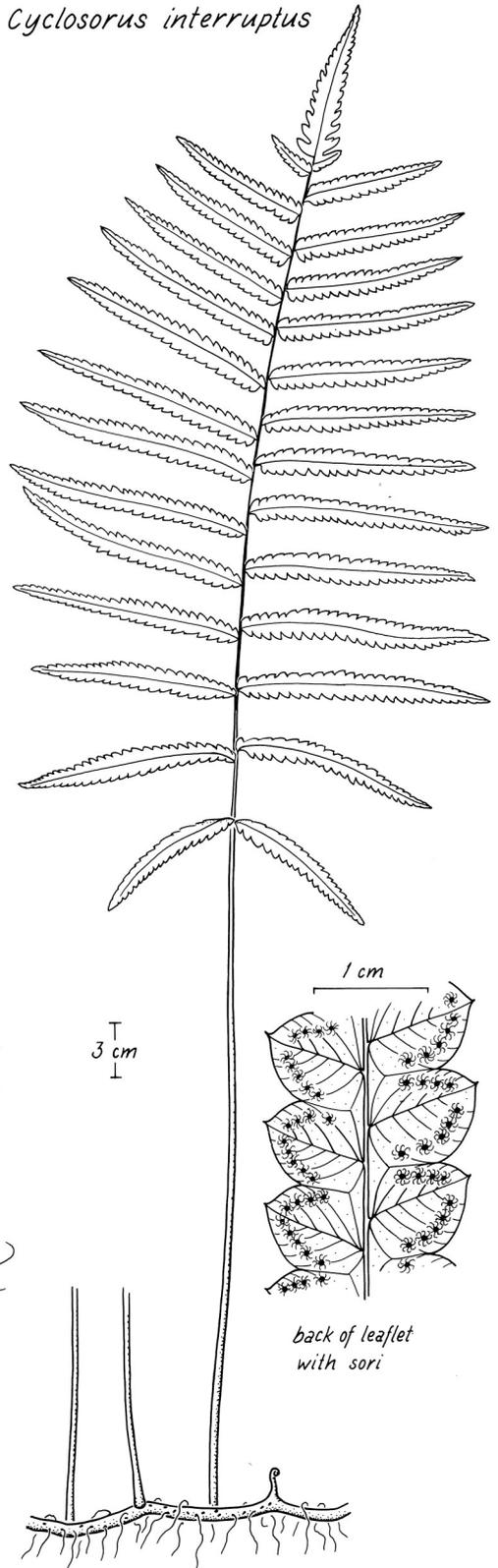
base of leaf with
megasporangium

Ceratopteris
thalictroides



T.S. of fertile
frond

Cyclosorus interruptus



back of leaflet
with sori