

## MEIOTHECIUM

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*Meiothecium* Mitt., *J. Linn. Soc., Bot.* 10: 185 (1868); from the Greek *meion* (smaller, less), and *theke* (a case, container or sheath), in reference to the small capsules.

T: not designated.

Autoicous. Plants small and slender or large and robust, forming broad compressed tufts, green to yellow to brownish green,  $\pm$ glossy. Stems creeping, irregularly pinnately branched; branches arched, ascending, blunt, thick and terete to complanately leaved, short and unbranched to longer and moderately branched. Leaves imbricate when dry, secund, occasionally weakly plicate,  $\pm$ cucullate-concave, ovate to elongate, acute, ecostate; margin entire, often recurved; branch leaves occasionally heteromorphic, the ventral leaves longer pointed more acute. Laminal cells smooth; upper cells rhomboidal with an elliptical lumen; marginal cells longer; basal irregularly quadrate; alar region with 3 or 4 swollen basal cells, hyaline or yellowish, quadrate; supra-alar cells forming a distinct group subquadrate cells.

Perichaetia on stems, occasionally on branches; inner perichaetial leaves small, erect, acuminate, often somewhat curved, smooth or with very obscure mammillae. Calyptra cucullate, small, smooth or  $\pm$ rough at the apex. Seta short, smooth or mammillate. Capsule inclined, small, ovoid to elongate-elliptical or cylindrical; mouth often contracted when dry; neck short; exothecial cells semi-collenchymatous, their longitudinal walls thickened; operculum short to long, rostrate from a swollen conical base. Peristome usually single; exostome teeth 8 or 16, lanceolate to linear-lanceolate, pale, unistriate, densely papillose, rarely smooth, lacking trabeculae; endostome absent or indistinct. Spores medium to large, finely papillose. Chromosome numbers not known.

A pantropical genus of more than 30 species. The three species in tropical and subtropical eastern Australia include one endemic and two that are also present in Papua New Guinea (Tan *et al.* 2011).

The genus is characterised by leaves usually  $\pm$ ovate, with comparatively short-rhomboidal smooth cells; large individual leaves tending to become somewhat plicate; alar cells differentiated, somewhat inflated, subquadrate to subrectangular, and coloured, but not as pronounced as in most other Sematophyllaceae. The capsules are erect to inclined, and the peristome is single, lacking an endostome absent, with the exostome teeth variously spaced and papillose (Ramsay *et al.*, 2004).

All of the Australian species are referable to *Meiothecium* sect. *Eumeiothecium* Broth., which has smooth cells, widely spaced and papillose exostome teeth and calyptrae that are distinctly roughened at the base.

### References

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### Key

- 1 Plants large and robust; leaves narrowly ovate, 1.0–1.5 mm long ..... **2. M. microcarpum**  
 1: Plants small and slender; leaves ovate to broadly ovate or orbicular, < 1 mm long ..... 2  
 2 Leaves strongly secund when dry, orbicular to broadly ovate; seta c. 9 mm long ..... **3. M. secundifolium**  
 2: Leaves patent-erect, occasionally secund when dry, ovate to oblong-ovate; seta 2–4 mm long ..... **1. M. intextum**

### 1. *Meiothecium intextum* Mitt., *J. Linn. Soc., Bot.* 10: 185 (1868)

T: [Western] Samoa, *Powell* 42; holo: BM *n.v.*, *fide* O’Shea (2007).

*Meiothecium tenellum* Broth. & Paris, *Öfvers. Förh. Finska Vetensk.-Soc.* 53 A(11): 39 (1911). T: Poindimie, Wagap region, New Caledonia, A. *Le Rat*; lecto: H-BR *fide* Tan *et al.* (2011: 37).

*Meiothecium brotheri* Watts, *Proc. Linn. Soc. New South Wales* 43:565 (1918). Based on: Police Yard, Cairns, Qld, 11 Aug. 1913, *W.W. Watts Q230, nom. illeg. sp. prior* (NSW) in synonym.

Illustration: H.P.Ramsay, W.B.Schofield & B.C.Tan. *J. Hattori Bot. Lab.* 95: 25, fig. 11 (2004), as *M. tenellum*.

Plants small to medium-sized, green to yellowish or brownish green, forming rather dense tufts. Stems elongate, 10–20 mm long; branches 3–6 mm long. Leaves small, 0.25–0.30 mm long, c. 0.2 mm wide, spreading, occasionally secund, concave, often with 2 central plicae, ovate to ovate-oblong; apex minutely crenulate, short-acuminate; margin recurved. Laminal cells small, 8–10 µm long, rhomboid, incrassate, longer towards the base; alar region with 3 or 4 small rectangular and occasionally yellow cells.

Perichaetia borne on primary stems, the perigonia on branches; inner perichaetial leaves similar to vegetative leaves but slightly larger. Seta 2–4 mm long. Capsule oval to elongate, c. 1 mm long; exothecial cells irregularly rectangular. Peristome reduced; exostome teeth 8, c. 100 µm long, narrow, widely separated. Spores 10–12 µm diam.

Known from Malesia, the western Pacific and north-eastern Qld, this species is epiphytic on the trunks and branches of rainforest trees.

Qld: Babinda Falls, The Boulders, *W.B.Schofield* 79796 & *M.I.Schofield* (NSW, UBC); Gillies Rd, between Gordonvale and Atherton, *W.A.Weber* 31851 (CANB); Cedar Bay Rd, S of Helensvale, *I.G.Stone* 15823 (MEL); Rifle Ck, Mount Molloy, *H.Streimann* 30660, 30663 (CANB); near airport, Cairns, *B.C.Tan* 94-870 (FH, NSW).

Streimann & Curnow (*Catalogue of Mosses of Australia and its External Territories*, Australian Flora and Fauna Series No. 10, 1989) excluded *M. tenellum* from the Australian moss flora, although it was subsequently reinstated by Streimann & Klazenga (*Catalogue of Australian Mosses*, Flora of Australia Supplementary Series No. 17, 2002). Bolin (in R.J.F.Henderson, *Queensland Plants: Names and Distribution*: 263–272, 1997) reported it from Queensland for specimens previously named as *M. brotheri*, and it was also recorded from there by Ramsay *et al.* (2004) and Ramsay & Cairns (2006). More recently, O’Shea (2007) reassessed *M. tenellum* and placed it in synonymy with *M. intextum*. Tan *et al.* (2011) use the name *M. tenellum* and do not refer to O’Shea’s revision.

This species is characterised by the slender habit, small leaves and small, widely separated peristome teeth. Leaves are often fragile and deciduous, leaving stems almost bare. This is distinguished from other species of *Meiothecium* by the very fine plants, small leaves and small, widely separated peristome teeth.

## 2. *Meiothecium microcarpum* (Hook.) Mitt., *J. Linn. Soc., Bot.* 10: 185 (1868)

*Pterogonium microcarpum* Hook., *Icon. Pl.* 1: 24, fig. 12 (1836). T: West Java, Wallich; holo: BM.

*Pterogoniella watsii* Broth., *Öfvers. Förh. Finska Vetensk.-Soc.* 42: 109 (1900); *Meiothecium watsii* (Broth.) Broth., *Nat. Pflanzenfam.* I, 3: 1103 (1908). T: Alstonville road, Ballina, N.S.W., 18 Aug. 1899, W.W.Watts 3722; holo: H-BR; iso: NSW.

*Stereophyllum watsii* Broth., *Proc. Linn. Soc. New South Wales* 24: 375 (1899), *nom. nud.*, in synonym. Based on: Tintenbar road, Ballina, Richmond R., N.S.W., Apr. 1897, W.W.Watts 1201 & 1202 (NSW).

[*Meiothecium jagorii* auct. non (Müll.Hal.) Broth.: H.Streimann, *Australas. Bryol. Newsletter* 34: 9–11, 1996] Illustrations: H.C.Gangulee, *Mosses of Eastern and Adjacent Regions* 3: 1875, fig. 954 (1980); W.R.Buck, D.H.Vitt & W.M.Malcolm, *Key to the Genera of Australian Mosses* 34 (2002); H.P.Ramsay, W.B.Schofield & B.C.Tan, *J. Hattori Bot. Lab.* 95: 27, fig. 12 (2004).

Plants medium to large, yellow-green, forming low tufts. Stems divaricate, pale red, glossy, subpinnate, 10–15 mm long; branches pinnate, 4–5 mm long. Leaves densely imbricate, narrowly ovate, 1.0–1.5 mm long, contorted or plicate when dry, suberect when wet; apices rounded or blunt, the apical cell short; margin slightly recurved, with a single central longitudinal plica. Laminal rhomboidal, slightly longer and narrower than other Australian species, thick-walled; mid-laminal cells c.  $45 \times 6 \mu\text{m}$ , wider near the margin; alar region with a basal row of several swollen cells; supra-alar cells quadrate to rectangular, forming 2–4 rows.

Perigonia and perichaetia on branches. Calyptra smooth, truncate at the base. Seta to 3 mm long, straight or occasionally twisted to the right, smooth. Capsule nodding-suberect, cylindrical, c. 1 mm long and 0.5 mm wide; neck smooth; operculum conical, long-rostrate. Peristome single; exostome teeth 8, widely separated, c. 200  $\mu\text{m}$  long. Spores 20–30  $\mu\text{m}$  diam., papillose.

A widespread epiphyte in tropical Asia, including eastern India, Malesia, New Caledonia, Samoa and tropical and subtropical eastern Australia (Qld and N.S.W.).

Qld: Cape Tribulation, *I.G.Stone 15914* (MEL); Finch Hatton Gorge, *I.G.Stone 12370* (MEL); Russell R., *W.A.Sayer 90* (NSW); Kuranda, *W.W.Watts Q642* (NSW); Herberton road, *H.Streimann 29164* (CANB). N.S.W.: Wardell, *W.W.Watts 2377* (NSW); Tintenbar road, 1 mile [c. 1.6 km] from Ballina, *W.W.Watts 3653* (NSW); E of Ballina, *W.W.Watts 2051* (NSW).

Although *Meiothecium watsii* differs from *M. microcarpum* in its shorter setae and smaller capsules, the numerous Australian collections examined by Ramsay *et. al.* (2004) revealed these distinctions to be inadequate to warrant continued separation.

*Meiothecium microcarpum* appears to have been common in the Richmond River and Byron Bay areas of northern New South Wales when William Watts collected there in the early years of the twentieth century. Its apparent absence there today is a likely consequence of land-clearing and deforestation.

A report of *M. jagorii* (Müll.Hal.) Broth. from Queensland by Streimann (1996) was based on an unusually large specimen of *M. microcarpum* (Woopan Creek road, 18 km WNW of Innisfail, Qld, *H.Streimann 45640*, CANB, NSW). *Meiothecium jagorii* differs from *M. microcarpum* in having narrower leaves with  $\pm$ recurved margins and smooth setae (Bartram, 1939), as well as predominantly narrowly elongate laminal cells (not oval-oblong) near the leaf apex.

## 3. *Meiothecium secundifolium* Dixon, *Notes Roy. Bot. Gard. Edinburgh* 20: 96, 97 (1948)

T: W.A. [locality not known], mixed with *Papillaria flavolimbata*, *Dr Morrison*; holo: E; iso: BM.

Illustrations: H.N.Dixon, *loc. cit.* 97, fig. 20; H.P.Ramsay, W.B.Schofield & B.C.Tan, *J. Hattori Bot. Lab.* 95: 23, fig. 10h-1 (2004).

Plants small to medium-sized, dull straw-coloured, not glossy, irregularly pinnate. Stems subcircinate; branches arched c. 2 mm long. Stem and branch leaves similar, strongly secund, not falcate when dry, 0.8–0.9 mm long, 0.4–0.5 mm wide, broadly ovate to suborbicular, acute, slightly contracted at the base; apex  $\pm$ blunt; margins entire, slightly recurved when wet, revolute when dry. Laminal cells elliptic-linear, sigmoid, c.  $30 \times 6 \mu\text{m}$ , thick-walled; alar region well developed, with a basal row of 3 or 4 somewhat inflated pigmented yellow cells; supra-alar cells numerous, short,  $\pm$ rectangular.

Perichaetia on secondary stems and branches; perichaetial leaves narrower and more elongate than vegetative leaves. Seta smooth, straight, c. 8–9 mm long. Capsule suberect when young; urn c. 1.5 mm long; operculum long-rostrate, c. 1 mm long; exothecial cells elongate, subcollenchymatous. Only immature sporophytes seen.

This endemic moss is known from W.A. (locality not known) and north-eastern Qld.

Qld: Tully, *I.G.Stone 23078* (MELU).

It is possible that two other collections from north-eastern Qld [Conway S.F., 16 km ENE of Proserpine, *H.Streimann 374013* (CANB); Tully Falls, *H.Streimann 30098* (CANB)] also represent this species.

*Meiothecium secundifolium* is rather similar to *M. microcarpum*, but it differs in having much longer setae, strongly arched branches and broadly ovate secund leaves with acute apices rather than narrowly ovate and somewhat acuminate. The only capsules known from this species are immature and lack a peristome; consequently its placement in *Meiothecium* remains tentative.