

CRYPHAEA

*Johannes Enroth*¹

Cryphaea D.Mohr, in F.Weber, *Tab. Calyptr. Operc.* [3] (1814); from the Greek *kryphos* (concealment), in reference to the immersed capsules, and *phaios* (dusky), alluding to the colour of some species.

Type: *C. heteromalla* (Hedw.) Brid.

Plants usually epiphytic, small and slender to medium-sized. Stems erect or ascending to pendent, subpinnately or irregularly branched. Leaves ovate to ovate-acuminate or elliptic, appressed when dry, spreading when wet; apices acuminate or broadly obtuse; costa ending well below the leaf apex to percurrent. Laminar cells smooth; alar cells indistinct.

Perichaetia pseudolateral, often in clusters on stems and branches; inner perichaetial leaves aristate due to their long-excurrent costa. Calyptra cucullate, hairy. Capsules immersed, erect, symmetrical, cylindrical to obloid; stomata absent; exothecial cells irregular, thin-walled; annulus deciduous or absent; operculum conical-rostrate. Peristome double; exostome teeth lanceolate, c. 100–400 µm long, distinctly spiculate to faintly papillose or nearly smooth, solid or perforate to cracked along the median line. Spores globose, papillose.

The circumscription of *Cryphaea* remains unclear, and no satisfactory infrageneric classification exists. All species possess pseudolateral perichaetia and non-differentiated alar cells, but the peristome can be single or double, and the annulus deciduous or absent.. Pending critical revision, the number of *Cryphaea* species can only be estimated to be approximately 50. Three species occur in Australia, and they are mainly epiphytic on the trunks and branches of trees or shrubs. The extra-Australasian distributions of two species is not well known due to previous taxonomic misinterpretations.

References

- Enroth, J. (1995), Taxonomy of *Cyrtodon*, with notes on *Dendrocryphaea* and selected Australasian species of *Cryphaea* (Cryphaeaceae, Bryopsida), *Fragm. Flor. Geobot.* 40: 133–152.
- Enroth, J. (1996), Amendments to Australasian *Cryphaea* (Cryphaeaceae, Bryopsida), *Ann. Bot. Fenn.* 33: 39–44.
- Manuel, M.G. (1973), Studies in Cryphaeaceae I. A revision of the genus *Cryphaea* in North America north of Mexico, *Bryologist* 76: 144–162.
- Rao, P. (2001), Taxonomic studies on *Cryphaea* (Cryphaeaceae, Bryopsida). 3. Revision of European, African, Australian and Oceanian, and American species, *Bryobrothera* 7: 37–111.

- 1 Leaf apices obtuse; costa mostly ending well below the leaf apex **2. C. ovalifolia**
- 1: Leaf apices acuminate to filiform; costa ending near the leaf apex or percurrent 2
- 2 Leaves tapering gradually; annulus not differentiated; exostome teeth c. 0.15–0.20 mm long, faintly papillose..... **3. C. tenella**
- 2: Leaves tapering more abruptly; annulus differentiated; exostome teeth c. 0.3–0.4 mm long, coarsely spiculate-papillose **1. C. parvula**

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1. *Cryphaea parvula* Mitt., in J.D.Hooker, *Handb. New Zealand Fl.* 460 (1867)

Cyrtodon parvulus (Mitt.) M.Fleisch., *Hedwigia* 55: 284 (1914). T: Otago, New Zealand, *Hector*; lecto: NY fide J.Enroth, *op. cit.* 43 (1996); isolecto: BM, NY.

Illustration: J.Enroth, *op. cit.* 42, fig. 1e–h (1996)

Plants slender, yellowish or brownish green. Stems procumbent, ascending or pendent, irregularly branched. Stem leaves c. 1.2–1.4 mm long, (broadly) ovate, rather abruptly tapering above mid-leaf to an acuminate or filiform and somewhat flexuose apex; margins entire, recurved below; costa single, often sinuose, variable in length, ceasing at mid-leaf or reaching the partly bistratose acumen; distal parts typically ill-defined and diffuse. Laminal cells hexagonal or rhomboid to oval; apical and median cells c. 10–20 × 6–10 µm.

Inner post-fertilisation perichaetial leaves c. 2 mm long. Capsules c. 0.9–1.0 mm long and 0.5 mm wide, cylindrical; annulus deciduous. Peristome: exostome teeth c. 300–400 µm long, densely spiculose-papillose throughout; endostome segments slightly longer than the teeth, similarly spiculose-papillose. Spores c. 20–25 µm diam.

Restricted to southern Tas.; also in New Zealand where it is more common.

Tas.: Coal River Tier, near Richmond, *coll. unknown* (“Herb. Oldfield”) (BM, NY); Wish Is., North-west Bay R., above the Well(n) Falls, *coll. unknown* (“Herb. Oldfield”) (BM); gully below Sawpit, Mt Wellington, July 1912, *L.Rodway* (H-BR).

2. *Cryphaea ovalifolia* (Müll.Hal.) A.Jaeger, *Ber. Thatigk. St. Gallischen Naturwiss. Ges.* 1874–75: 182 (1876) [Ad. 2: 98]

Pilotrichum ovalifolium Müll.Hal., *Bot. Zeitung (Berlin)* 9: 564 (1851); *Cryphidium ovalifolium* (Müll.Hal.) Broth., in H.G.A.Engler & K.A.E.Prantl, *Nat. Pflanzenfam.* 1(3): 743 (1905); *Cyrtodon ovalifolius* (Müll.Hal.) M.Fleisch., *Hedwigia* 55: 282 (1914). T: “Australasia, ad truncos fruticeti (scrub) filicum, ad Twofold Bay” [N.S.W.], 1850, *S.Mossman* 770; *n.v.*

Cryphaea crenulata Mitt., *J. Linn. Soc., Bot.* 4: 90 (1860); *Dendropogon crenulatus* (Mitt.) A.Jaeger, *Ber. Thatigk. St. Gallischen Naturwiss. Ges.* 1874–75: 187 (1876) [Ad. 2: 103]; *Cryphidium crenulatum* (Mitt.) Broth. ex Paris, *Coll.* 7 (1909). T: “N. Holl. ad fl. Tarwin”, [Vic.], 1855, *F.Mueller*; holo: NY; iso: BM, H-SOL.

Cryphaea squarrolosa Hampe, *Linnaea* 30: 636 (1860), *nom. illeg. incl. spec. prior.* (*Cryphaea crenulata* Mitt.); *Dendropogon squarrolus* (Hampe) A.Jaeger, *Ber. Thatigk. St. Gallischen Naturwiss. Ges.* 1874–75: 187 (1876) [Ad. 2: 103]; *Cryphidium squarrolus* (Hampe) Broth., in H.G.A.Engler & K.A.E.Prantl, *Nat. Pflanzenfam.* 1(3): 743 (1905).

[*Cryphaea auct. non dilatata* Hook.f. & Wilson: D.G.Catcheside, *Mosses of South Australia* 294 (1980)]

Illustrations: D.G.Catcheside, *loc. cit.* fig. 176, as *C. dilatata*; J. Enroth, *Fragm. Florist. Geobot.* 40: 147, fig. 5a–e (1995).

Plants epiphytic, medium-sized, elongate-frondose, green to yellowish or brownish. Stems pendent, subpinnately branched. Leaves c. 1.5 mm long and 0.9 mm wide, (sub)elliptic; apex obtuse; margins plane to somewhat recurved, entire throughout or weakly serrulate above; costa tapering above, ending well below the leaf apex. Laminal cella mostly rhomboid; apical laminal cells 10–15 × 10 µm; median cells 15–20 × 10 µm.

Post-fertilisation inner perichaetial leaves to c. 2.5 mm long, oblong-lanceolate. Capsules 1.2–1.5 mm long; annulus absent. Peristome: exostome teeth c. 200–270 µm long, yellow, faintly papillose; upper parts perforate or cracked along the median line; endostome segments c. 250–300 µm long, faintly papillose below, coarsely papillose above. Spores c. 25 µm diam., sordid greyish yellow.

Occurs in south-eastern Qld, N.S.W., Vic. and Tas. Apparently an obligate epiphyte that is seen in various types of forest and scrub. Also in New Zealand.

Qld: Nerang, *coll. unknown* (NSW). Vic: Club Terrace–Combiobar road, 7 km N of Club Terrace, *H.Streimann* 35612 (CANB); near Chapple Vale, western Otways, 26 Nov. 1961, *J.H.Willis* (MEL). Tas.: Alberton, *coll. unknown* (MEL).

This species has previously often been overlooked due to confusion with *Cyrtodon dilatatus* (a New Zealand endemic), from which it can be distinguished by the pseudolateral

perichaetia, obtuse rather than acute leaf apices, shorter costa, and the exostome teeth being usually cracked along the median line. The more robust habit, shape of leaf apex, and shorter costa serve to distinguish it from the Australian congeners.

3. *Cryphaea tenella* (Schwägr.) Hornsch. ex Müll.Hal., *Linnaea* 18: 679 (1845)

Neckera tenella Schwägr., *Sp. Musc. Frond.*, Suppl. 2(2): 163, 198 (1827); *Pilotrichum tenellum* (Schwägr.) Müll.Hal., *Syn. Musc. Frond.* 2: 166 (1851). T: "In Nova Hollandia [Australia] lectum a Siebero [F.W.Sieber]"; n.v. (F.Schwägrichen, *op. cit.* 164).

Cryphaea brevidens Müll.Hal., *Hedwigia* 41: 130 (1902). T: near Sydney, N.S.W., 1872, *Kayser*; isosyn: BM; *loc. id.*, 1881, *W.Woolfs s.n.* (n.v.); Richmond River, N.S.W., 1881, *Fawcett s.n.* (two duplicates H-BR).

Cryphaea exannulata Dixon & Sainsb., *Trans. Proc. Roy. Soc. New Zealand* 75: 182 (1945). T: Mt Hikurangi, Poverty Bay, Mokoivi, New Zealand, on bark, *G.O.K.Sainsbury 703*; lecto: BM, *vide* J.Enroth, *op. cit.* 40 (1996); isolecto: CHR, MEL, WELT.

Illustrations: G.A.M.Scott & I.G.Stone, *The Mosses of Southern Australia* 349, pl. 65 (1976), as *C. exannulata*; D.Meagher & B.Fuhrer, *A Field Guide to the Mosses and Allied Plants of Southern Australia* 56 (2003).

Plants slender, yellowish or brownish green. Stems procumbent, ascending or pendent, irregularly branched. Stem leaves c. 1.0–1.3 mm long, carinate along the costa, ovate-lanceolate, tapering gradually; apex acuminate-shortly aristate; margins entire, recurved below; costa single, strong, usually percurrent. Laminal cells hexagonal to rhomboid or oval; apical and median cell c. 15–30 × 6–10 µm; juxtacostal cells often longer.

Innermost post-fertilisation leaves c. 2.0 mm long, oblong-lanceolate. Capsules c. 1 mm long and 0.5 mm wide, cylindrical; annulus absent. Peristome: exostome teeth c. (120–) 150–200 µm long, somewhat irregular, often perforate to cracked along the median line, almost smooth or faintly papillose above, yellowish grey; endostome segments slightly longer than the teeth, coarsely and irregularly granulose. Spores c. 20 µm diam.

Sometimes common in Qld, N.S.W. and Vic.; predominantly epiphytic, especially on twigs, but also epilithic in forest and scrub. Also in New Zealand and islands of the tropical Pacific Ocean.

Qld: Hurdle Gully, 14 km WSW of Monto, *H.Streimann 9887* (CANB). N.S.W.: Macquarie Pass, 25 km SW of Wollongong, *H.Streimann 4769* (H). Vic: Lakes Entrance, 8 Nov. 1901, *R.A.Bastow* (WELT).

Excluded species

Cryphaea consimilis Mont., *Ann. Sci. Nat., Bot.*, sér. 3, 4: 100 (1845)

T: Chile, *Gay s.n.*; holo: PC.

This name was first applied to Australian plants by R.A.Bastow (*Pap. & Proc. Roy. Soc. Tasmania* 1886: 44, 1887). Subsequently, it was synonymised with *C. tenella* by H.N.Dixon (*Bull. New Zealand Inst.* 3: 243, 1927). However, plants similar to the original material of *C. consimilis* do not occur either in Australia or New Zealand (Enroth, 1996).