

CONOSTOMUM

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Conostomum Sw., *Naturh. Reise Schwed.* 122 (1804); from the Greek *cono* (conical) and *stoma* (a mouth), in reference to the perforated cone formed by the fused tips of the peristome teeth.

Type: *C. articum* Sw. [= *C. tetragonum* (Brid.) Lindb.]

Monoicous. Plants sparingly to densely tufted, bright green to yellow-green above, brown below. Stems simple to fastigately branched; tomentose below. Rhizoids smooth, red-brown. Leaves 5-ranked, imbricate, erect to erect-spreading, usually lanceolate; margin plane or recurved, denticulate; costa excurrent to long-excurrent, varying in width at leaf base; laminal cells rectangular, smooth or with apical papillae; alar cells not differentiated.

Capsules erect to horizontal, globose, ovoid or short-cylindrical; operculum beaked and sloping to one side. Peristome absent or single; exostome teeth 16, joined apically. Spores large, globose, reniform or ovoid, papillose-warty. $n = 8$; H.P.Ramsay, in A.Löve, *Taxon* 16: 557 (1967).

The world revision by Frahm *et al.* (1996) reduced the 15 previously accepted species to seven. More recently, Fife (1998) and Virtanen (1999) published revisions of the New Zealand and Papua New Guinean species which disagreed with Frahm *et al.* on the synonymy of *C. pusillum* and *C. pentastichum* with the Northern Hemisphere species *C. tetragonum*. This treatment of Australian material agrees with the conclusions of Fife and Virtanen.

References

- Fife, A.J. (1998), A synopsis of the New Zealand representatives of *Conostomum* (Musci: Bartramiaceae), *New Zealand J. Bot.* 36: 605–615.
- Frahm, J.-P., Börner, H., Streiber, N., Wallau, B. & Weitkus, S. (1996), Revision der Gattung *Conostomum* (Musci, Bartramiaceae), *Tropical Bryol.* 12: 97–114.
- Virtanen, V. (1999), Bryophyte flora of the Huon Peninsula, Papua New Guinea. LX. *Bartramia*, *Conostomum* and *Leiomela* (Bartramiaceae, Musci), *Acta Bot. Fenn.* 165: 1–15.

- 1 Plants less than 5 mm tall; leaves 0.5–0.9 mm long; capsules wrinkled; peristome absent **1. *C. curvirostre***
- 1: Plants usually more than 5 mm tall; leaves 0.75–2.40 mm long; capsules sulcate; peristome present 2
- 2 Costa well-defined, occupying c. one-third of leaf base; leaves not clearly in ranks of 5 (*l.*) **3. *C. pusillum***
- 2: Costa broad and poorly defined, occupying c. two-thirds of leaf base; leaves usually clearly 5-ranked, especially on the lower parts of the stem **2. *C. pentastichum***

1. *Conostomum curvirostre* (Mitt.) Mitt., *Trans. & Proc. Roy. Soc. Victoria* 19: 68 (1882)

Bartramia curvirostris Mitt., *Hooker's J. Bot. Kew Gard. Misc.* 8: 260 (1856), as *B. curvirostra*. T: Munyang Mtns, Australian Alps, [Vic.], 1885, *F. Mueller* 83; syn: MEL, NY *n.v.*, *fide* J.-P.Frahm *et al.*, *Trop. Bryol.* 12: 100 (1996); syn: BM, CHR *n.v.*, *fide* A.J.Fife, *New Zealand J. Bot.* 36: 606 (1998).

Illustration: A.J.Fife, *op. cit.* 607, fig. 1 (1998).

Plants small. Stems simple, 2–4 mm tall (rarely taller), green to red-brown. Leaves lanceolate to triangular-lanceolate, rarely ovate-lanceolate, acuminate, 0.5–0.9 mm long, 0.1–0.2 mm

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wide; margins denticulate above; costa well-defined, excurrent, bluntly denticulate dorsally towards the apex, multistratose costal wings absent, occupying up to one-third of the leaf base; laminal cells rectangular, smooth to prorate, losing shape near the apex and margin, $20\text{--}55 \times 10\text{--}12 \mu\text{m}$.

Perigonia located below the perichaetium. Perichaetial leaves large, lanceolate; margin serrulate towards apex; basal cells elongate. Setae to 7 mm long. Capsules erect, globose, unevenly wrinkled. Peristome absent. Spores globose, ovoid or reniform, densely warty, $36\text{--}50 \mu\text{m}$ diam.

Occurs on soil at high altitudes in N.S.W., A.C.T. and Vic.; also in New Zealand (South Island).

N.S.W.: Etheridge Ra., 1 km NE of Mt Kosciuszko, *D.J.Wimbush* 45 (CANB). A.C.T.: Mt Bimberi, *H.Streimann* 4362 (CANB). Vic.: "Ruined Castle", Bogong High Plains, *H.Streimann* 53525 (CANB).

The capsules of this commonly fruiting moss are sometimes slightly furrowed rather than wrinkled. The lack of a peristome, along with the usually wrinkled capsule and comparatively small size are diagnostic.

2. *Conostomum pentastichum* (Brid.) Lindb., *Öfvers. Förh. Kongl. Svenska Vetensk.-Akad.* 20: 392 (1863)

Bartramia pentasticha Brid., *Muscol. Recent.* 2(3): 134 (1803). T: ad stretum Magellanicum, *P.Commerson*, ex Herb. Swartz; holo: BM n.v., fide A.J.Fife, *op. cit.* 609 (1998); B? n.v., fide J.-P.Frahm *et al.*, *op. cit.* 106 (1996).

Conostomum australe Sw., *J. Bot. (Schrader)* 1(3): 31 (1806); *Philonotis australis* (Sw.) Mitt., *J. Proc. Linn. Soc., Bot.* 4: 81 (1860); *Bartramia australis* (Sw.) Mitt., *J. Linn. Soc., Bot.* 12: 267 (1869). T: as for *Bartramia pentasticha*.

Illustrations: A.J.Fife, *op. cit.* 609, fig. 3 (1998); J.Beever, K.W.Allison & J.Child, *Mosses of New Zealand*, 2nd edn 104, fig. 46 (1992); R.D.Seppelt, *The Moss Flora of Macquarie Island* 73, fig. 29 (2004).

Plants small to medium. Stems simple to fastigiate, red to red-brown, to c. 20 mm tall. Leaves distinctly 5-ranked, lanceolate to linear-lanceolate, acuminate, 1.75–2.40 mm long, 0.33–0.56 mm wide; margin recurved and denticulate above; costa excurrent to long-excurrent, toothed dorsally by projecting cell ends, poorly defined due to the presence of multistratose costal wings that extend to within 5–9 cells of the margin, occupying c. two-thirds of the leaf base; laminal cells poorly defined, rectangular, $30\text{--}60 \times 4\text{--}10 \mu\text{m}$, prorate; lower cells longer.

Perigonia and perichaetia terminal. Perichaetial leaves similar to stem leaves but with a markedly thinner costa. Setae c. 20 mm long. Capsules inclined to horizontal, globose to ovoid, sulcate. Peristome single; exostome teeth red, long-triangular-lanceolate, trabeculate, smooth, joined at the apices. Spores subglobose to reniform, $58\text{--}60 \mu\text{m}$ diam.

This species is found on soil in alpine and subalpine regions. It has been reported from A.C.T., Vic. and Tas., but I have only seen specimens from Tas., and I consider mainland records of *C. pentastichum* doubtful due to previous confusion with *C. pusillum*. *Conostomum pentastichum* is also found in New Zealand, Macquarie Is., Auckland Is., Campbell Is., South America and southern Africa.

Tas.: Zig Zag Track, Mt Wellington, A.V.Ratkowsky H171 (CANB); L. Fenton, Mount Field Natl Park, *D.H.Norris* 28545 (CANB).

Frahm *et al.* (1996) included *C. giganteum* in the Australian flora, but Fife (1998) synonymised it with *C. pentastichum*. A duplicate of the specimen cited by Frahm *et al.* (*H.Streimann* 4371, CANB) is a large *C. pusillum*. It has been included in the Australian flora as a misapplied name under that species.

3. *Conostomum pusillum* Hook.f. & Wilson, in J.D.Hooker, *Fl. Nov.-Zel.* 2: 88 ('1855') [1854]

var. *pusillum*

Bartramia pusilla (Hook.f. & Wilson) Mitt., *Hooker's J. Bot. & Kew Gard. Misc.* 8: 260 (1856), *nom. illeg.*; *Philonotis pusilla* (Hook.f. & Wilson) Mitt., *J. Proc. Linn. Soc., Bot.* 4: 81 (1860). T: Top of the Ruahine Mountains, [New Zealand], *W.Colenso* 2746; holo: BM n.v., *fide* A.J.Fife, *New Zealand J. Bot.* 36: 611 (1998).

Conostomum parvulum Hampe, *Linnaea* 28: 207 (1856). T: In rupibus montium Grampians et in monte Cobboras, 6000', [Vic.], *coll. unknown*; holo: BM n.v., *fide* A.J.Fife, *op. cit.* 613 (1998).

[*Conostomum giganteum* auct. non E.B.Bartram & Dixon: J.-P.Frahm *et al.*, *Trop. Bryol.* 12: 100 (1996)]

Illustrations: A.J.Fife, *op. cit.* 612, fig. 5g–k (1998); D.Meagher & B.Fuhrer, *Field Guide to the Mosses and Allied Plants of Southern Australia* 109 (2003).

Plants small to medium. Stems simple to fastigately branched, red to red-brown, to c. 6 mm long. Leaves triangular or linear-lanceolate, acuminate, 0.73–1.90 mm long, 0.15–0.37 mm wide; margin recurved and denticulate above; costa well-defined, excurrent to long-excurrent, toothed dorsally by projecting cell ends, occupying c. one-third of the leaf base (rarely half), without multistratose costal wings (rarely with small wings blurring costa edges); laminal cells rectangular, 26–44 × 6–10 µm, prorate; lower cells more elongate.

Perigonia most commonly just below perichaetia. Perichaetia in branch axils; leaves similar to those on the stem. Setae 9–20 mm long. Capsules erect to inclined or, rarely, pendulous, globose to ovoid, sulcate. Peristome single; exostome teeth red, long-triangular-lanceolate, trabeculate, smooth, joined at the apices. Spores globose, reniform or ovoid, c. 58 µm diam. *n* = 8 [Blackheath, N.S.W., *Ramsay* 56/64 (SYD)].

This species grows on soil in alpine or subalpine regions of N.S.W., A.C.T., Vic. and Tas.; also in New Zealand.

N.S.W.: Charlotte Pass, Mount Kosciuszko Natl Park, *D.H.Vitt* 26783 (CANB). A.C.T.: Mt Aggie, Brindabella Ra., *D.Verdon* 1020 (CANB). Vic.: Dargo High Plains Rd, 6 km SW of Mt Hotham, *H.Streimann* 57340 [*Musci Australas. Exsicc.* 531] (CANB). Tas.: L. Dobson, *D.McVean* 267113 (CANB).

Conostomum pusillum and *C. pentastichum* are readily separated. The leaves of the latter are distinctly 5-ranked, especially lower on the stem, and the poorly defined costa is comparatively broad. In contrast, the leaves of *C. pusillum* are not as obviously 5-ranked due to slight twisting of the leaves around the stem, and the costa is well-defined, narrower and scarcely winged. Sterile specimens of *C. pusillum* can be difficult to distinguish from *Philonotis tenuis* which differs in the occasional presence of subquadrate outer basal cells, papillose rhizoids, and the absence of 5-ranked leaves.