

## POLYTRICHASTRUM

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*Polytrichastrum* G.L.Sm., *Mem. New York Bot. Gard.* 21(3): 35 (1971); from the Greek *poly* (many), *trichos* (a hair) and the Latin *-astrum* (indicating likeness or inferiority), in reference to the relationship to *Polytrichum*.

Type: *P. alpinum* (Hedw.) G.L.Sm.

Dioicous. Plants loosely caespitose, bright green to brown. Stems erect, simple or branched. Rhizoids restricted to stem base and bases of lowermost scale-like leaves. Leaves appressed, erect-spreading when dry, erect-spreading to distinctly recurved when moist; lamina linear-lanceolate, gradually narrowing to a sharp apex, with ovate to subquadrate abaxial cells; margin serrate with large teeth, distinctly upcurved to flat, unistratose; sheathing base ovate, abruptly or gradually narrowing to lamina, with subquadrate to rectangular cells with firm walls; costa slightly excurrent, reddish brown, apically sharply serrate with abaxial teeth; lamellae almost covering the lamina.

Calyptra hairy. Setae usually solitary, terminal or pseudolateral by subperichaetial innovation, smooth. Capsules erect or slightly inclined, pale to dark brown; urn cylindrical, terete to faintly plicate; exothecial cells smooth, subquadrate to elongate, with firm walls; stomata restricted to basal hypophysis; operculum rostellate. Peristome teeth c. 64, pale brown; epiphragm thick. Spores with a granulose surface.

A genus of approximately 15 species in both hemispheres. Represented in Australia by two non-endemic species, *Polytrichastrum* is a pioneer plant of open soil and peat.

### 1. *Polytrichastrum alpinum* (Hedw.) G.L.Sm., *Mem. New York Bot. Gard.* 21(3): 37 (1971)

*Polytrichum alpinum* Hedw., *Sp. Musc. Frond.* 92 (1801); *Pogonatum alpinum* (Hedw.) Röhl., *Ann. Wetterauischen Ges. Gesamte Naturk.* 3(2): 226 (1814). T: Europe; *n.v.*

*Polytrichum pseudoalpinum* Müll.Hal., *Bot. Zeitung (Berlin)* 13: 750 (1855); *Pogonatum pseudoalpinum* (Müll.Hal.) A.Jaeger, *Ber. Tätigk. St. Gallischen Naturwiss. Ges.* 1873–74: 262 (1875). T: “Australia Felix, in subalpinis”; *n.v.*

*Polytrichum austroalpinum* F.Muell. ex Hampe, *Linnaea* 28: 211 (1856), *nom. inval.* (in synonym.). T: “In monte Cobboras”, [Vic.], *F.Mueller*; *n.v.*

*Polytrichum austroalpinum* Müll.Hal., *Bot. Jahrb. Syst.* 5: 77 (1883); *Pogonatum austroalpinum* (Müll.Hal.) Paris, *Index Bryol.* 971 (1898). T: Kerguelen Island, *F.C.Naumann*; *n.v.*

*Polytrichum obliquirostre* Müll.Hal., *Hedwigia* 36: 342 (1897). T: Mt William, Vic., Oct. 1878, *D.Sullivan*; iso: JE.

Illustrations: H.A.Crum & L.E.Anderson, *Mosses of Eastern North America* 2: 1267, fig. 629 (1981), as *Pogonatum alpinum*; D.G.Long, *Bioscience* 17: 28, fig. 8 (1985); J.Beever, K.W.Allison & J.Child, *Mosses of New Zealand*, 2nd edn 27, fig. 12f (1992).

Stems to 13 cm tall. Leaves appressed to erect-spreading when dry, recurved when moist, 4.8–11.0 mm long; lamina 0.4–0.8 mm wide, with abaxial cells having a distinctly incrassate outer wall; margin serrate, upcurved, unistratose, 3–6 cells wide; sheathing base rather abruptly widened; costa with apical abaxial teeth; lamellae 26–44, on adaxial surface of lamina, 5–8 (–9) cells high, ±straight by upper margin, with apical cells pyriform in cross-section and with an extremely incrassate and ±papillose outer wall.

Urn terete, 3.7–5.9 mm long, 1.7–2.7 mm wide. Spores 13–23 µm diam. *n* = 7, *fide* H.P.Ramsay, *J. Hattori Bot. Lab.* 82: 219 (1997).

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Occurs in N.S.W., A.C.T., Vic. and Tas.; also in the Antarctic, Subantarctic islands, New Zealand and South America; widespread in the temperate and boreal parts of the Northern Hemisphere. This is a plant of various open habitats, most commonly found near non-calcareous boulders and rocks.

N.S.W.: Mt Kosciuszko, *H.Streimann 5313* (AD, H, L, MO, NICH). A.C.T.: Brindabella Ra., *D.Verdon 1014* (CANB, HO, L). Vic.: Bogong High Plains, *I.G.Stone 10614* (MEL); Langford Gap, *I.G.Stone 14347* (MEL). Tas.: Mt Field, *A.Moscal 23341* (HO).

*Polytrichastrum alpinum* is distinguished from all other large Australian Polytrichaceae by its terete capsules and the extremely incrassate and papillose outer wall of the apical cells of the adaxial lamellae.

## 2. *Polytrichastrum formosum* (Hedw.) G.L.Sm., *Mem. New York Bot. Gard.* 21(3): 37 (1971)

*Polytrichum formosum* Hedw., *Sp. Musc. Frond.* 92 (1801). T: Die Vogelsteine, Sudetes; *n.v.*

Illustrations: A.J.E.Smith, *Moss Flora of Britain and Ireland* 93, fig. 354 (1978); H.A.Crum & L.E.Anderson, *Mosses of Eastern North America* 2: 1273, fig. 632 (1981); J.Beever, K.W.Allison & J.Child, *Mosses of New Zealand*, 2nd edn 27, fig. 12a (1992).

Stems to 18 cm tall. Leaves appressed to erect-spreading when dry, distinctly recurved when moist, 6.0–12.3 mm long; lamina 0.7–1.2 mm wide, abaxial cells with distinctly incrassate outer walls; margin flat to upcurved, unistratose, 3–10 cells wide; sheathing base gradually widened; costa with apical abaxial teeth; lamellae 42–66, on adaxial surface of lamina, 3–7 cells high, ±straight to obliquely crenate by upper margin; apical cells rounded to very slightly pyriform in cross-section.

Urn 4.5–6.2 mm long, 1.9–2.4 mm wide, with 4 rounded angles. Spores 15–20 µm diam.

Occurs in N.S.W. and Tas.; also in New Zealand, southern South America and widespread in the Northern Hemisphere. Grows in various open habitats, also in rather moist sites.

N.S.W.: path to Wentworth Falls, Blue Mtns, *D.G.Catcheside 81.23* (AD). Tas.: Mt Rufus, *A.V.Ratkowsky 78/182* (HO); Middlesex Plains, *A.Moscal 1089* (HO); Adamson Peak, Dec. 1913, *L.Rodway* (HO); Cradle Mtn, Dec. 1971, *G.A.M.Scott* (MEL).

The Australian specimens are identical to those collected in New Zealand and Patagonia. Most of the plants I have studied from these areas closely resemble *P. formosum* from Japan and Taiwan, but the habitats in Australia (moist to wet peaty sites) resemble those preferred by *P. longisetum* Sw. ex Brid. The ranges of these two species overlap in the Northern Hemisphere, and *P. longisetum* has been recorded for South America and New Zealand. However, based on the present material, only *P. formosum* is tentatively accepted for Australia.

*Polytrichastrum formosum* has essentially unspecialised apical cells on its adaxial lamellae. The outer walls of these cells are neither incrassate nor papillose, and they have no special form and are quite peculiarly obliquely crenate when seen in side view. The only other large Australian species of Polytrichaceae with similar cells is *Dawsonia polytrichoides*, but that species is not present in Tasmania. Moreover, when capsules are present they are easily distinguished because of the extremely long and narrow peristome teeth of *Dawsonia*.