DAWSONIA

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Dawsonia R.Br., *Trans. Linn. Soc. London* 10: 315 (1811); named after Dawson Turner (1775–1858), a distinguished cryptogamist and friend of Robert Brown.

Type: *D. polytrichoides* R.Br.

Dioicous; male gametoecia terminal, discoid, often repeatedly proliferating. Plants medium-sized to robust, to 25 cm tall, dark green. Stems erect or horizontally divergent from the substratum, simple, densely foliate, stiff. Rhizoids dense at base, whitish. Leaves usually appressed when dry, spreading when moist; sheath base usually with some longitudinal folds. Lamina lingulate or (narrowly) linear, with a broad ill-defined costa and a sharply serrate margin; dorsal cells rectangular, (1.4: 1–12.0: 1); shoulder cells 2- or 3-layered, forming well-differentiated swelling tissue; ventral surface of lamina with numerous rows of lamellae; lamella-free margin to 4 cells wide, the cells rectangular (1.2: 1–5.0: 1; outermost row 4: 1–8: 1), strongly and irregularly thickened on transverse walls.

Calyptra cucullate, coriaceous, with a dense mat of entwining branched serrate hairs. Outer perichaetial leaves longer than stem leaves or not differentiated. Setae stiff, c. 2–4 cm long, brownish. Capsules erect, greenish when young, becoming inclined to horizontal, brownish or blackish when mature, ovoid, sharply 2-angled, flattened or concave dorsally, convex ventrally, with a small mouth; stomata at capsule base; columella strongly inflated, reticulate; epiphragm absent; operculum narrowly conical. Peristome consisting of numerous long filiform papillose teeth, connected at the base, inserted in several concentric rows, forming a slightly twisted white or dirty white brush-like tuft. Spores small, 5–14 µm diam., smooth, green. $n = 7$, *fide* H.P.Ramsay, *Bryologist* 67: 157 (1964).

Readily recognised in fruit by the distinctive peristome. Vegetatively some other taxa are very similar, but Dawsonia can always be recognised by the rectangular, dorsal laminal cells that are 1.4: 1–12.0: 1 compared with 1.0: 1–1.5: 1 in other local Polytrichaceae. The cells of the lamella-free lamina are also usually more elongated (1.2: 1–5.0: 1, and in outermost row 4: 1–8: 1, compared with 1.0: 1–1.5: 1 other species of Polytrichaceae) and more strongly thickened.

Dawsonia comprises two sections: sect. *Dawsonia* is distinguished by the central strand (hydrome) of the leafy part of the stem consisting of hydroids only; sect. *Superba* Schlieph. & Geh. emend. G.J.Sm. is characterised by this consisting of both hydroids and sclerenchyma. The former includes two taxa, *D. polytrichoides* and *D. longiseta*, both of which are endemic to Australia. The second section of seven species has its centre of diversity in New Guinea and extends into the eastern part of the Malesian region and the Solomon Is. This section includes mainly rainforest species, and it is represented in Australia by *D. superba* var. *pulchra*.

Dawsoniaceae was placed in the Polytrichaceae by Smith (1971) and van Zanten (1973) because of the significant similarities in vegetative characteristics, and this placement is maintained here.

References

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Smith, G.L. (1971), A conspectus of the genera of Polytrichaceae, *Mem. New York Bot. Gard.* 21: 1–83.

Wijk, R. van der (1957), Revision of the genus *Dawsonia* R.Brown, *Rev. Bryol. Lichénol.*, n.s., 26: 8–19.

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1. Dawsonia longiseta Hampe, *Linnaea* 28: 634 (1860)

T: Paramatta [Parramatta], N.S.W., *F.Mueller s.n.*; holo: BM.

Dawsonia longisetacea F.Muell., *Austral. Mosses* pl. 9 (1864), *nom. inval.* (orthogr. error).

Dawsonia appressa Hampe, *Linnaea* 28: 635 (1860). T: Onkaparinga, S.A., Mar. 1857, *F.Mueller s.n.*; holo: BM.

Dawsonia victoriae Müll.Hal., *Hedwigia* 36: 335 (1897). T: Doncaster, near Melbourne, Vic., 27 July 1884, *F.M.Reader s.n.*; iso: MEL.

Illustrations: B.O. van Zanten, *Lindbergia* 2: pls IIIh–k, VIIIa, Xd (1973); G.A.M.Scott & I.G.Stone, *The Mosses of Southern Australia* 77, pl. 6 (1976); D.G.Catcheside, *Mosses of South Australia* 66, fig. 10 (1980).

Stems 0.5–3.0 (–5.0) cm tall; hydrome cylinder of hydroids only. Leaves appressed when dry; sheath 1.5–2.5 mm long, c. 1.5 mm wide, somewhat abruptly or more gradually narrowed to the lamina, usually pale brownish to almost hyaline, the cells elongate-rectangular to linear, c. 60–100 × 8–12 µm. Lamina narrowly lingulate, often slightly contracted just above the leaf shoulder, (4–) 5–7 (–10) mm long, 0.6–1.0 mm wide, dorsally dentate near the acute ±boat-shaped apex; margin in upper 75% of leaf narrowly inflexed, sharply serrate (largest teeth cells to c. 100 µm long); dorsal laminal cells c. 15–35 × 12–15 µm (1.4: 1–2.5: 1), lateral and cross walls moderately incrassate; lamella-free lamina 2–4 cells wide, with short cells 14–20 × 8–10 µm, those of outermost row 2–4 times as long as wide with strongly incrassate walls. Lamellae 4–5 (–6) cells high, the apical cells symmetrically convex (side view), usually with strongly thickened outer walls, granulose, the lower lamellar cells usually quadrate or hexagonal.

Outer perichaetial leaves not differentiated. Calyptra 8–15 mm long, not or somewhat (rarely strongly) barbed, only covering capsule, with yellowish brown to rusty brown hairs. Setae 2–4 cm long. Capsules 3–5 mm long. Spores 8–12 (–14) µm diam.

Endemic to south-eastern S.A., eastern Qld, N.S.W., A.C.T. and Vic. Grows mainly on clay, sandy or rocky soil on river banks, road cuttings, gullies, etc. in shady situations, often in dry- or wet-sclerophyll forest from sea level to c. 1000 m.

S.A.: Cleland Wildlife Reserve, Mt Lofty Ra., *R.D.Seppelt 52168* (HO). Qld: Upper Coomera R., McPherson Ra., *H.Streimann 329* (CANB). N.S.W.: Lapstone Stone Hill, *W.Forsyth 1150* (GRO, H, JE, NSW, NY). A.C.T.: Black Mtn, *B.Hain 36* (AD, BRI, CANB, GRO, NY). Vic.: Upper Sealers Ck, Wilsons Promontory, *D.McVean 26569* (CANB).

Some sterile collections can be confused with *Polytrichum juniperinum*, but the latter is distinguished by its entire, membranaceous and strongly inflexed leaf margin. On rare occasions, plants are vegetatively identical to *D. longiseta* but have the rusty brown, strongly barbed calyptra of *D. polytrichoides*. Capsules of these specimens contain mostly aborted spores, possibly indicating hybridisation between the two species. This moss can also be confused with *Pogonatum subulatum*, but the latter is less densely leafy, has shorter, blunt marginal teeth, isodiametrical marginal cells and much shorter sheath cells.

This species was also recorded from Tasmania by Burges (*op. cit.* 95) and van der Wijk (*op. cit.* 14), but there are no herbarium specimens available for confirmation. Its occurrence in Tasmania is, therefore, doubtful.

2. Dawsonia polytrichoides R.Br., *Trans. Linn. Soc. London* 10: 316 (1811)

Triplocoma polytrichoides (R.Br.) Bach.Pyl., *J. Bot. (Desvaux)*, sér. 2, 3(5): 7 (1814), *nom. illeg. gen. prior, fide* R. v.d. Wijk & W.D.Margadant, *Index Muscorum* 5: 160 (1969). T: near Port Jackson, N.S.W., 1801–03, *R.Brown* [incorrectly labelled '*Chamisso*'?]; holo: BM.

Dawsonia polytrichoides var. *minor* Müll.Hal. ex Burges, *Proc. Linn. Soc. New South Wales*, ser. 2, 74: 92 (1949), *nom. inval*. T: Kangaroo Valley, N.S.W., Dec. 1885, *T.Whitelegge s.n.*; iso: GRO, H, JE, NSW.

Illustrations: A.Burgess, *Proc. Linn. Soc. New South Wales* 74: 88, fig. 8; 92, fig. 21 (1949); B.O. van Zanten, *Lindbergia* 2: pls IIIa–g, VIIIb, Xa (1973); G.A.M.Scott & I.G.Stone, *The Mosses of Southern Australia* 77, pl. 6 (1976).

Stems 3–10 (–20) cm tall; hydrome cylinder of hydroids only. Leaves appressed, rarely spreading when dry; sheath 1.5–2.5 mm long, 1.5–2.0 mm wide, rather abruptly narrowed to the lamina, brownish, the cells narrowly linear, 80–150 × 7–10 µm. Lamina linear, tapering to a fine usually sharply serrate point, (4–) 6–10 (–15) mm long, the upper leaves often longer, 0.5–0.8 mm wide, dorsally dentate to ±half-way down blade; margin sharply serrate (largest teeth cells to c. 150 µm long); dorsal laminal cells c. 50–80 × 8–10 µm (5: 1–10: 1), incrassate, especially the lateral walls; lamella-free lamina 1–3 cells wide, the cells firm-walled, 15–25 × 8–12 µm, those of outermost margin 3–5 times as long as wide and with strongly incrassate walls. Lamellae 4–5 (–6) cells high, the apical lamellar cells (side view) slightly longer to 1.5 times as long as high, asymmetrically convex (biggest bulge ±towards one end of cell) rendering lamellae serrulate; outer wall thin or firm, usually granulose, the lower lamellar cells quadrate-rectangular to hexagonal, often horizontally elongated. Outer perichaetial leaves not differentiated.

Calyptra very large, 10–20 mm long, barbed, covering the entire capsule and usually the upper part of the seta, with long rusty brown hairs partly diverging from contracted calyptra base. Setae (15–) 20–30 mm long. Capsules (3–) 4–6 mm long. Spores 6–8 µm diam.

Endemic and common in eastern Qld and N.S.W., rarer in Vic. Grows on exposed or semi-shaded clay, sandy or rocky soil, often on river banks and road cuttings in dry- and wet-sclerophyll forest, from sea level to 1550 m.

Qld: E of Atherton, Great Dividing Ra., *B.O. van Zanten 681273* (CANB, GRO, L); Kidner Rd, 9 km N of Ravenshoe, *H.Streimann 46643* (CANB). N.S.W.: Maxwells Rd, Nagee State Forest, 41 km SSW of Eden, *H.Streimann 38068* (CANB); 2 km E of Penrose, *D.Verdon 73/127* (CANB). Vic.: Bonang Hwy, 11 km SSW of Bonang, *H.Streimann 35466* (B, CANB, CHR, GRO, MICH, NY).

When fertile this species is always recognisable by its rusty brown, barbed calyptra. Vegetatively, while it is also quite distinctive, small plants can be confused with *D. longiseta* due to the small size and similar shape of the leaf blade. The difference in shape of the apical lamellar cells is not always conclusive because of the erosion of the outer wall of the apical cells. In these rare cases, the rather abruptly narrowed sheath, the narrowly linear sheath cells and shorter dorsal laminal cells are diagnostic for *D. polytrichoides*.

This species can also be confused with *Polytrichum formosum*, *Polytrichastrum longisetum*, and with young plants of *Polytrichadelphus magellanicus* with simple stems. However, it can always be recognised by the rectangular, dorsal laminal cells and the elongate, strongly incrassate cells of the outermost row of marginal laminal cells.

This species was reported from Tasmania by Burges (*op. cit.* 93) and van der Wijk (*op. cit.* 14), but there are no herbarium specimens available for confirmation. Its occurrence in Tasmania is, therefore, doubtful.

3. Dawsonia superba Grev., *Ann. Mag. Nat. Hist.* 19: 226 (1847)

var. **pulchra** (Wijk) Zanten, *Jaarb. Kon. Ned. Bot. Ver.* 1971: 36 (1972)

Dawsonia pulchra Wijk, *Rev. Bryol. Lichénol.*, n.s., 26: 11 (1957). T: Mt Wilson, N.S.W., 25 Mar. 1952, *M.Tindale & E.F.Constable s.n.*; holo: NSW; iso: GRO, L.

Polytrichum longifolium Bruch & Schimp., *Bryol. Eur.* 4: 256 (1844); *Dawsonia longifolia* (Bruch & Schimp.) Zanten, *Lindbergia* 4: 133 (1977). T: "Neuholland" [Australia], *Von Huegel s.n.*; holo: W.

Dawsonia intermedia Müll.Hal. ex Schlieph. & Geh., *Rev. Bryol.* 23: 78 (1896); *D. superba* var. *intermedia* (Schlieph. & Geh.) Zanten, *Jaarb. Kon. Ned. Bot. Ver.* 1971: 36 (1972). T: Fernshaw, Upper Yarra R., Vic., Jan. 1881, *Luehmann s.n.*; holo: JE; iso: BM, H.

Illustrations: R. van der Wijk, *Rev. Bryol. Lichénol.*, n.s., 26: 10, fig. 3.1; 13, fig. 4.1 (1957); B.O. van Zanten, *Lindbergia* 2: pls IVb, e, f, IXa, Xf (1973); G.A.M.Scott & I.G.Stone, *The Mosses of Southern Australia* 77, pl. 6 (1976), as *D. superba*.

Stems 6–25 cm tall; leafy part to 15 cm tall; hydrome cylinder of hydroids and sclerenchyma. Leaves sometimes slightly secund at stem tips, usually appressed when dry; sheath 2.5–3.0 mm long, 2.0–2.5 mm wide, ±abruptly narrowed to the lamina, the cells linear, 120–150 × 8–11 µm. Lamina narrowly linear, usually spirally twisted (to 2 turns), rarely almost straight, ending in sharply serrate arista 9–18 (–22) mm long and 0.75–1.00 mm wide, dorsally usually sharply serrate near apex; margin often inrolled, making the lamina channelled or tubular; dorsal laminal cells c. (50–) 80–100 (–120) × 8–12 µm, firm-walled, the lateral walls usually more strongly thickened than cross walls; lamella-free lamina 1–3 (–4) cells wide, the cells irregularly transversely rectangular, 20–30 × c. 8–12 µm, incrassate, those of the outermost row 30–50 × c. 8 µm, hyaline with incrassate walls. Lamellae with straight outer walls (side view), (4–) 5–8 (–9) cells high, the apical cells usually ±enlarged, thin-walled or equally thickened, smooth or finely granulose, the lower lamellar cells irregularly hexagonal, thin-walled. Perichaetial leaves often considerably longer than stem leaves (to 30 mm). Calyptra not barbed, covering only the upper half of the capsule, pale brownish. Setae 10–35 mm long, smooth or minutely ribbed. Capsules 6–11 mm long, usually not or only slightly overtopping the perichaetial leaves. Spores 5–8 µm diam., green.

Endemic to and widespread in eastern Qld, N.S.W., Vic. and Tas.; doubtfully recorded from Malesia. Grows in shady places on dry or damp earth-banks on heavy soils, road-cuttings in wet-sclerophyll forest, at c. 400–1500 m; in Tas. from sea level to c. 200 m.

Qld: Kroombit Tableland, Port Curtis District, *I.R.Telford 5801* (CANB, GRO). N.S.W.: Zig Zag Rd, Mt Wilson, 21 km NNE of Katoomba, *H.Streimann 31695* (B, CANB, GRO, NICH, NY); Pinkwood Forest Reserve, 25 km SW of Moruya, *H.Streimann 15838* (ALTA, CANB, GRO, NICH, NY). Vic.: Sealers Cove, Wilsons Promontory, Aug. 1854, *F.Mueller* (BM, GRO, MEL). Tas.: Castra Rd, Ulverstone, *W.A.Weymouth 854* (BM, GRO, H, JE, S).

This species is much taller and has longer leaves than the other Australian species of *Dawsonia*. Small specimens, however, are similar in size to *D. polytrichoides*, but can be distinguished by the peculiar central strand, being a composite of hydroids and sclerenchyma. The straight outer walls of the lamellae (side view) are also distinctive. *Dawsonia superba* var. *superba* is the only *Dawsonia* occurring in New Zealand. It differs from var. *pulchra* in its taller stems (to 65 cm), more strongly twisted and longer leaf blades (to 30 mm), the decurrent swelling tissue, lower lamellae [4–5 (–6) cells high], shorter perichaetial leaves, and the setae that are minutely papillose in the upper part.