

Fissidens curvatus Hornsch., *Linnaea* 15: 148 (1848)

T: Cape of Good Hope, South Africa, 24 Oct. 1827, *Ecklon*; holo: H-BR; iso: MEL.

Two varieties occur in Australia.

The authors intended to create a third variety in their *Flora of Australia* treatment: *F. curvatus* var. *aristatus*, based on *F. aristatus* Broth. (see below) — Ed.

Limbidium complete or almost complete on all laminae..... var. **curvatus**
Limbidium vestigial or absent on dorsal and apical laminae var. **inclinabilis**

Fissidens curvatus Hornsch. var. **curvatus**

Fissidens pungens Müll.Hal. & Hampe, *Linnaea* 26: 502 (1855). T: Barossa Ranges, S.A., *F. Mueller* 3; syn: BM; isosyn: MEL; Planty Creek [Plenty River], Vic., *F. Mueller* 8; syn: MEL, *fide* R.A.Pursell, *Mem. New York Bot. Gard.* 69: 62, 63 (1994).

Fissidens wildii Broth., *Öfvers. Förh. Finska Vetensk.-Soc.* 33: 94 (1891). T: Pimpana, Qld, Aug. 1887, *C. Wild* 2; holo: H-BR; iso: MEL, NSW.

Fissidens strictulus Müll.Hal., *Nuov. Giorn. Bot. Ital.*, n. ser., 5: 159 (1898). T: Mt Tui-Kio-San, western Schen-si, China, Sept. 1896, *J.P. Giraldi*; iso: FI n.v.

Fissidens liliputanobryoides Müll.Hal., *Gen. Musc. Fr.* 56 (1900), *nom. nud.*

Fissidens incurvobryoides Müll.Hal., *Gen. Musc. Fr.* 59 (1901), *nom. inval.* T: n.v.

Fissidens bartramiocarpus Müll.Hal., *Proc. Linn. Soc. New South Wales*, Suppl. 27: 22 (1902), *nom. nud.*

Fissidens sordidevirens Broth., *Proc. Linn. Soc. New South Wales* 41: 579 (1916). T: Cambewarra, N.S.W., *W. Forsyth* 1140; holo: H-BR; iso: MEL, NSW.

Fissidens warningensis Broth. ex Burges, *Proc. Linn. Soc. New South Wales* 57: 240 (1932), *nom. nud.* Based on: Mt Warning, N.S.W., *W. Forsyth* 682 (NSW 214584).

Fissidens homomallulus Müll.Hal. ex Dixon, *Notes Roy. Bot. Gard. Edinburgh* 20: 94 (1948). T: Lilyvale, N.S.W., Sept. 1891, *T. Whitelegge*; holo: BM; iso: NSW.

Illustrations: G.O.K.Sainsbury, *Bull. Roy. Soc. New Zealand* 5: 46, pl. 6, fig. 3 (1955), as *F. pungens*; G.A.M.Scott & I.G.Stone, *Mosses Southern Australia* 85, pl. 7; 87, pl. 8; 89, pl. 9 (1976), as *F. pungens*; D.G.Catcheside, *Mosses of South Australia* 71, fig. 11 (1980), as *F. pungens*; Z.Iwatsuki & T.Suzuki, *J. Hattori Bot. Lab.* 48: 181, fig. 5 (1980), as *F. strictulus*; H.Streimann, *Mosses of Norfolk Island* 78, fig. 33 (2002), as *F. curvatus*; J.Beever, B.Malcolm & N.Malcolm, *The Moss Genus Fissidens in New Zealand*[:] *an illustrated key* 24 (2002); D.Meagher & B.Fuhrer, *A Field Guide to the Mosses and Allied Plants of Southern Australia* 39 (2003), as *F. curvatus*.

Polyoicous. Plants small, 2–5 mm tall, usually dimorphic. Sterile stems with leaves 8–12-jugate, ±uniform; hyaline axillary nodules weak. Leaves oblong-lanceolate or linear-lanceolate, 0.75–1.50 mm long, 0.15–0.30 mm wide; limbidium strong, 2–4-stratose, usually confluent with the excurrent costa; apex acute, acuminate. Vaginant laminae 50–75% of the leaf length, closed. Dorsal lamina tapered to the base; margin entire; laminal cells pellucid, firm- or thin-walled, ±hexagonal, 8–16 µm long, longer below. Male plants gemmiform, rhizautoicous or axillary at the base, occasionally separate.

Fertile stems short or long; leaves 2–10-jugate; perichaetial leaves with vaginant laminae ±open. Calyptra 0.40–0.55 mm long. Setae to 5 mm long. Capsules ovate, asymmetrical, inclined, to c. 1 mm long, rarely subsymmetrical and erect; operculum conical-rostrate, 0.40–0.55 mm long. Spores 9–15 µm diam. $x = 13$, *fide* H.P.Ramsay, *Taxon* 16: 552–561 (1967), as *F. pungens*.

Widespread in all States and Territories, on soil and rocks. Also in southern U.S.A., Mexico, South America, Europe, South Africa, India, China, Japan, New Caledonia, New Zealand, the Auckland Islands, Campbell Island and Norfolk Island.

W.A.: Cape D'Entrecasteau, *D.G.Catcheside* 74.172 (AD, PERTH). N.T.: Daly R., 13 Aug. 1952, *V.Pederson* (MEL). S.A.: Mount Crawford Forest, *D.G.Catcheside* 78.238 (AD). Qld: Chiminya Ck area, Lamington Natl Park, *D.G.Catcheside* 65.48 (AD); Lake Eacham Natl Park, *I.G.Stone* 25529A, 25551 (MEL); Wallaman Falls, *I.G.Stone* 14655 (MEL). N.S.W.: Parsley Bay, Sydney, *I.G.Stone* 21711 (MEL). A.C.T.: below Fishermans Gap, Tidbinbilla Valley, *D.G.Catcheside* 65.48 (AD). Vic.: Kallista, *I.G.Stone* 499 (MEL). Tas.: Marakoopa Cave area, *I.G.Stone* 25201 (MEL).

A very variable species in the dimensions of plants and the width of leaves. Typical *F. curvatus* is usually dimorphic, the sterile stems having smaller, more numerous, \pm uniform leaves, the fertile one shorter with terminal subperichaetial and perichaetial leaves much larger than the lower, \pm uniform leaves. The synonyms cited above are mostly longer plants than the typical form, usually fertile, and they do not always exhibit dimorphism. The holotype and isotype of *F. sordidevirens* is a mixture of *F. leptocladus* and *F. curvatus*. The *F. strictulus* expression is characterised by its erect, ovate, \pm symmetrical capsules and rhizautoicous inflorescence. It commonly occurs in eastern Qld on soil banks in rainforest.

The limbidium can be absent from some leaf apices and, particularly in barren plants, it can be very imperfect.

Fissidens curvatus Hornsch. var. **inclinabilis** (Müll.Hal. ex Dixon) J.E.Beever, *Bryologist* 98: 315 (1995)

Fissidens inclinabilis Müll.Hal. ex Dixon, *Bull. New Zealand Inst.* 3(3): 100 (1923); *F. pungens* Müll.Hal. & Hampe var. *inclinabilis* (Müll.Hal. ex Dixon) Sainsb., *Rev. Bryol. Lichénol.* 21: 214 (1952). T: Christchurch, New Zealand, 1892, *Beckett*; holo: CHR-Beckett.

Fissidens semilimbatus Müll.Hal. & Hampe, *Linnaea* 26: 501 (1855). T: Yarra R., *F.Mueller*; holo: BM; iso: MEL.

Illustrations: J.Beever, B.Malcolm & N.Malcolm, *The Moss Genus Fissidens in New Zealand[:] an illustrated key* 26 (2002).

Rhizautoicous. Sterile shoots to 8 mm tall. Leaves lax, 12–15-jugate, largest in mid-stem, linear-lanceolate, 0.5–1.0 mm long, 0.15–0.20 mm wide; apex acute. Costa strong, subpercurrent to percurrent. Vaginant laminae c. three-quarters of the leaf length, c. half open; limbidium below 4–5-seriate; cells of outer row rectangular, broader and shorter; dorsal lamina broad above, narrowed below, ceasing above the base to slightly decurrent; limbidium absent or vestigial. Laminal cells thin-walled, \pm quadrate to hexagonal, c. 6–12 \times 6–10 μ m; rectangular basally in vaginant laminae, 12–25 \times 8–10 μ m.

Fertile plants with leaves 4–8-jugate, lanceolate; perichaetial leaves to 1.4 mm long and 0.3 mm wide; limbidium intermittent; costa short-excurrent; vaginant laminae broad, open; limbidium conspicuous; dorsal lamina failing just above the leaf base, with a vestigial limbidium. Setae 2–5 mm long. Capsules oblong asymmetrical, \pm horizontal; theca c. 0.6 mm long and 0.4 mm wide; operculum conical; rostrum erect, c. 0.5 mm long. Spores 15.0–17.5 μ m diam.

Occurs in W.A., A.C.T., Vic. and Tas; also in New Zealand.

W.A.: Pemberton, *I.G.Stone* 23598 (MEL). A.C.T.: Gibraltar Creek valley, 27 km SW of Canberra, 30 July 1977, *H.Streimann s.n.* (BM). Vic.: Latrobe R., *F.Mueller* 56 (MEL); Brisbane Ra., *D.H.Ashton & I.G.Stone* 699 (MEL). Tas.: Bates Ck, Woodbridge, 9 Nov. 1889, *W.A.Weymouth* (HO).

Small sterile plants having a vestigial or obsolete limbidium can be difficult to distinguish from *F. taylorii*. On the other hand, fertile plants are readily recognisable by the intermittent limbidium on dorsal laminae and the asymmetrical capsules.

Note: The authors intended to create a new variety, *F. curvatus* var. *aristatus* (basionym: *F. aristatus* Broth.), in their *Flora of Australia* treatment.

Fissidens aristatus Broth., *Proc. Linn. Soc. New South Wales* 41: 578 (1916)

T: Mossmans Bay, Falls, N.S.W., on damp soil, *W.W.Watts* 4585; syn: H-BR; isosyn: MEL, NSW; Brunswick River, N.S.W., on mud covered log by creek, *W.W.Watts* 5238; syn: H-BR; isosyn: NSW; Neutral Bay, near Sydney, N.S.W., damp waterway, *W.W.Watts* 8080; syn: H-BR; isosyn: NSW; Upper Terrace, The Eyrie, Manly, N.S.W., damp places in gutter, *W.W.Watts* 6790; syn: H-BR; isosyn: NSW.

Autoicous. Plants green, 5–10 mm tall, with terminal and lateral innovations that can be sterile, fertile or male. Axillary nodules small. Leaves lanceolate to oblong-lanceolate, 0.50–2.0 mm long, 0.25–0.50 mm wide; limbidium complete and confluent with the costa at the apex, 2–5-seriate, 1–3-stratose; apex acute or broadly acute, cuspidate. Costa excurrent in a sharp cusp. Vaginant laminae 50–67% of the leaf length, closed, often invaginated near the junction. Dorsal lamina usually ending at the insertion, occasionally slightly decurrent. Laminal cells irregularly hexagonal, 10–20 × 8–10 µm, in vaginant laminae 10–20 × c. 10 µm.

Male inflorescences numerous, variously borne. Perichaetia terminal or terminating a lateral innovation; perichaetial leaves 2.0–2.5 mm long; vaginant laminae open. Setae 7–10 mm long. Calyptra conical, slightly split at the base, to 0.7 mm long. Capsules asymmetrical, curved; theca 0.5–0.8 mm long, 0.4–0.5 mm wide; exothecial cells oblong, weakly collenchymatous. Spores 12.5–16.0 µm diam.

Apparently endemic to eastern N.S.W., near the Qld border and in Sydney; grows in very wet, muddy conditions.

N.S.W.: Newrybar, Richmond R., *W.W.Watts* 2966 (NSW).

Fissidens aristatus was incorrectly reduced to synonymy in *F. pungens* (Stone, 1990a), but later reinstated (Stone, 1994a). Pursell *et al.* (1992) regarded it as a synonym, but it seems preferable to treat it as a variety of *F. curvatus*. It is usually a larger plant, often branching, and the perigonia differ in their position from those of the type variety.

Stems and leaves are similar to but larger than those of *F. curvatus*, and the cells of the vaginant laminae are not as conspicuously enlarged. The dimorphic habit is absent, and plants are larger with lateral branches and sporophytes. Moreover, male inflorescences are numerous, either sessile or on axillary rhizoids, frequently subtending a fertile innovation, sometimes terminating a lateral innovation, occasionally terminal on a separate 4–8-jugate plant.