Fissidens bryoides Hedw., *Sp. Musc. Frond.* 153 (1801)

Heterodon bryoides (Hedw.) Raf., *Med. Repos.*, ser. 2, 5: 350 (1801). Type: '*Hypnum bryoides* fronde simplicissima pinnata lanceolata, apice pedunculifera. Linn., Sp. Pl. 2, p 1588, n. 4' (in Hedwig's script); lecto: G, *fide* R.A.Pursell, *Bryologist* 89: 36, 37 (1986).

Plants light to dark green. **Stems** unbranched to sparingly branched, 3–10 mm long, 1–3 mm wide with leaves; rhizoids basal and axillary, smooth, reddish; axillary hyaline nodules absent; in section with a central strand and with the outer 1 or 2 rows of cells small, thick-walled. **Leaves** in up to 20 pairs, lanceolate to oblong-lanceolate or oblong-lingulate, 0.8–2.7 mm long, 0.2–0.5 mm wide; **apex** acute to short-acuminate or obtuse-apiculate; **margins** entire, often serrulate distally, limbate; **limbidium** on all laminae, 1–3-stratose, confluent with the costa or ending a few cells below apex, sometimes only on vaginant laminae of most leaves or only perichaetial leaves, rarely absent; **vaginant laminae** reaching 1/2–2/3 leaf length, mostly acute, ±equal; **dorsal lamina** tapering to the base, not decurrent, occasionally ending above insertion; **laminal cells** firm-walled, smooth, ±plane, irregularly quadrate to hexagonal, 7–16 µm long, longer in proximal parts of vaginant laminae; **costa** of *bryoides*-type, joining with the limbidium at the apex or ending a few cells below.

Monoicous (rhizautoicous). **Perigonia** and **perichaetia** terminal on stems. **Setae** 1.4–10.0 mm long, reddish, 1 or 2 per perichaetium, smooth. **Capsules** symmetrical, erect to ±inclined, 0.2–1.2 mm long; **exothecial cells** quadrate to oblong, ±collenchymatous. **Operculum** conical-rostrate, c. half length of theca. **Peristome** of *bryoides*-type. **Calyptra** cucullate, smooth, to 0.5 mm long. **Spores** finely papillose to smooth, 10–20 µm. diam.

Pursell (2007) noted: "*Fissidens bryoides* is notoriously variable in leaf shape, limbidium, position of the gametangia, and attitude of the capsule. There is no dearth of names that have been introduced to reflect the many expressions. All expressions, however, are monoicous, often with naked axillary antheridia, and characterized by a limbidium or uni- to tristratose cells, laminal cells 7–16 µm long, distinct, typically unistratose, smooth, plane to slightly bulging and in transverse section no deeper than wide, exserted capsules, and a *bryoides*-type peristome. *Fissidens bryoides* s. str., i.e., with axillary, gemmiform perigonia, has not been found in the Neotropics."

One variety is recognised in Australia, from a few sterile plants collected in Qld.

Fissidens bryoides Hedw. var. **schmidii** (Müll.Hal.) R.S.Chopra & S.S.Kumar, *Ann. Cryptog. Phytopathol.* 5: 43 (1981)

Fissidens schmidii Müll.Hal., *Bot. Zeitung (Berlin)* 11: 18 (1853); *F. bryoides* subsp. *schmidii* (Müll.Hal.) Norkett, *in* H.C.Gangulee, *Mosses of Eastern India* 2: 471 (1971). Type: Nilghiri (Tamil Nadu), India, *B.Schmid 43b*; holo: *n.v.*

Illustrations: H.C.Gangulee, *loc. cit.* fig. 216; Z.Iwatsuki & T.Suzuki, *J. Hattori Bot. Lab.* 51: 456, pl. 10 (1982).

Plants small, light green to deep green. **Stems** 0.5–3.0 mm long; in section lacking a central strand; axillary hyaline nodules weakly differentiated or lacking. **Leaves** in 6–10 pairs, lanceolate to oblong-lanceolate, mostly 0.4–0.6 mm long, 0.15–0.20 mm wide; **margins** entire; **apex** acute; **limbidium** complete, except at the apex and base of dorsal lamina, unistratose, mostly 1 cell wide, broadening to 2 or 3 cells wide at the base; **vaginant laminae** reaching 1/2–3/5 leaf length, closed; **dorsal lamina** often short-decurrent on the stem; **laminal cells** ±hexagonal, 7–10 µm wide, to c. 20 µm in proximal part of vaginant laminae; surface convex to mammillose. **Costa** of *bryoides*-type, pale, subpercurrent to percurrent.

Autoicous.

Images

Very rare and always collected sterile in north-eastern Qld; grows on wet, shaded, weathered basalt in rainforest.

Also known from Uganda, Pakistan, India, Nepal, Sri Lanka, Malesia, Cambodia, China and Japan.

Selected specimen examined: Qld: Wrights Ck, Lake Eacham Natl Park, *I.G.Stone 25529 p.p.* (MEL).

This species differs from *F. leptocladus* Müll.Hal. ex Rodway (Australia, Lord Howe Is., Norfolk Is., New Zealand, its Subantarctic islands and Chile), in having larger axillary nodules, a narrower hyaline costa, and larger lamina cells, the tumescent nature of which gives the erroneous impression of them being papillose.

Fissidens bryoides has also been reported from New Zealand, where it is now regarded as being a single highly variable species.

Pursell (2007) described fertile plants as follows:

Monoicous (rhizautoicous). **Perigonia** and **perichaetia** terminal on stems; naked antheridia sometimes in leaf axils; **perichaetial leaves** slightly longer than stem leaves. **Sporophytes** 1 or 2 per perichaetium. **Seta** smooth, 1.4–10.0 mm long. **Capsules** erect, symmetrical, or ±inclined, ±arcuate, 0.2–1.2 mm long; **exothecial cells** quadrate to oblong, ±collenchymatous; **peristome** of *bryoides*-type. **Calyptra** cucullate, smooth, to 0.5 mm long. **Spores** 10–20 µm diam., finely papillose to smooth.

Li & Iwatsuki (2001) suggested that the species is dioicous and the lamina cells are small (4–7 µm long), mammillose, thin-walled and obscure.

Iwatsuki & Suzuki (1982) reported var. *schmidii* from calcareous habitats in Japan, but no sporophytes were found. They and Gangulee (1971) noted that lamina cells are irregularly collapsed when dry and are difficult to restore. Theses are distinctly mammillose and the cell walls obscure because of the convexity of the surface.

Beever & Stone (1999a) provide an account of *F. bryoides* in New Zealand, where the species is autoicous and sporophytes are found.

Bibliography