Fissidens perpusillus Wilson ex Mitt., *J. Proc. Linn. Soc. Bot.*, Suppl. 1: 141 (1859)

Type: Ceylon [Sri Lanka], Aug. 1847, *Gardner 630*; holo: NY-Mitten.

Fissidens punctulatus Sande Lac., *Verh. Kon. Ned. Akad. Wetensch., Afd. Natuurk* 13: 2 (1872). Type: Saparoea, Indonesia, *de Vries*; holo: L *n.v.*, *fide* B.C.Tan & Z.Iwatsuki, *Willdenowia* 18: 599 (1989).

Illustrations: Z.Iwatsuki & M.A.Haji Mohamed, *J. Hattori Bot. Lab.* 62: 344, fig. 1 (1987), as *F. brevilingulatus* E.B.Bartram.

Plants small, delicate, 1–3 (–5) mm tall. **Stems** ±densely foliate, simple, in section lacking or with an indistinct central strand; rhizoids brown-red, basal on the stems, with ±globose yellowish gold to reddish gold gemmae on rhizoids and growing from the base of female innovations. **Leaves** in 5–12 pairs; upper leaves larger and more crowded, to 0.8 mm long, 0.2 mm wide, mostly oblanceolate, contracted proximally; **apex** obtuse; **margins** crenulate to serrulate by projecting cells; **vaginant laminae** reaching to ±mid leaf, subequal, joining at or near to the margin; **limbidium** short, on the lower half of margin of vaginant laminae on mid-stem to upper leaves, of 1–4 rows of narrow ±rectangular to elongate smooth cells 5–10 µm wide; **dorsal lamina** tapered or somewhat rounded to the base; **laminal cells** rounded-quadrate to hexagonal, 7–10 × 5–7 µm, larger towards the base and juxtacostally, convex, unipapillose; **costa** of *bryoides*-type, subpercurrent.

Monoicous, occasionally **synoicous**, ?**rhizautoicous.** Male stems at the base of female stems, short; antheridia terminal. Archegonia terminal. **Sporophyte** terminal, usually on an axillary innovation overtopping a main branch. **Setae** 3.0–3.5 mm long, ±smooth to indistinctly scabrous. **Capsules** ±symmetrical, elliptical, inclined to erect; theca 0.50–0.55 mm long, 0.30–0.35 mm wide; **exothecial cells** quadrate to rectangular, thin-walled, collenchymatous. **Operculum** conical-rostrate, c. 0.55 mm long. **Peristome** of *scariosus*-type. **Calyptra** ±scabrous, conical, 0.40–0.45 mm long. **Spores** 11–13 µm diam.

Images

Occurs at low elevations in north-eastern Qld; grows on silt between roots of *Melaleuca* along seasonal creeks and in swampy areas.

Also in Indonesia, Borneo (high elevations), Peninsular Malaysia, the Philippines and Fiji.

Selected specimens examined: Qld: Rowland's property, Lyons Ck, c. 30 km W of Cooktown, *I.G.Stone 25469, 25694* (MEL, as *F. punctulatus*); Middle Oakey Ck, c. 30 km W of Cooktown, *I.G.Stone 25701* (MEL); "Galmara" near Meunga Ck, Cardwell, *I.G.Stone 18821, 18828* (MEL).

The identification of the Australian specimens is based on the illustrations of Iwatsuki & Haji Mohamed (1987) which were drawn from a Malaysian specimen identified as *F. brevilingulatus* E.B.Bartram, itself based on a Fijian type collection.

Sporophytes have only been seen on lateral innovations in Australian material, and rhizoidal gemmae have not been reported from other collections. There is variation in the convexity of the cells, those of sterile plants bulging strongly, while those of fertile individuals are considerably flatter, and also in the degree of papillosity of the calyptra. The leaf apex can be broadly obtuse, but it is not cucullate as in *F. cucullatus*, and the presence of oblanceolate leaves is characteristic. *Fissidens subspathulatus* Dixon, from Papua New Guinea, is very similar and it is possibly conspecific with *F. perpusillus*.

While the stems, in section, lack an obvious central strand, the innermost cells are darker coloured and give the appearance of central strand when stems are viewed from the surface.

When present, the large (c. 100 µm diam.) ±globose yellowish gold to reddish gold gemmae or tubers borne on the rhizoids are a striking feature.

The type specimen of *F. punctulatus* is in poor condition (Z.Iwatsuki, pers. comm.) and has not been examined for the present study.

Iwatsuki & Haji Mohamed (1987) and Eddy (1988) suggested that Peninsular Malaysian specimens have longer stems (1.5–5.0 mm) with leaves in 6–15 pairs. Eddy also described the lamina cells as multipapillose, perhaps based on observations of another species.

Bibliography