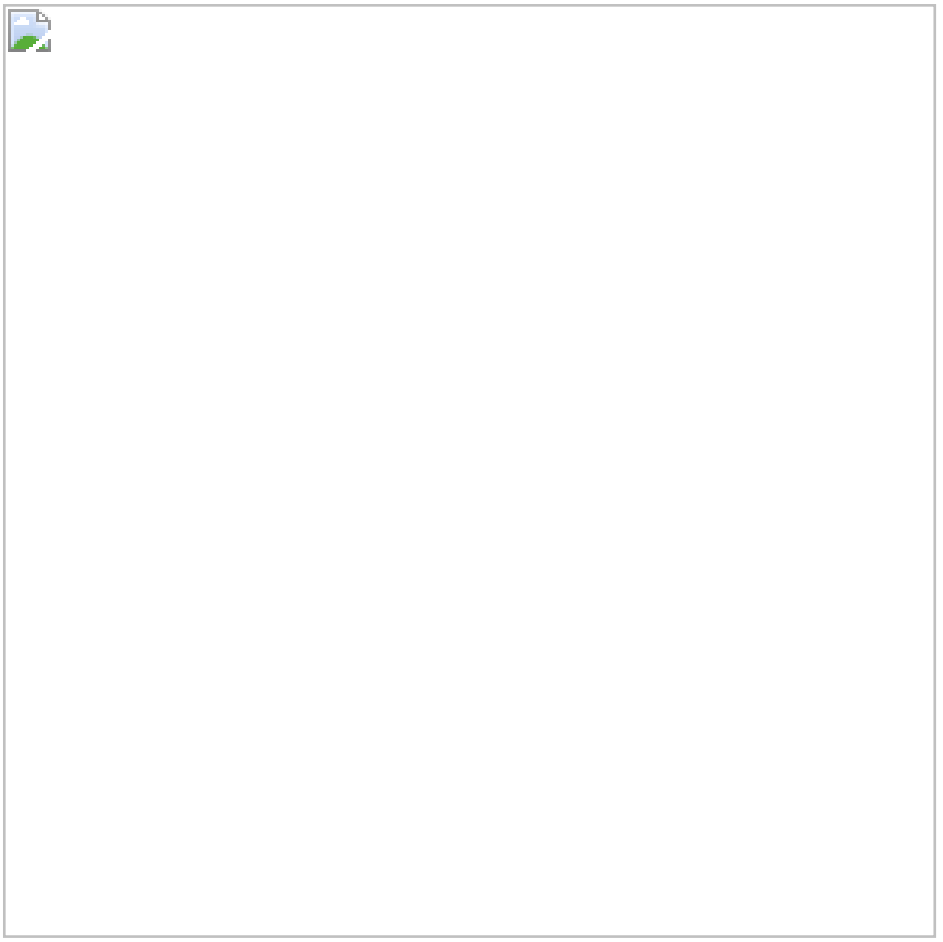

Fissidens macrosporus (Fissidentaceae: Bryophyta) — a little known species of the Western Ghats rediscovered after more than 90 years

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Fissidens macrosporus (Fissidentaceae: Bryophyta) – a little known species of the Western Ghats rediscovered after more than 90 years

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Fissidens macrosporus Dixon, a poorly known species from the Western Ghats of India, was recollected after more than 90 years. It belongs to subgenus *Aloma*.

The genus *Fissidens* includes about 450 species (Crosby et al. 2000) distributed mainly in the humid tropics, and to a lesser extent in temperate regions of the world. Members of the genus are easily distinguished from all other mosses by their complanate shoots with conduplicate, distichously arranged leaves. In India the genus is represented by about 78 species (Gangulee 1969, Manju et al. 2008a, Daniels 2010, Dandotiya et al. 2011, Verma et al. 2011, Frahm et al. 2013, Schwartz 2014) with several recent additions such as *F. longtonianus* (Iwatsuki and Suzuki 2005) and *F. kammadensis* (Manju et al. 2008b). Since this genus shows many diverse characters some of the early workers attempted to subdivide it. Among these Brotherus (1909), based on the classification by Müller (1901), was the most widely accepted one. New taxonomically useful characters have been introduced in the past few years and which improved the classifications also. Pursell and Bruggeman (2004) divided the genus into four subgenera viz. *Pachyfissidens*, *Octodiceras*, *Fissidens* and *Aloma*. Subgenus *Pachyfissidens* and subgenus *Fissidens* are again divided into three and two sections respectively.

During the revisionary studies of the Fissidentaceae of the Western Ghats of India, we collected a *Fissidens* in the evergreen forests of the Wayanad District in Kerala state which appeared to be *F. macrosporus* Dixon. This remarkable species was described by Dixon (1921) with latin description only. After him, this species has not been collected nor described by any authors from Western Ghats. Frahm et al. (2013) listed this species in the checklist of mosses of Karnataka based on the original description. Hence, the present collection from the Western Ghats is a rediscovery after more than 90 years.

Fissidens macrosporus differs from other *Fissidens* species by its immersed sporophytes, and anomalous peristomes. *Fissidens macrosporus* is one of quite a few species from southern India that Crosby et al. (2000) included as insufficiently known. The present finding is a good opportunity to draw this remarkable, poorly known, species from oblivion and to provide it with a new description, diagnosis and figures. This epiphytic species is characterized by short, erect sporophyte, peristome ending as a single filament above, irregularly perforated below, unipapillose laminal cells, elimbate leaves, and large spores. It belongs to the subgenus *Aloma*.

Fissidens macrosporus Dixon (1921, p.179)

Type: Dixon, Gairsoppa falls, Kanara district (6463), Karnataka, India, on twigs of trees in very wet evergreen [forest] (BM). Epiphytic. Plants light greenish to dark greenish, stem brownish green in cross-section with central strand of about 6 cells, 2 or 3 tiers of thin walled large (15.0–22.5 µm) inner and 1–3 tiers of small thick walled (10–15 µm) outer cortical cells; rhizoids brown and smooth; axillary nodules absent; perichaetial plants branched or unbranched, 4–7 (without branches) × 1.5–2.0 (including leaves) mm with 11–17 pairs of slightly overlapping closely arranged leaves; mid leaves of vegetative stems oblong with apiculate apex, margin crenulate, elimbate, 1.0–1.5 × 0.42–0.50 mm, leaf apices curl when dry; vaginant lamina slightly open to closed, reaching more than half the length of leaf, dorsal lamina tapering towards the insertion, not decurrent; costa prominent,

dark yellowish, ending 2 or 3 cells below the leaf apex, in cross-section of the bryoides type; cross section of leaf shows 3 central cells surrounded by small cells at costa region; laminal cells irregularly hexagonal, unipapillose, cells of apical lamina 12.5–17.5 × 5.0 µm, middle cells of apical lamina 12.5–17.5 × 5.0–7.5 µm, basal cells of dorsal lamina 12.5–25.0 × 7.5 µm, mid dorsal laminal cells plane to slightly convex, gemmae not observed.

Fertile parts: perigonia not observed; perichaetia terminal on main stems and branches, , perichaetial leaf 1.62–1.74 × 0.60–0.66 mm, base broad with 0.52–0.55 mm. Sporophyte 1.4–1.5 mm long, dark brown, seta very

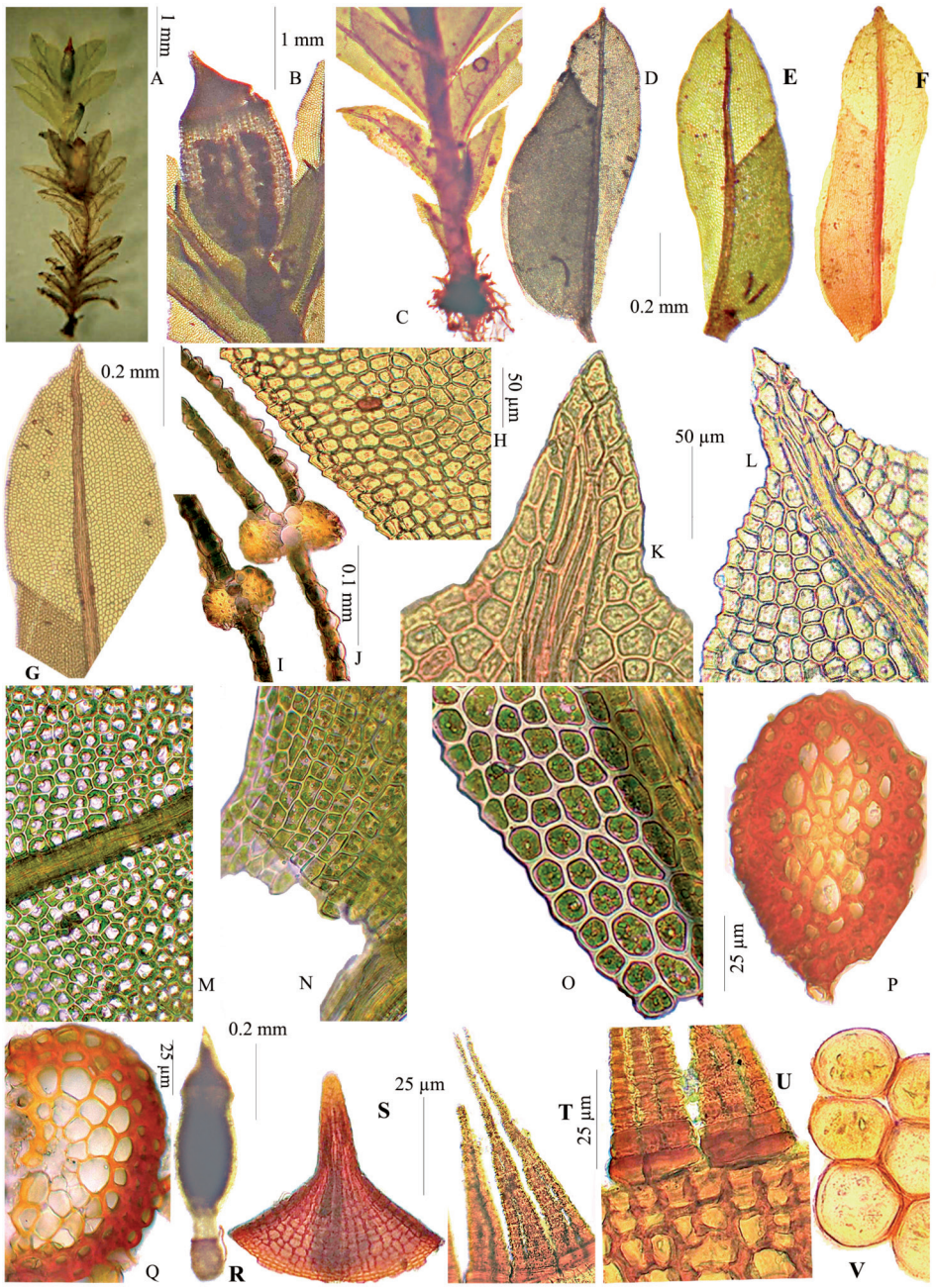

Fig. 1. *Fissidens macrosporus*, A. Perichaetial plant with perichaetial branch (innovation), B. Immersed sporophyte, C. basal part of plant, D-E. Perichaetial leaves, F. Vegetative leaf, G. Apical part of leaf, H. Middle marginal cells, I. Cross section of upper part of leaf, J. Cross section of lower half of leaf showing the bryoides type of costa, K-L. Leaf apices, M. Mid laminal cells, N. Bsal part of vaginant lamina, O. Basal part of dorsal lamina, P. C.S. of stem, Q. enlarged view of c.s. of stem, R. sporophyte, S. Operculum, T. Peristome teeth, U. Capsule mouth and basal part of peristome teeth, V. spores (B&C, D-F, I&J, K&O, S&T, U&V same magnification)

short, 0.09–0.17 mm long, capsule/theca 0.8–1.1 mm long with 28–30 files of quadrate or rectangular exothecial cells with thickened vertical walls; peristome teeth 16, brownish-orange, up to 61–78 µm long, ending as a single filament above, irregularly perforated below; spores large, subglobose to ellipsoid 22.5–35.0 µm in longest diameter.

Diagnostic characters

Fissidens macrosporus is characterized by short, almost lacking *setae*, immersed to emergent capsules, 28–30 files of exothecial cells around the capsule, peristome ending as a single filament above, irregularly perforated below (anomalous) and large spores. Gametophyte with bryoides type costa, elimbate, oblong leaves, axillary nodules lacking, and unipapillose laminal cells.

Dixon placed this species in section *Crispidium* which is characterized by large axillary nodules and zippelianus type peristomes (Pursell and Bruggeman-Nannenga 2004). The present species, however, lacks axillary nodules and has a different peristome. Since it has bryoides type costae (characteristic of subgenus *Aloma*, *Fissidens* and *Octodiceras*), 28–30 files of exothecial cells around the capsule (typical of subgenus Aloma, but subgenus *Fissidens* and *Octodiceras* typically have 40 or more), unipapillose laminal cells (subgenus *Fissidens* and *Octodiceras* have smooth laminal cells, whereas cells of subgenus *Aloma* vary from unipapillose to pluripapillose to smooth) and elimbate leaves (subgenus *Fissidens* has limbate leaves, whereas limbidia in subgenus *Aloma* vary from lacking to present on all laminae). So it fits best in subgenus *Aloma.* Typically subgenus *Aloma* species have scariosus type peristomes, but anomalous ones are characteristic of several, particularly corticolous species in this subgenus.

Distribution and ecology

Epiphytic on branches and twigs along with *Syrrhopodon parasiticus* (Brid.) Besch., widely distributed in the evergreen forests of Kuruva dweep, an uninhabited small delta Islet (3.8 km^2) on the middle of the tributaries of east flowing river, Kabani of Wayanad district in Kerala state and in Karnataka state and evergreen forests of Kozhikode district.

Specimens examined

India, Kerala, Wayanad District, Kuruva dweep (900 m), 25.09.2013, Manjula, K.M. 861a, 862a, 865a; Kozhikode district, Malabar WLS, Kakkayam (700 m), 14.11.2014, Manjula K.M. 3902 (CALI, ZGC, MH, MBG).

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