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REDISCOVERY OF A LONG-LOST MOSS *FISSIDENS SERRATUS* VAR. *SERRATUS* IN THE WESTERN GHATS OF INDIA

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Fissidens serratus, a long-lost liverwort, is rediscovered in the Indira Gandhi National Park in Anamalais in the Western Ghats in Peninsular India after nearly two centuries. Till now, the collection made by Perrottet between 1834 and 1839 in the Nilgiri Hills has been the only Indian representative of this species.

Key words: Anamalais, *Fissidens serratus*, Nilgiri Hills, rediscovered, Western Ghats

INTRODUCTION

Müller (1847) described *Fissidens serratus* the type of which came from Java (Indonesia). In 1859, he described *Conomitrium wilsoni* based on a collection by Perrottet from the Nilgiri Hills. However, *C. wilsoni* is currently treated as a synonym of *F. serratus*. Mitten (1859) who included *F. serratus* in his enumeration, referred to only Perrottet's collection and is thus the lone Indian representative of this species. Granting that Perrottet collected his material in the Nilgiri Hills between 1834 and 1839 (Stafleu and Cowan 1983: 353), while he was stationed at Pondicherry on the East Coast, a French colony then, the present collection from the Indira Gandhi National Park, Anamalais, not very far from the Nilgiri Hills, forms a rediscovery of this species after almost two centuries. A brief description with an illustration is provided. The specimen is housed at SCCN.

Fissidens serratus Müll.Hal., Bot. Zeitung (Berlin) 5: 804 (1847)
(Figs 1–18)

Syn. Musc. Frond 1: 65 (1849) & Bot. Zeitung (Berlin) 17: 197 (1859); Mitt., J. Proc. Linn. Soc., Bot. 1 (Suppl.): 140 (1859); Bruehl, Rec. Bot. Surv. India 13(1): 18 (1931); Z. Iwatsuki, Tad. Suzuki, J. Hattori Bot. Lab. 51: 395 (1982). ≡ *Conomitrium serratum* (Müll.Hal.)

Müll.Hal., Syn. Musc. Frond 2: 527 (1851). ≡ var. **serratus**: Brugg.-Nann. et Pursell, Lindbergia 20: 53. 1995; A. E. D. Daniels, Arch. Bryol. 65: 57 (2010); Brugg.-Nann. et T. Arts, J. Bryol. 32: 201 (2010); Dandotiya *et al.*, Arch. Bryol. 88: 14 (2011). ≡ *F. serratus* var. *serratus* Manju *et al.*, Arch. Bryol. 42: 7 (2009), non Müll.Hal. (1847).

= *C. perpusillum* Müll.Hal. et Hampe, Linnaea 28: 214 (1856).

= *C. pseudo-serratum* Müll.Hal., Bot. Zeitung (Berlin) 17: 197 (1859).

= *C. wilsoni* Müll.Hal., Bot. Zeitung (Berlin) 17: 197 (1859). ≡ *Fissidens wilsoni* (Müll.Hal.) Mont. ex Paris, Index Bryol. 489 (1896).

= *Fissidens australiensis* A. Jaeger, Enum. Fissident., p. 24 (1869). – Type: Indonesia (Java), Coll.: Zollinger 2100; neotype: Indonesia, Java, Tjibodjas, Coll.: Fleischer s.n. (FH) (vide Brugg.-Nann. et Pursell, l. c.).

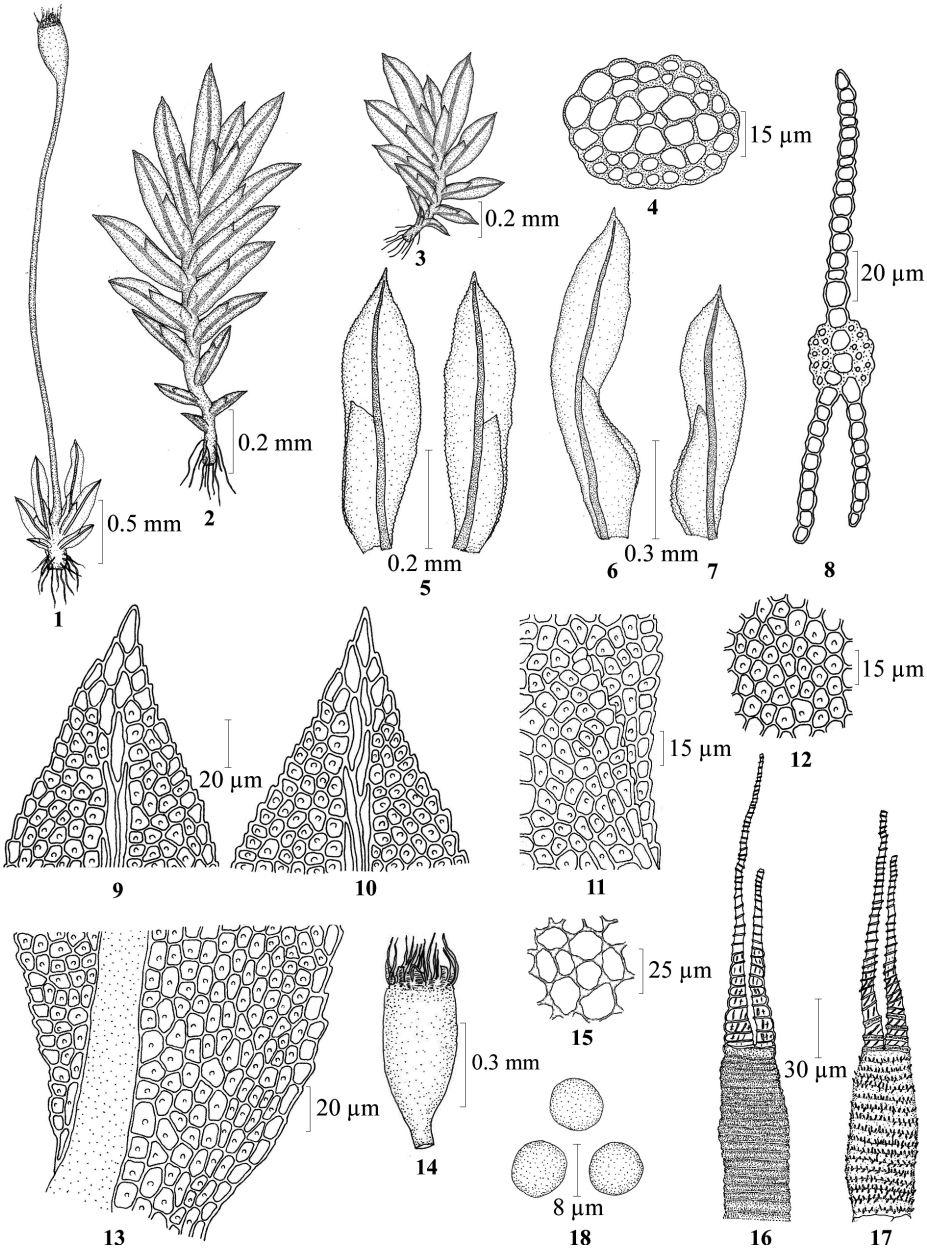
Further synonymy in Bruggeman-Nannenga and Arts (2010), Bruggeman-Nannenga and Pursell (1995).

Plants autoicous or rhizoautoicous, caespitose, 4–5 mm high, pale green to dark green. Stems simple, *ca* 64 × 52 μm in cross section, ovate, 7- or 8-celled across, without a central strand, greenish white above, pale reddish brown below; cortex 1- or 2-layered; cells 4–12 × 6–16 mm, thick walled; medullary ones 12–20 × 14–16 mm, thin walled. Leaves 3–8 pairs, curled and shrunk when dry, 0.5–0.7 × 0.13–0.15 mm, lanceolate to lingulate, narrowing dorsally, wedge-shaped at base, not decurrent, serrate at margin, acute at apex; apical and median cells 4–10 × 3–8 mm, rounded-hexagonal with a mamillate-papilla; basal ones 10–12 × 6–10 mm, quadrate-rectangular; vaginant laminae 1/2 as long as leaf, unequal, closed or open, acute at apex; limbidium absent; costa ending a little below apex of leaf, with 2 or 3 guide cells in cross section. Male plant at base of female plants. Perigonial leaves similar to vegetative ones, 0.6–0.7 × 0.14–0.15 mm, broadly constricted at middle, serrate at margin. Sporophytes apical. Perichaetial leaves longer and narrower than vegetative ones, 1–1.2 × 0.15–0.2 mm, broadly constricted at middle, serrate at margin. Setae 4–5 mm long, erect. Capsules erect, 0.4–0.5 × 0.25–0.3 mm, ovoid-cylindrical, reddish brown. Peristome teeth scariosus-type, *ca* 260 × 36 mm, reddish brown. Spores 8–10 mm, globose, faintly papillose, pale brown.

Habitat: Rupicolous, in degraded evergreen forests, *ca* 1,150 m.

Distribution: Africa, America, Asia, Australia, Madagascar, Mauritius, La Réunion, New Zealand, Seychelles, Socotra and India: Western Ghats of Tamil Nadu (Coimbatore and Nilgiri).

Specimens examined: Western Ghats: Tamil Nadu, Coimbatore Dist., Anamalais, Valparai, evergreen forest. Alt.: *ca* 1,150 m a.s.l. 4.2.2015, Coll.: K. C. Kariyappa and R. Sreebha (9830), 4 February, 2015 (SCCN); Kerala, Aralam Wildlife Sanctuary, Chavachi, on rocky patches. Alt.: *ca* 180 m a.s.l. Coll.: M. C. Nair (87539, 87494b!) (CALI).



Figs 1–18. Fissidem serratus Müll.Hal. – 1 = sporophytic plant; 2–3 = vegetative plants; 4 = cross section of stem; 5 = vegetative leaves; 6 = perichaetial leaf; 7 = perigonial leaf; 8 = cross section of leaf; 9–10 = leaf apical cells; 11 = junction of vaginant lamina; 12 = leaf median cells; 13 = leaf basal cells; 14 = capsule; 15 = exothecial cells; 16 = peristome teeth outer side; 17 = peristome teeth inner side; 18 = spores (drawn from Kariyappa, K. C. and Sreebha, R., 9830)

DISCUSSION

Fissidens serratus var. *serratus* is a widespread species occurring in the tropical zones of the world. However, its rarity in the Western Ghats, the only place of collection for the country, is undoubtedly due to the clearing of natural forests to introduce monoculture plantations, such as coffee, tea, *Chinchona*, *Eucalyptus* and establishment of Hill Stations in high-altitude areas, such as the Nilgiri Hills, Anamalai Hills and Palani Hills during the Colonial European era in the early 19th century. Moreover, establishment of hydel power stations, large scale industries, tea factories, roads and railway tracks paved way for tourism related establishments, such as hotels, restaurants, shopping complexes, etc. Thus, it is not hard for one to imagine the enormity of deforestation and the resultant loss of habitats making the survival of the species all the more difficult in the Western Ghats and elusive for bryologists. The present collection was made in the remnants of evergreen forests found in the Anamalais. This stresses the need for conservation of natural forests especially the evergreen ones.

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REFERENCES

Bruggeman-Nannenga, M. A. and Arts, T. (2010): A revision of the Fissidentaceae (Musci) of La Réunion (including all species known from Mauritius and Rodriguez). – *J. Bryol.* **32**(3): 170–207. http://dx.doi.org/10.1179/037366810x12735734836179

Bruggeman-Nannenga, M. A. and Pursell, R. A. (1995): Notes on Fissidens V. – *Lindbergia* **20**: 49–55.

Mitten, W. (1859): Musci Indiae Orientalis. – *J. Proc. Linn. Soc., Bot.* **1**(Suppl.): 1–171. http://dx.doi.org/10.1111/j.1095-8339.1859.tb02466.x

Müller, C. (1847): De muscis nonnullis novis vel minus cognitis exoticis. – *Bot. Zeitung* (Berlin) **5**: 801–806.

Müller, C. (1859): Supplementum novum ad Synopsin Muscorum. – *Bot. Zeitung* (Berlin) **17**: 197–198.

Stafleu, F. A. and Cowan, R. S. (1983): *Taxonomic literature*. Vol. 4. Ed. 2. – Regnum Vegetabile 110. Bohn, Scheltema and Holkema, Utrecht, 1214 pp.