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Research Communication

Pterobryopsis kegeliana (Müll. Hal.) M. Fleisch. and *P. scabriuscula* (Mitt.) M. Fleisch. - new to the moss flora of the Eastern Ghats

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Abstract

Pterobryopsis kegeliana (Müll. Hal.) M. Fleisch., so far known from Pachmarhi and the Western Ghats in India, and *P. scabriuscula* (Mitt.) M. Fleisch., known from the Western Ghats, Sri Lanka and Thailand (?), are recorded for the first time in the Eastern Ghats. A perusal of literature revealed that *Meteorium scabriusculum* Mitt., the holotype of *P. scabriuscula*, collected by Law from Concan, presumed to be a place in Thailand by Noguchi refers to only the present-day Konkan region in Peninsular India. Hence, the distribution of *P. scabriuscula* is amended here. Detailed descriptions with figures and photographic plates are provided.

Keywords

Pterobryopsis kegeliana; *P. scabriuscula*; Peninsular India; Eastern Ghats

Citation

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Introduction

In India, so far, 13 species of *Pterobryopsis* M. Fleisch. have been reported [1,2,3,4]. Of these, *P. auriculata* Dixon is currently *Calyptothecium auriculatum* (Dixon) Nog. [5], *P. nematosa* (Müll. Hal.) Dixon is a synonym of *Calyptothecium wightii* (Mitt.) M. Fleisch. and *P. tumida* (Dicks. ex Hook.) Dixon is a synonym of *Calyptothecium recurvulum* (Broth.) Broth. [6]. As a result, only 10 species are so far known from India and all the 10 species occur in the Western Ghats [1,2,3,4]. However, only 3 species viz., *P. acuminata* (Hook.) M. Fleisch., *P. divergens* (Mitt.) Nog. and *P. orientalis* (Müll. Hal.) M. Fleisch. have so far been reported from the Eastern Ghats [7,8,9]. While studying the bryoflora of the Eastern Ghats, 2 more species namely *P. kegeliana* (Müll. Hal.) M. Fleisch. and *P. scabriuscula* (Mitt.) M. Fleisch. were collected which are incidentally new to the moss flora of the Eastern Ghats. Detailed descriptions with figures and photographic plates are provided. The specimens

are deposited at SCCN. A key is provided to distinguish the species so far known from the Eastern Ghats.

1a. Leaves cucullate ---------- 2

b. Leaves faintly cucullate or not ---------- 4

2a. Leaves ovate-cochleate, acute at apex; capsules suberect, cylindric ---------- *P. scabriuscula*

b. Leaves ovate to ovate-cordate, acuminate to apiculate at apex; capsules erect, ovoid-cylindric--3

3a. Leaves ovate-cordate, apiculate at apex; costa 2/3 as long as leaves ---------- *P. acuminata*

b. Leaves ovate, acuminate at apex; costa 1/2 as long as leaves or shorter ---------- *P. orientalis*

4a. Leaves distinctly toothed at margin; alar cells rectangular to subrectangular; capsules erect, cylindric ---------- *P. divergens*

b. Leaves smooth at margin; alar cells quadrate to subquadrate; capsules suberect, ovoid-cylindric ---------- *P. kegeliana*

1. *Pterobryopsis kegeliana* (Müll.Hal.) M. Fleisch., Hedwigia 45: 61. 1905; Noguchi, Hattori Bot. Lab. 62: 190. 1987. *Neckera kegeliana* Müll. Hal., Bot. Zeitung (Berlin) 16: 165. 1858. - Type: Neotype (L, *vide* Noguchi *l.c.*). *Pterobryon walkeri* Broth., Rec. Bot. Surv. India 1(12): 324. 1899. *Pterobryopsis walkeri* (Broth.) Broth. in Engl. & Prantl, Nat. Pflanzenfam. 1(3): 803. 1906. (Figs 1 & 2).

Plants pale green. Stems creeping, 4 - 5 cm long, wiry, dark brown, 0.28–0.32 × 0.2–0.22 mm in cross section, ovate, without a central strand; cortex 3- or 4-layered; cells 4–10 × 2–4 mm, thick-walled; medullary cells 16–28 × 12–20 mm, thin-walled; branches ascending, 1.5–3 cm, pinnate. Leaves dense, squarrose, ovate, decurrent, faintly cucullate or not, slightly incurved at margin above, entire, acute; stem leaves 1.8–2.1 × 1.6–1.8 mm; branch leaves 1.1–1.8 × 0.5–0.9 mm; cells incrassate, elongate-rhomboid, with walls distinctly porose, faint at middle; apical cells 28–52 × 8–12 μm; median cells 32–62 × 8–10 μm; basal cells 28–50 × 12–16 μm; alar cells 8–24 × 8–20 μm, quadrate to subquadrate, red-brown; costa single, almost 2/3 as long as leaf, sometimes with an additional shorter one at base. Sporophyte not seen.

Habitat: Corticolous, in degraded evergreen forests, ca 1240 m.

Distribution: India: Madhya Pradesh (Pachmarhi), Western Ghats of Karnataka and Maharashtra [9], and Eastern Ghats of Tamil Nadu (Kolli Hills).

Specimens examined: Eastern Ghats: Tamil Nadu, Namakkal Dist., Kolli Hills, Perumakka Shola, ca 1240 m, 21.1.2016, *P.M. Biju* 1501 (SCCN).

2. *Pterobryopsis scabriuscula* (Mitt.) M. Fleisch., Hedwigia 45: 61. 1905; Noguchi, Hattori Bot. Lab. 60: 152. 1986. *Meteorium scabriusculum* Mitt., J. Proc. Linn. Soc., Bot. 1(Suppl.): 85. 1859. - Type: Concan, *Law* 919 (NY). *Meteorium frondosum* Mitt., J. Proc. Linn. Soc., Bot. 1(Suppl.): 86. 1859. *Endotrichum frondosum* (Mitt.) A. Jaeger, Ber. Senckenberg Naturf. Ges.: 233. 1876. *Garovaglia*

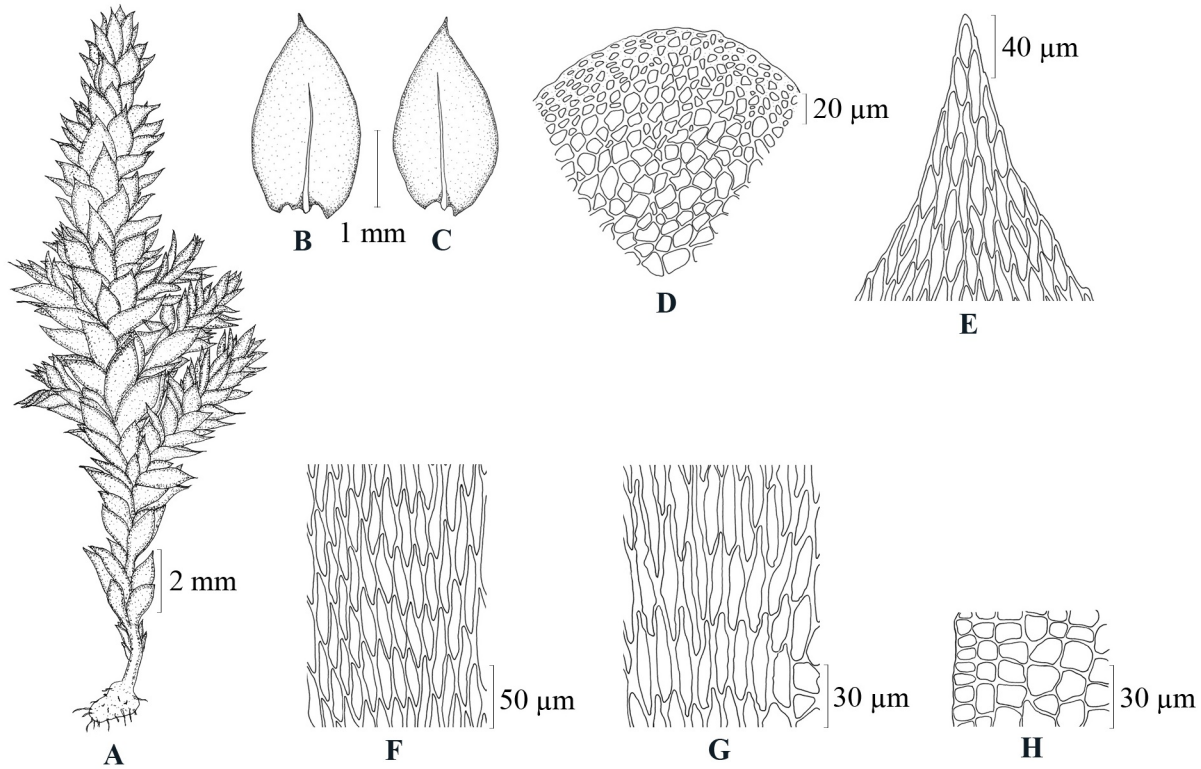

Fig 1. *Pterobryopsis kegeliana* (Müll. Hal.) M. Fleisch.
A. Plant **B.** Stem leaf **C.** Branch leaf **D.** Cross section of stem **E.** Leaf apical cells
F. Leaf median cells **G.** Leaf basal cells **H.** Leaf alar cells (P. M. Biju 1501)

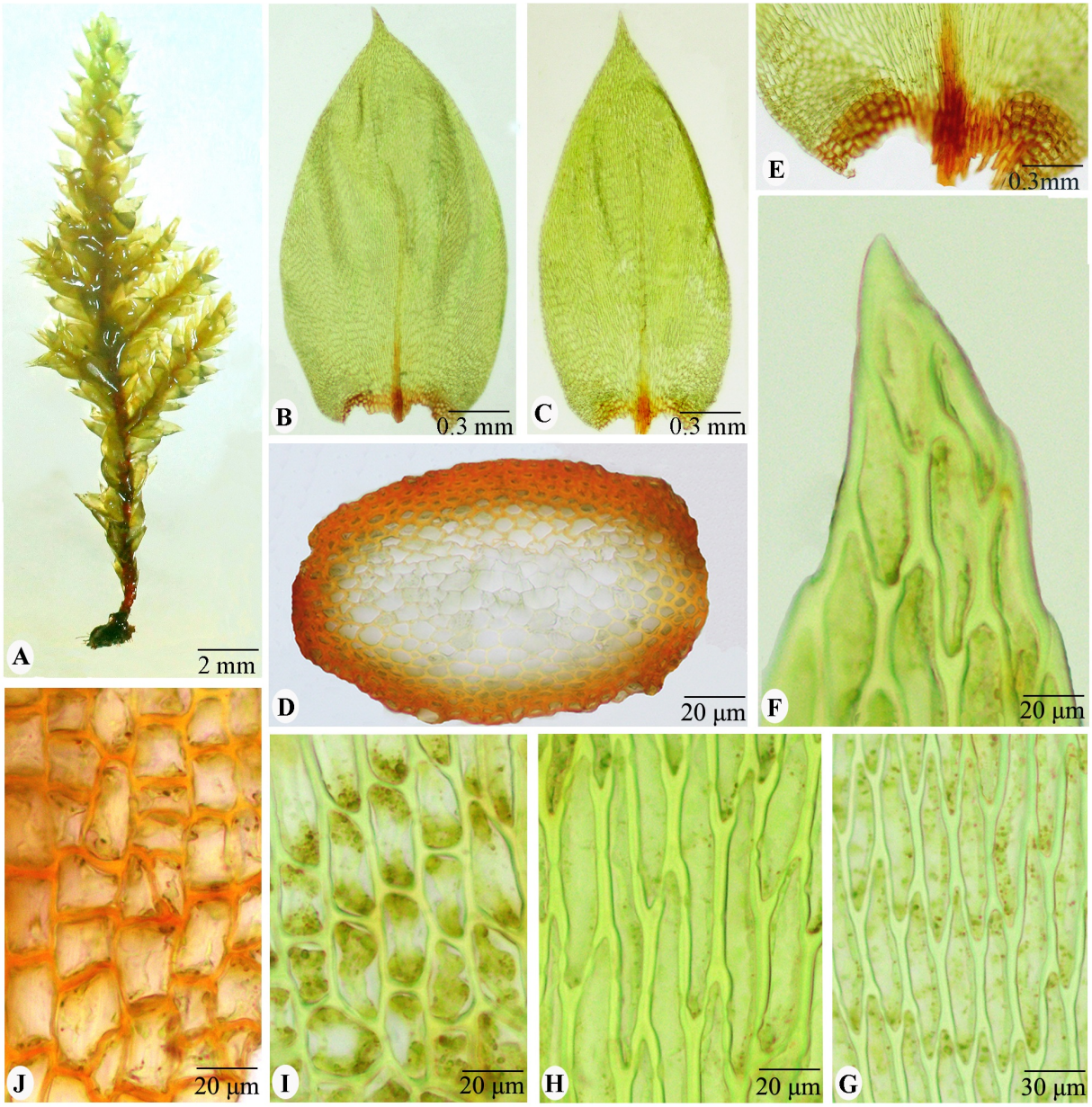

Fig 2. *Pterobryopsis kegeliana* (Müll. Hal.) M. Fleisch.
A. Plant **B.** Stem leaf **C.** Branch leaf **D.** Cross section of stem **E.** Leaf base showing alar region **F.** Leaf apical cells **G.** Leaf median cells **H.** Leaf midbasal cells **I.** Leaf basal cells **J.** Leaf alar cells (P. M. Biju 1501)

frondosa (Mitt.) Paris, Index Bryol.: 508. 1896. *Pterobryopsis frondosa* (Mitt.) M. Fleisch., Hedwigia 45: 60. 1905; Gangulee, Moss. E. India 2(5): 1268. 1976. (Figs. 3 & 4).

Plants pale green. Stems creeping, 4–6 cm long, wiry, dark brown, 0.26–0.30 × 0.18–0.20 mm in cross section, ovate, without a central strand; cortex 2- or 3-layered; cells 2–24 × 2–16 mm, thick-walled; medullary cells 8–28 × 4–20 mm, thin-walled; branches ascending, 1.2–1.8 cm, irregularly pinnate. Leaves dense, squarrose, ovate-cochleate, concave, cucullate, decurrent, incurved at margin above, entire, acute; stem leaves 2.0–3.5 × 1.0–1.3 mm; branch leaves 1.0–1.1 × 0.3–0.6 mm; cells incrassate, narrow, vermicular, elongate, with walls distinctly porose; apical cells 16–48 × 4–8 µm; median cells 40–96 × 8–12 µm, linear-vermicular; basal cells 8–32 × 8–24 µm; alar cells 20–32 × 18–28 µm, quadrate to subquadrate, red-brown; costa single, almost 2/3 as long as leaf. Sporophyte not seen.

Habitat: Corticolous, in degraded evergreen forests, ca 1400 m.

Distribution: Sri Lanka and India: Western Ghats of Tamil Nadu (Nilgiri Hills and Palani Hills) [4,9] and Eastern Ghats of Tamil Nadu (Sherveroy Hills).

Specimens examined: Eastern Ghats: Tamil Nadu, Salem Dist., Sherveroy Hills, Yercaud, ca 1400 m, 10.8.2015, *A.E.D. Daniels* & *P.M. Biju* 962 (SCCN).

Discussion

Noguchi [10], under the distribution of *Pterobryopsis scabriuscula* included Thailand (?) based on the collection of the holotype of *Meteorium scrabriusculum* Mitt. (NY), by Law (919), from Concan, a place which he assumed to

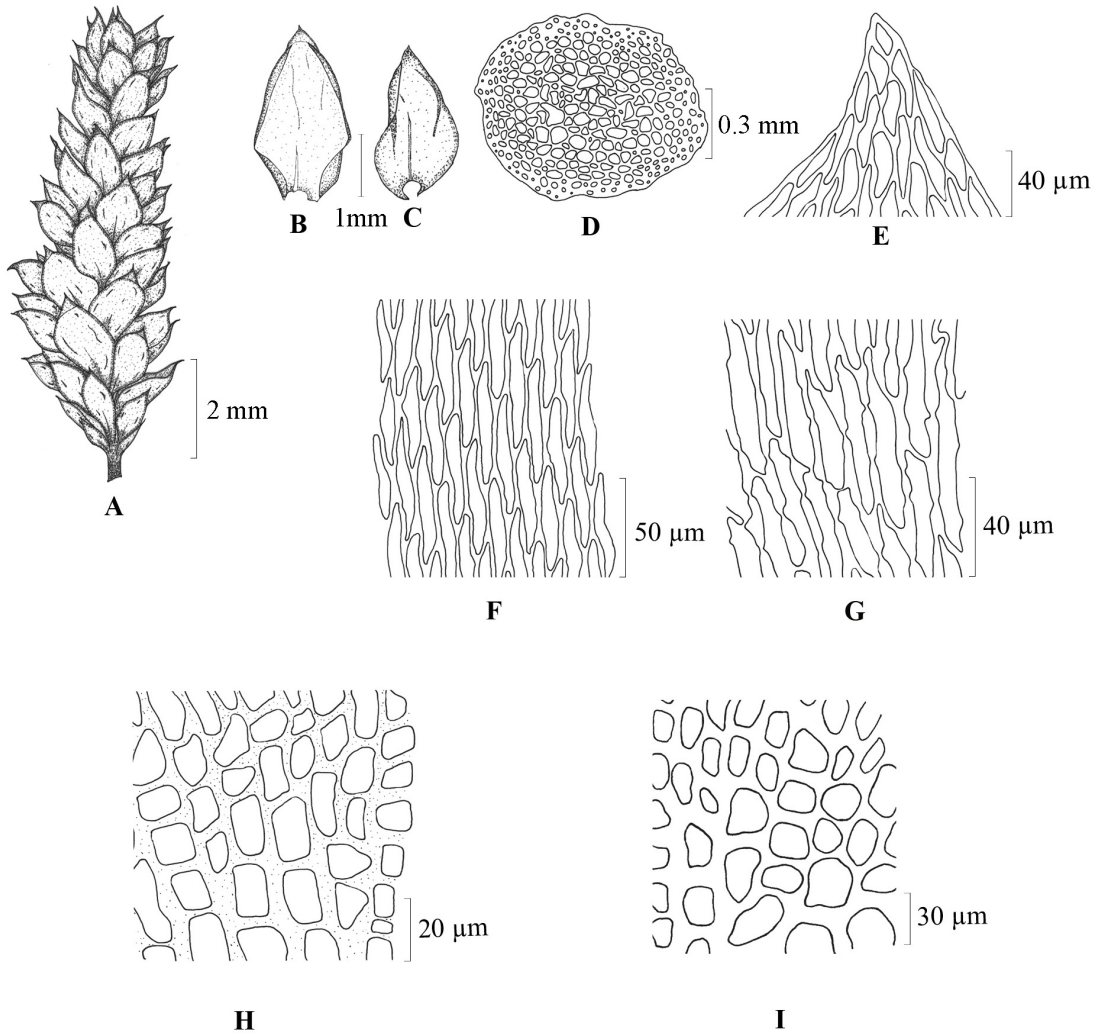

Fig 3. *Pterobryopsis scabriuscula* (Mitt.) M. Fleisch.
A. Plant **B.** Stem leaf **C.** Branch leaf **D.** Cross section of stem **E.** Leaf apical cells **F.** Leaf median cells **G.** Leaf midbasal cells **H.** Leaf basal cells **I.** Leaf alar cells (A.E.D. Daniels & P.M. Biju 962)

be in Thailand. However, a perusal of the specimens examined provided under *P. scabriuscula* indicates that all the samples cited had been collected in and around the Western Ghats of Maharashtra and Sri Lanka (Ceylon) only. Similarly, in his subsequent publication [11] where *P. kegeliana* is included, again under specimens examined, all the samples had been collected in and around the Western Ghats of Maharashtra and Karnataka, and Pachmarhi (erroneously spelt as 'Pachmashi') in Madhya Pradesh. Saradesāya [12], on page 2 states that, Concan is the narrow strip of land that runs from the sea to the Ghats. From this, it is obvious that Concan refers to the present-day Konkan (Konkan Coast) region in India, the narrow strip of land along the western coasts of Maharashtra, Goa and Karnataka bounded by the Western Ghats in the east, the Arabian Sea in the west, the Mayura River in the north and the Gangavalli River in the south and not a place in Thailand as presumed by Noguchi. Hence, *P. scabriuscula* is currently known only from Peninsular India and Sri Lanka, and Thailand is hereby excluded from its range of distribution.

Authors' contribution

AEDD - Collection, determination and preparation of the MS; PMB – Collection, dissection and help in determination; VA - Dissection and preparation of figures and photographic plates.

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Conflict of interest

The authors declare that they have no competing interests.

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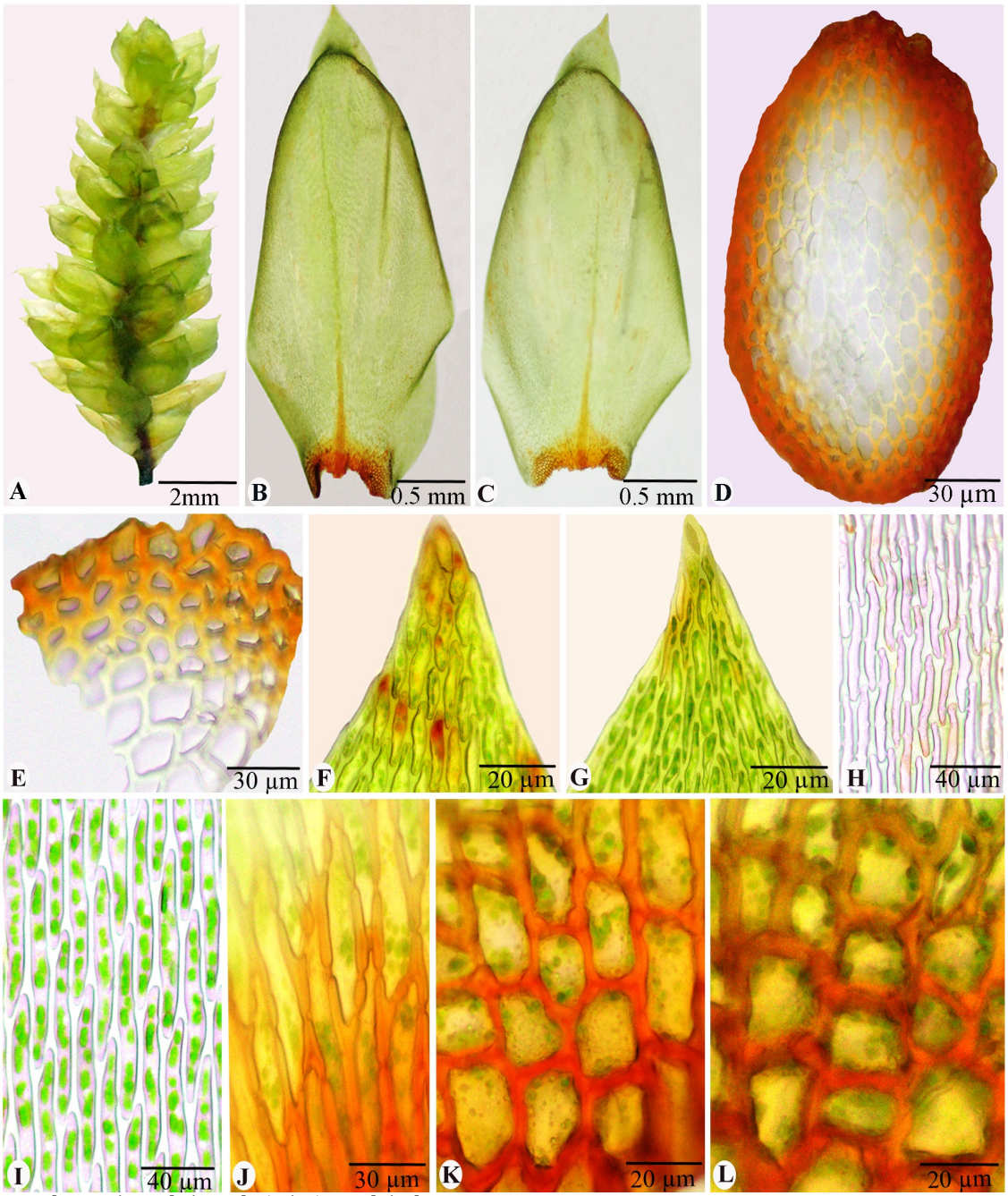

Fig 4. *Pterobryopsis scabriuscula* (Mitt.) M. Fleisch.
A. Plant **B.** Stem leaf **C.** Branch leaf **D–E.** Cross section of stem **F–G.** Leaf apical cells
H–I. Leaf median cells **J.** Leaf midbasal cells **K–L.** Alar cells (A.E.D. Daniels & P.M. Biju 962)

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