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TWO SPECIES OF *DALTONIA* HOOK. & TAYLOR (*DALTONIACEAE*: BRYOPHYTA) NEW TO THE MOSS FLORA OF INDIA

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ABSTRACT

Daltonia angustifolia and *D. contorta* are added here to the bryoflora of India from the part of the Agasthyamalai Biosphere Reserve of Tamil Nadu in the southern Western Ghats. The genus *Daltonia*, earlier known to be distributed only in the Himalaya in India, is new to the bryoflora of Peninsular India.

Key words : Moss, Daltonia, new record, India.

INTRODUCTION

The genus *Daltonia* Hook. & Taylor is reported to have 12 species and one subspecies in India including *Daltonia perlaxiretis* Dixon and *D. flexifolia* Mitt. (Lal, 2005). However, the latter 2 are now considered synonyms of *D. aristifolia* Renauld & Cardot and *D. marginata* Griff. respectively. As a result, there are only 10 species and one subspecies in India now. All of them are known to be distributed in the Eastern Himalaya except *D. gemmipara* Dixon which occurs in the Northeast. *Daltonia aristifolia* and *D. marginata* have been reported from both Eastern Himalaya and the Northeast.

Earlier, Daniels and Daniel (2003) added *Fissidens griffithii* Gangulee, and Kariyappa and Daniels (2010) added the African *Trachyphyllum dusenii* (Müll.Hal ex Broth.) Broth. to the bryoflora of India. Now, *Daltonia angustifolia* Dozy & Molk. and *D. contorta* Müll.Hal. are added from the Agasthyamalai Biosphere Reserve in the Southern Western Ghats thereby raising the number of species in the genus to 12 in the country. These are described and illustrated. Specimens examined are housed at SCCN (Herbarium, Scott Christian College, Nagercoil) and CAL.

Key to the species

1a. Leaves flexuose when dry, erectopatent when wet, linear-lanceolate, recurved, gradually acuminate; cells thin-walled, not pitted ... *1. D. angustifolia*

1b. Leaves distinctly twisted when dry, erect-spreading when wet, ovate-lanceolate, not recurved, abruptly short-acuminate; cells thick-walled, pitted ... *2. D. contorta*

1. Daltonia angustifolia Dozy & Molk., Ann. Sci. Nat., Bot. 3, 2: 302. 1844; Müll.Hal., Syn. Musc. Frond. 2: 18. 1851; B.C. Tan & H. Rob., Smithsonian Contr. Bot. 75: 12. 1990; Mohamed & H. Rob., Smithsonian Contr. Bot. 80: 13. 1991; P.-J. Lin & B.C. Tan, Harvard Pap. Bot. 7: 31. 1995. - Type: (Indonesia) Borneo, *Korthals s.n.* (L). *D. longipedunculata* Müll.Hal., Syn. Musc. Frond. 2: 18. 1851. Type: (Indonesia), Java, Mt. Sakoenbang, without collector's name (B). *D. strictifolia* Mitt., J. Proc. Linn. Soc., Bot. 1(Suppl.): 146. 1859. - Type: Ceylon, *Gardner s.n.* (NY). *Streptopogon australis* Mitt., J. Linn. Soc., Bot. 15: 66. 1877; R.H. Zand., Bull. Buffalo Soc. Nat. Sci. 32: 145. 1993. - Type: Spain, Tenerife Is., *H.N. Moseley s.n.* (NY). *D. angustifolia* Dozy & Molk. var. *strictifolia* (Mitt.) M. Fleisch., Musc. Buitenzorg 3: 959. 1908. *D. revoluta* Broth., Philipp. J. Sci., 5C: 156. 1910. - Type: The Philippines, Luzon, Mt. Pulog, *Curran, Merritt & Zschokke, For. Bur.* 16405 (iso - NY *vide* B.C. Tan & H. Rob., *l.c.*). (Figs. 1 & 2; Pl. 1)

Plants caespitose, erect, 7 10 mm high, yellow-green to green. Stems simple, rarely branched, 0.18 0.22 × 0.16 - 0.18 mm in cross section, ovoid, without a central strand; cortical cells 1- or 2-layered, thick-walled, 8 - 20 × 6 - 12 µm, quadrate to rounded-quadrate; medullary ones thin-walled, 20 - 40 × 16 - 30 µm, rounded-quadrate to rounded-hexagonal. Leaves crowded, flexuose when dry, erectopatent when wet, 2 - 3 × 0.2 - 0.35 µm,

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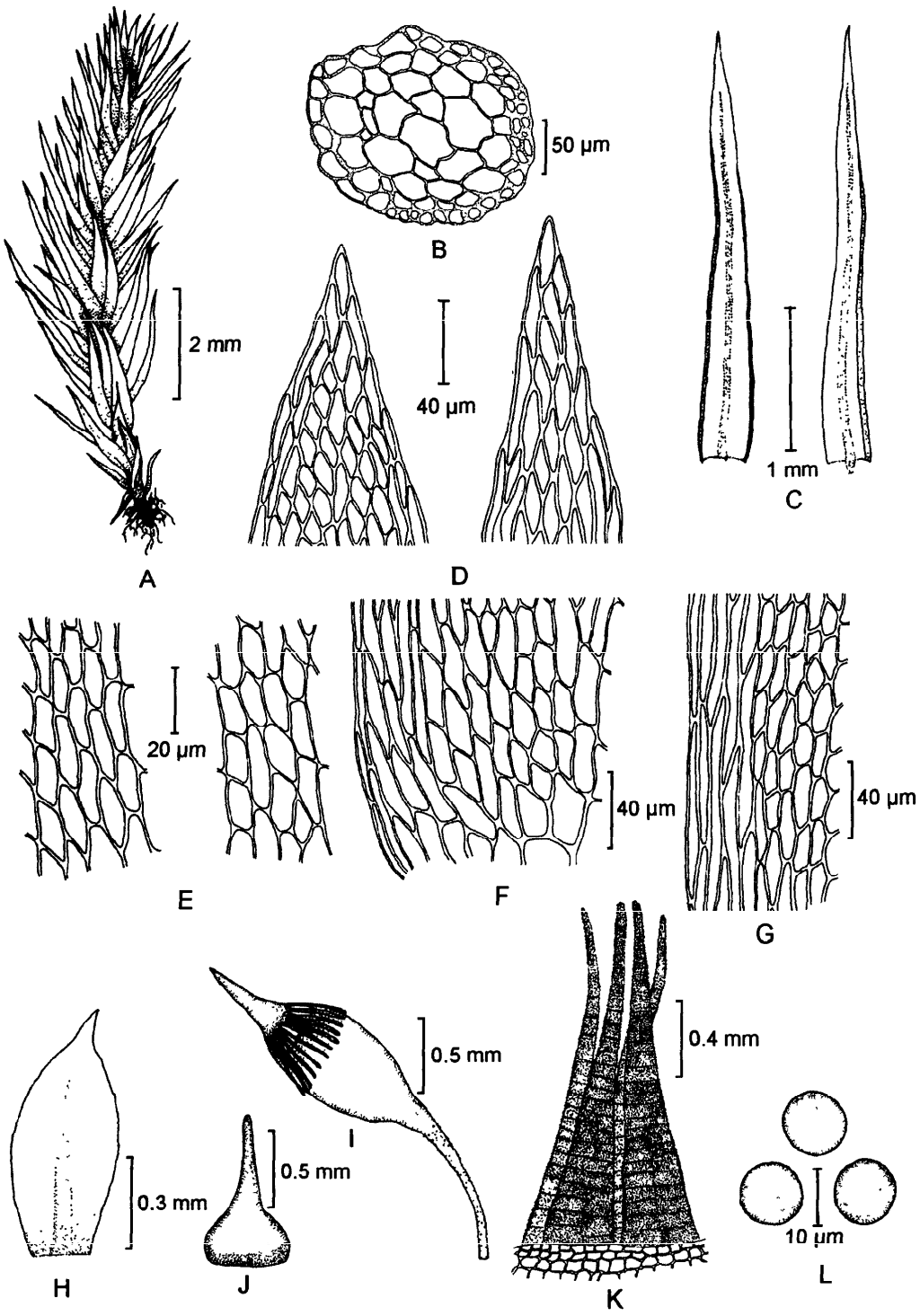

Fig. 1. *Daltonia angustifolia* Dozy & Molk. **A.** Plant; **B.** Cross section of stem; **C.** Leaves; **D.** Leaf apical cells; **E.** Leaf median cells; **F.** Leaf basal cells; **G.** Leaf marginal cells in middle; **H.** Perichaetial leaf; **I.** Capsule; **J.** Operculum; **K.** Peristome; **L.** Spores (drawn from *Kariyappa* 3717 p.p.)

linear-lanceolate, entire, recurved, gradually acuminate, distinctly bordered with 1 or 2 rows of linear, elongated cells above becoming 3 - 6 rows below; cells thin-walled, ovate to narrowly rhomboid; apical and median cells 20 - 30 × 6 - 8 µm; basal ones 30 - 50 × 12 - 16 µm, linear-rhomboid to rectangular; extreme basal cells pale reddish. Costa ending a little below apex. Sporophytes on short, lateral branches. Perichaetial leaves 0.64 - 0.96 × 0.24 × 0.32 mm, ovate-lanceolate, costate. Setae 1 1.2 mm long, scabrous above. Calyptrae 1.28 - 1.44 × 0.64 - 0.72 mm, mitriform, covering only operculum, long-hairy at base. Capsules 1.04 - 1.12 × 0.48 - 0.53 mm, ovoid, erect to inclined. Operculum 0.88 - 0.96 × 0.57 - 0.56 mm, conic. Peristome teeth 2-rowed, 1.6 - 1.76 × 0.08 - 0.09 mm, densely papillose. Spores 8 - 10 µm, globose, faintly papillose, pale brown.

Habitat: Rupicolous, and corticolous on *Vernonia travancorica* Hook.f., a rare Asteraceous tree in montane evergreen forests and endemic to the study area and adjacent areas in Kerala, 1800 1860 m.

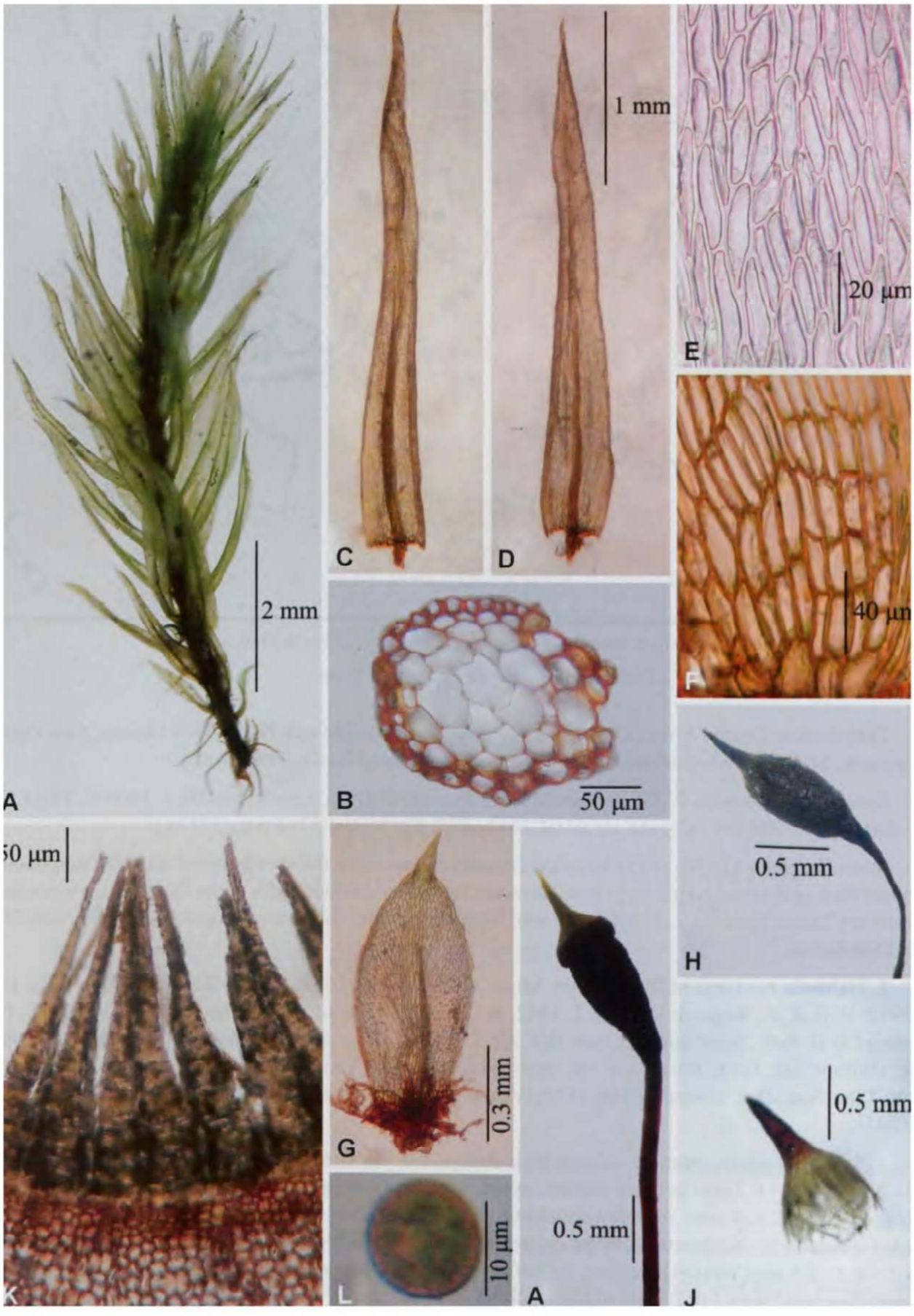

Plate 1. *Daltonia angustifolia* Dozy & Molk. **A.** Plant; **B.** Cross section of stem; **C & D.** Leaves; **E.** Leaf median cells; **F.** Leaf basal cells; **G.** Perichactial leaf; **H.** Capsule with calyptra; **I.** Capsule with operculum; **J.** Calyptra; **K.** Peristome; **L.** Spore.

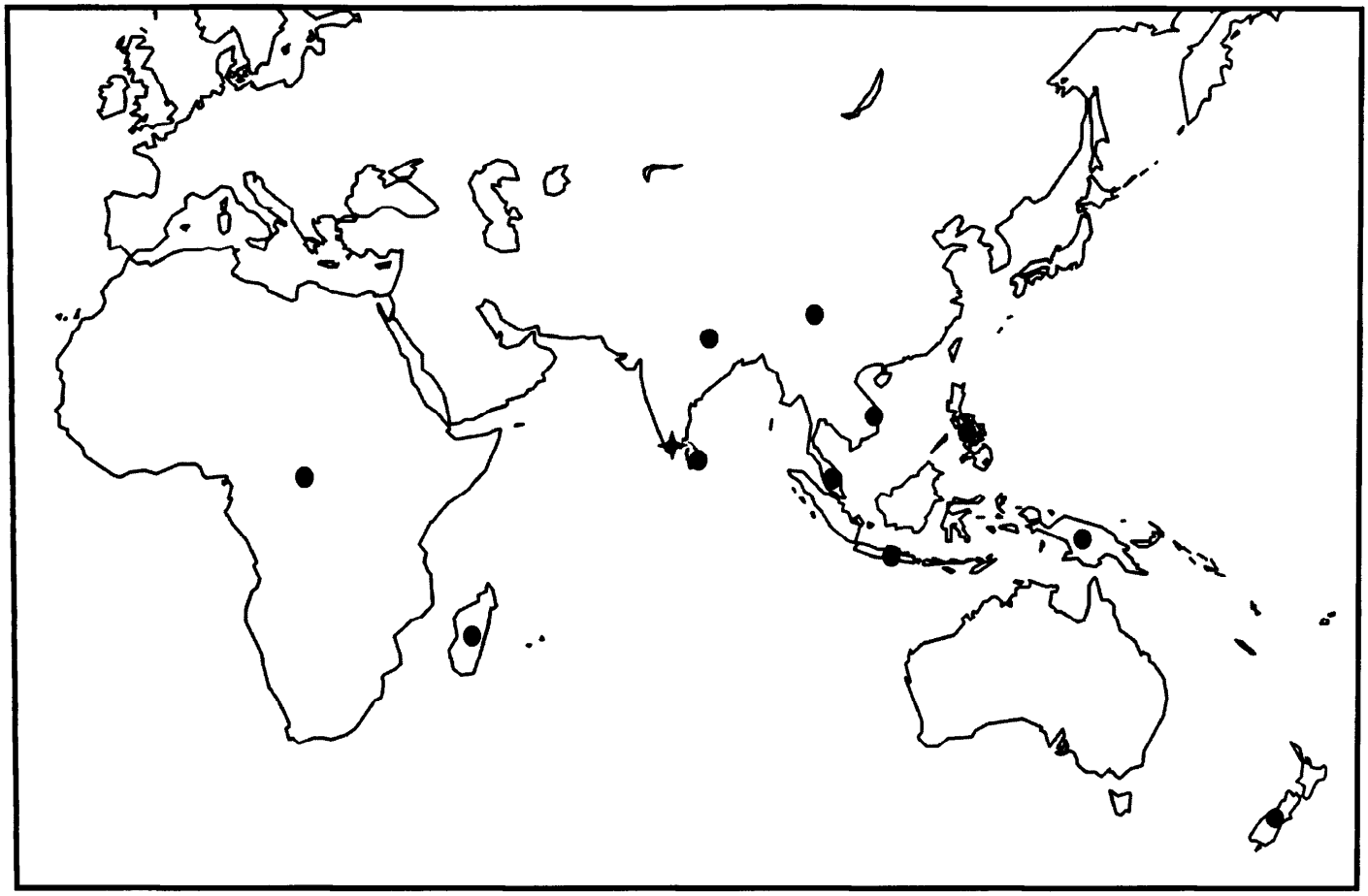

Fig. 2. Distribution of *Daltonia angustifolia* Dozy & Molk.

• Earlier localities ✦ Present localities

Distribution: Central Africa, China, Indonesia, Madagascar, Malaya, Nepal, New Guinea, New Zealand, Philippines, Sri Lanka, Vietnam and India: Western Ghats (Tamil Nadu, Tirunelveli).

Specimens examined: W. Ghats, Tamil Nadu, Tirunelveli Dist., Agasthyamalai, c. 1800 m, 19.04.2010, *K.C. Kariyappa* 3707 p.p.; c. 1860 m, 19.04.2010, *K.C. Kariyappa* 3712 p.p., 3717p.p.

Note: Gangulee (1974: 1477) included *D. angustifolia* since the area covered included neighbouring countries such as Bhutan, Nepal and Tibet. However, he did not include India under Distribution since he had not seen any Indian material. Lal (2005: 44) who listed this species following Gangulee (*l.c.*) gave only Nepal under Distribution.

2. Daltonia contorta Müll.Hal., Syn. Musc. Frond. 2: 660. 1851; Bruehl, Rec. Bot. Surv. India 13(1): 79. 1931; Wijk & al., Regnum Veg. 26: 2. 1962; B.C. Tan & H. Rob., Smithsonian Contr. Bot. 75: 13. 1990; Mohamed & H. Rob., Smithsonian Contr. Bot. 80: 13. 1991; Streimann, J. Hattori Bot. Lab. 88: 123. 2000. Type: (Indonesia), Java, *Blume s.n.* (B, destroyed *vide* B.C. Tan & H. Rob., *l.c.*). *D. scaberula* Mitt., J. Proc. Linn. Soc., Bot. 1(Suppl.): 146. 1859; Wijk & al., Regnum Veg. 26: 4. 1962. - Type: Ceylon, *Thwaites s.n.* (BM). (Figs. 3 & 4; Pl. 2)

Plants caespitose, erect, 10 - 15 mm high, dull yellow-brown to brown. Stems simple, rarely branched, 0.18 - 0.24 × 0.16 0.2 mm in cross section, ovoid, without a central strand; cortical cells (1-) 2 - 4 - thick-walled, 4 8 × 2 4 µm, rounded-quadrate; medullary ones thin-walled, 16 40 × 12 30 mm, rounded-quadrate to -hexagonal. Leaves crowded, distinctly twisted when dry, erect-spreading when wet, 2 3.1 × 0.3 - 0.5 mm, ovate-lanceolate, widest below, entire, abruptly short-acuminate, sometimes twisted, distinctly bordered with 1 or 2 rows of linear, elongated cells above becoming 4 - 7 rows below; cells thick-walled, pitted, ovate to narrowly rhomboid; apical cells 20 - 50 × 4 - 6 µm; median ones 12 - 20 × 6 - 8 µm; basal ones 20 - 40 × 8 12 µm, linear-rhomboid to rectangular, reddish at extreme base. Costa 2/3 as long as leaf. Sporophyte not seen.

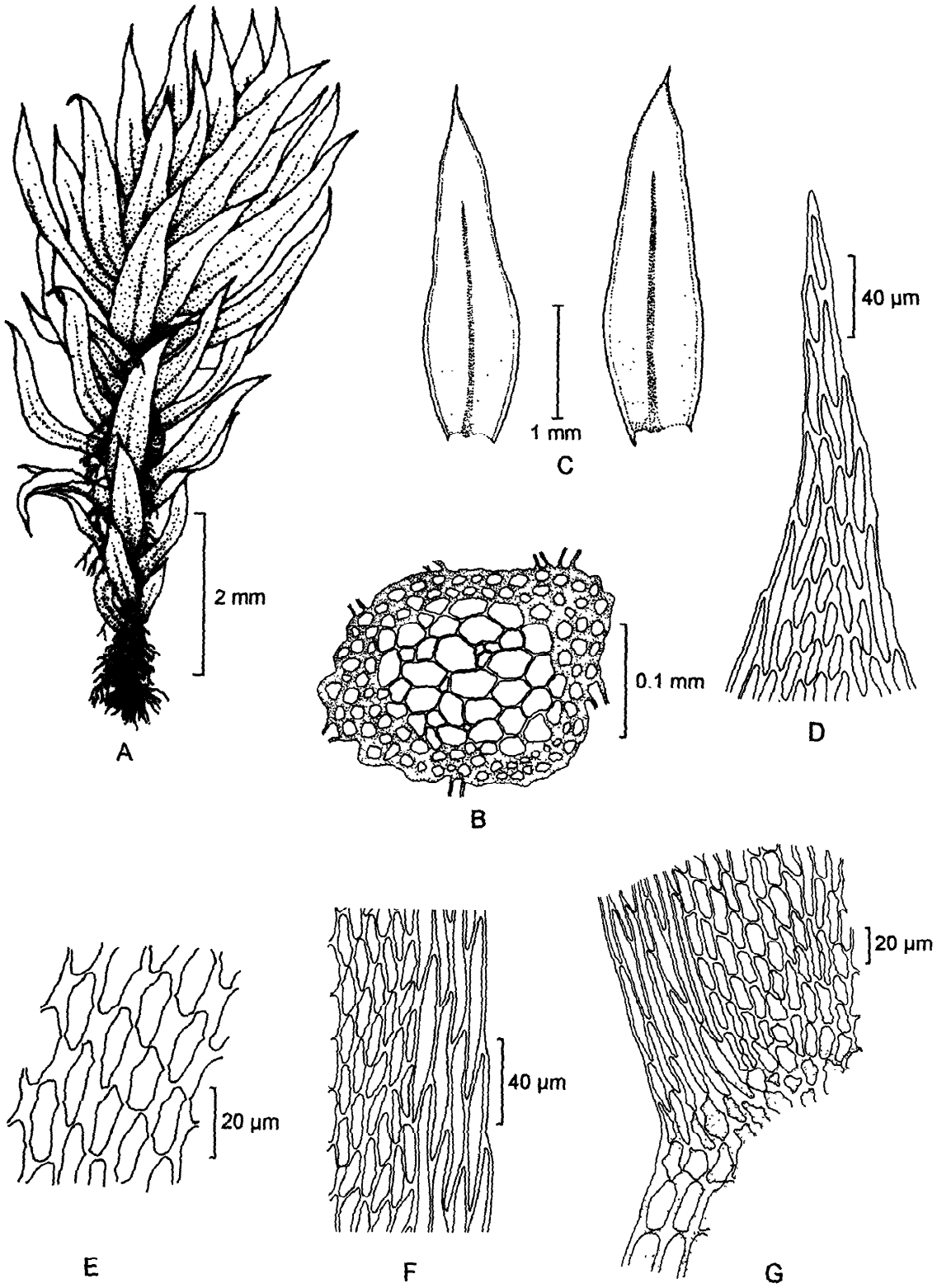

Fig. 3. *Daltonia contorta* Müll. Hal. **A.** Plant; **B.** Cross section of stem; **C.** Leaves; **D.** Leaf apical cells; **E.** Leaf median cells; **F.** Leaf marginal cells; **G.** Leaf basal cells (drawn from *Kariyappa* 3717 p.p.).

Habitat: Corticolous on *Vernonia travancorica* Hook.f., c. 1860 m.

Distribution: Fiji, Hawaii, Indonesia, Malaya, the Philippines, Sri Lanka and India: Western Ghats (Tamil Nadu, Tirunelveli).

Specimens examined: Tamil Nadu, Tirunelveli Dist., W. Ghats, Agasthyamalai, c. 1860 m, 19.04.2010, *K.C. Kariyappa* 3717 p.p.; 3719 p.p.; 3720 p.p.

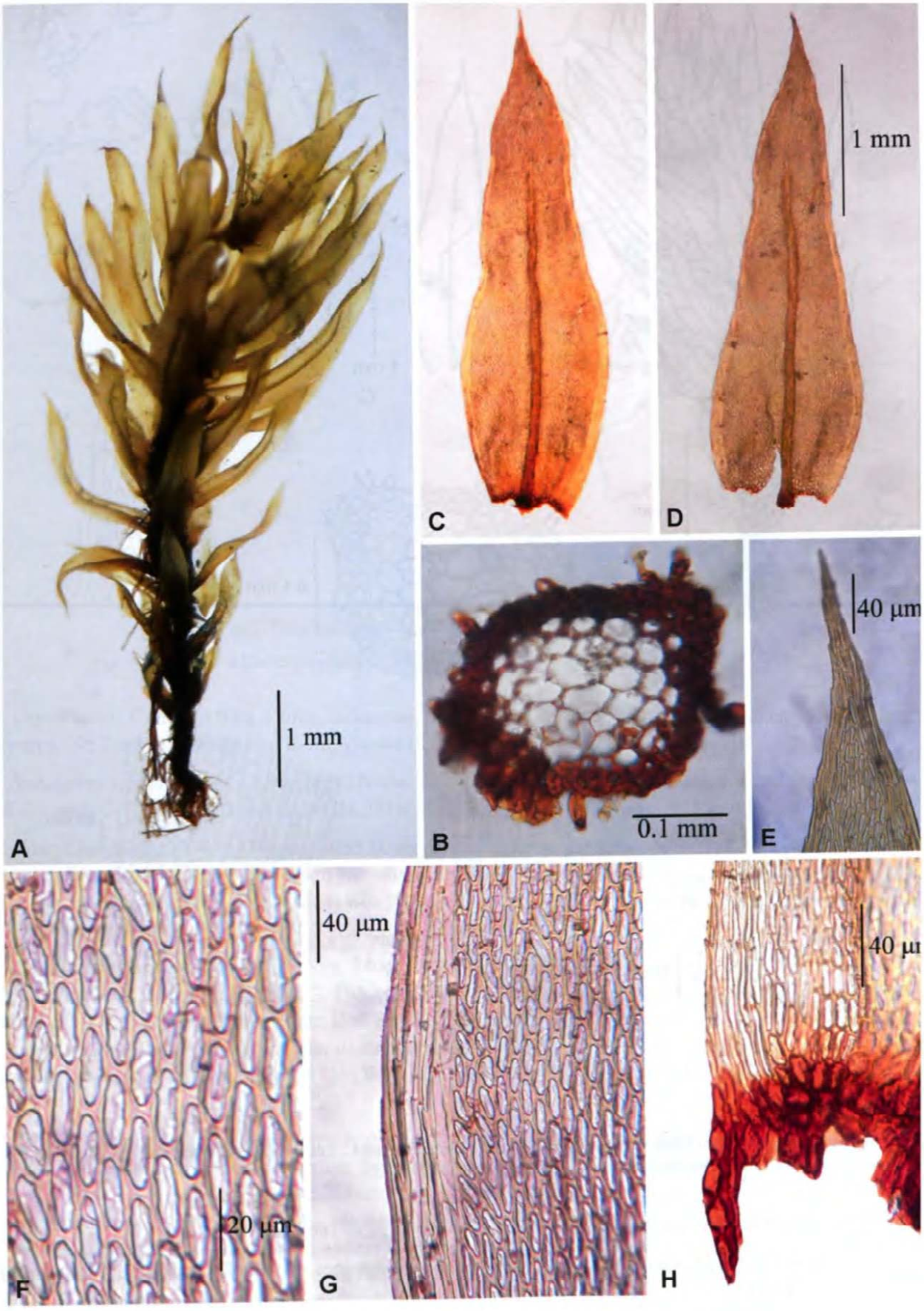

Plate 2. *Daltonia contorta* Müll. Hal. **A. Plant; B.** Cross section of stem; **C & D.** Leaves; **E.** Leaf apex; **F.** Leaf median cells; **G.** Leaf marginal cells; **H.** Leaf basal leaves.

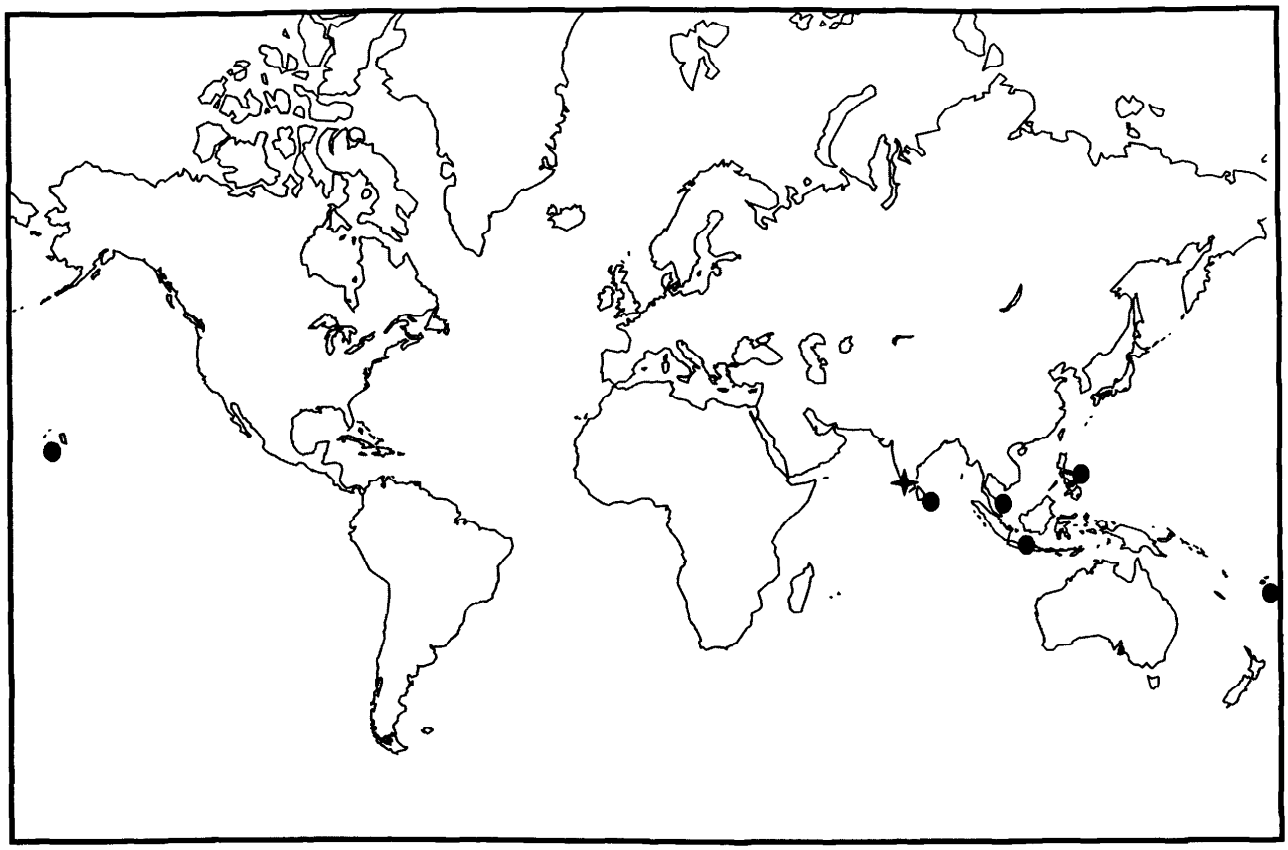

Fig. 4. Distribution of *Daltonia contorta* Müll. Hal.

● Earlier localities ✦ Present locality

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भारत के मॉस वनस्पतिजात के लिए नई *डेल्टोनिआ* की दो जातियां (डेल्टोनिएसी : ब्रायोफाइटा)

ए.इ.डी. डेनिएल्स, के.सी. करियप्पा एवं पी. डेनियल[1]

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सार संक्षेप

दक्षिण-पश्चिमी घाट में अगस्त्यमलै जीवमंडल रिजर्व के तमिलनाडु भाग से भारत के ब्रायोफ्लोरा के नये अभिलेख *डेल्टोनिआ एंगास्टिकोलिआ* एवं *डेल्टोनिआ कॉन्टोर्टा* के वर्णन किए गए हैं। वंश *डेल्टोनिआ* जिसकी पहले भारत में मात्र हिमालय में व्याप्ति ज्ञात थी, प्रायद्वीपीय भारत के ब्रायोफ्लोरा के लिए नया है।