

ADDITIONS TO THE MOSS FLORA OF THE INDIAN MAINLAND

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A B S T R A C T

Four mosses, viz., *Calymperes motleyi*, *Fissidens robinsonii*, *Leucophanes glaucescens* and *L. nicobaricum* are recorded for the Indian mainland. They are described in detail and illustrated.

INTRODUCTION

It is pointed out time and again that the lower groups of plants are continued to be neglected in India. Though our knowledge on the flowering plants of a given region in the country is reasonably good, whatever is known about the cryptogams except the ferns and fern-allies is scanty and sketchy. The Western Ghats region is no exception to this. Hence, with the aim of inventorying the bryophytes of the Western Ghats in Kanyakumari and Tirunelveli Districts of Tamil Nadu we began collecting here four years ago and publish the more important findings as and when find them. In an earlier contribution we recorded a liverwort, *Leptolejeunea balansae* Steph., earlier known to occur only on the Andaman Islands in India, for the Indian mainland (Daniels & Daniel, in press). In the present contribution four mosses, viz., *Calymperes motleyi* Mitt. ex Dozy & Molk., *Fissidens robinsonii* Broth., *Leucophanes glaucescens* C. Müll. ex M. Fleisch. and *L. nicobaricum* C. Müll. ex Gangulee, earlier known to occur on the Lakshadweep Islands, only on the Andaman & Nicobar Islands, on the Andaman Islands and only on the Katschal Island in the Nicobars respectively are added to the moss flora of the Indian mainland. Each species is provided with the correct name, basionym/synonym, if any, a detailed description, notes on habitat and distribution and an illustration. Specimens cited are all deposited at MH and Herbarium, Botany Deptt., Scott Christian College, Nagercoil (SCCN).

Calymperes motleyi Mitt. ex Dozy & Molk., Bryol. Jav. 1: 48. 1856; L.T. Ellis in J. Bryol. 15: 712. 1989-
Type: Borneo, Labuan Is., Tanjong, *Motley s. n.* (BM). *C. isleanum* Besch. in Ann. Sci. Nat. Bot. 6, 9: 344. 1880. Type: Seychelles, Praslin, 1875, *G. de l'Isle s. n.* (BM). *C. omanicum* Besch. in Ann. Sci. Nat. Bot. 8, 1: 264. 1895. Type: Indian Ocean, Laccadives, Minikoi, 1891, *H.M.S. Investigator s. n.* (BM). *C. panduraefolium* Broth. in Ofvers Förh. Kongl. .Sevenka Vetensk.-Akad. 40: 165. 1898. Type: Australia, Torres Straits, Cape York, 1897, *W. Micholitz* 210 (BM). (Fig. 1)

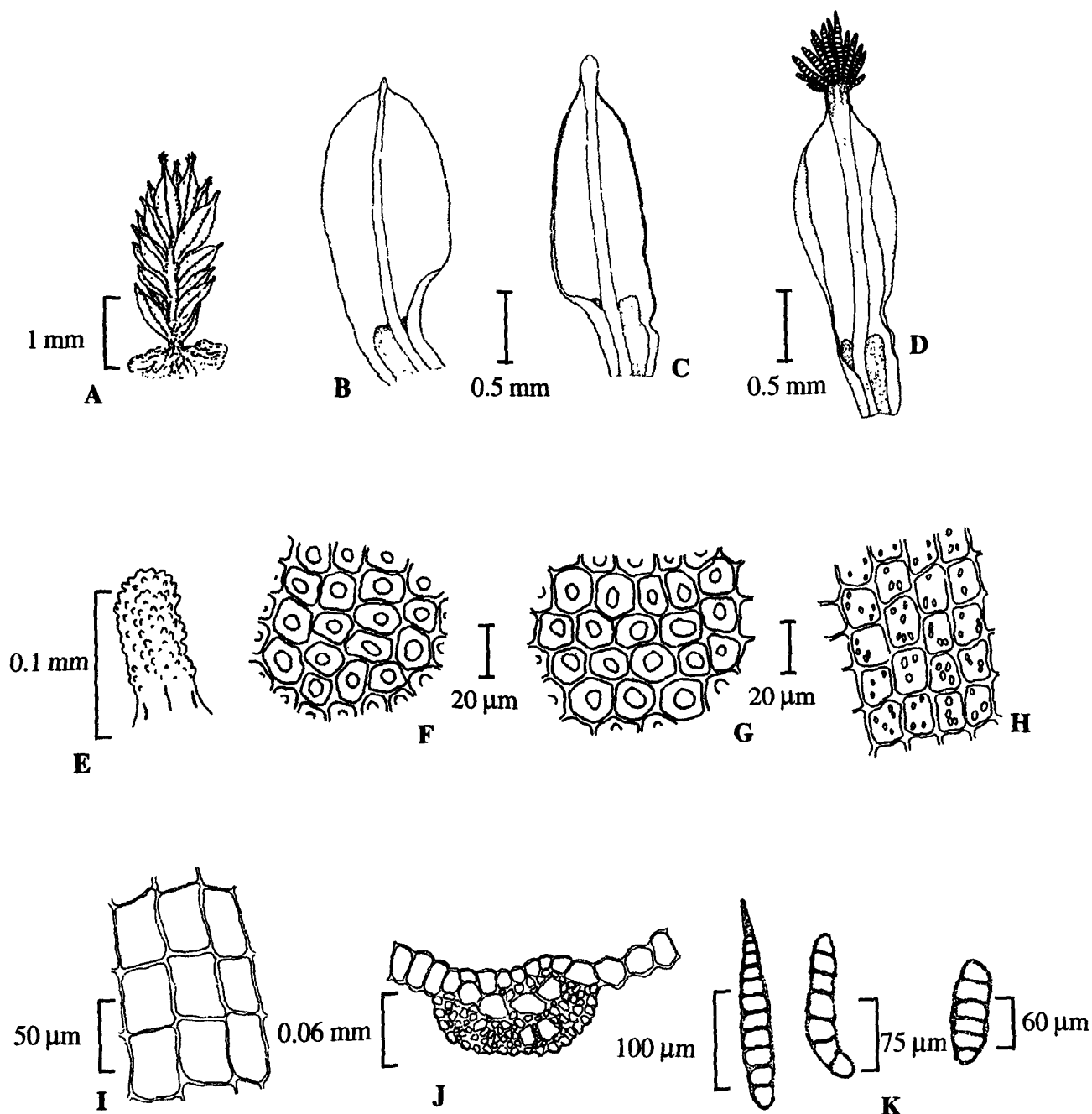


Fig. 1 (A-K). *Calymperes motleyi* Mitt. ex Dozy & Molk.

A. Plant; B & C. Leaves; D. Leaf with gemmae; E. Leaf apex dorsal side; F. Leaf apical cells;
 G. Leaf median cells; H. Leaf basal cells near margin; I. Leaf basal cells near costa;
 J. Costa C. S.; K. Gemmae.

Plant 3-4 mm, in tufts or mats, yellowish green. Leaves incurled when dry, erecto-patent when moist, dimorphic; nongemmiferous ones $1.5-2 \times 0.5-0.9$ mm, obovate to unguulate with plane to mildly inrolled margin, obtuse to blunt-apiculate at apex; costa percurrent or ending below tip; gemmiferous leaves $2-3 \times 0.5-0.7$ mm, suboblong with apex modified into a proboscis and strongly inrolled entire margin; costa strong, extending into proboscis, ending below leaf tip. Gemmae $120-200 \times 30-35$ μ m, in a radial ventral cluster at costal apex. Cells of lamina above semisheathing base rounded-hexagonal; apical ones $7-15 \times 5-13$ μ m; median ones $10-20 \times 7-17$ μ m; basal ones of cancellinae $45-70 \times 40-45$ μ m, rectangular; those at margin $20-25 \times 18-23$ μ m. Teniola absent.

Habitat : Corticolous, in foothills.

Distrib. : Oceania, Seychelles, SE. Asia and India: Lakshadweep Islands and Tamil Nadu. Recorded here for the Indian mainland from the foothills of the Western Ghats of Kanyakumari District, Tamil Nadu.

Specimen examined : Tamil Nadu, Kanyakumari Distr., W. Ghats, Melpuram, ca 50 m, 11.6.2002, G. Shilu 183.

Fissidens robinsonii Broth. in Philipp. J. Sci. 13: 204. 1918; Gangulee, Moss. E. India 1(2): 534. 1971.-
Type: Nicobar Is., *Hampe* 3858 (BM). (Fig. 2)

Plant 3-8 mm high, yellowish green. Stem with a small protuberance near axils of mature leaves from which rhizoids arise. Leaves 8-15 pairs, closely pinnate, shrunk when dry, $1.5-2 \times 0.2-0.4$ mm, lanceolate, narrowing from sheathing lamina, recurved at margin; sheathing laminae equal and closed or unequal and open ending a little below leaf margin; dorsal lamina rounded at base, more or less symmetrical at apex; costa excurrent, yellow-brown; cells 5-8 μ m, irregularly rounded-hexagonal, mamilliose-conical-papillate, not obscure. Sporophyte not seen.

Habitat : Terricolous, in open degraded forests.

Distrib. : India: Andaman & Nicobar Islands and Tamil Nadu. Recorded here for the Indian mainland from the Western Ghats of Tirunelveli District, Tamil Nadu.

Specimen examined : Tamil Nadu, Tirunelveli Distr., W. Ghats, Kalakkad-Mundanthurai Tiger Reserve, Mundanthurai, ca 240 m, 30.7.1999, *Daniels* 566.

Leucophanes glaucescens C. Müll. ex M. Fleisch., Musc. Buitenzorg 1: 178. 1904; Gangulee, Moss. E. India 1(2): 433. 1971. Type: India, Andaman Is., *Kurz* s.n. (BM). (Fig. 3)

Plant 1-1.5 cm high, whitish green. Stem ca 6×0.14 mm, branched or not, without a central strand; cortical cells $10-16 \times 8-13$ μ m; medullary ones $24-32 \times 20-22$ μ m. Leaves $4-9 \times 0.5-0.8$ mm, lingulate, patent to spreading, without much change when dry; costa broad, almost covering entire leaf

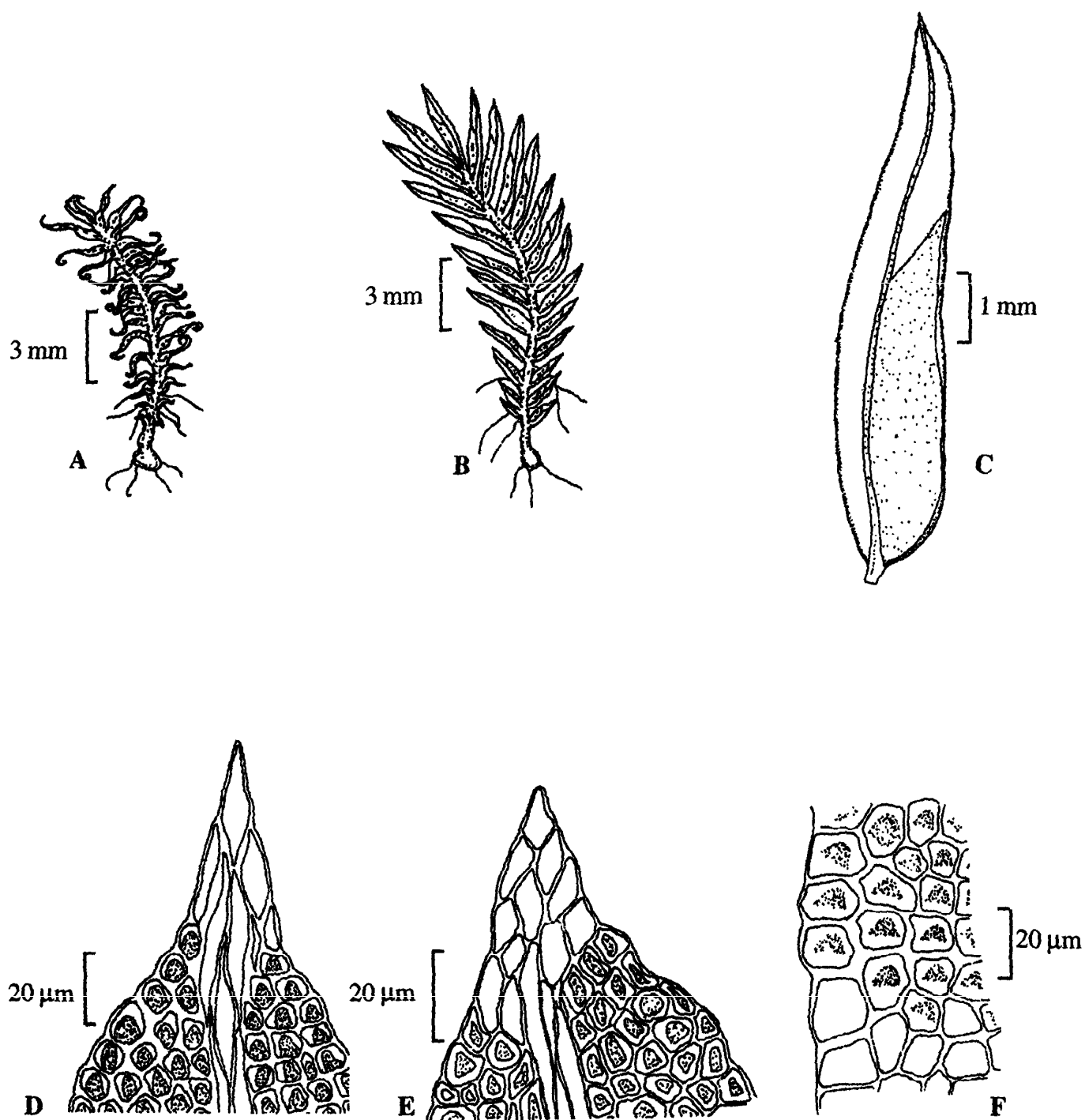


Fig. 2 (A-F). *Fissidens robinsonii* Broth.

A. Plant when dry; B. Plant when wet; C. Leaf; D & E. Leaf apices; F. Leaf Basal cells.

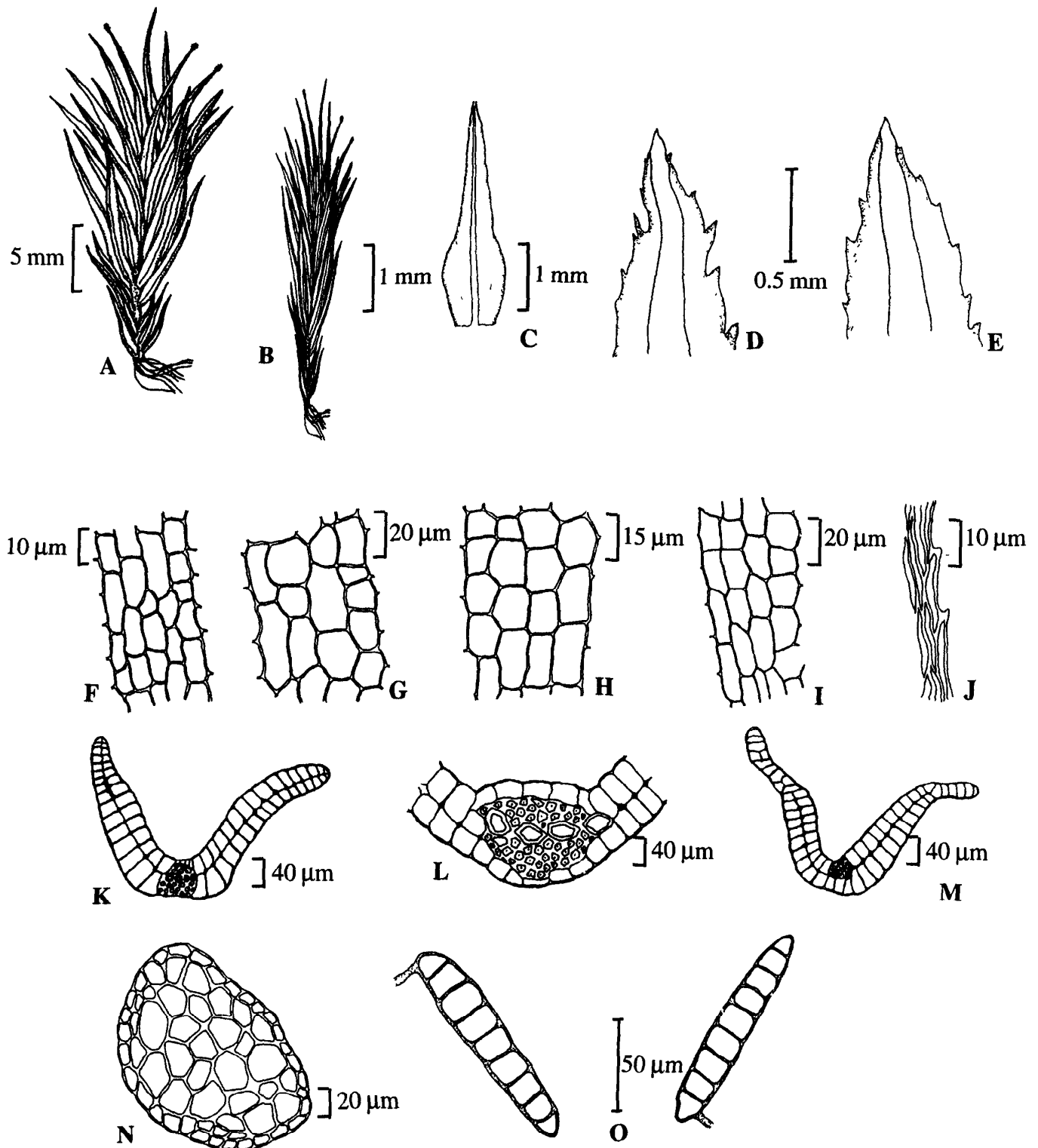


Fig. 3 (A-O). *Leucophanes glaucescens* C. Müll. ex M. Fleisch.

A. Plant; B&C. Leaves; D. Leaf apex dorsal side; E. Leaf apex ventral side;
 F. Leaf apical cells; G. Leaf median cells; H. Leaf basal cells; I. Leaf marginal hyaline cells at
 base; J. Leaf marginal cells; K-M. Leaf C.S. showing stereide band on costa; N. Stem C.S.; O.
 Gemmae.

width at apex, narrower at base, smooth at back, sometimes with scattered spines below with a central stereide band dorsally flanked on either side by short hyaline cells at base; chlorocysts one-layered between 2 layers of leucocysts in cross section; margin bordered throughout by 2–4 layers of narrow elongated cartilaginous $44\text{--}50 \times 4\text{--}6 \mu\text{m}$ cells, spinose at apex; apex acute with a short spinulose tip. Apical cells $10\text{--}28 \times 10\text{--}14 \mu\text{m}$; median ones $16\text{--}52 \times 16\text{--}20 \mu\text{m}$; basal ones $16\text{--}36 \times 16\text{--}20 \mu\text{m}$; hyaline basal cells $20\text{--}52 \times 20\text{--}30 \mu\text{m}$; leucocysts rectangular, $18\text{--}40 \times 12\text{--}24 \mu\text{m}$ above, $20\text{--}56 \times 12\text{--}32 \mu\text{m}$ below. Sporophyte not seen. Gemmae at leaf apex, $100\text{--}120 \times 24 \mu\text{m}$, 9-celled.

Habitat : Corticolous, near water sources in evergreen forests, rare.

Distrib. : Indonesia, Sri Lanka, Vietnam and India: Andaman Islands and Tamil Nadu. Recorded here for the Indian mainland from the Western Ghats of Tirunelveli District, Tamil Nadu.

Specimen examined : Tamil Nadu, Tirunelveli Distr., W. Ghats, Agasthyamalai, ca 900 m, 26.4.2002, Daniels 2080.

Leucophanes nicobaricum C. Müll. ex Gangulee, Moss. E. India 1(2): 438. 1971. – Type: India, Nicobars, Katschal Is., *Kurz s.n.* (BM). (Fig. 4)

Plant 5–8 mm high, whitish green. Stem $0.3\text{--}0.4 \times 0.15 \text{ mm}$, simple, without a central strand; cortical cells $10\text{--}12 \times 2\text{--}4 \mu\text{m}$, moderately thick-walled, brownish; medullary ones $20\text{--}32 \times 20\text{--}22 \mu\text{m}$. Leaves $5\text{--}7 \times 0.3\text{--}0.5 \text{ mm}$, lanceolate from a broader base, erecto-patent to spreading, without much change when dry; costa broad, almost covering entire leaf width at apex, narrower at base, distinctly spinose at back, without a central stereide band, flanked on either side by short hyaline cells at base; chlorocysts one-layered between 2 layers of leucocysts in cross section; margin bordered throughout by 2–4 layers of narrow elongated cartilaginous $75\text{--}85 \times 3\text{--}4 \mu\text{m}$ cells, toothed at apex, wavy below, acute at apex with a short spinulose tip. Apical cells $20\text{--}40 \times 12\text{--}16 \mu\text{m}$; median and basal ones $20\text{--}35 \times 20\text{--}32 \mu\text{m}$; hyaline basal cells $20\text{--}40 \times 20\text{--}25 \mu\text{m}$; leucocysts rectangular, $18\text{--}33 \times 20\text{--}22 \mu\text{m}$ above, $20\text{--}40 \times 20\text{--}28 \mu\text{m}$ at base. Sporophyte not seen. Gemmae at leaf apex, $100\text{--}120 \times 24 \mu\text{m}$, 5-celled.

Habitat : Rupicolous and corticolous, near water sources in evergreen forests, rare.

Distrib. : India: Katschal Island in Nicobars and Tamil Nadu. Recorded here for the Indian mainland from the Western Ghats of Tirunelveli District, Tamil Nadu.

Specimen examined : Tamil Nadu, Tirunelveli Distr., W. Ghats, Agasthyamalai, 750 – 850 m, 26.4.2002, Daniels 2049, 2074.

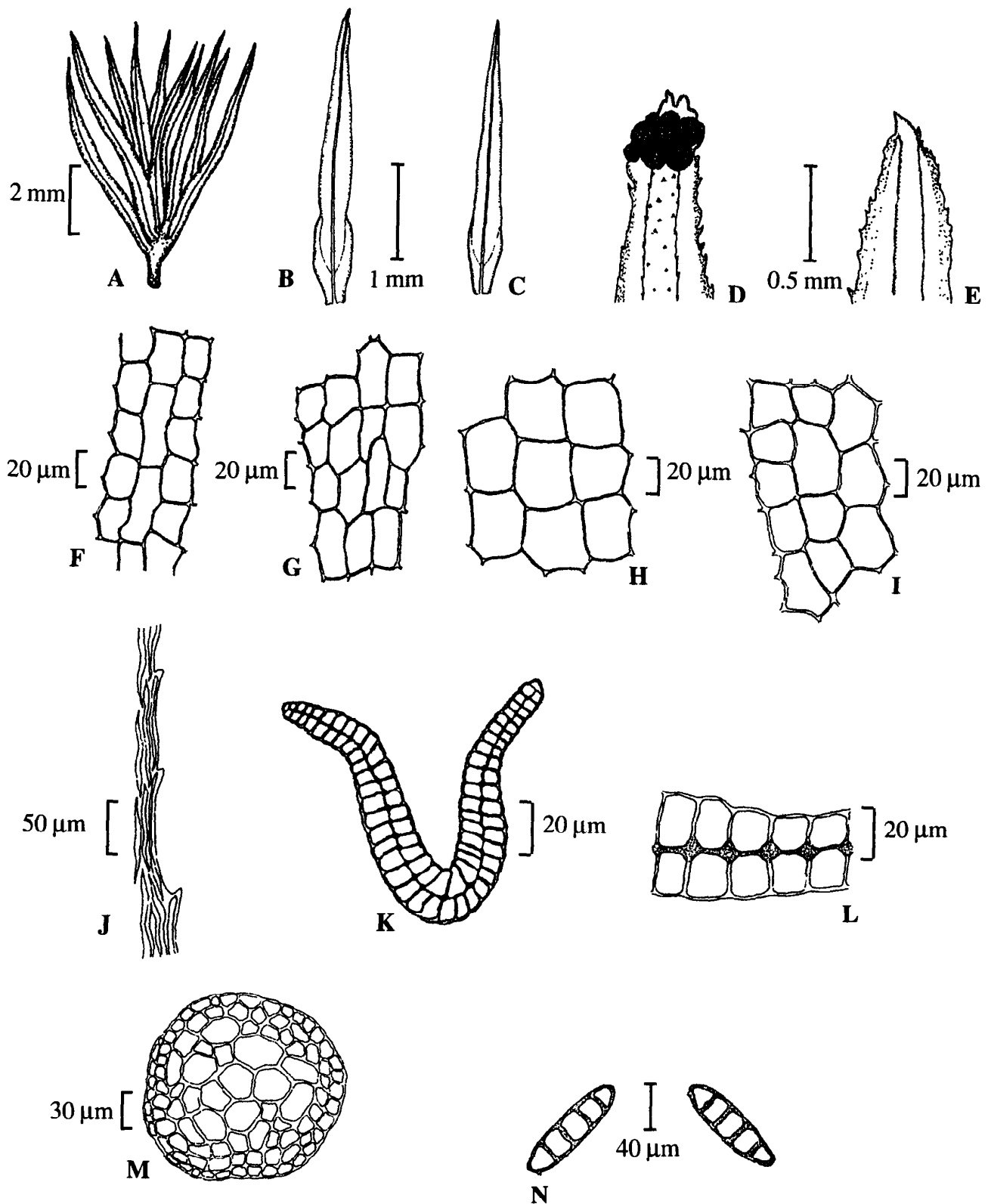


Fig. 4 (A-N). *Leucophanes nicobaricum* C. Müll. ex Gangulee

A. Plant; B & C. Leaves; D. Leaf apex dorsal side; E. Leaf apex ventral side;
 F. Leaf apical cells; G. Leaf median cells; H. Leaf basal cells; I. Leaf marginal hyaline cells at
 base; J. Leaf marginal cells; K & L. Leaf C.S.; M. Stem C.S.; N. Gemmae.

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REFERENCE

DANIELS, A.E.D. AND P. DANIEL. *Leptolejeunea balansae* Steph. (Hepaticae : Jungermanniales) New to the bryoflora of the Indian mainland. *J. Bombay nat. Hist. Soc.* (in press).

भारतीय मुख्य भूमि के मॉस वनस्पतिजात के नये अभिलेख

ए. ई. डी. डेनियल्स एवं पी. डेनियल

सार संक्षेप

भारतीय मुख्य भूमि के लिए चार मॉस *केलिम्पेरेस मोटलेयी*, *फिस्सिडेन्स रोबिन्सोनी*, *ल्युकोफेनिज ग्लॉसिसेन्स* एवं *एल. निकोबेरिकम* के अभिलेख हुए।