

THE MOSS GENUS *OCHROBRYUM* MITT. (*LEUCOBRYACEAE*) ADDED TO THE BRYOFLORA OF THE WESTERN GHATS

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ABSTRACT

The moss genus *Ochrobryum*, with the lone species *O. kurzianum*, earlier known to occur in the Garo Hills (Meghalaya) and the Eastern Ghats (Orissa) in India is recorded for the Western Ghats from the Kerala part of the Agasthyamalai Biosphere Reserve. The species is described in detail, illustrated and its distribution mapped. It is pointed out in the discussion that no Indian bryologist/muscologist had seen any Indian material earlier and that the present material has been collected after more than a century.

Key words: *Ochrobryum*, addition, bryoflora, Western Ghats, Agasthyamalai Biosphere Reserve.

INTRODUCTION

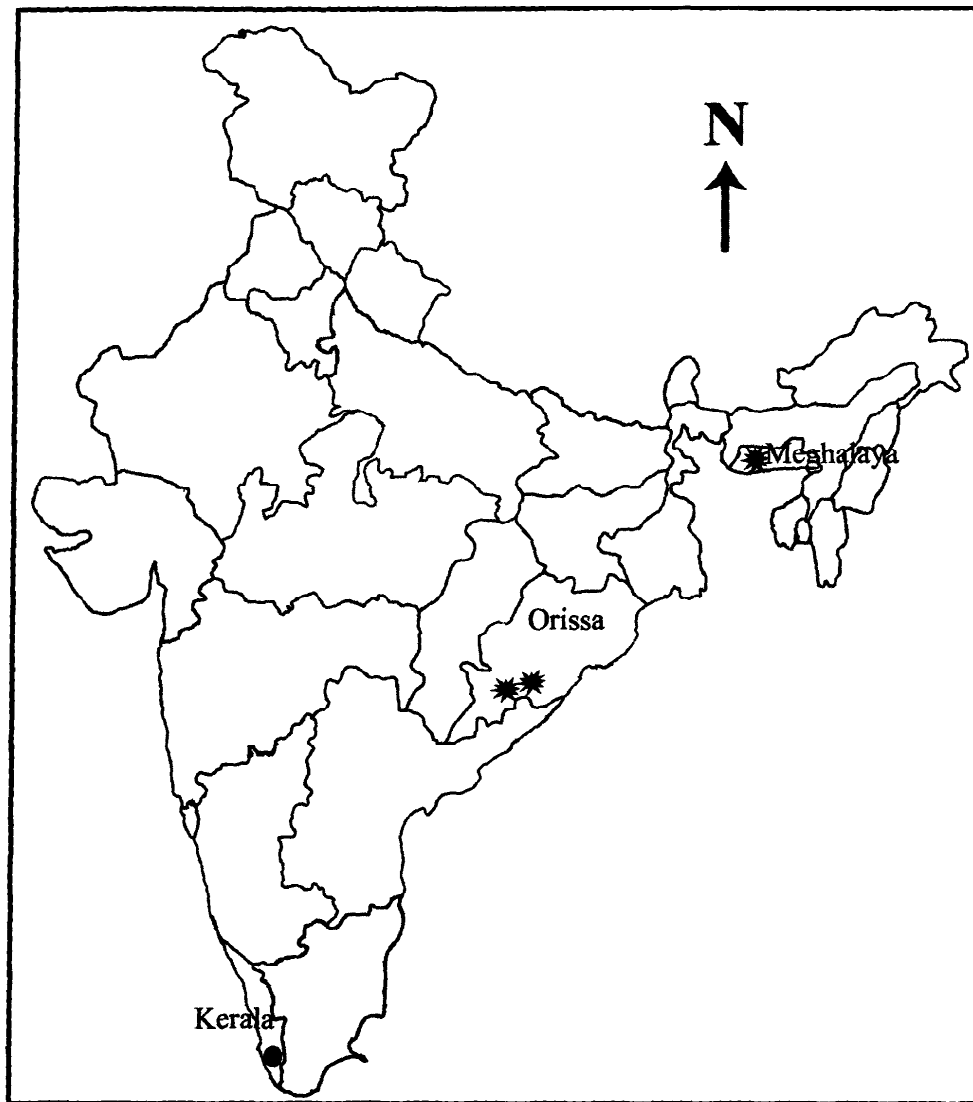
Mitten (1869) established the genus *Ochrobryum*. The type species *O. gardnerianum* (Müll.Hal.) Mitt. is distributed in Central and South America and Africa (Guinea). The genus has 20 species in the world and most of them are distributed in the tropics (Allen, 1992). In India, it is represented by the lone species *O. kurzianum* Hampe ex Besch. (= *O. nepalense* Besch.), earlier known to be distributed in the Garo Hills and the Eastern Ghats.

Lal (2005), following Chopra (1975), included another species *O. propaguliferum* Dixon as well. Allen (l.c.) pointed out that *O. propaguliferum* Dixon (1938) (= *Leucobryum propaguliferum* (Dixon) Robins.) is a superfluous name and as a result illegitimate since it included the type of *O. wightii* Besch. (1897) and the correct name for the species is *Leucobryum humillimum* Cardot (1900) which is a new name for *O. wightii* Besch. (1897) non *L. wightii* Mitt. (1859). Yamaguchi (1993) who included *L. wightii* Cardot as the correct name did not refer to the illegitimacy of either *O. wightii* or *O. propaguliferum* Dixon though he cited both in the synonymy.

Allen (l.c.) stated, "*O. kurzianum* and *O. gardneri* were treated as a single species by Mitten (1859)" Mitten (1869), when he placed *Leucophanes gardneri* Müll.Hal. in *Ochrobryum* as *O. gardneri* (Müll.Hal.) Mitt. cited *Schistomitrium gardneri* (Müll.Hal.) Mitt. as a synonym and two materials from South America and none from Asia. When Mitten (1856) placed *L. gardneri* Müll.Hal. in *Schistomitrium* as *S. gardneri* (Müll.Hal.) Mitt. for the first time he cited Parish No. 2, Moulmein (Burma) from Asia, in addition to the two South American materials. But in 1859, earlier referred to by Allen (l.c.), Mitten, in addition to the two South American materials, cited Wallich (Nepal) (type of *O. nepalense* Besch. 1897), Parish (Moulmein) (type of *O. parishii* Besch. 1897), Wight (Madras) (type of *O. wightii* Besch. 1897, replaced synonym of *Leucobryum humillimum* Cardot), J.D.H. & T.T. No. 1274 (Khasia) (type of *L. mittenii* Besch. 1897) and Bowring (Hong Kong) from Asia. Nowhere did Mitten cite any Kurz material on which Besch. (1897) typified *O. kurzianum*. Besides, since priority for the generic name *Ochrobryum* Mitt. begins in 1869 (and as a result for the species name *O. gardneri*) and for that of *O. kurzianum* only in 1897, nearly three decades later, to conclude that Mitten (1859) treated *O. kurzianum* and *O. gardneri* as a single species, as done by Allen (l.c.), appears somewhat odd.

Bescherelle (1897) separated the Parish material from Moulmein earlier treated as part of *S. gardneri* by Mitten (1856, 1859, vide supra) and the Wallich material from Nepal included therein by Mitten (1859) and described as *O. parishii* Besch. and *O. nepalense* Besch. respectively. He also described *O. kurzianum* Hampe ex Besch. (l.c.) based on four Kurz materials, all from Burma.

Allen (l.c.) after studying ample material considered the three species of *Ochrobryum* viz., *O. parishii*,



Map: Distribution of *Ochrobryum kurzianum* Hampe ex Besch. in India

★ Earlier localities ● Present locality

O. nepalense and *O. kurzianum* described by Bescherelle (l.c.) conspecific. Though all the three names have equal priority Allen (l.c.) chose *O. kurzianum* as the correct name for the combined taxon stating that it is the name in common use in (Southeast) Asia. However, this species has always been known by the name *O. nepalense* in Indian literature.

Allen (l.c.) stated that Bescherelle (l.c.) described *O. kurzianum* Hampe ex Besch. (incl. *O. nepalense* and *O. parishii*) and differentiated it from *O. gardneri* based on the allopatric distribution and certain morphological characters of the lamina, and number of rows of cells therein and pointed out that they are best distinguished based on characters such as leaf lamina narrower, propagula borne on upper dorsal surface of leaves and calyptrae laciniate in *O. gardneri* versus lamina broad, propagula in leaf axils and calyptrae strongly ciliate at base in *O. kurzianum* apart from the different geographic distributions.

Material of *O. kurzianum* was collected in the Kerala part of the Agasthyamalai Biosphere Reserve during our explorations for an inventory of the bryoflora of this region. The genus is added here to the bryoflora of the Western Ghats.

Ochrobryum kurzianum Hampe ex Besch., J. Bot. (Morot) 11: 145. 1897; Bruehl, Rec. Bot. Surv. India 13(1): 29. 1931; B. Allen, Contr. Univ. Mich. Herb. 18: 120. 1992. - Types: Burma, Moulmein, *Stoliczka* [Kurz] 4434 (BM lecto; BM, H isolecto, vide Allen, l.c.). *O. gardneri* (Müll.Hal.) Mitt., J. Linn. Soc., Bot. 12: 108. 1869 (*gardnerianum*), p.p., quoad syn. *Schistomitrium gardneri* (Müll.Hal.) Mitt.; *S.*

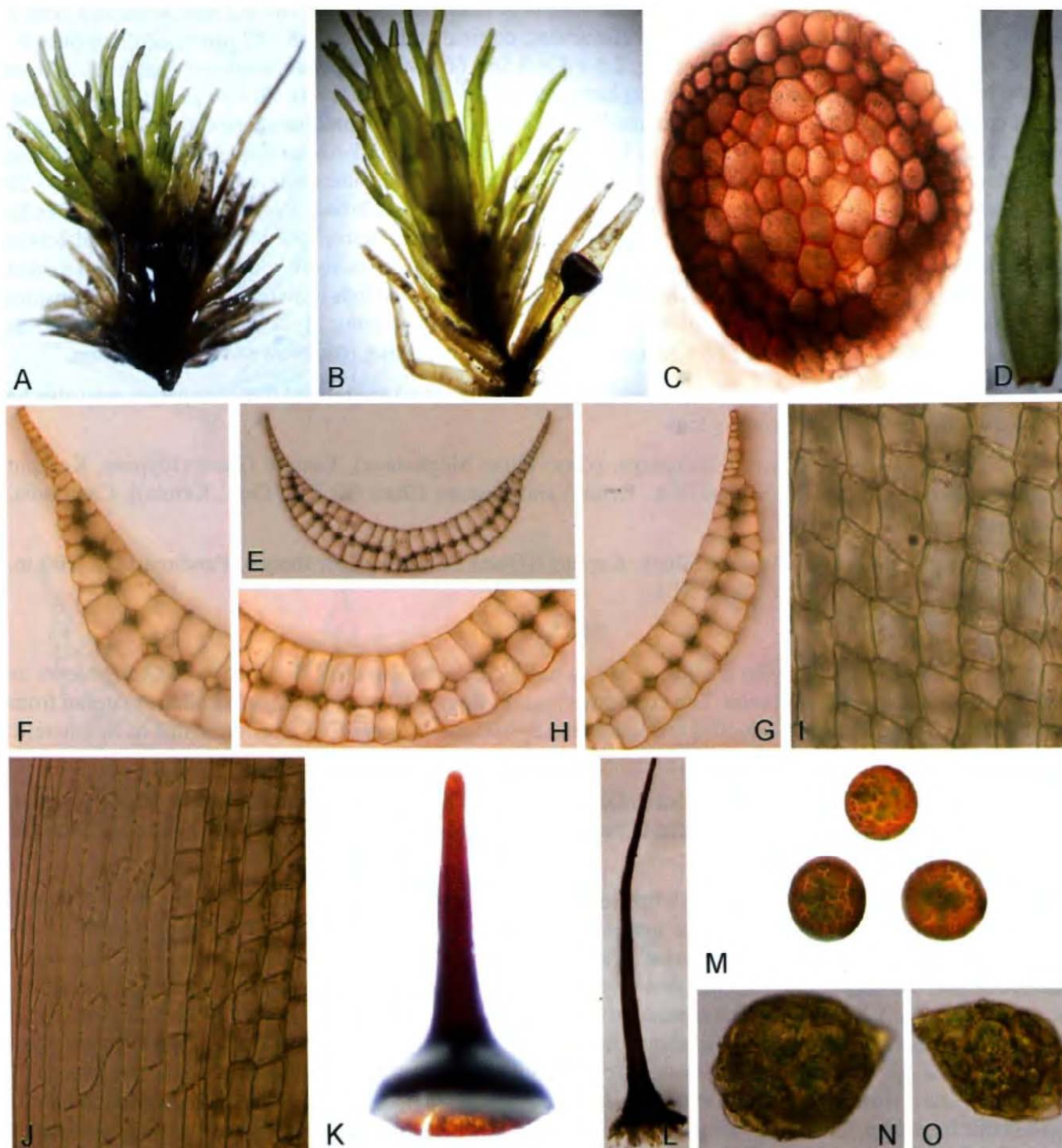


Plate 1. *Ochrobryum kurzianum* Hampe ex Besch.: A & B. Plants with sporophyte; C. Cross section of stem; D. Leaf; E H. Cross section of leaf; I. Leaf median cells; J. Leaf hyaline marginal cells; K. Operculum; L. Calyptra; M. Spores; N & O. Propagula.

gardneri (Müll.Hal.) Mitt. (1856), p.p., Parish No. 2 (Moulmein) & *S. gardneri* (Müll.Hal.) Mitt. (1859), p.p., Wallich (Nepal) & Parish (Moulmein). *O. kurzianum* Hampe [in Mason, Burmah 2: 49. 1883, nom. nud.]. *O. nepalense* Besch., J. Bot. (Morot) 11: 145. 1897; Bruehl, Rec. Bot. Surv. India 13(1): 29. 1931; Gangulee, Moss. E. India 1(2): 412, f. 193. 1971; R.S.Chopra, Tax. Indian Moss.: 89. 1975; R.S.Chopra & S.S.Kumar, Moss.W.Himal.: 63, f. 67. 1981; J.Lal, Checklist Indian Moss.: 145. 2005. Type: Nepal, Wallich 30 (BM holo & iso). *O. parishii* Besch., J. Bot. (Morot) 11: 142. 1897; Bruehl, Rec. Bot. Surv. India 13(1): 29. 1931. Type: Burma, Moulmein, Parish 2 (BM holo; NY iso, also vide Allen, l.c.).

(Plate 1; Fig. 1)

Plants 0.7 - 1 cm high, pale green. Stems simple or branched, 5 - 7 × 0.16 - 0.2 mm, without a central strand, with 10 - 12 quadrate to hexagonal cells across; cortical cells 8 - 16 × 8 - 12 µm; medullary ones 8 - 28 × 8 - 16 µm. Leaves patent to spreading, 2.5 - 4 × 0.56 - 0.66 mm, lanceolate, concave, canaliculate from middle to apex, with one layer of chlorocysts between two layers of leucocysts, 80 - 90 µm in cross section; apical epidermal cells 20 - 40 × 16 - 30 µm; median ones 32 - 80 × 20 - 30 µm; basal ones 60 - 90 × 12 - 16 µm; hyaline marginal cells narrow, elongate, 7- to 10-rowed at base becoming 1-rowed above, with faintly nodulose and pitted walls; inner row of cells 50 - 100 × 12 - 16 µm, those at the outermost two rows 40 - 180 × 6 - 20 µm; leucocysts 30 - 40 × 24 - 30 µm in cross section, rectangular; costa broad. Propagula 1 or 2, in leaf axils, 120 - 150 × 60 - 100 µm, short-stalked, globose to ovoid, brown. Sporophyte lateral. Perichaetial leaves lanceolate, concave, 3.5 - 4 × 0.8 - 1.1 mm. Setae 1.2 - 1.4 mm high, straight, reddish-brown, with a stout vaginula. Calyptrae 4.5 - 5 × 0.8 - 0.88 mm, narrow, elongated, reddish-brown, ciliate at base. Capsules immersed, erect, c. 0.4 × 0.5 mm, subglobose, symmetric; operculum conic, 1 - 1.25 × 0.7 - 0.75 mm, 2/3 as high as urn, reddish-brown. Spores 16 - 20 µm, globose, finely papillose, pale brown to reddish-brown.

Habitat: Terricolous in evergreen forests, c. 200 m. Allen (l.c.) mentioned that the species may also be (epiphytic) on tree trunks and rotting logs.

Distribution: India: [Eastern Himalaya, (Garo Hills, Meghalaya), Eastern Ghats (Jeypore, Koraput Dist. and Russelconda Hills, Ganjam Dist., Orissa) and Western Ghats (Kollam Dist., Kerala)], Cambodia, Myanmar, Nepal and Thailand

Specimens examined: Western Ghats, Kerala, Kollam Dist., Shankili forests, Pandimotta, c. 200 m, 02.06.2009, Kariyappa 17 (SCCN, CAL).

DISCUSSION

Gangulee (1971: 413), who had not seen any Indian material, gave the distribution of *O. nepalense* as East Nepal (Wallich) and Cambodia. The vegetative parts in figure 193 were based on a Poilane material from Cambodia and those of the reproductive ones, as stated by Gangulee, were reproduced from that of Bescherelle (1897).

Chopra (1975: 89) who did not refer to Gangulee (l.c.) keyed out *O. nepalense* and *O. propaguliferum* and gave the distribution as North Western Himalayas and Nepal for the former, and Madras and Ceylon for the latter without citing any specimen.

Chopra and Kumar (1981: 63, 64) who did not refer to either Gangulee (l.c.) or Chopra (l.c.) listed only *O. nepalense* and stated, "In India this genus (*Ochrobryum*) is represented by a single species i.e., *O. nepalense*, which is also found in our area". The distribution given is Western Himalayas, East Nepal and Cambodia. But the only specimen cited is a Cambodian material, perhaps the one earlier cited by Gangulee (l.c.) and Allen (l.c.). In figure 67 the reproductive parts are after Bescherelle (l.c.) (also vide Gangulee, l.c.). Though the authors were not specific about the material on which the vegetative parts were drawn, they perhaps were based on the Cambodian material earlier referred to. Since the authors did not cite any specimen from the Western Himalaya, the reported distribution of the species in this region remains unsubstantiated. Against this backdrop, it appears safe to conclude that no Indian bryologist/musicologist had seen any Indian material earlier.

Though Allen (l.c.) did not say in so many words it appears that he was the first author to record this species for India based on old collections now at BM, H and NY. He did not cite any specimen from the Western Himalaya. Including types Allen (l.c.) cited one material from Nepal, six each from Myanmar (Burma) and Thailand (Siam) and one from Cambodia (also vide Gangulee, l.c.; Chopra & Kumar, l.c.) for this Southeast Asian species. From India Allen (l.c.) cited a Martin material from the Garo Hills, two of Walker from Jeypore and one of Beddome from the Russelconda Hills in the Eastern Ghats of Orissa. So the species was earlier known to occur only in Meghalaya and Orissa in India. The present material shows its extended distribution right up to the Southernmost Western Ghats (Map). Though Allen (l.c.) did not mention the date of collection for any material, literature (Gangulee, 1969, p.7) shows that the Martin material from the Garo Hills is the last to have been collected in India during 1899 - 1901. As a result the present material is a rediscovery of this species, far away from the earlier collected localities, after more than a century. And now that it is found to occur at the opposite ends of the Eastern and Western Ghats, its occurrence in other areas in both these

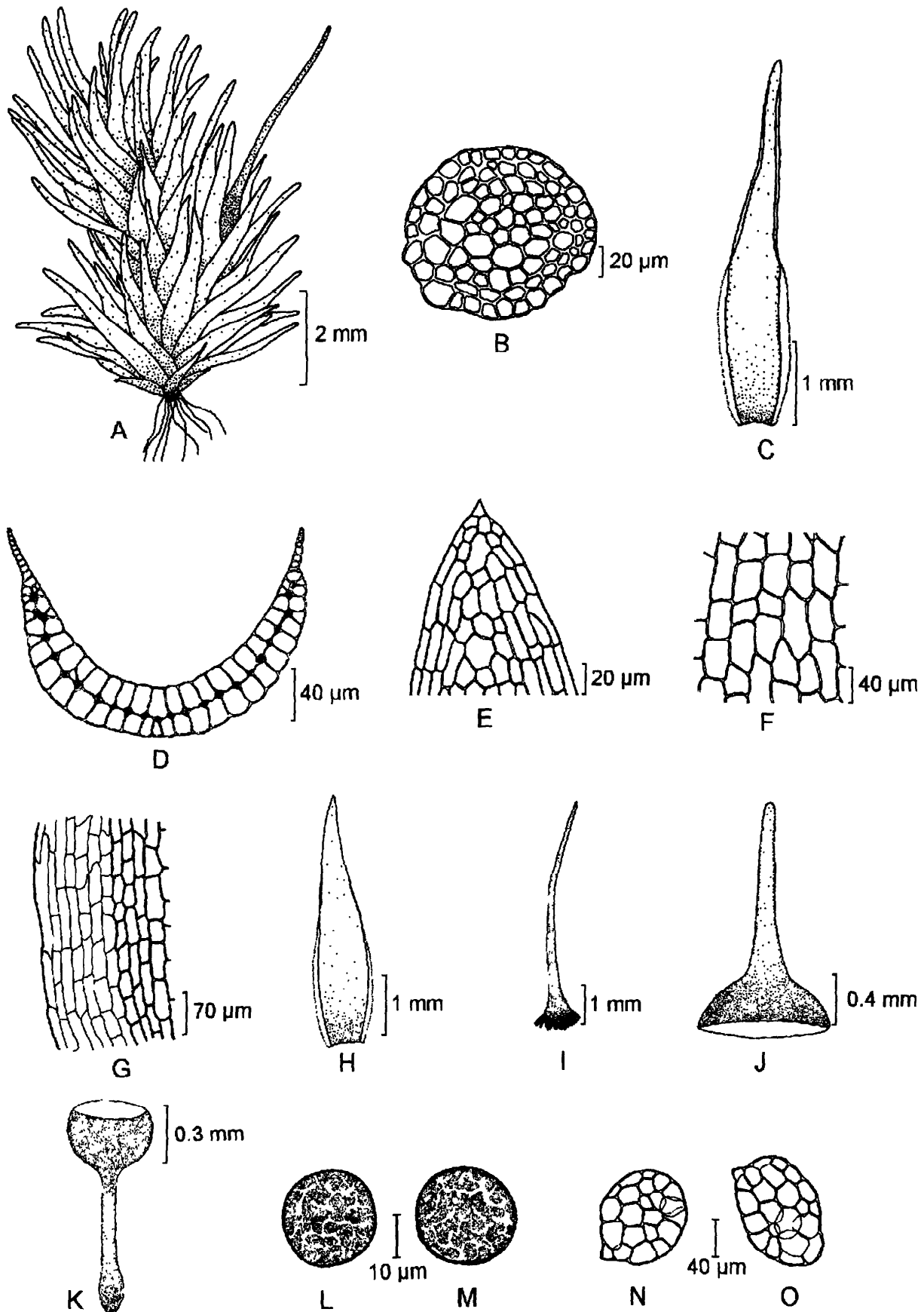


Fig. 1. *Ochrobryum kurzianum* Hampe ex Besch.: A. Plant; B. Cross section of stem; C. Leaf; D. Cross section of leaf; E. Leaf apical cells; F. Leaf median cells; G. Leaf basal cells; H. Perichaetial leaf; I. Calyptra; J. Operculum; K. Capsule urn with seta; L & M. Spores; N & O. Propagula (drawn from Kariyappa 17).

regions cannot be ruled out. The present discovery may be pointed out as a singular instance which goes to prove that most regions in Peninsular India still remain mostly unexplored and/or underexplored for bryophytes.

ACKNOWLEDGEMENTS

We thank the Kerala State Forest Department, for permission to explore the said area and help in the field and Drs. J. Enroth, University of Helsinki, Finland, R.E. Magill and R.H. Zander (MO), G. Hardy (E), P. Venu (CAL) and G. Winter, Senckenberg Natural History Museum, Germany, for help with literature. AEDD is thankful to Dr. S.C. Rose, Principal, Scott Christian College, for encouragement and to Dr. M. Sanjappa, ex-Director, BSI, Kolkata, for his keen interest in the work and encouragement. The financial support from the MoEF, GoI, New Delhi through AICOPTAX is gratefully acknowledged. KCK is grateful for a fellowship.

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पश्चिमी घाट के ब्रायोफ्लोरा में परिवर्धित मॉस वंश ओक्रोब्रायम (ल्यूकोब्रायेसी)

ए.इ.डी. डेनियल्स, के.सी. करियप्पा एवं 'पी. डेनियल

ब्रायोफाइट विज्ञान प्रयोगशाला, वनस्पति विज्ञान विभाग एवं शोध केन्द्र, स्कॉट क्रिश्चियन महाविद्यालय
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सार संक्षेप

भारत में गारो पहाड़ियां (मेघालय) और पूर्वी घाट (उड़ीसा) से पूर्व ज्ञात एक जाति *ओक्रोब्रायम कुर्जिएनम* वाले मॉस वंश *ओक्रोब्रायम* का अगस्त्यमलई जीवमंडल रिजर्व के केरल भाग से पश्चिमी घाट के लिए अभिलेख हुआ है। इस जाति का विस्तृत वर्णन, चित्रांकण एवं व्याप्ति मानचित्रण हुआ है। भारत के किसी ब्रायोलॉजी/मस्कोलॉजी ज्ञाता ने पहले कोई भारतीय सामग्री नहीं देखा है, वर्तमान सामग्री का संग्रह एक शताब्दी से भी बाद हुआ है।