

Contribution to the Hepaticae and Anthocerotae of Mizoram IV. *Lopholejeunea recurvata* Mizut., new to Mizoram

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ABSTRACT

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Lopholejeunea recurvata Mizut., a rare species of Lejeuneaceae, is recorded for the first time from Mizoram, north-eastern India. Detailed taxonomic description and line drawings are provided for its easy identification.

Key-words: *Lopholejeunea recurvata*, new record, Mizoram, north-eastern India.

INTRODUCTION

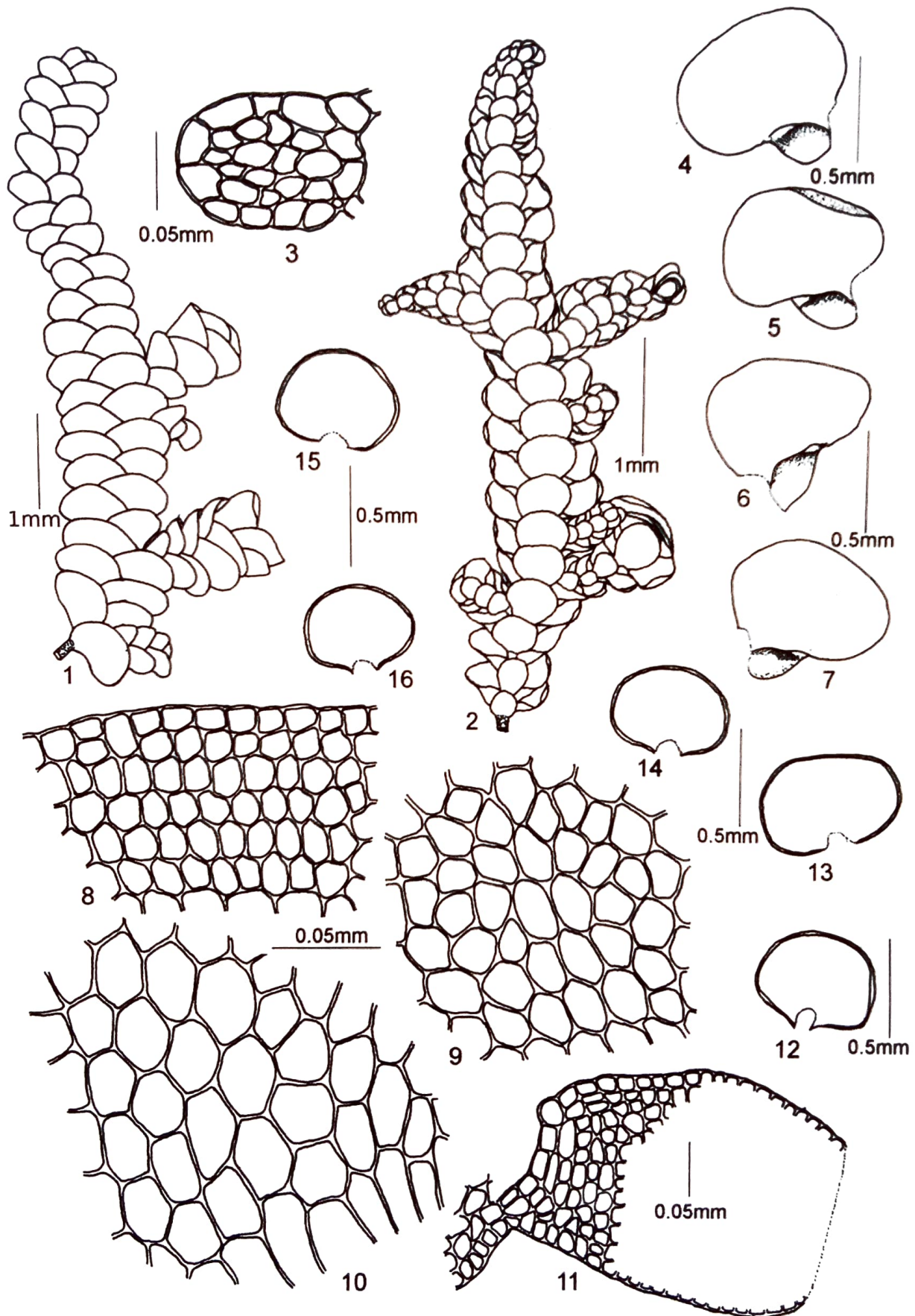
Lopholejeunea (Spruce) Schiffn., belonging to subfamily Ptychanthoideae of Lejeuneaceae, is one of the largest genera of the family and is represented by 123 binomials in the world (Geissler & Bischler 1985). Recently, in a monographic study of genus *Lopholejeunea* from Asia, only 30 species are recognized throughout the world, of which 17 species are accredited to Asia (Zhu & Gradstein 2005). On the basis of characters, viz. unlobed underleaves, isodiametrical leaf cells, homogeneous oil bodies, absence of gynoecial innovations and 2-5-keeled perianth with lacinate to toothed keels, the members of this genus can be easily separated from other allied genera of the family.

In India, the study on this genus was started by Mitten (1861), who described *Lopholejeunea applanata* Nees from Khasia Mountains and Sikkim and *L. subfusca* Nees from Khasia Mountains and southern India. Later, few scattered reports on the genus were made by Stephani (1912), Verdoorn (1934), Mizutani (1976, 1985), Udari et al. (1983), Udari and Awasthi (1983), Joshi et al. (1989) and Singh and Nath (2004). Awasthi et al. (1999) published a detailed

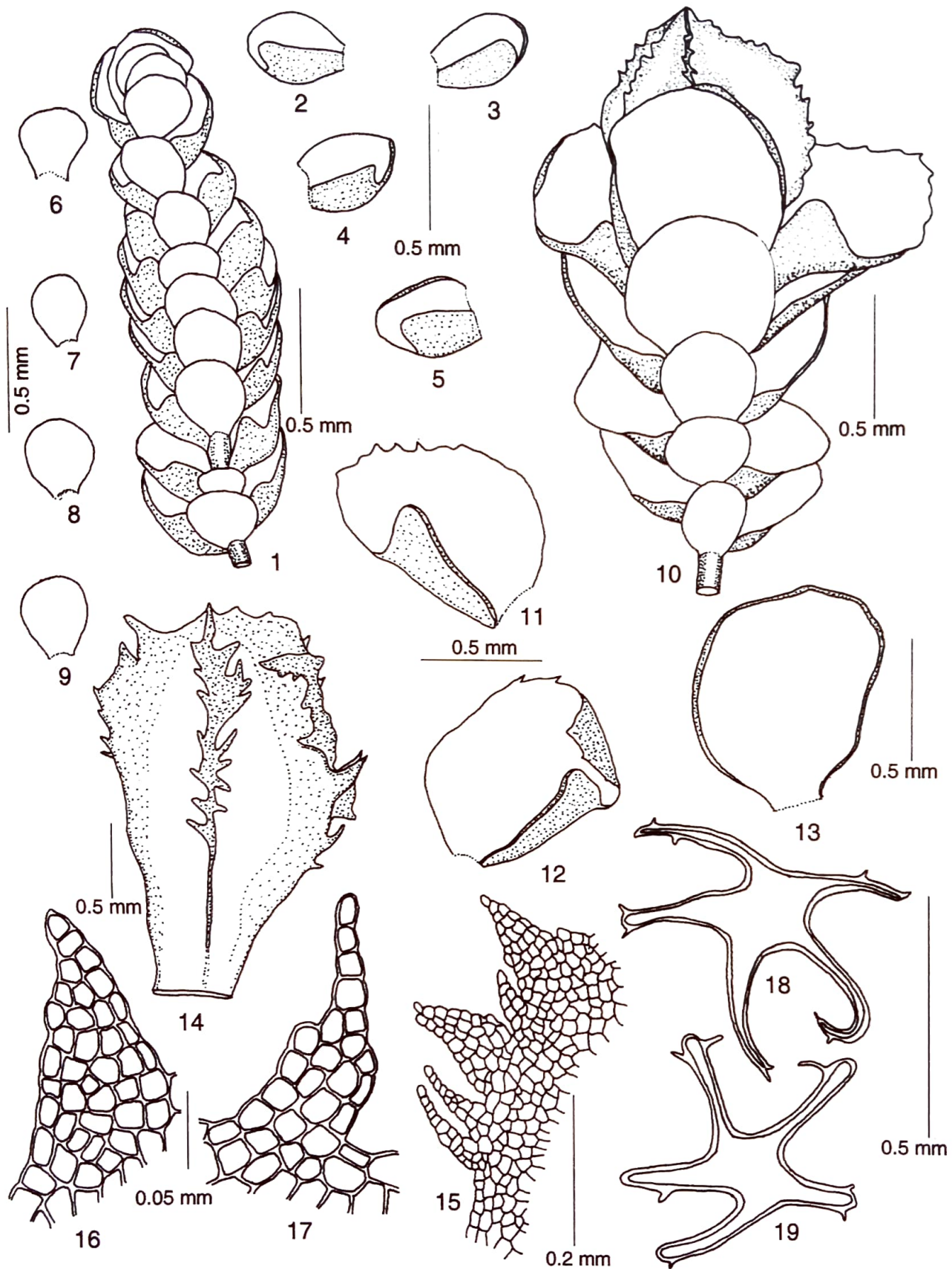
taxonomic account of the genus and recognized 12 taxa from India. However, according to Zhu and Gradstein (2005), only five species, viz. *L. applanata* (Reinw. et al.) Schiffn., *L. eulopha* (Taylor) Schiffn., *L. nigricans* (Lindenb.) Schiffn., *L. recurvata* Mizut. and *L. subfusca* (Nees) Schiffn. are recognized from India.

Lopholejeunea recurvata was instituted by Mizutani (1979) on the basis of collection made by Verdoorn from Java, Indonesia. Subsequently, this species was reported from Papua New Guinea and Malaysia (Mizutani 1987, Zhu & Gradstein 2005). Singh and Nath (2004, 2007) reported this species for the first time from Meghalaya.

During field exploration of Blue Mountain National Park, Mizoram in 2008, the author (S.K.S.) came across with a small epiphytic population of this species. After critical examination, the identity of the plant was determined as *Lopholejeunea recurvata* hitherto not described species from Mizoram. This is interesting to note that this report constitutes the second authentic collection from any of the Indian regions. Author abbreviations in the text follow the Authors of Plant names by Brummitt and Powell (1992).



Text-figure 1. *Lopholejeunea recurvata* Mizut. 1. A portion of the plant in dorsal view. 2. The same in ventral view. 3. C.S. of stem. 4-7. Leaves with lobule. 8. Marginal leaf cells towards apex. 9. Median leaf cells. 10. Basal leaf cells. 11. A leaf-lobule. 12-16. Underleaves.



Text-figure 2. *Lopholejeunea recurvata* Mizut. 1. Male inflorescence showing arrangement of bracts and bracteoles. 2-5. Male bracts. 6-9. Male bracteoles. 10. Female inflorescence showing arrangement of bracts, bracteoles and perianth. 11-12. Female bracts. 13. Female bracteole. 14. A perianth. 15. Laciniae at lateral keels. 16-17. Magnified view of laciniae. 18-19. C.S. of perianth.

TAXONOMIC DESCRIPTION

Lopholejeunea recurvata Mizut. in J. Hattori Bot. Lab. 46: 369. 1979; Singh & Nath in Phytotaxonomy 4: 116. 2004; R. L. Zhu in Syst. Bot. Monogr. 74: 67. 2005.

Text-figures 1, 2

Description: Plants dark brown, 10-22 mm long, 1.0-1.3 mm wide, irregularly branched, branching *Lejeunea*-type. Stem in cross-section spherical in outline, 125-140 µm in diam., cortical cells 12-13, rectangular, comparatively larger than medullary cells, 25-40 x 12.5-22.5 µm, medullary cells 15-18, smaller, 17.5-32.5 x 12.5-20 µm, ventral merophytes 4 cells wide. Leaves imbricate, widely spreading; leaf-lobe ovate, slightly concave, 0.77-0.85 mm long, 0.57-0.62 mm wide, apex rounded to obtuse, incurved, margin entire, marginal cells towards apex subquadrate to quadrate, 10-22.5 x 15-17.5 µm, median cells pentagonal-hexagonal, 20-35 x 15-25 µm, basal cells comparatively larger, 27.5-50 x 17.5-30 µm, trigones triradiate, intermediate thickenings absent; leaf-lobule ovate, 0.30-0.37 mm long, 0.15-0.20 mm wide, apex of the leaf-lobule attached to leaf-lobe by 2-3 cells, apical free margin with a blunt, unicellular tooth. Underleaves imbricate, suborbicular to reniform, 0.45-0.55 mm long, 0.57-0.72 mm wide, usually wider than long, 4-5 times as wider than stem width, margin entire, strongly recurved, base slightly cuneate, insertion arched. Monoecious. Male inflorescence terminal or intercalary, 1.5-2.3 mm long, 0.5-0.6 mm wide, bracts 5-10 pairs, imbricate, obliquely spreading; bract-lobe ovate-oblong, 0.41-0.45 mm long, 0.30-0.33 mm wide, bract-lobule slightly shorter and narrower than bract-lobe, 0.32-0.37 mm long, 0.15-0.18 mm wide; bracteole 5-10, 0.27-0.35 mm long, 0.22-0.30 mm wide. Female inflorescence terminal on the main stem or on lateral branches; bracts in 1-2 pairs, bract-lobe ovate-oblong, 1.0-1.3 mm long, 0.62-0.65 mm wide, apex acute, margin slightly dentate, bract-lobule narrowly oblong, 0.62-0.67 mm long, 0.22-0.25 mm wide, apex obliquely truncate or obtuse, free margin recurved; bracteole ovate-oblong, 0.95-1.2 mm long, 0.75-0.82 mm wide. Perianth slightly emergent, pyriform, 1.0-1.1 mm long, 0.65-0.70 mm wide, 5-

keeled, upper half strongly lacinate, beak short 2-3 cells long.

Specimen examined: Epiphytic, growing on tree trunk in association with *Cheilolejeunea* sp., *Radula* sp. and *Riccardia* sp., Mizoram, Blue mountain National Park, 25.06.2008, S. K. Singh 119782.

Distribution: India: Meghalaya (West Khasi Hills), Mizoram (present study); Indonesia; Malaysia; New Guinea (Mizutani 1979, Gradstein et al. 2002, Singh & Nath 2004, Zhu & Gradstein 2005).

DISCUSSION

Lopholejeunea recurvata is a rare species of the genus *Lopholejeunea*. It is characterized by its lobular attachment with leaf-lobe which is at apex 2-3 cells across and dorsal margin of the leaf-lobe recurved, larger leaf cells, strongly arched insertion line of the underleaves and large female bract-lobules and 5-keeled perianth. This species is closely related to *L. subfusca* (Nees) Schiffn. However, latter is clearly distinct from the former by having almost straight insertion line of underleaves, with reduced female bract-lobules, underleaf and dorsal margin of leaf-lobe flat, leaf-lobe apex rounded and 4-keeled perianth (Zhu & Gradstein 2005).

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