Lopholejeunea soae (Marchantiophyta: Lejeuneaceae)
—New to India from Arunachal Pradesh, Eastern Himalaya

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Lopholejeunea soae R. L. Zhu & Gradst., a species so far known only from China and Thailand, is recorded for the first time in the Indian bryoflora from West Siang district of Arunachal Pradesh in Eastern Himalaya. The species, characterized by having the leaf lobule apex attached to the leaf lobe across 2–3 cells, belongs to section Lopholejeunea of subgenus Lopholejeunea.

Key words: Arunachal Pradesh, Eastern Himalaya, India, Lopholejeunea soae, new record.

The genus Lopholejeunea (Spruce) Schiffn. has maximum diversity and abundance in Southeast Asia with the Malesian archipelago considered to be the center of diversity for the genus (Gradstein 1991, Gradstein et al. 2002, Zhu and Gradstein 2005). The various species of the genus are categorized into three subgenera, namely subg. Lopholejeunea, subg. Pholianthus B. M. Thiers & Gradst. and subg. Pteryganthus B. M. Thiers. The subg. Pholianthus is monotypic and confined only to Australia and New Zealand and the subg. Pteryganthus, with four species, is known only from Africa, whereas the subg. Lopholejeunea is the most diverse and widespread amongst them (Zhu and Gradstein 2005). The Asian species of subg. Lopholejeunea are further classified into two sections, viz. sect. Lopholejeunea and sect. Eulophae Verd.

var. doliformis, L. javanica, L. kashyapii, L. sikkimensis and L. sikkimensis var. dentata as synonyms], L. recurvata and L. subfuscă [incl. L. indica and L. nilgiriensis as synonyms].

Recently, Dey and Singh (2011) described L. udarii M. Dey & D. K. Singh in the Indian liverwort flora. Another species, L. nongstoinii A. P. Singh & V. Nath, described from Meghalaya (Singh and Nath 2006) is an invalid taxon (Art. 40.1; McNeill et al. 2012) and is considered to be a synonym of L. subfuscă.

Recent identifications of the liverworts and hornworts of West Siang district of Arunachal Pradesh in the Eastern Himalaya revealed the presence of L. soae R. L. Zhu & Gradst. known only from China and Thailand (Zhu and Gradstein 2005, Kornochalert et al. 2012). This species is described and illustrated for the first time based on Indian plants.


Plants blackish brown in herbarium; shoots 1.0–2.2 cm long, 0.9–1.4 mm wide including leaves, irregularly branched; branching ‘Lejeunea’ type, present throughout the plant. Stem orbicular – suborbicular in outline in transverse section, 100–165 μm in diameter, 6–8 cells thick; cortical cells in 11–13 vertical rows, more or less rectangular, 21.0–27.5(–36.0) × 16.5–37.5 μm, thin-walled; medullary cells in 19–28 vertical rows, 12.5–22.5 × 14.0–29.0(–34.0) μm, thin-walled with small trigones. Leaves imbricate, widely – obliquely spreading; leaf lobe ovate, 0.47–0.61 mm long, 0.36–0.54 mm wide, apex rounded, usually incurved, margin entire, dorsal margin slightly arched, ventral margin nearly straight; apical leaf cells subquadrate – rectangular, 14.0–19.0 × 12.5–19.0 μm; median leaf cells more or less suborbicular, 20.0–34.0 × 16.0–26.0 μm; basal leaf cells oval – ellipsoidal, 31.0–46.0 × (16–)20.0–25.0 μm; slightly thick-walled with distinct trigones, intermediate thickenings frequent; cuticle smooth; oil-bodies not seen; leaf lobule inflated, 2/5–1/2 as long as the leaf lobe, ovate-triangular – rectangular, 0.2–0.3 mm long, 0.1–0.17 mm wide; free lateral margin bordered by 8–9 cells, apex attached to leaf lobe across 2(–3) cells, apical tooth unicellular, indistinct; keel arched, smooth. Underleaves contiguous – distant, 2.0–3.5 times as wide as the stem, more or less suborbicular, 0.28–0.39 mm long, 0.36–0.5 mm wide, usually wider than long, apex rounded, margin entire, often recurved. Rhizoids few, near the base of underleaves.

Monoicous. Androecia intercalary – terminal on main shoot or short lateral branches; bracts in 3–5 pairs, densely imbricate; bract lobe ovate – oblong ovate, 0.49–0.58 mm long, 0.26–0.39 mm wide, apex obtuse, margin entire; bract lobule strongly inflated, 3/4–4/5 as long as the bract lobe; bracteoles present throughout the androecium, more or less suborbicular, 0.26–0.35 mm long, 0.26–0.43 mm wide, apex rounded, margin entire. Gynoecia terminal on lateral branches, pseudoinnovations absent; bracts in 1 pair, bract lobe oblong-ovate, 0.64–0.97 mm long, 0.4–0.52 mm wide, apex acute, obtuse – apiculate, sometimes recurved, margin entire – sparsely dentate; bract lobule oblong – obcuneate, about 1/2–2/3 as long as the bract lobe, margin entire, revolute; bracteole obovate, 0.6–1.0 mm long, 0.58–0.75 mm wide, apex rounded, margin entire, recurved; perianth emergent, pyriform, 0.85–1.0 mm long, 0.54–0.63 mm wide; keels 5 (2 lateral, 2 ventral, 1 dorsal), extending from apex to 1/2–3/5 of perianth length, slightly laciniate or weakly dentate, laciniae 1–6 cells long, 1–5 cells wide at base, lateral keels slightly winged; beak 2 cells long; mature sporophyte not seen.

Habitat: Lignicolous, growing on fallen logs in subtropical forests in association with Caudalejeunea lehmanniana (Gottsche) A. Evans, Drepanolejeunea erecta (Steph.) Mizut., Lejeunea cf. curviloba Steph., L. flava (Sw.) Nees, L. tuberculosa Steph., Plagiochila parvifolia Lindenb., Spruceanthus semirepandus (Nees) Verd.

Specimen examined: INDIA. Eastern Himalaya, Arunachal Pradesh, West Siang District, Payum, 94°39'27"E, 28°34'43"N, ca. 900 m, 11 September 2011, S. Singh Deo 51272D (CAL).

*Lopholejeunea soae* is characterized by the ovate leaf lobe with rounded apex (Fig. 1D–H), leaf lobule 2/5–1/2 as long as the leaf lobe, ovate-triangular–rectangular (Fig. 1D–H), leaf lobule apex attached to leaf lobe across 2(–3) cells (Fig. 1L), oblong-ovate female bract lobe with entire to sparsely dentate margin and oblong–obcuneate bract lobule, about 1/2–2/3 as long as the bract lobe (Fig. 1U, V), pyriform perianth with 5 slightly laciniate or weakly dentate keels (Fig. 1X, Y). The Indian plants of *L. soae* broadly conform to those described by Zhu and Gradstein (2005) in all the significant morphological details.

Amongst the Indian species of the genus, *Lopholejeunea soae* resembles *L. subfusca* (Nees) in general appearance, ovate leaf lobe with rounded, usually incurved apex, and the strongly inflated ovate lobule with apex attached to leaf lobe across 2–3 cells. It can, however, be distinguished from the latter in having the stem with 19–28 medullary cells (8–16 medullary cells in *L. udarii*), leaf cells without protrusions (with dorsal protrusions in *L. subfusca*), female bract lobes with entire or sparsely dentate margin (with strongly dentate margin in *L. udarii*), oblong – obcuneate female bract lobules about 1/2–2/3 as long as the bract lobe and pyriform perianth with 5 slightly laciniate – weakly dentate keels (subtriangulate – rectangulate female bract lobules about 3/5 as long as the bract lobe, obovate perianth which is mostly immersed with 6 strongly laciniate – dentate keels in *L. udarii*) (see also Dey and Singh 2011).

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References


S. D. Singh\(^a\), D. K. Singh\(^b\): アルナチャル・プラデシュ州から新しく報告された、インド新産の *Lopholejeunea soae*（タイ類、クサリゴケ科）

*Lopholejeunea soae* R. L. Zhu & Gradst.（タイ類、クサリゴケ科）が東ヒマラヤに当たる、インド、アルナチャル・プラデシュ州の *West Siang* 地方から得られていたことが明らかとなった。本種はこれまで中国とタイにしか知られておらず、インドでは初めての報告となる。

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