

---

*Leptolejeunea subdentata* Schiffn. ex Herzog, new to  
Meghalaya from East Khasi hills

Praveen Kumar Verma<sup>1</sup>, Krishna Kumar Rawat<sup>2</sup> and Ranjeet Kumar<sup>3</sup>

<sup>1,3</sup>Rain Forest Research Institute Deovan Sotai Ali, Post Box # 136, Jorhat -785001 (Assam)

<sup>2</sup>CSIR-National Botanical Research Institute, Rana Pratap Marg, Lucknow -226 001 (U.P.)  
e-mail of Corresponding author : [pkverma\\_bryo@yahoo.co.in](mailto:pkverma_bryo@yahoo.co.in)

**Abstract**

*Leptolejeunea subdentata* Schiffn. ex Herzog, has been reported as new to Meghalaya from Khasi Hills of Meghalaya. The paper provides its detailed taxonomic description with the note on their status and distribution.

**Key-words:** Bryophytes, Liverwort, *Leptolejeunea*, East Khasi Hills, Meghalaya

**Introduction**

*Leptolejeunea* (Spruce) Schiffn. is usually tropical in distribution with majority of the species growing as epiphyllous flora. The genus is characterized by small, delicate nature of plant; 'Lejeunea-type' branching; stem with 7 large (2 ventral row) cortical and 3 small medullary cells in cross-section; leaf never appressed to each other, more or less erect at an angle of about 45°-60° with numerous small ocelli in leaf-lobe; single large dark-brown supra-basal ocellus; bilobed underleaf with linear lanceolate lobes; basal disc of small compactly arranged cells; always terminal hypostatic androecia; male bracteole present only at the base of androecium and presence of gynoecial innovation. The taxonomic parameters used for species determination are texture of plant; morphology of leaf-lobe, leaf lobule and underleaves; their margin; position and number of ocelli and position of androecial innovation.

In Asia, the genus is represented with 25 species (Piippo 1990), while in India, it is represented by 11 species viz. *Leptolejeunea arunachalensis* Sudipa Das & D. K. Singh, *L. balansae* Steph., *L. epiphylla* (Mitt.) Steph., *L. elliptica* (Lehm. & Lindenb.) Schiffner, *L. foliicola* (Horik.) R.M. Schust., *L. latifolia* Herzog, *L. maculata* (Mitt.) Schiffn., *L. mirikana* M. Dey & D. K. Singh, *L. subdentata* Schiffn. ex Herzog, *L. sikkimensis* Udar & U.S. Awasthi, A. Evans and *L. udarii* M. Dey & D. K. Singh (Awasthi 1986; Udar and Awasthi, 1979; Udar and Awasthi 1982; Zhu and Long 2003; Daniels and Daniel 2004; Das and Singh 2008; Singh *et al.* 2006; Dey and Singh 2010).

Being the part of Meghalaya plateau, the Khasi Hills are highly dissected and have irregular terrain and steep slope interspersed with river valleys. The climate of the district ranges from temperate in the plateau region to the warmer tropical and sub-tropical pockets on the Northern and Southern regions. The region hosts an interesting diversity of plants including all the three lineages of bryophytes viz. Liverworts, Hornworts and Mosses, out of which several have already been recorded from Khasi hills from time to time (Srivastava and Rawat 2001; Nath and Singh 2006; Singh *et al* 2008a; 2008b; Singh and Nath 2007a, 2007b, 2008).

In recent collections from Khasi Hills, one of the terricolous species has been identified as *Leptolejeunea* and after proper taxonomic study and comparison with available authentic literature (Zhu and So, 2001; Singh *et al.* 2006), the species has been validated as *Leptolejeunea subdentata* (Mitt.) Steph. It is a welcome addition to Meghalaya state, as it was earlier known in India only from 'Lower Dibang Valley' district of Arunachal Pradesh (Singh *et al.*, 2006).

### Material and Method

Field survey of bryophytes growing as terricolous population in East Khasi hills of Meghalaya was made in the month of September 2012. All the specimens collected from this site are deposited at the Cryptogamic Herbarium of Rain Forest Research Institute (RFRI), Jorhat, India.

### Taxonomic description and discussion

*Leptolejeunea subdentata* Schifff. ex Herzog, Flora 135: 403. 1942 (Fig. 1. 1-3)

Plants terricolous, appressed, pale green or light green, up to 9 mm long, 1.3 mm wide; growth habit deliquescent, branching 'Lejeunea-type, collar small, microphyllous branches present. Stem differentiated; cortical cells 7, ventral stem merophytes 2 cells wide. Rhizoids hyaline, numerous, fasciculate. Leaves contiguous to sub imbricate, spreading at angle of 60° from stem; leaf-lobe obovate (fan shaped), widely spreading, 0.55-0.83 mm long, 0.40-0.61 mm wide, apex apiculate; teeth present at apex, 3-6 in number, blunt, 1-3 cells long; leaf-lobe cells thin-walled, trigones small, intermediate nodulous present along the walls; marginal cells subquadrate, 14-20 x 11-19 µm, median cells hexagonal, 18-25 x 13-24 µm. Suprabasal ocellus single, light brown, 53-89 x 26-31 µm; Scattered Ocelli up to 14 per leaf lobe, scattered, (11) 30 x 26 (09) µm; leaf-lobule oblong, 1/3 as long as the lobe, inflated, rectangular, free lateral margin usually slightly incurved, apex obliquely truncate, with 2 teeth, tooth obtuse, first tooth one celled, second tooth obsolete, hyaline papilla at proximal side of first tooth, keel faintly arched to straight, smooth. Underleaves distant, deeply bilobed, about half of underleaf length, lobes lanceolate to ligulate, sinus 'U' shaped, 2-3 cells long. Fertile plant not found.

**Type locality:** Indonesia (Java - Tjiburrum. Massart) (Zhu and So 2001).

**Range:** Asia: Vietnam (Jovet-Ast & Tixier 1958), Japan, Indonesia, Malaysia, Philippines (Onraedt 1991; Piippo & Tan 1992), New Caledonia (Hiirlimann 1995), China (Zhu and So 2001) and India (Singh *et al.* 2006).

**Distribution in India:** Arunachal Pradesh – Lower Dibang Valley (Singh *et al.* 2006), Meghalaya (present report).

**Ecology:** Plants form terricolous population on wet rocks.

**Specimen examined:** India: Meghalaya – East Khasi Hills (1.5 km from Laitlyngkot towards Dawaki), 25°26'31.0" N, 91°50'46.6" E; about. 1556 m; 26.09.2012; P. K. Verma and Party; 212/2012 (RFRI).

*Leptolejeunea subdentata* is easily separable from other Indian species of *Leptolejeunea* in shape and size, while differentiation with other species of the genus already described in detailed by Singh *et al.* 2006.

#### Acknowledgments

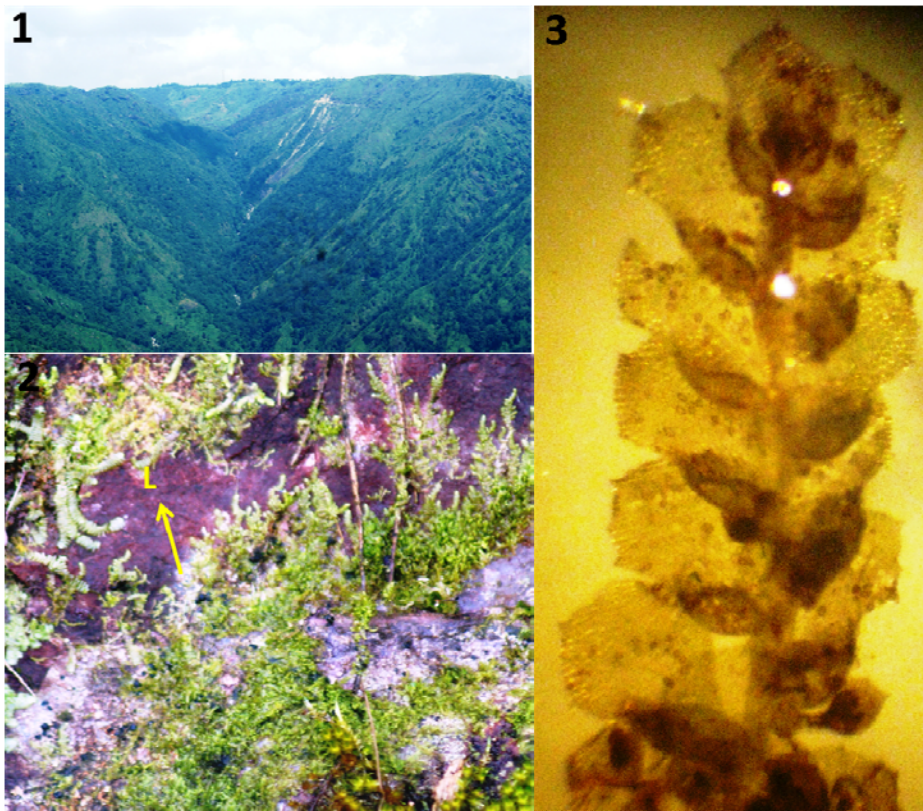
We are thankful to the Director, Rain Forest Research Institute, Jorhat, Assam, for his valuable support and facilities for study and Department of Environment and Forests, Meghalaya for permission to carry out field activities.

#### Literature:

- AWASTHI, U. S. (1986). The genus *Leptolejeunea* (Spruce) Steph. in India. *Journal of Indian Botanical Society* 65: 117-123.
- DANIELS, A. E. D. AND DANIEL, P. (2004). *Leptolejeunea balansae* Steph. (Hepaticae: Jungermanniales) – A new record of bryoflora from the Indian mainland. *Journal of Bombay Natural History Society* 101: 333-334.
- DAS, S. AND SINGH, D. K. (2008). *Leptolejeunea arunachalensis* (Lejeuneaceae, Hepaticae) – a new species from India. *The Journal of Japanese Botany* 83: 343-346.
- DEY, M. AND SINGH, D. K. (2010). Two new epiphyllous *Leptolejeunea* (Hepaticae: Lejeuneaceae) from Eastern Himalaya, India. *Taiwania* 55: 355-362.
- HURLIMANN, H. (1995). Hepaticae aus dem Gebiete des Sudlichen Pazifik XIII. *Bauhinia* 11 : 159- 175.
- JOVET-AST, S. AND TLXIER P. (1958). Hepatiques du Viet-Nam. I. - Rev. Bryol. Lichenol. 27: 201-210.
- NATH, V. AND SINGH, A. P. (2006). *Frullania udarii* Nath *et* Singh – A new species from Meghalaya, India. *Current Science* 91: 744-746.
- ONRAEDT M. (1991). Bryophytes des Iles Philippines. I. Le genre *Leptolejeunea* (Spruce) Steph. - *Journal Hattori Botanical Laboratory* 70: 157-166.
- PIIPPO, S. (1990). Annotated catalogue of Chinese Hepaticae and Anthocerotae. *Journal Hattori Botanical Laboratory* 68: 1–192.
- PIIPPO, S. AND TAN, B.C. (1992). Novelities for the Philippine hepatic flora. *Journal Hattori Botanical Laboratory* 72: 117-126.
- SINGH A. P. AND NATH, V. (2007a). A New *Calypogeia* Raddi from India. *Taiwania* 52(4): 320-323.
- SINGH, A.P. AND NATH, V. (2007b). *Hepaticae of Khasi and Jaintia hills: Eastern Himalayas*, Bishen Singh Mahendra Pal Singh, Dehra Dun.
- SINGH A. P. AND NATH, V. (2008). A New Species of *Trocholejeunea* (Hepaticae: Ptychanthoideae) from Meghalaya, Eastern Himalayas, India. *The Journal of Japanese Botany* 83: 1-6.
- SINGH, A. P. NATH, V. AND ASTHANA, A. K. (2008a). Studies on Two Noteworthy Species of *Drepanolejeunea* (Lejeuneaceae) from Meghalaya (India). *The Bryologist* 111: 476–481
- SINGH, A. P. KUMAR, D. AND NATH, V. (2008b). Studies on the Genera *Frullania* Raddi and *Jubula* Dum. From Meghalaya (India): Eastern Himalayas. *Taiwania* 53: 51-84.
- SINGH, D. K., DAS, S. AND DEY, M. (2006). *Leptolejeunea subdentata* Schiffn. ex Herzog (Hepaticae: Lejeuneaceae) New to India. *Indian Journal of Forestry* 29: 339-342.

- 
- SRIVASTAVA, S. C. AND RAWAT K. K. 2001. On a long-lost endemic liverwort (Hepaticae) from India. *Current Science* 80: 1484-1486.
- UDAR, R. AND AWASTHI, U. S. (1979). A new species of *Leptolejeunea* from India. *Misc. Bryol. et Lichenol.* 8: 115-117.
- UDAR, R. AND AWASTHI, U. S. (1982). *Leptolejeunea foliicola* St. – New to Indian Bryoflora. *J. Indian Bot. Soc.* 61: 299-30.
- WIGGINTON, M. J. (2002). Checklist and distribution of the liverworts and hornworts of sub-Saharan Africa, including the East African Islands. *Tropical Bryology Research Reports* 3: 1-90.
- ZHU, R. L. AND LONG, D. G. (2003). Lejeuneaceae (Hepaticae) from several recent collections from the Himalaya. *Journal Hattori Botanical Laboratory* 93: 101-115.
- ZHU, R-L. AND SO, M. L. (2001). Epiphyllous Liverworts of China. *Nova Hedwigia, Beiheft.*, 121: 200-218, Publisher J. Cramer, Stuttgart.

Online July 3, 2013



**Fig.1. 1-3:** *Leptolejeunea subdentata* Schiffn. ex Herzog. 1. Panoramic view of East Khasi hills of Meghalaya, 2. Terricolous plant population (showing in arrow), mixed with other taxa of lejeuneaceae, 3. Plant, ventral view (from, 212/2012 (RFRI)).