

# *Lejeunea flava* (Swartz) Nees - An addition to the bryoflora of western Himalaya

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THE genus *Lejeunea*, a member of family Lejeuneaceae, is represented in India by 21 species (Singh, 2001), of which 5 species, viz. *Lejeunea bidentula* Herz., *L. cavifolia* (Ehrh.) Lindenb., *L. nepalensis* Steph., *L. tuberculosa* Steph. and *L. wightii* Lindenb. are known to occur in western Himalaya (Mizutani, 1964, 1971; Bapna & Kachroo, 2000). All the above taxa, however, are so far known from Uttaranchal only. During studies on a recent collection of bryophytes from Sainj Valley ecozone of Great Himalayan National Park, Kullu, Himachal Pradesh, some interesting specimens of the genus were encountered which conformed to *Lejeunea flava* (Swartz) Nees, an ubiquitous species so far known to occur in eastern Himalaya and western Ghats in Indian bryoflora, in all the significant taxonomic details. While this appears to be the first report of its occurrence in western Himalaya, family Lejeuneaceae has been recorded for the first time from Himachal Pradesh.

*Lejeunea flava* (Swartz) Nees, *Naturg. Eur. Leberm.* 3: 277. 1838; Chopra, *Proc. Ind. Acad. Sci.* 7:250. 1938. *Jungermannia flava* Swartz, *Prodr. F1. Ind. Occid.* 144. 1788.

Plants yellowish green - dull green, 8 -18 long, 0.7 - 1.2 mm wide with leaves, irregularly pinnately branched. Stem oval - slightly elliptical in cross section, 79.9 - 83.2 x 99.9 - 113.2  $\mu\text{m}$ , 6 cells across the diameter; cortical cells 7, large, 23.3-36.6 x 16.6-26.6  $\mu\text{m}$ , medullary cells 12-14, smaller than cortical cells, 9.9-19.9 x 8.3 - 13.3  $\mu\text{m}$ ; cells slightly thick walled. Leaves imbricate, widely spreading, oblong-ovate to ovate, 0.43 - 0.8 mm long, 0.35-0.67 mm wide, margin entire, apex rounded; apical marginal

cells quadrate - polygonal, 13.3-26.6 x 9.9 - 19.9  $\mu\text{m}$ ; median cells polygonal, 23.3 - 33.3 x 19.9 - 26.6  $\mu\text{m}$ ; basal cells slightly elongated, polygonal, 29.9 - 43.4 x 19.9 - 29.9  $\mu\text{m}$ , cells with small tri-radiate trigones and intermediate thickenings; lobules small, inflated, oblong-ovate, 119.8 - 196.47 x 49.9 - 73.2  $\mu\text{m}$ , free margins slightly incurved except apex, first tooth obtuse, consisting of a projecting cell with hyaline papillae on the proximal side, the second tooth indistinct; keel arched and decurrent with a deep sinus. Underleaves about 4 times as wide as stem, ovate - orbicular, as long as wide or little longer than width, 0.26-0.37 x 0.26-0.36 mm, margin entire, apex bilobed up to 1/3 - 1/2 of the length; lobes acute to obtuse, sinus narrow, acute. Male inflorescence on short lateral branches, bracts 4 paired, smaller than vegetative leaves, closely imbricate. Female inflorescence on main or lateral branches; bracts oblong-moderately obovate, 0.49 - 0.53 mm long, 0.21-0.28 mm wide, rounded at apices; lobules large, usually oblong to ovate-lanceolate, 0.22-0.25 mm long, 0.07-0.08 mm wide, subacute-rounded at apex; bracteoles connate with bracts, ovate to oblong-ovate, 0.42-0.5 mm long, 0.21 - 0.3 mm wide at middle, margin entire, bilobed to 1/2; lobes acute-obtuse, sinus narrow, perianth large, pyriform 5 keeled; keels smooth.

*Specimen examined:* Terrestrial, grows in patches in moist and shady places in association with *Heteroscyphus pandei*. Himachal Pradesh, great Himalayan National Park, Sainj Valley ecozone, Neuli, alt. ca 1400 m, 8th February 2002, S.K. Singh 99522-b (BSD).

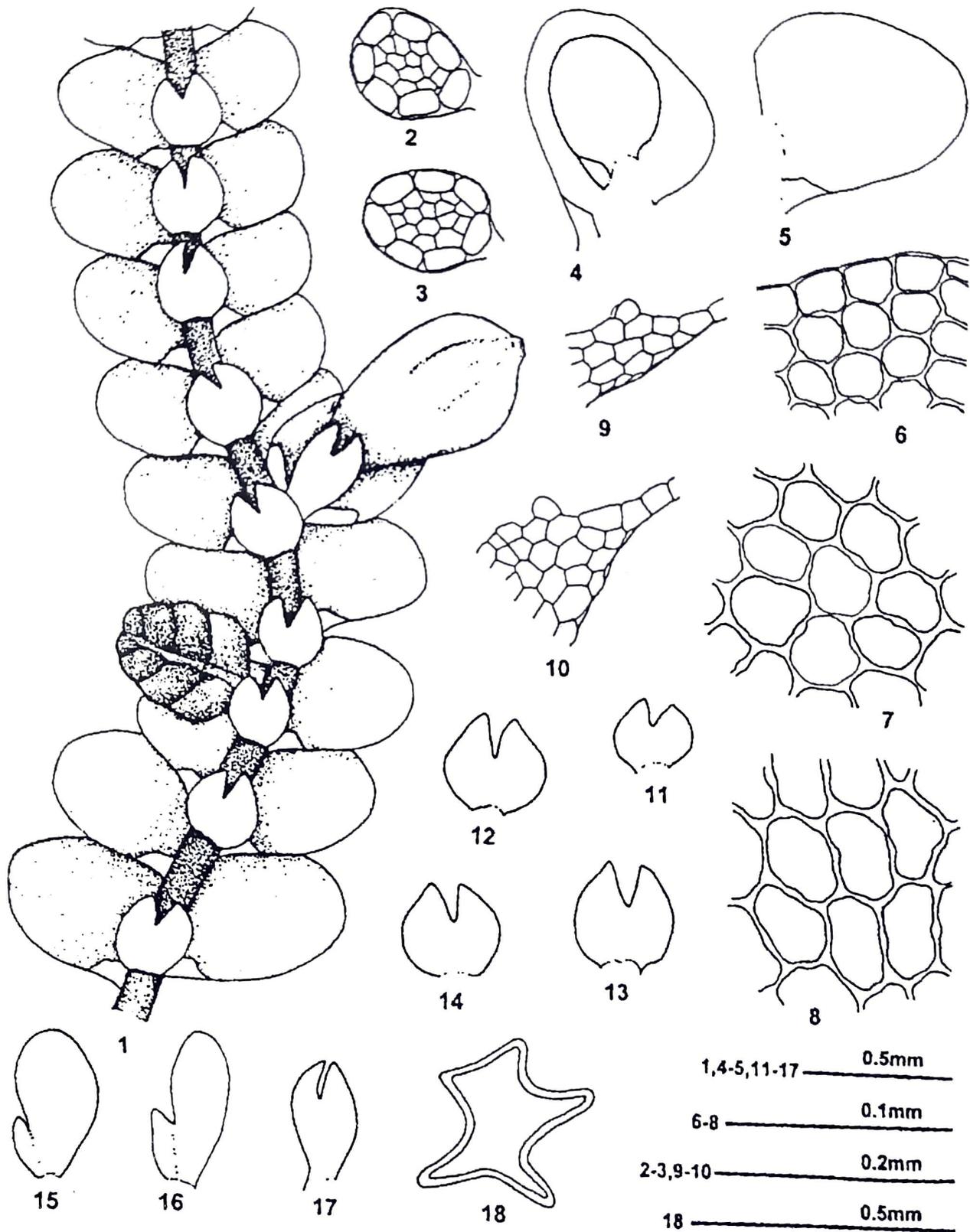


Fig.1. *Lejeunia flava* (Swartz) Nees: 1. A portion of plant (ventral view), 2-3. Cross sections of stem, 4-5. Leaf lobes with lobule, 6. Apical marginal cells, 7. Median cells, 8. Basal cells, 9-10. Lobules, 11-14. Underleaves, 15-16. Female bracts, 17. A female bracteole, 18. Cross section of perianth.

*Distribution:* India (West Bengal, Assam, Meghalaya, Sikkim, Karnataka, Tamil Nadu); Nepal; Bhutan Taiwan; Indonesia; New Zealand; N. & S. America; Europe.

*Lejeunea flava* can be easily separated from other five species of the genus in western Himalaya. It differs from *Lejeunea bidentula* which has bidentate lobule with multicellular first tooth and large, distinct second tooth (Bapna & Kachroo, 2000). Similarly, *Lejeunea cavifolia*, with pale green, plants, strongly inflated, ovate lobule and ovate-orbicular; bifid underleaves with acute - rectangulate sinus (Schuster, 1980), is easily distinguished from the present species. Whereas, *Lejeunea wightii* differs from the species in discussion with smaller, up to 5mm long plants, crenulate leaflobe and larger lobule, up to 1/2 the length of leaf-lobe (Mizutani, 1964). *Lejeunea nepalensis* and *Lejeunea tuberculosa* strongly differ from *Lejeunea flava* in having dioecious plants. Further, *Lejeunea nepalensis* with only 7 medullary cells in stem and smaller plants can be easily differentiated from the present species, while *Lejeunea tuberculosa* with 8 medullary cells and bilobed underleaves divided up to 1/3 of its length is also easily distinguishable.

*Lejeunea flava* is a cosmopolitan species showing a wide range of distribution in India, Nepal, Bhutan, Taiwan, Indonesia, New Zealand, Africa, N. &

S. America and Europe. In India, it is one of the most widespread species of the genus distributed in Tamil Nadu, Karnataka, Sikkim, West Bengal, Meghalaya and Assam. Its present record from western Himalaya is therefore, interesting from the phytogeographic point of view as it bridges the gap in its range of distribution between Indo-Malaya and Eurasia.

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