

# *Cololejeunea producta* (Mitt.) Hatt. (Hepaticae), from Kumaun region in Western Himalayas

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The paper describes some hitherto unreported features in the corticolous hepatic, *Cololejeunea producta* (Mitt.) Hatt., collected for the first time from the Kumaun region in the Western Himalayas. Such features include description of the male plants, occurrence of discoid, multicellular gemmae, distribution of the oil-bodies in leaf cells, presence of sporophytes and observation of a distinct, hyaline papilla at the tip of the first tooth in the leaf-lobule.

**Key-words** - *Cololejeunea producta* (Mitt.) Hatt., Corticolous hepatic, Kumaun region, Western Himalayas.

## INTRODUCTION

THIRTY species of the hepatic, *Cololejeunea* (Spruce) Schiffn., are recognized in India, out of which only two species, namely, *C. latilobula* (Herzog) Tixier and *C. producta* (Mitt.) Hatt. are known from the West Himalayan territory (Asthana & Srivastava, 2003). While the former species has much wider distribution across the Indian subcontinent and is represented in Eastern Himalayas, Central India and South India in addition to the Western Himalayas, the latter species has limited distribution and is known from Bhutan in addition, from type locality in Eastern Himalayas (Hattori, 1966; Asthana & Srivastava, 2003, Long & Grolle 1990).

So far as the locality wise distribution of the two West Himalayan species is concerned, *C. latilobula* (Herzog) Tixier is known from Bageshwar, Nainital, Chaubatia in the Kumaun region, whereas *C. producta* (Mitt.) Hatt. is recorded only from the Valley of Flowers in the Garhwal region. The present study, records the occurrence of the species from the district, Champawat (28°22' N; 80° 06' E; alt. 1400 to 2000m) in the Kumaun region and provides characters, which are not known earlier.

### *Cololejeunea producta* (Mitt.) Hatt.

In Hara, Fl. E. Him. : 533 (1966); *Physocolea producta* (Mitt.) Steph., Spec. Hepat. 5 : 902 (1916)

Basionym: *Lejeunea producta* Mitt., Journ. Linn. Soc., London, 5: 117 (1861).

Plate 1; Figs, A-M

.Plants small, pale green, appressed to the bark of the tree. Stem 4-6 mm long and 0.06-0.15 mm in diameter, with leaves 1.4-1.8 mm wide, irregularly pinnate; in cross-section, cortical cells in 5 rows, walls somewhat thicker, medullary cell 1, the ventral 2 rows of cortical cells slightly smaller. Rhizoids in tufts, colourless. Leaves imbricate, widely spreading; the leaf-lobe plane, ovate, 0.4-0.9 mm long and 0.38-0.75 mm wide, the margin partly bordered by 1-2 rows of hyaline cells, the dorsal margin arched towards the base, the apex rounded; the leaf-lobule 1/4- 1/3 the length of leaf lobe, nearly parallel to stem, ligulate, the first tooth large, occupying the upper half of the leaf-lobule, the second tooth indistinct, the hyaline papilla distinct, at the tip of the first tooth, keel straight, the apex of the leaf-lobule truncate-rounded. Marginal hyaline cells of the leaf-lobe 20-28 x 13-16 µm, walls thin, ordinary cells neighbouring the hyaline cells 18-20 x 12-14 µm, walls thick, median cells 22-32 x 22 µm, walls thick, intermediate thickenings absent, trigones small, cuticle punctate. Oil-bodies small, spherical to elongated, distinctly segmented, 4-16 per cell. Gemmae numerous, discoid, the margin slightly crenate, 70-80 µm in diameter, 18-24 celled.

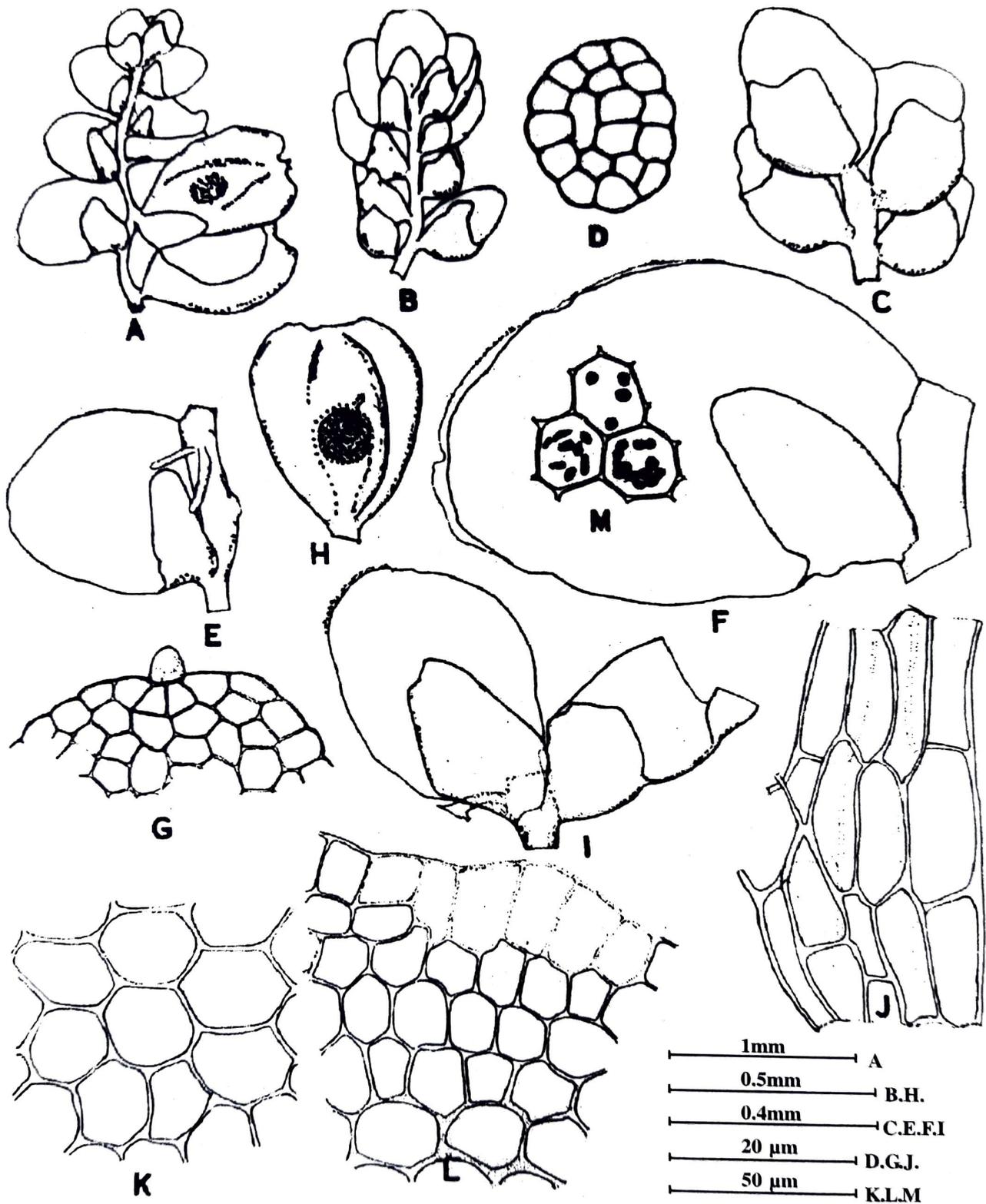


PLATE-1

Figs. A-M. *Cololejeunea producta* (Mitt.) Hatt.

A. Part of the female plant with perianth, ventral view; B. Part of the male plant with male inflorescence; C. Part of the male inflorescence, magnified; D. A gemma; E. Young leaf, attached to the stem; F. Leaf; G. Apex of the leaf-lobule with distinct papilla; H. Perianth; I. Two female bracts with a sub floral innovation; J. Part of the stem magnified to show 5 rows of cortical cells; K. Median cells of the leaf-lobe; L. Marginal cells of the leaf-lobe; M. Median cells of the leaf-lobe with oil-bodies.

Dioecious. Male inflorescence usually terminal, bracts in 6-8 pairs, smaller than the stem leaves; the bract-lobule nearly 1/2 the length of the bract-lobe inflated, saccate. Female inflorescence terminal, often with 1 sub floral innovation; the bract-lobe smaller than the leaf-lobe, obovate, with a rounded apex, 0.50-0.75 mm long and 0.25 -0.45 mm wide, may be bordered by a few hyaline cells; the bract-lobule 0.24-0.45 mm long and 0.10-0.25 mm wide, the apex ligulate. Perianth obovate, campanulate, 0.65-0.85 mm long and 0.5-0.6 mm wide, the apex rounded to truncate, sometimes concave, keels 5 (2 ventral, 2 lateral and 1 dorsal), one of the two ventral keels low and indistinct. Sporophytes present. Capsule spherical, wall hyaline, 2-layered.

### Ecology and Distribution

The species grows on the trunk of *Quercus leucotrichophora* Roxb. alongwith *Frullania ericoides* (Nees) Mont. or in pure, unmixed stands.

Type locality – Sikkim in Eastern Himalayas.

Distribution – In India - Eastern Himalayas (Sikkim, Darjeeling); Western Himalayas (Valley of Flowers)

Specimens Examined - Western Himalayas, Kumaun region, District Champawat : H-79/1, Abbott Mt., Lohaghat, 2000 m, June 1979, leg. S.N.Srivastava, det. S.N. Srivastava; H - 82/5, Bastia, 1400 m, April 1982, leg. S.N. Srivastava, det. S.N. Srivastava, in Allahabad University Herbarium located in the Botany Department.

### DISCUSSION

Asthana and Srivastava (2003) have described only female plants with a question mark (?) on its dioecious sexuality. However, abundant finding of both female and male plants in fertile state in the present collection, establishes the dioecious sexuality of the species. The presence of enormous multicellular discoid gemmae is distinct and features which differ from earlier description include the presence of a distinct papilla (as against the indistinct one) at the tip of the first tooth in the leaf-lobule, the recording of spherical to elongated, segmented oil-bodies in leaf cells and the presence of mature sporophyte. The small, pale green plants remain strongly appressed to the bark of the oak trees.

The species is distinguishable from *Coloejeunea latilobula* (Herzog) Tixier, in having dioecious sexuality, fewer number and rows of the hyaline cells at the leaf margin, wider leaf-lobule and the leaf cells with smaller trigone and indistinct intermediate thickening.

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