

Trocholejeunea infuscata (Mitt.) Verd. : An addition to the hepatic flora of Western Himalayas

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The paper reports the occurrence of *Trocholejeunea infuscata* (Mitt.) Verd.: a corticolous leafy hepatic from the Champawat District of the Kumaun region in the Western Himalayas. The report extends distribution of the species from Eastern Himalayas to the Kumaun region in the Western Himalayas. Further, the reported specimens show the presence of gynoecia which have not been reported so far in the Indian specimens of *T. infuscata*.

Key-words — *Trocholejeunea infuscata* (Mitt.) Verd.; Leafy hepatic; Kumaun region; Western Himalayas.

INTRODUCTION

THE hepatic genus, *Trocholejeunea* Schiffn., is represented by two species, namely, *T. sandvicensis* (Gott.) Mizut. and *T. infuscata* (Mitt.) Verd. in India (see, Schuster & Kachroo, 1970; Awasthi & Srivastava, 1988; Mizutani, 1989; Bapna & Kachroo, 2000). Both the species are known from the tropical and warm-temperate zones in Asia. So far as the distribution of these species in India is concerned, *T. sandvicensis* (Gott.) Mizut. has much wider distributional range and is known from the South Indian hills (Perumalmai, Kodaikanal), the Eastern Himalayas (Sikkim, Assam), and the Western Himalayas (Mussoorie, Nainital, Ranikhet) whereas *T. infuscata* (Mitt.) Verd. is confined to the Eastern Himalayas (Sikkim, Assam) only. In the present study, both the species of *Trocholejeunea* Schiffn. were collected from the oak-dominated forest located in the district Champawat (28°22'N: 80°06' E, alt. 2010 m) of the Kumaun region in the Western Himalayas. The two species can easily be distinguished in nature. While *T. sandvicensis* (Gott.) Mizut. plants are green, rather smaller (nearly 1.5 cm long) with squarrose leaves, the *T. infuscata* (Mitt.) Verd. plants are deep brown, medium-sized (2.5-3.0 cm) and worm-like when wet. The plants of *T. infuscata* (Mitt.) Verd., being a new record for the Western Himalayas and having gynoecia hitherto undescribed in Indian specimen, are described and illustrated in detail. All the specimens are deposited in the Allahabad University Herbarium.

SYSTEMATIC DESCRIPTION

Trocholejeunea infuscata (Mitt.) Verd.

Ann. Bryol. Suppl. 4: 190 (1934); Hattori, in Hara, Fl. E. Him. : 533 (1966).

Brachiolejeunea infuscata (Mitt.) Schuster & Kachroo in Schuster, Bryologist 64 : 165 (1961).

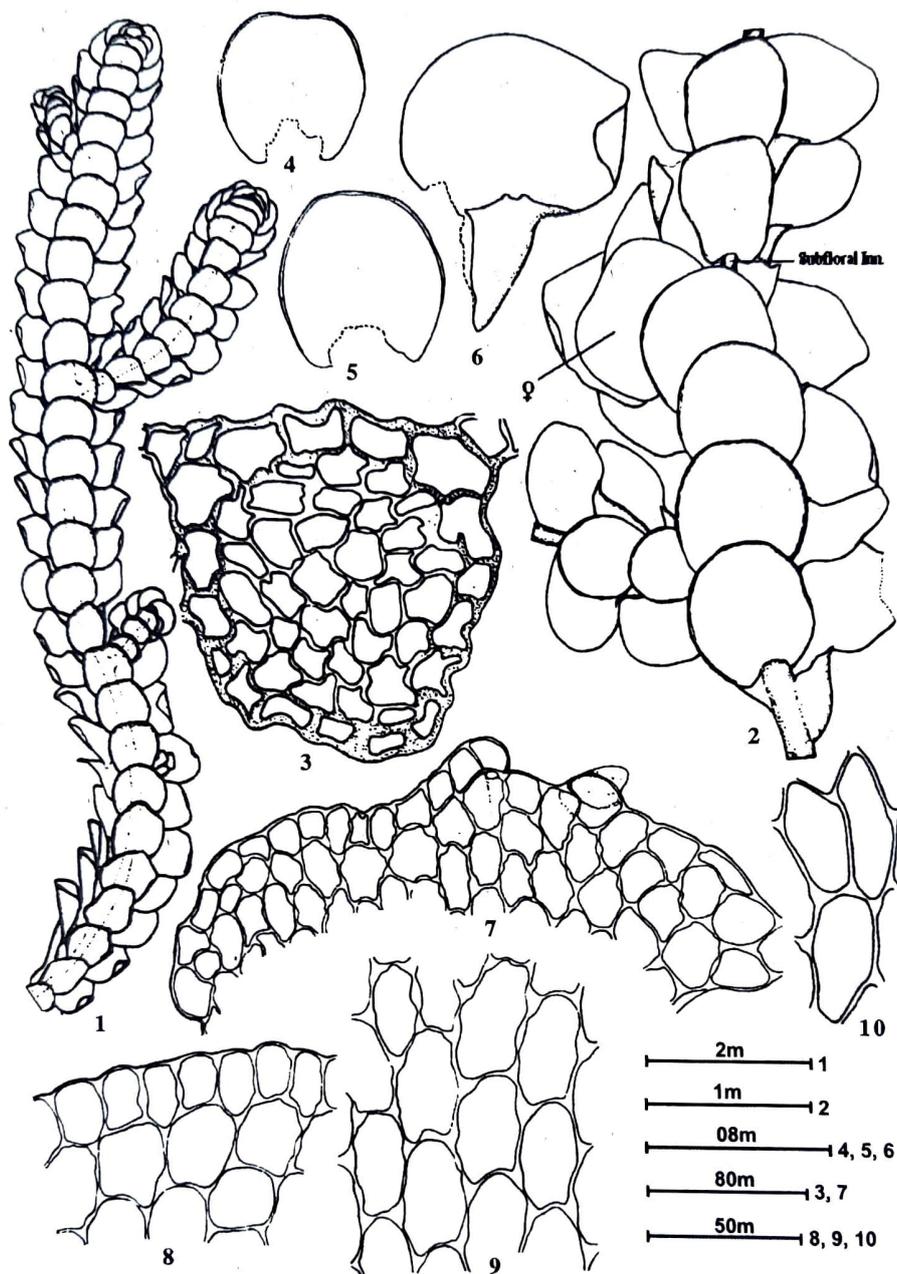
Basionym : *Lejeunea infuscata* Mitt. Journ. Proc. Soc., London 5: 111 (1861).

(Text-Figs 1-10)

Plants medium-sized, deep brown, worms like when wet, in mats irregularly branched; Stem 2.5-3.0 cm long and 0.15-0.20 mm in diameter with leaves about 1.5 mm wide, in cross-section, 15-20 cortical cells surrounding medullary cells, the cortical cells larger with thicker walls than medullary cells, trigones absent. Rhizoids few. Leaves imbricate; leaf-lobe obliquely to nearly vertically inserted, somewhat concave, ovate, 0.90-0.95 mm long and 0.75-0.80 mm wide, margin entire, apex rounded to obtuse, frequently incurved along with ventral margin; the leaf lobule half to slightly smaller the length of leaf lobe, inflated, the free margin flat, usually with 2 short, rounded teeth, keel oblique, straight up to greater extent. Underleaves imbricate, orbicular, wider than long, 0.45-0.70 mm long and 0.65-0.85 mm wide, apex rounded to truncate rounded, margin entire, incurved. Marginal cells of the leaf-lobe 15-20 x 10-14 mm, median cells 30-35 x 20 mm, basal cells up to 40 x 32 mm, walls with distinct intermediate thickenings and trigones. Female inflorescence terminal, with 1 subfloral innovation, bracts similar to stem leaves, bracteoles slightly larger than the underleaves.

ECOLOGY AND DISTRIBUTION

The species has been collected from the trunks of oak trees, *Quercus leucotrichophora* D. Don. The female branches in some plants bore gynoecia though they did not possess perianths. The most common associates are the liverwort,



Text-Figures 1-10. *Trocholejeunea infuscata* (Mitt.) Verd. 1. Plant, ventral view. 2. Part of the same magnified (Note the female branch, though without perianth). 3. Cross-section of a Stem, 4-5. Underleaves. 6. Leaf. 7. Margin of the leaf-lobule, T.S. 8. Marginal cells of the leaf lobe. 9. Median cells of the leaf-lobule. 10. Basal cells of the leaf-lobule.

Frullania ericoides (Nees) Mont. and the moss, *Herpetineuron toccoae* (Sull. & Lesq.) Card.

Distribution—Distributed in Nepal, Ceylon, Burma, Bhutan, China and India (Eastern Himalayas – Khasia, Darjeeling).

Specimens examined—India, Western Himalayas, Kumaun region, District Champawat : 730, Kanteshwar hill top, 2010 m, September 1977, leg. S.N. Srivastava, det. S.N. Srivastava; Deposited in Allahabad University Herbarium.

DISCUSSION

The diagnostic characters of the species include (i) the leaf-lobe with an arched or curved postical margin (straight postical margin in *T. sandvicensis*), (ii) the leaf-lobule is subtriangular and its long axis is at right angles to the long axis of the leaf-lobe (parallel in *T. sandvicensis*), (iii) the two teeth on lobule margin are two-celled in height (1-celled in *T. sandvicensis*), (iv) the gynoecium has 2-3 bracts and 1-2 bracteoles (2 bracts and 1 bracteole in *T. sandvicensis*), (v) the terminal female inflorescence with 1 sub-floral innovation of

Frullania-type in branching (sub-floral innovation of *Radula-Jubula*-type in *T. sandvicensis*).

It is interesting to observe that the Indian specimens collected in the past had always been found in sterile condition. Awasthi and Srivastava (1988) state that 'Plants of *T. infuscata* were collected repeatedly from the several sites in Eastern Himalayas but they were found only in sterile condition. Even the specimens obtained on loan from Conservatoire et Jordin Botanique were also sterile'. On the contrary, the present collection shows plants bearing gynoecia with bracts and bracteoles, though they did not have perianth. Each gynoecium has one sub-floral innovation, which is *Frullania*-type.

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