

***Frullanoides tristis* (Steph.) Van Slageren**
A new Addition to
East Himalayan bryoflora

Ajit Pratap SINGH, Virendra NATH* and A.K. ASTHANA

Bryology Laboratory
National Botanical Research Institute, Lucknow-226 001- India

(Received 20 December 2003, accepted 20 September 2004)

Abstract – *Frullanoides tristis* (Steph.) Van Slageren, an epiphytic species, is described from Meghalaya, eastern Himalayas, India. It is the only known species of the genus *Frullanoides* in India. Earlier this species was described from south India; the present study has extended its distribution to eastern Himalayas. *Frullanoides tristis* is characterized by 13 longitudinal rows of larger cortical and 29-30 longitudinal rows of smaller thin walled, medullary cells in the stem; leaf lobules 1/2 as long as the lobe, free margin with 7-9 small, 2-3(-4) celled long tooth, and about 10 keeled perianth.

Bryophyta/ liverwort/ *Frullanoides tristis*/ new addition/ Meghalaya/ eastern Himalayas

INTRODUCTION

The history of genus *Brachiolejeunea* (Spruce) Schiffn. on the Indian sub-continent dates back to Mitten (1861), who described the genus under the name *Lejeunea infuscata* Mitt., from Sikkim and Khasi Hills in eastern Himalayas. Subsequently the genus is variously treated by many workers (Stephani, 1912; Schiffner, 1932; Verdoorn, 1934; Chopra, 1938; Parihar, 1961-62; Parihar *et al.* 1994; Mizutani, 1961, 1989; Schuster, 1963, 1980). Van Slageren (1985) treated three subgenera i.e. *Brachiolejeunea*, *Plicolejeunea* and *Trocholejeunea* of genus *Brachiolejeunea* (Spruce) Schiffn. at the generic rank, conserving the subgeneric name except that of subgenus *Plicolejeunea* which has been considered as genus *Frullanoides* Raddi. *Frullanoides* is represented in India by only single species, *F. tristis* (Steph.) Van Slageren, which was described by Awasthi and Srivastava (1988) from south India. During a recent study on the collections made from various localities of West Khasi Hills, Meghalaya, plants closely resembling to *Frullanoides tristis* have been encountered. This is a new additional record to the bryoflora of eastern Himalayas.

* Correspondence and reprints: drvirendranath2001@rediffmail.com

MATERIALS AND METHODS

Pure populations of plants were collected in September, 2000 from the localities of Nongstoin: Mawaiban and Mawkadiang, (West Khasi Hills), a heavily moist region in Meghalaya. The specimens were critically studied and the line drawing illustrations were made with the help of Camera Lucida (Olympus, Tokyo- 203954). Voucher specimens have been deposited in Bryophyte Herbarium, National Botanical Research Institute, Lucknow (LWG).

TAXONOMIC OBSERVATION

Frullanoides tristis (Steph.) Van Slageren, Meded. Bot. Mus. Herb. van de Rijks Univ. Utrecht **544**: 110 (1985) (Figs 1-15, Fig. 16)

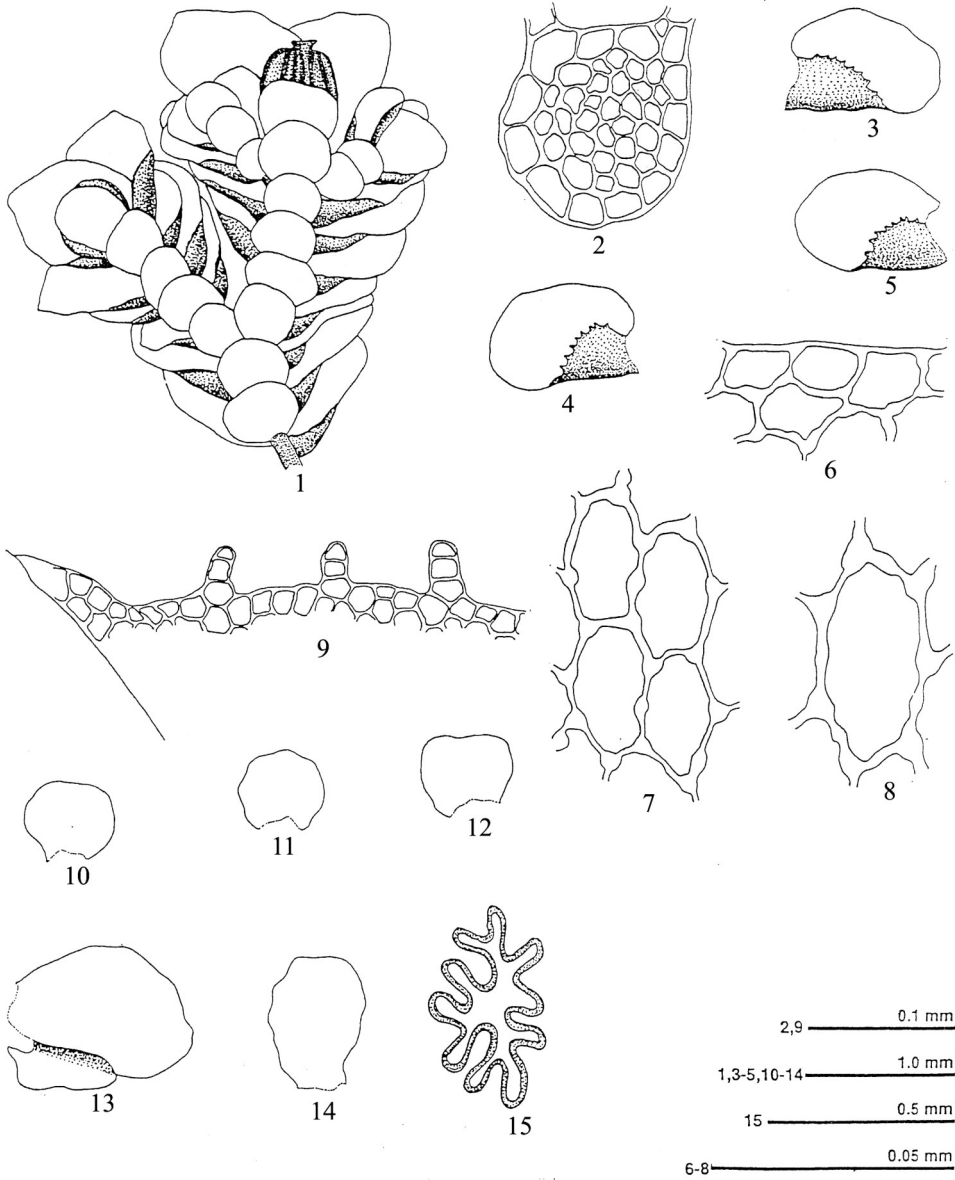
Dioicous. Plants greenish brown, robust, prostrate, 20 mm long and 1.75 mm wide including leaves, irregularly branched, branches of *Jubula* type or occasionally with *Frullania* type. Stem 0.13-0.15 mm in diameter and 8 cells across; cortical cells in 13 longitudinal rows of cells, 17.5-20 × 30-37.5 µm, thin or slightly thick walled; medullary cells in 29-30 longitudinal rows, 15-17.5 × 20-22.5 µm, thin walled, smaller than cortical cells; ventral merophytes of the stem 4 or 5 cells wide. Rhizoids few, pale brown. Leaf lobes imbricate, obliquely spreading, slightly squarrose, 0.85-1.0 mm long and 0.70-0.75 mm wide, widely ovate, entire, apices obtuse; leaf marginal cells 10-12.5 × 12.5-17.5 µm, trigonous, thin or slightly thick walled; median cells 15-17.5 × 25-35 µm, trigonous, thin walled with intermediate thickenings; basal cells 22.5-25 × 42.5-45 µm, trigonous, thin walled with intermediate thickenings; cuticle smooth; leaf lobules triangular, about 1/2 as long as the lobe, apex obliquely truncate, free margin with 7 to 9 small teeth, tooth 2 or 3 (rarely 4) celled long, lobules 0.48-0.50 mm long and 0.26-0.34 mm wide. Underleaves imbricate or approximate, rotund, 0.52-0.57 mm long and 0.60-0.62 mm wide, margin entire, subtransversely inserted. Perianth terminal on stem with 2 subfloral innovations, innovation of *Jubula* or occasionally with *Frullania* type; bracts usually 2, oblong-ovate, 1.25-1.30 mm long and 0.63-0.88 mm wide, margin entire, or undulate, apex obtuse, lobules oblong, about 1/2 more as long as the lobe, entire, ligulate; bracteoles usually one, rotund, 0.8-1.0 mm long and 0.56-0.63 mm wide, margins entire or undulate. Perianth 0.66-0.70 mm long and 0.50-0.57 mm wide, keels about 10, irregular knot like, beak short.

Distribution and ecology: North Eastern Himalaya: Meghalaya: West Khasi Hills: Nongstoin: Mawaiban, Mawkadiang.

Plants grow on bark in association with *Frullania neurota*, *F. ericoides*, *Lopholejeunea subfusca*, between 4500-4900 ft altitude, 22.5-26.3°C temperature and 61-70% relative humidity.

Range: India.

Specimens examined: India: Meghalaya: West Khasi Hills: Nongstoin: near F.R.H. Mawaiban, 14.09.2000, leg. A.P. Singh, 208537-A (LWG); Mawkadiang, 17.09.2000, leg. A.P. Singh, 208671-A (LWG). Det. V. Nath, A.P. Singh and A.K. Asthana.



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DISCUSSION

Schuster (1963, 1980), while splitting the complex genus *Brachiolejeunea* (Spruce) Schiffn. into three subgenera (*Brachiolejeunea* (Spruce) Schiffn., *Plicolejeunea* Schuster and *Trocholejeunea* (Schiffn.) Schuster), emphasized that there were few contrasting stable characters among them. Van Slageren (1985) considered these characters useful and raised the subgenera of Schuster (1963, 1980) to the generic level. He raised the subgenus *Plicolejeunea* to generic rank as *Frullanoides* Raddi and also considered the other two subgenera as distinct, individual genera, *Brachiolejeunea* and *Trocholejeunea*. In a work on the status of *Brachiolejeunea* (Spruce) Schiffn. in India, Awasthi and Srivastava (1988) remarked that *Frullanoides* and *Trocholejeunea* are closely related as they do not possess sufficient contrasting stable characters, and therefore subject to controversy until more information in this regard is provided. However, Gradstein (1994) and Gradstein *et al.* (2003) delimited *Trocholejeunea* as a distinct genus on the basis of their total lack of blackish secondary pigmentation, *Frullania*-type innovation, scarcely swollen epistatic male bracts, and non-articulate seta made up of more than 20 cell rows. In view of the above elevation of the subgenus *Plicolejeunea* to generic rank *Frullanoides*, the treatment of Van Slageren (1985) and Gradstein *et al.* (2003) has been followed. The present study is based on plants collected near F.R.H. Mawaiban and Mawkadiang, Nongstoin in West Khasi Hills (Meghalaya), that add *Frullanoides tristis* to eastern Himalayas, India (Fig. 16). The taxonomic observations on the plants from Meghalaya show slight variation in the diameter of leaf cells and perianth as compared to the plants which was earlier described from south India. These variations are considered to be due to alteration in ecological conditions.

Acknowledgements. Authors are grateful to the Director, National Botanical Research Institute, Lucknow for his encouragement. Department of Science and Technology and Council of Scientific and Industrial Research, New Delhi are acknowledged for providing the financial assistance. Thanks are also due to Prof. S.R. Gradstein and Prof. Alan Whittemore for their valuable suggestions. The Chief Conservator of Forest, Meghalaya is deeply acknowledged for his kind help extended during exploration of various localities of the Khasi, Jaintia and Garo Hills: Meghalaya.

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