

# Addition to the Bryoflora of Western Himalaya : *Frullania neurota* Taylor\*

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*Frullania neurota* Taylor earlier known from Eastern Himalaya and South India, is reported for the first time from Western Himalaya. It is characterized by bifid underleaves (amphigastria), cucullate lobules with truncate keels or auricles, entire bracts and bracteoles and 4-keeled obovate-oblong perianth.

Key-words - Bryophyta, *Frullania neurota*, new record, Western Himalaya.

## INTRODUCTION

*Frullania neurota* Taylor belonging to subgenus *Chonantheria* of the genus *Frullania* (Frullaniaceae) has been listed and briefly described from Eastern Himalaya and southern India by Mitten (1861), Stephani (1910), Parihar (1962), Verdoorn (1930), Chopra (1943), Hattori (1966) and Kachroo (1970). The details of oil-bodies in *Frullania* have also been provided recently by Udar and Nath (1971, 1979).

*Frullania neurota* is an epiphytic monoecious species which shows wide range of distribution in N. America, South China, Vietnam, Java, Nepal and Sri Lanka. In India it occurs in Khasia Hills, Sikkim, Kurseong, Darjeeling, Bhutan (Eastern Himalaya) and Madurai, Coorg, Ootacamund, Kodaikanal (southern India). However, it has not been reported so far from Western Himalaya. An investigation of Bryophytic collections from Pithoragarh district and neighbouring areas (Kumaon Himalaya) has revealed the presence of some interesting plants which resemble *Frullania neurota*. The occurrence of this taxon in this territory is a new record and an addition to the West Himalayan bryoflora.

The plants were collected from bark of trees in Shobhla forest (on way to Sun Dung) at an altitude of ca 2500 m. in September 1990. The investigations were made on fresh plants and the specimens have been deposited in NBRI,

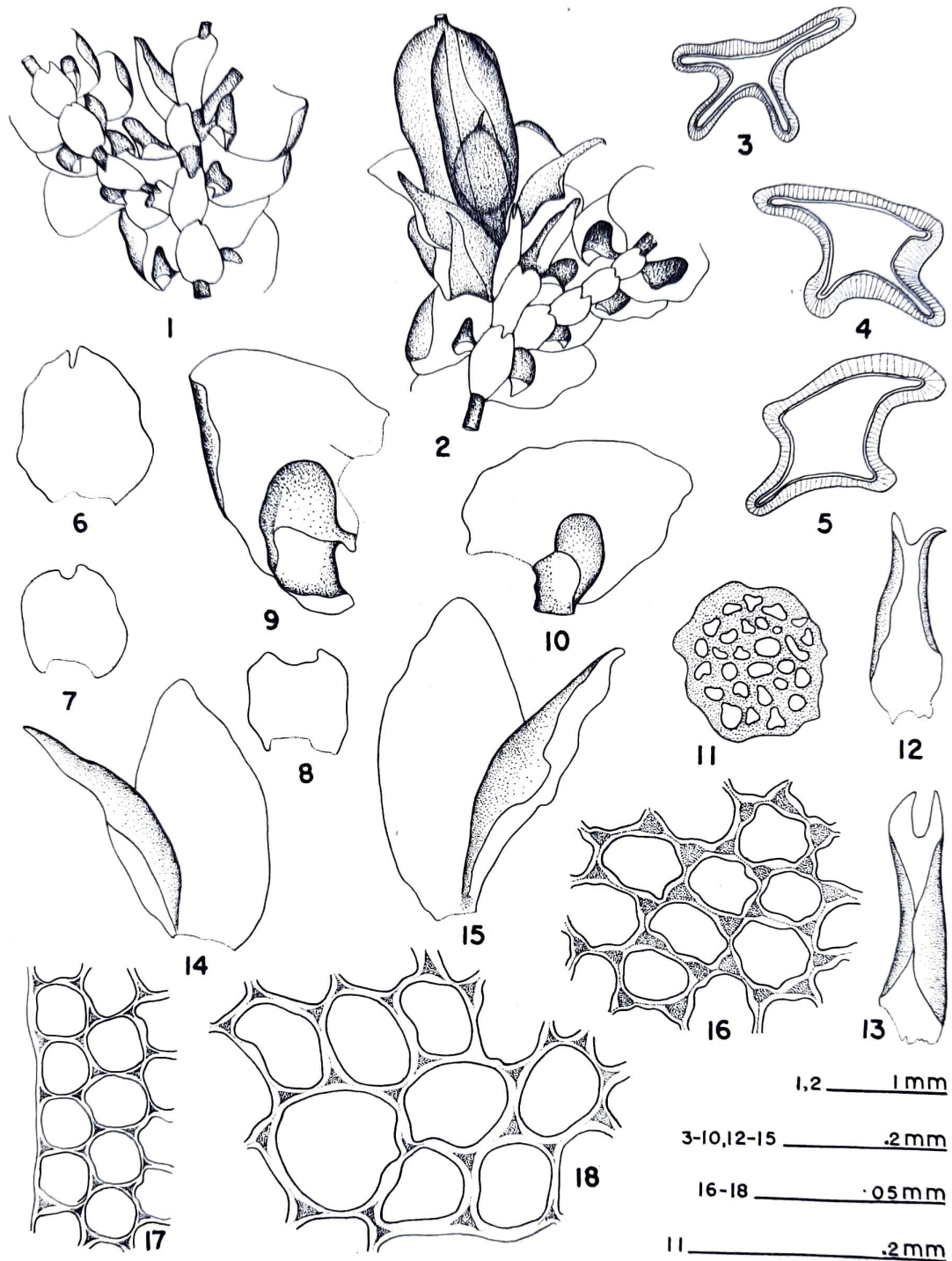
Herbarium, Lucknow (LWG).

## DESCRIPTION

*Frullania neurota* Taylor (Text-fig. 1)

Plants slender, reddish brown, medium to large-sized, 14-26 mm long, prostrate, irregularly pinnately branched; stem 0.15-0.2 mm in diameter, in cross-section 6-8 cells across, thick-walled; leaves imbricate, widely spreading, ovate-oblong with obtuse apices, margin entire, 0.72-0.9 mm long and 0.85-0.95 mm wide, marginal cells 12.5-20  $\mu$ m long and 12.5-15  $\mu$ m wide with triangular trigones, median cells 17.5-22.5  $\mu$ m long and 10-17.5  $\mu$ m wide, thin-walled with prominent nodulose trigones, basal cells 25-35  $\mu$ m long and 20-35  $\mu$ m wide with prominent trigones; lobules large, 0.25-0.35 mm long and 0.3-0.55 mm wide, subcucullate-cucullate without beak, obliquely oriented to stem, mouth truncate with triangular auricles or keels, longer than wide, subparallel to stem, margin free or slightly connate to leaf-lobes; underleaves ovate-rotundate, 3 or 4 times as wide as stem, little wider or equally broader than its length, 0.5-0.62 mm long and 0.45-0.6 mm wide, slightly wide and obtuse, lobes triangular, acute or obtuse, margin entire, insertion transverse. Monoecious, plants sexually immature, male inflorescence not fully developed; female inflorescence terminal on branches; perichactial

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Text figures. 1-18, *Frullania neurata* Taylor.

1. A portion of plant (ventral view); 2. A portion of plant with perianth (ventral view); 3-5. Cross-section of perianth 3. Apical region; 4. Median region; 5. Basal region; 6-8. Underleaves; 9-10. Leaf-lobes with lobule; 11. Cross-section of stem; 12-13. Female bracteoles; 14-15. Female bracts; 16. Leaf cells from middle region; 17. Leaf cells from marginal region; 18. Leaf cells from basal region.

leaves 2-3 pairs; bract-lobes oblong-elliptical, 1-1.35 mm long and 0.57-0.65 mm wide, apex subacute-obtuse, margin entire; bract-lobules strongly canaliculate-lanceolate with acuminate apices, margin entire, recurved along margin; bracteoles large, 0.85-1 mm long and 0.3-0.4 mm wide,

narrowly ovate to angular oblong-elliptical, connate to bract-lobes below and to lobules from lateral sides, margin entire, bilobed, lobes obtuse to subacute; perianth ovate-oblong, 2-2.5 mm long and 1-1.5 mm wide, strongly 4-keeled, surface smooth, margin entire, rostrum short,

sometimes truncated. Spores and elaters not fully matured.

**Specimen examined:** *Frullania neurota* Taylor: India. Western Himalaya, Kumaon region: Shobhla forest (on way to Sun Dung), altitude ca 2500 m, growing in moist and shady places on bark of trees intermixed with *Frullania muscicola* St. and mosses, V. Nath, 27.9.1990 (LWG 205100).

### DISCUSSION

*Frullania neurota* exhibits a great range of plasticity at the specific level in having various morphoforms. It appears that due to varying climatic conditions, populations of this taxon found in different bryogeographical regions of our country have been designated as new species by several workers. Thus the two species *F. breviscula* Mitten (1861) and *F. lauterbachii* Stephani (1910) from Eastern Himalaya were later found to be allied species of *F. neurota*. This shows minor variations in vegetative features of plants and should be considered as ecological modification or an adaptation to climatic factors.

The plants of same population of this species collected recently from Western Himalaya also show a range of variation in shape and size of leaf-lobes, lobules and underleaves. However, the diagnostic characters such as bifid underleaves, sexuality (monoecious), entire perichactical leaves and 4-keeled perianth seem to be constant.

*F. neurota* is often found intermixed with *F. wallichiana* Mitt. of the same subgenus *Chonanthelia*. Both resemble significantly in external appearance yet differ in other characters. In *F. neurota* underleaves are rotund, slightly longer or as long as its width, slightly bifid with transverse insertion, lobules cucullate with a small obliquely spreading

keels, 4-keeled perianth and entire female bracts and bracteoles whereas in *F. wallichiana* underleaves are broader or equally broader than its length, cordate, slightly notched (bifid) with sinuate insertion, lobules galeate with well-developed appendages, many keeled perianth and denticulate female bracts and bracteoles.

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