

# THE GENUS *JAMESONIELLA* (SPRUCE) SCHIFFN. IN INDIA\*

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## Abstract

In this paper two species of the genus *Jamesoniella*, viz., *J. elongella* (Tayl.) St. and *J. nipponica* Hatt. have been described. The genus is confined to the Himalayas in India.

## Introduction

In present state of our knowledge the genus *Jamesoniella*, a primitive taxon of family Jungermanniaceae s. str., is distributed in our country only in the Himalayas. The genus is characterised by dioecious, green or brownish plants forming mats. The stem is straight or sometimes with acroscopic curvature of apex. The branches are intercalary and postical, less often lateral and often innovating from beneath gynoecia. The leaves are alternate, succubous, ovate, entire to retuse and with collenchymatous cells. The underleaves are wanting or vestigial to rarely more developed on young branches or on female shoots. The male inflorescence is terminal or intercalary with ventricose bracts having 1-2 toothed, infolded dorsal flap or lobule. The antheridia are usually solitary with 2-4 seriate stalk. The female inflorescence is terminal on main axes or on branches. The bracts are larger than cauline leaves, dentate, ciliate or lacinate and the bracteole, which is also ciliate or dentate, is well developed. The perianth is at least 1/2 emergent, oblong to fusiform-ovoid to obclavate, smooth, distally distinctly 4-5(-8) plicate, gradually narrowed apically and normally not subtended by a perigynium at base. The mouth of the perianth is never beaked, usually distinctly ciliate or dentate to crenulate-denticulate. The seta is massive. The capsule is ovoid and the wall is 4-5 stratose. The outer layer is with strong nodular thickenings, in surface view, on radial walls and the inner layer is with complete to incomplete thickening bands, in surface view, on inner tangential wall. The asexual reproduction is lacking (Amakawa, 1959; Schuster, 1969).

Our knowledge of the genus in Indian bryology has so far been from the contribution of Kashyap (1932) who described a single species, *J. elongella*, from western Himalayas. This species has also been discovered for the first time from eastern India during a survey of the collection made from Ukhrul (Manipur) and Shillong (Meghalaya).

The plants collected from Champawat (Pithoragarh) and Hemkund in western Himalayas agree with *J. nipponica* in leaf shape and perianth mouth. Amakawa (1959) treats this species under *J. autumnalis* (D. C.) St. and Hattori (1966) reports this species from India. However, Schuster (1969) and Grolle (1971) state that the plants do not occur in India. Schuster (1969) treats *J. nipponica* as a variety of *J. autumnalis* but Grolle (1971) regards it as a distinct taxon which seems to be more sound.

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Thus, *Jamesoniella* is represented in our country by *J. elongella* and *J. nipponica*, which are being described here with relevant illustrations.

*Key to the Species :*

1. Plants up to 5 cm long; leaves normally oblong, with antical margin decurrent.  
*J. elongella*
1. Plants up to 2 cm long; leaves normally ovate with antical margin hardly decurrent.  
*J. nipponica*

**Taxonomic Description**

1. *Jamesoniella elongella* (Tayl.) St. Species Hepaticarum 2:93 (1901).

Text-figs. 1-15

Plants dioecious, robust, up to 5 cm long, dark green to brown, suberect. Stem 155-250 (-315 $\mu$ m) in diameter, 8-15 cells across, cortical region 1-2 cell layered thick, slightly thick or thin-walled, cells smaller, 12-29 $\times$ 14-35  $\mu$ m, medullary cells thin-walled, larger, 12-44  $\times$ 14-47  $\mu$ m; sometimes stoloniferous; branching mostly ventral-intercalary, sometimes lateral. Leaves contiguous to distant, entire-retuse or rarely bilobed, succubous, normally oblong, 0.90-1.60 mm long, 0.70-1.10 mm broad, widely spreading or sometimes dorsally appressed at shoot apices, dorsally decurrent, obliquely inserted with wide base, cell walls thin with small, acute trigones, surface smooth; marginal cells 18-26 $\times$ 15-26  $\mu$ m, middle cells 18-42 $\times$ 18-34  $\mu$ m, basal cells 26-60 $\times$ 31-39  $\mu$ m. Oil-bodies 3-12 in each leaf cell, spherical, 4-7  $\mu$ m in diameter, oval to elliptical, 7-13 $\times$ 4-6  $\mu$ m, finely segmented. Underleaves wanting or vestigial, when present variable in size and shape, subulate to ovate or rarely bifid. Rhizoids few to sometimes abundant, hyaline, throughout ventral surface of axis, tips bulbous or branched harbouring mycorrhiza. Male inflorescence terminal or intercalary, bracts up to 7 pairs, ventricose, with infolded 1 toothed dorsal flap, antheridia solitary.

*Specimens examined*—LWU 3636/79; Loc. Ukhrul (Manipur), alt. ca 1860 m; Leg. A. Kumar and U. S. Awasthi; Date October 31, 1979; LWU 3910/79; Loc. Elephant Fall in Shillong Meghalaya), alt. Ca 1800 m; Leg. A. Kumar and U. S. Awasthi; Date November 10, 1979. Det. R. Udar and A. Kumar. 1608-Allahabad University Herbarium (Bryophyta); Loc. Champawat in Pithoragarh, alt. ca 2000 m; Leg. S. N. Srivastava; Date January 1978; Det. J. Vana.

*Habitat*—The plants grow on wet soil surface of ravines either in pure population or in association with *Marchantia* sp., *Phaeoceros laevis* (L.) Prosk. and *Riccardia* sp.

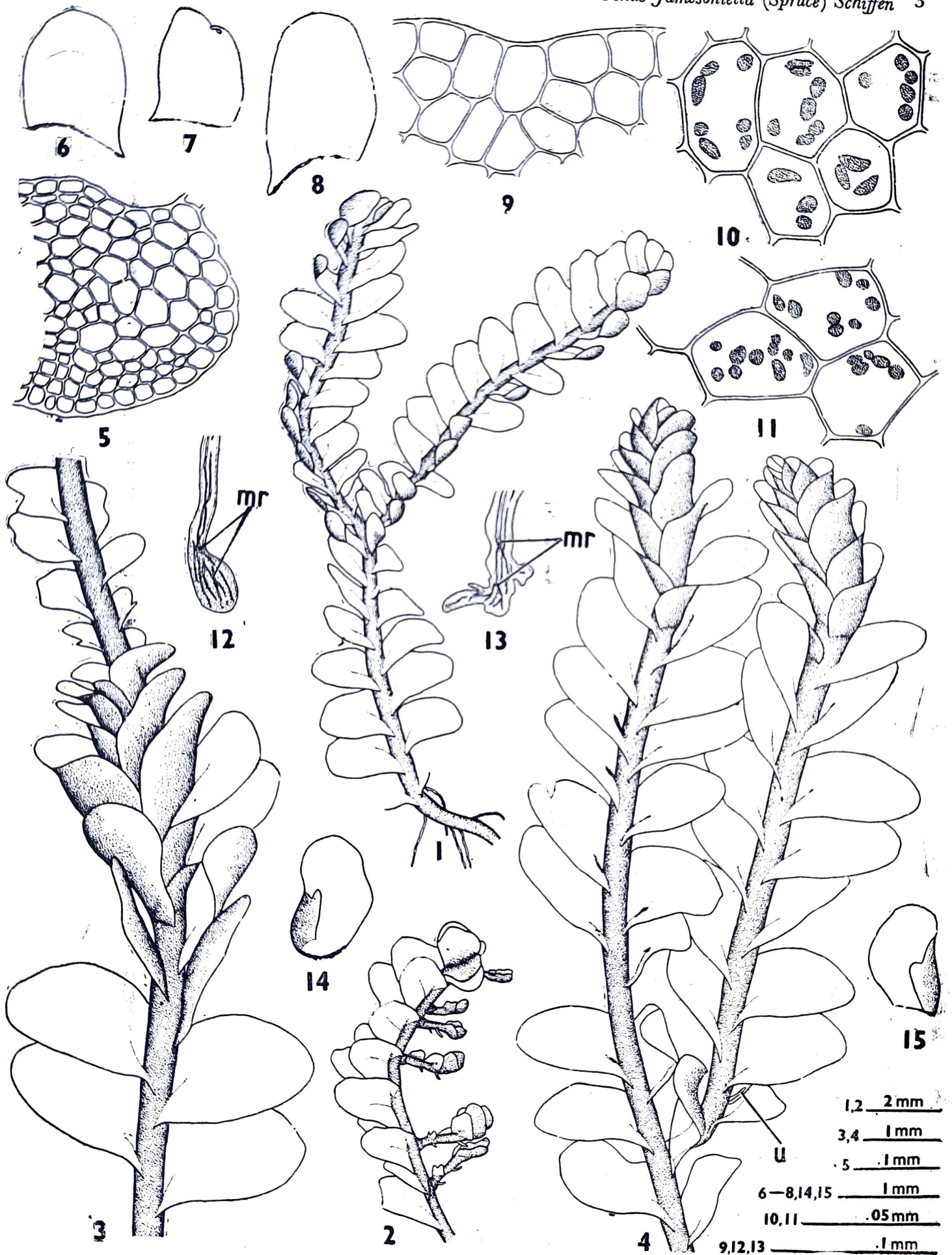
*Range*—India, Nepal and Southwest China.

*Distribution in India*—Eastern Himalayas: Shillong (Meghalaya), Ukhrul (Manipur); Western Himalayas: Champawat in Pithoragarh; Kashyap (1932) from Kumaon (Uttar Pradesh).

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Text-fig. 1. 1-15. *Jamesoniella elongella* (Tayl.) St. 1. A vegetative plant with stoloniferous base, 2. A portion of young plant bearing several branches (Note the presence of bilobed leaves and underleaves at the base of these branches), 3. Posterior part of the male plant bearing the intercalary male inflorescence (Note the retuse and bilobed leaves on proliferating branch), 4. Anterior part of the above plant bearing terminal male inflorescence on each branch (Note the presence of underleaf at posterior part of the branch; u-underleaf), 5. Transection of the axis (in part), 6-8. Leaves, 9. Marginal cells of the leaf, 10. Median cells of the leaf with oil-bodies, 11. Basal cells of the leaf with oil-bodies, 12, 13. Tips of rhizoids harbouring mycorrhiza (mr-mycorrhiza; 12. Swollen tip, 13. Branched tip), 14, 15. Male bracts.





1,2	2 mm
3,4	1 mm
u	.5
5	.1 mm
6-8,14,15	1 mm
10,11	.05 mm
9,12,13	.1 mm

Text-fig. 1.



The plants from Ukhrul form pure populations but those from Shillong are associated with other bryophytes. The plants growing in these territories are vegetative and smaller in size. The stoloniferous (Text-fig. 1) shoots are commonly present. The ventral-intercalary branching (Text-fig. 2) has been observed to be more predominant in the plants collected from Shillong. The bulbous or branched rhizoids harbour mycorrhiza (Text-fig. 12 mr, 13 mr). The west Himalayan populations, as those from Ukhrul, form pure populations, but male plants are considerably larger attaining a length of 5 cm.

2. *Jamesoniella nipponica* Hatt., Journ. Jap. Bot. 19: 350 (1943).

Text-figs. 16-39

Plants dioecious, up to 2 cm long, dark green, prostrate in mats. Stem 140-210 (-270  $\mu\text{m}$ ) in diameter, 6-9 cells across, cortical and medullary regions more or less indistinct, 13-23(-26)  $\times$  13-23(-26)  $\mu\text{m}$ , cells thin-walled; branching rare, ventral intercalary, or with 1-2 subfloral innovations. Leaves contiguous, entire or retuse, rarely bilobed, succubous, normally ovate (oval on female plants), broader than long, or as long as broad, 0.41-0.80 mm long, 0.41-0.98 mm broad, obliquely spreading, dorsally appressed, concave, hardly decurrent dorsally, obliquely inserted, normally with wide base on vegetative plants and with narrower base on female plants; cell walls thin, with small, acute trigones, surface smooth; marginal cells 13-26  $\times$  18-26  $\mu\text{m}$ , middle cells 15-34  $\times$  20-29  $\mu\text{m}$ , basal cells 26-42  $\times$  23-36  $\mu\text{m}$ . Underleaves wanting or vestigial on young branches, subulate to bifid. Rhizoids numerous throughout ventral surface of axis, hyaline. Male inflorescence not seen. Female inflorescence terminal on main shoot, slightly projected upwardly; bracts in 1 pair, more concave and much larger than cauline leaves, margin ciliated or lobed or rarely only undulate; bracteole always present, margin entire or lobed, often undulate, connate with bracts at base. Perianth obclavate, 1/2 exerted, up to 6 (rarely 8) plicate, mouth ciliated, cilia about 5 cells in height, cells isodiametric, walls thin, trigones feebly developed and acute.

*Specimens examined*—LWU 5275/80; Loc. Hemkund (Uttar Pradesh), alt. ca 4670 m; Leg. S. C. Srivastava, D. Kumar and D. K. Singh; Date May 23, 1980, 341-Allahabad University Herbarium (Bryophyta); Loc. Champawat in Pithoragarh, alt. ca 2000 m; Leg. S. N. Srivastava; Date September 14, 1977. Det.: R. Udar and A. Kumar.

*Habitat*—The plants grow on wet soil surface of rocks, at comparatively high altitude (200-4670 m), in association with *Calypogeia* sp., *Herberta kurzii* St., *Lophocolea* sp., *Metzgeria* sp., *Plagiochila* sp. and *Tritomaria* sp.

*Range*—Bhutan, India, Japan, Nepal, North Borneo and Taiwan.

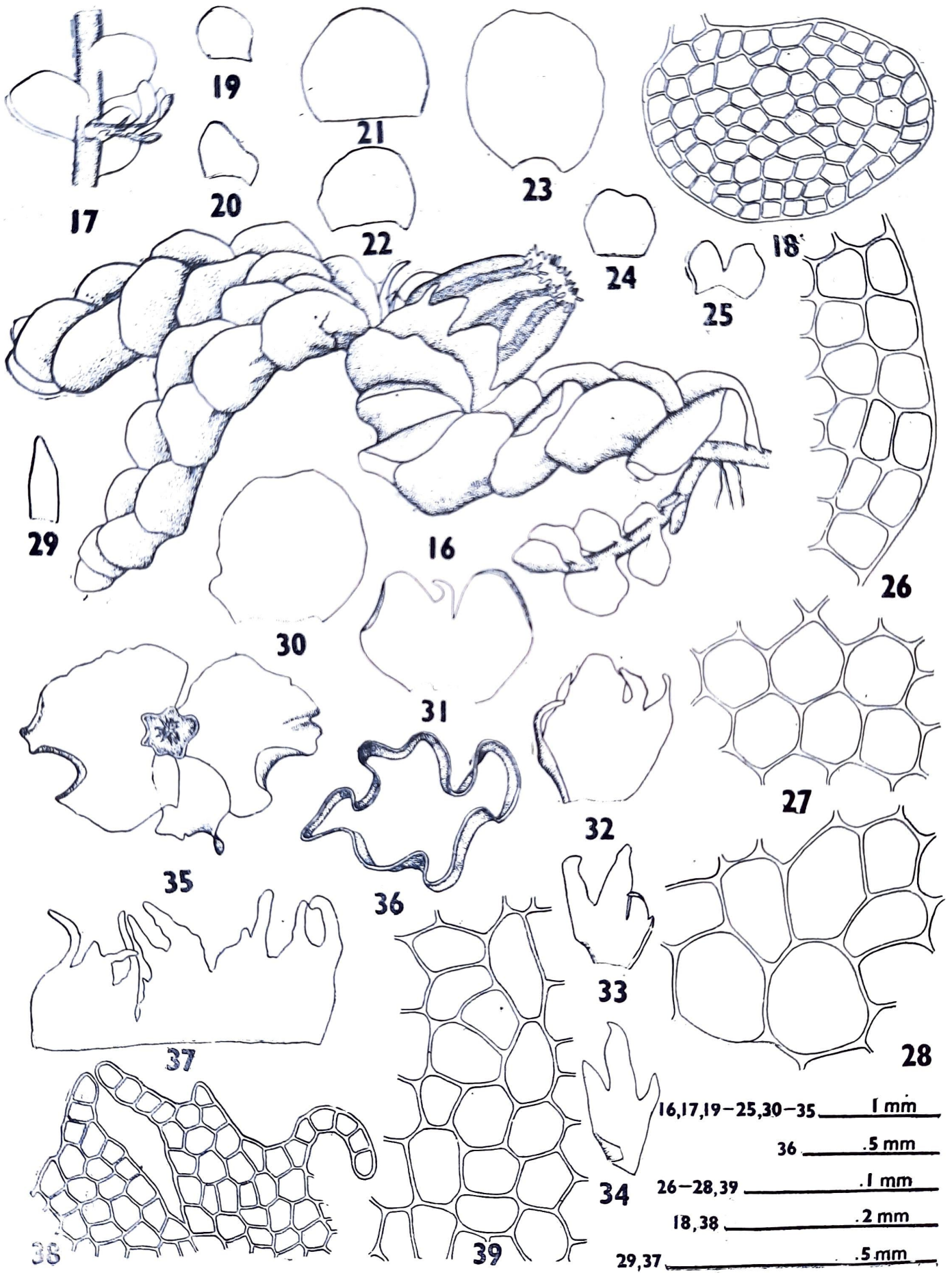
*Distribution in India*—Western Himalayas: Hemkund; Champawat in Pithoragarh (Uttar Pradesh); Grolle (1971) from Simla (Himachal Pradesh).

Of the two species of *Jamesoniella* described here, only *J. nipponica* had perianth. The cilia at perianth-mouth of this species are up to 5 cells in height (Text-fig. 38) but those of *J. elongella* (Grolle, 1971) are only 1-2 cells in height.

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Text-fig. 2. 16-39. *Jamesoniella nipponica* Hatt. 16. A female plant with perianth and the subfloral innovation, 17. A portion of plant in ventral view showing branching, 18. Transection of the axis, 19-25. Leaves, 26. Marginal cells of the leaf, 27. Median cells of the leaf, 28. Basal cells of the leaf, 29. Underleaf, 30-32. Female bracts, 33, 34. Female bracteoles, 35. One set of bracts and bracteole, 36. Transection of the perianth, 37. A portion of perianth mouth, 38. Cells at perianth mouth, 39. Median cells of the perianth.





Text-fig. 2.

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