

Metzgeria sikkimensis sp. nov. from Sikkim Himalayas, India

S.C. Srivastava and K.K. Rawat

Department of Botany, University of Lucknow, Lucknow - 226007

Srivastava, S.C. & Rawat, K.K. 2003. *Metzgeria sikkimensis* sp. nov. from Sikkim Himalayas, India, *Geophytology* 31(1&2): 71-73.

A new species of *Metzgeria*, *M. sikkimensis* is described from Sikkim Himalayas, India. This species can be distinguished by the presence of 18-27 cells broad wing on either side of mid-rib, broad and obtuse apex, 2/2 (3) rows of epidermal cells on mid-rib, monoecious sexuality, '*M. furcata*' type capsule wall and absence of gemmae. Though it shows some affinity with *M. conjugata* subsp. *japonica* (Hatt.) Kuwah., *M. himalayensis* Kash. and *M. molokaiensis* Kuwah. known from the same or neighbouring territory, it does not fully correspond with any of them.

Key-words— *Metzgeria*, Sikkim, Himalaya, India.

INTRODUCTION

THE first report of genus *Metzgeria* from Sikkim as well as India occurs in the publication of Mitten (1861) who reported *M. furcata* from Sikkim. Later on four more species, *M. hamata* Lindb. (now *M. leptoneura* Spruce), *M. madagassa* St., *M. longitexta* St. and *M. crispula* Herz. were added from the same territory (Stephani, 1900, 1917; Herzog, 1939). In his work on Himalayan Metzgeriaceae Kuwahara (1965, 1969) made further addition of *M. consanguinea* Shiffin., *M. conjugata* subsp. *japonica* (Hatt.) Kuwah., *M. leptoneura* Spruce (\equiv *M. hamata*), *M. molokaiensis* Kuwah. and *M. macrospora* Kuwah. in the Metzgeriaceae flora of Sikkim Himalayas Srivastava and Udar, 1975). Some of the above mentioned species earlier reported from this territory have been treated as doubtful records. These include *M. furcata* (L.) Dum., *M. molokaiensis* Kuwah. and *M. longitexta* St. which may be treated as extremely rare and threatened plants from this territory. *M. longitexta* St., a very old species of *Metzgeria* never recollected ever since its original discovery from the Eastern Himalaya (Stephani, 1900), may be placed in the list of Red Data Book.

Metzgeria sikkimensis sp. nov. (Fig. 1)

Monoica. Thalli latis et obtusis. Ala unistrata, 18-27 cellulis lata ad utrimque latus nervi medii; cellulae marginales 30.4 - 45.6 (-55.6) x 22.8-34.2 μ m., cellulae mediae 34.2-49.4 x 22.8 - 38.0 μ m.. Pili recti, dispositi singuli ad margines, dispersi in superficie ventrali nervi medii. Nervus medius ornatus duplici serie cellularum epidermalium in utraque facie; cellulae interiores parvae, parietibus

crassis. Rami antheridiales globosi, absque pilis. Rami archigoniales cordati et pilosi. Capsule ovata vel spherica, parietibus bistrata '*M. furcata*' typo. Sporae 20.0-27.5 x 15.0-22.5 μ m. diam., elateres 135-350 μ m. longi, 5.0 - 7.5 μ m. lati, ornate zona unispirali spissescente. Gemmae absque.

Typus: Epiphytice crescit in Sikkim, in India. Leg. U. S. Awasthi & A. Kumar in Nathula Road die 28 Decembris 1977. *Typus* (8191/77) positus in herbario hepaticae universitatis Lucknow.

Thalli yellowish when dry, dichotomously branched, with broad and obtuse apices; ventral adventitious branches often present; wing broad, 18 - 27 cells wide on either side of the mid rib, cells thin walled with minute trigones; marginal cells 30.4 - 45.6 (-55.6) x 22.8 - 34.2 μ m., middle cells 34.2 - 49.4 x 22.8 - 38.0 μ m., hairs straight, disposed singly at the margin, also scattered on the ventral surface of the midrib; midrib distinct, epidermal cells 2/2 (-3), inner cells small, up to 17 in number, slightly thick walled. Monoecious. Antheridial branches inrolled, globose, without hairs. Archegonial branches cordate with hairy margins, calyptra pyriform, fleshy, with pointed hairs, seta long, up to 5 cells across diameter, capsule oval to spherical, blackish brown, wall bistratose, capsule wall thickening '*M. furcata*' type i.e., the nodulose thickening on the radial wall of the inner layer are prolonged on to the tangential wall of the layer and thus appearing semiannular (in surface view), the median wall absent. Cells of outer layer 45.0 - 75.0 x (-7.5) 15 - 35 μ m., cells of inner layer 70.0 - 80.0 x 12.5 - 20.0 μ m. Spores irregular in shape, 20.0 - 27.5 x 15.0 - 22.5 μ m., elaters 135 - 350 μ m. long, 5.0 - 7.5

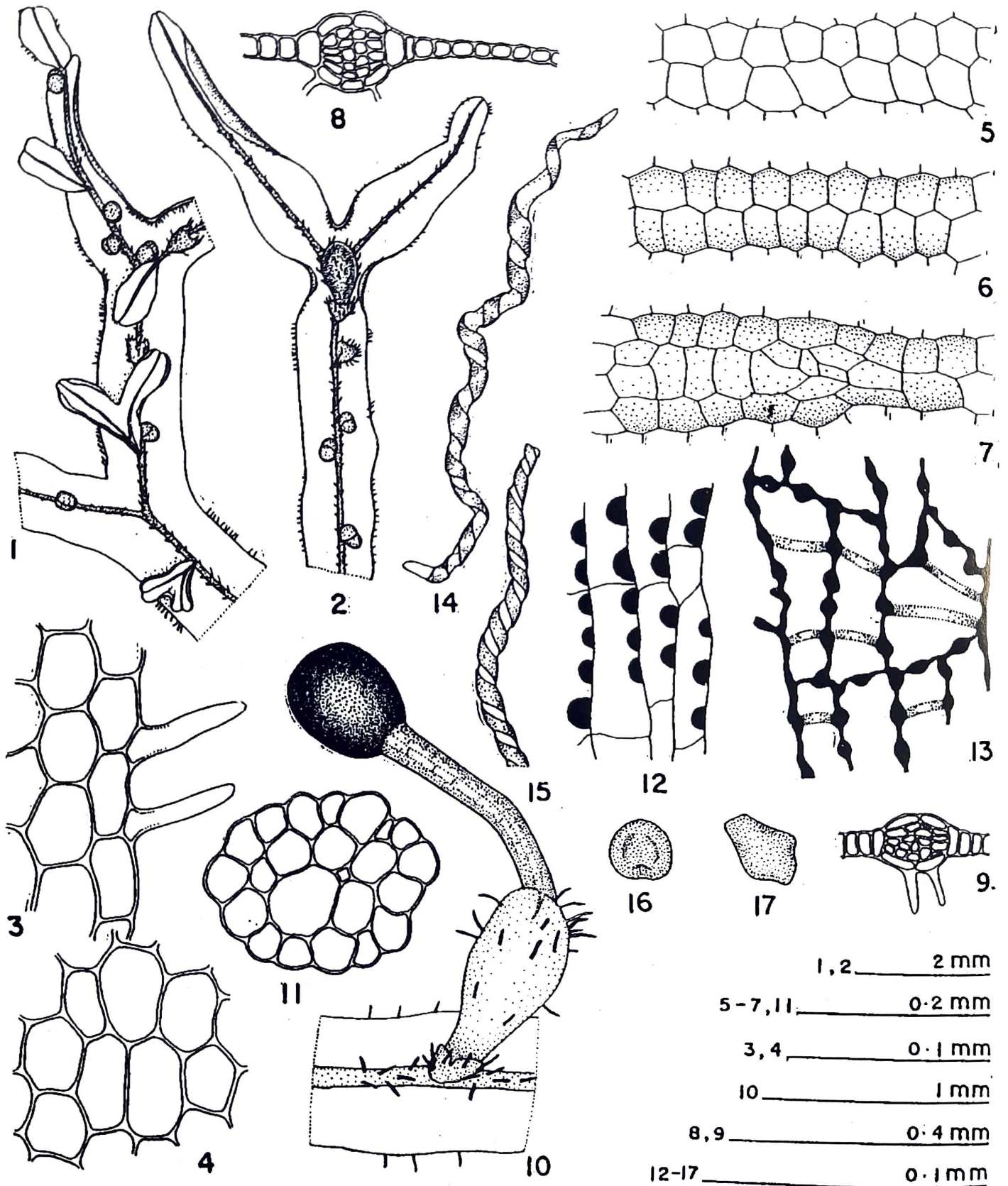


Fig. 1: *Metzgeria sikkimensis* sp. nov. 1. Thallus with adventitious branches. 2. Thallus with archegonial and antheridial branches. 3. Marginal cells. 4. Median cells. 5. Dorsal epidermal cells of midrib. 6. Ventral epidermal cells of midrib. 7. Ventral midrib near branching. 8-9. T. S. of thallus. 10. Part of thallus with sporophyte. 11. T.S. Seta. 12. Capsule wall outer layer. 13. Capsule wall inner layer. 14-15. Elaters. 16 - 17. Spores.

µm. wide in middle, with a single broad spiral band.

Type: LWU 8191 (Holotype) *M. sikkimensis* Bryophytes from Eastern Himalayas: Sikkim Loc.: Nathula Road, Gangtok, Date: 28.12.1977 Leg.: U. S. Awasthi & A. Kumar, Det.: S. C. Srivastava and K. K. Rawat.

Other specimens examined

*G009875 Hepaticae Japonicae Ser. 2 (1947) edidit S. Hattori 93. *Metzgeria himalayensis* Kashyap (forma) Kiushiu, Miyazaki Minaminaka, Kitago, in valle Montana ad rupes humides umbrosa ca 300 m, Leg. S. Hattori et T. Kurata v. 1947 det. SH.

*G 011730 V. Schiffner, Hepaticae europae exsiccatae 1247. *Metzgeria conjugata* S.O. Lindb. rupicola-Bayern : Fichtelgebirge; au Granitfelsen bei Berneck, ca 400 m. 11 Juli 1903 Leg. W. Monkemeyer.

*G011731 Herb. F. camus *Metzgeria conjugata* Nees. Fructifie Jordy rochers ombrugo's (Finistere) 1 Oct. 1878.

*G011732 Hepaticae of the Nearctic collected by R. M. Schuster July 17, 1950 No. 18410 *Metzgeria conjugata* Lindb. over shaded moist sand stones rocks on steep slope; along Route 33 about 12 miles west of Harrisonburg, Washington National forest Va. Occurring with *Leucolejeunea clypeata* a few plants *Metzgeria crassipilis* (dorsal gemmae; in paper)

*LWU 8189 *Metzgeria conjugata* sub sp. *japonica* Bryophytes from Eastern Himalaya: Sikkim. Loc.: Nathula Road. Date: 28.12.1977 Leg.: U.S. Awasthi & A. Kumar, Det.: S. C. Srivastava and K. K. Rawat

*Lucknow University Hepatic Herbarium, Liverworts from Eastern Himalayas No. 50 *Metzgeria conjugata* sub. sp. *japonica* (Hatt.) Kuwah. Loc.: Darjeeling, Date:.....?, Leg.: R. Udar, Det.: S. C. Srivastava

*As entered on herbarium label

Ecology and distribution: Growing epiphytically in pure patches. Endemic to Sikkim.

Characteristic features of the species: 1. Wing 18 - 27 cells broad on either side of midrib. 2. Gemmae absent. 3. Ventral epidermal cells on midrib usually in 2 rows. 4. Apex broad and obtuse 5. Hairs present singly at the margins of the wing, also scattered on the ventral midrib. 6. Monoecious. 7. Capsule wall thickening '*M. furcata*' type.

DISCUSSION

This species shows close resemblance with *M. conjugata* sub.sp. *japonica* in number of ventral epidermal cells on mid rib, sexuality and capsule wall structure but differs from the latter in wing width (18 - 27 cells wide in *M. sikkimensis* and 14 - 1/8 (22) in the latter) and hair distribution at wing margin (singly in *M. sikkimensis* and paired in *M. conjugata* sub sp. *japonica*).

This species also approaches *M. himalayensis* Kash. in distribution of hairs, absence of gemmae, and number of ventral epidermal cells of midrib but differs in the wing width (18 -27 in *M. sikkimensis* and 12-18 in the latter) and capsule wall structure ('*M. furcata*' type in *M. sikkimensis* and '*M. comata*' type in *M. himalayensis*).

M. sikkimensis also shows close affinity with *M. molokaiensis* Kuwah. in number of ventral epidermal cells of midrib and wing width but differs in distribution of hairs (present at margins and midrib in *M. sikkimensis* while all over the ventral surface of wing, margins and mid rib in *M. molokaiensis*). Further, *M. sikkimensis* is monoecious in contrast to dioecious sexuality of *M. molokaiensis*. Both may be further distinguished by the absence of gemmae in the former and presence of gemmae in the latter.

ACKNOWLEDGEMENT

Grateful thanks are due to Department of Science and Technology, Government of India, New Delhi for financial support.

REFERENCES

- Herzog, T 1939, Zwei Bryophyten sammlungen aus dem Sikkim Himalaya. *Anns. Bryol.* **12**: 71-97.
- Kuwahara, Y 1965. A short survey of the Himalayan Metzgeriaceae. *J. Hattori Bot. Lab.* **28**: 292-298.
- Kuwahara, Y 1969. An addendum to the Himalayan Metzgeriaceae. *J. Hattori Bot. Lab.* **37**: 17-20.
- Mitten, W 1861 Hepaticae Indiae Orientalis. An enumeration of the Hepaticae of the East Indies. *J. Linn. Soc.* **5**: 89-128.
- Srivastava, SC and Udar, R 1975. Taxonomy of the Indian Metzgeriaceae a monographic study. *New Botanist* **2**(1): 1 - 57.
- Stephani, F 1900. *Species Hepaticarum* I, Geneve
- Stephani, F 1917. *Species Hepaticarum* IV, Geneve