A NEW *HETEROSCYPHUS* FROM EASTERN HIMALAYAS

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Abstract

A new species of *Heteroscyphus* Schiffn., *H. udarii*, has been described from the eastern Himalayas, India. The taxon is characterised by laterally compressed plants having bifid leaves and underleaves with smooth margins. The underleaves are orbicular and connate at their basal margins by the adjoining lateral leaves. Besides, the lateral leaves are also connate dorsally at their antical end

Introduction

Heteroscyphus is widely distributed in different parts of India and belongs to the subfamily Lophocoleoideae, which is the largest of the three subfamilies (including Leptoscyphoideae and Geocalycoideae) under Geocalycaceae (Schuster, 1980). The genus is characterized by spicate terminal androecia borne on short lateral branches with male bracts distinctly different from the vegetative leaves. The lateral leaves are often connate with each other dorsally and with underleaves ventrally having tri-radiate to knot-like trigones.

Heteroscyphus is closely related to *Chiloscyphus* with which it distinctly differs in the position of androecia and structure of antheridial bracts. In *Chiloscyphus* androecia are intercalary on main axis or on lateral branches and male bracts are more or less similar to vegetative leaves (Schiffner, 1910). It further differs from *Chiloscyphus* in the degree of connation of lateral leaves dorsally and with the amphigastria ventrally (Schuster, 1980) and also in presence of trigones in leaves and underleaves (Engel & Schuster, 1984). However, in *Chiloscyphus* leaves and underleaves are free and trigones are absent.

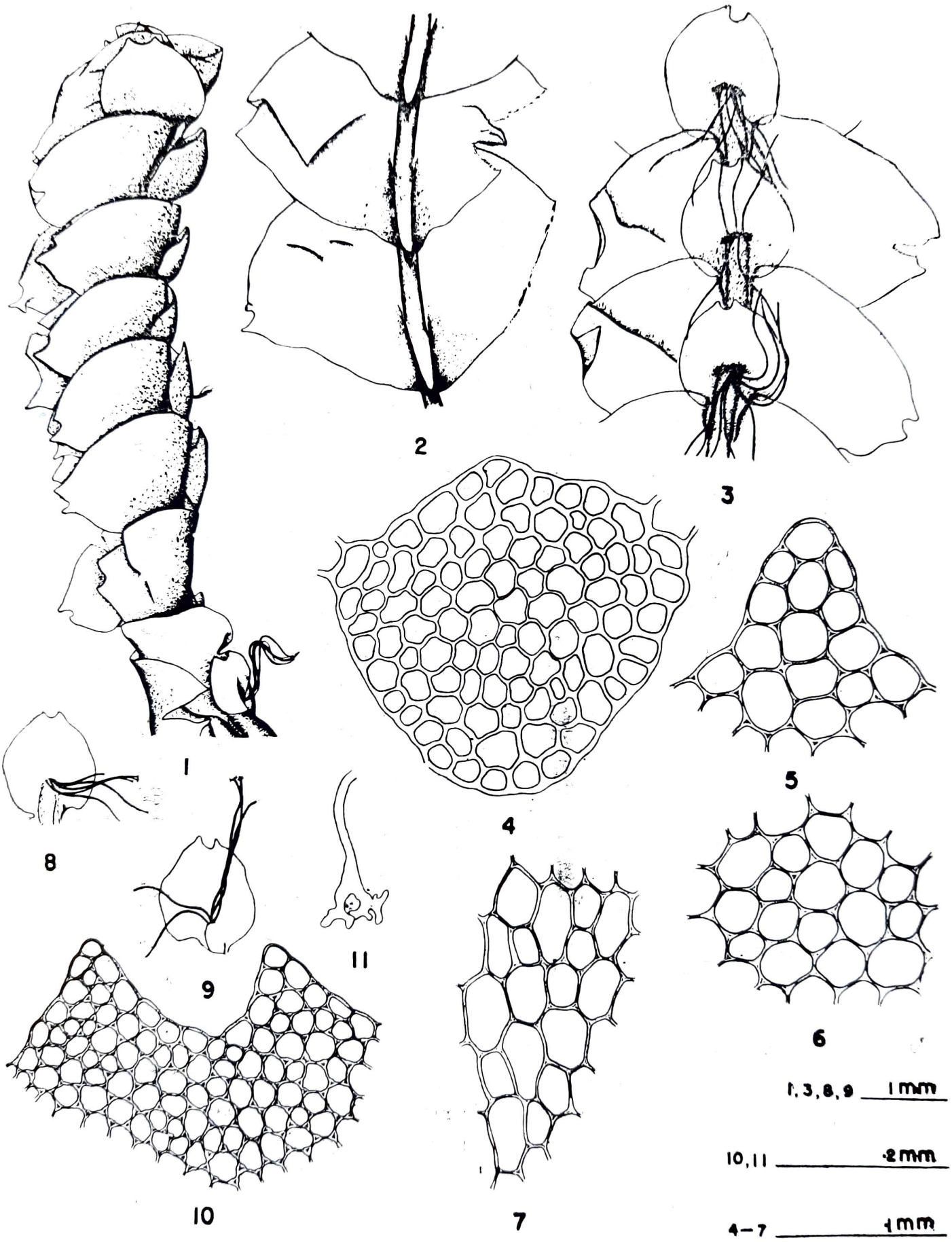
In the present state of our knowledge 7 species of *Heteroscyphus* are known so far from India (with one more species, *H. decurrens*, whose occurrence is doubtful in India) (see Mitten, 1861; Schiffner, 1910; Stephani, 1906-1909; Kashyap, 1932; Chopra, 1938; Pande *et al.*, 1960; Hattori, 1966; Bonner, 1966).

During the floristic survey of a recent collection of liverworts from eastern Himalayas, some interesting plants of *Heteroscyphus* have been discovered which strikingly differ from all the known species of the genus and are clearly referable to a new species, *H. udarii* sp. nov.

Description

Planta plano compressus, oppositifolius. Folia magna, ovata, biloba, connatus dorsaliter and anticus extremum. Amphigastria magna, orbiculata, biloba, margine integra, connatus ad basim cum lateralis folia. Cellulae distinctus trigonus.

Plants laterally compressed, delicate in texture and light brown. Stem 3-4 cm long, sometimes up to 6 cm, usually branched, 11-12 cells across diameter, cells 12-23 × 12-27 μm, usually undifferentiated, outer cells thick-walled, inner medullary cells relatively thin-walled. Leaves opposite, succubous, overlapping, ventrally connate with the basal margin



Text-fig.1-11—*Heteroscyphus udarii* sp. nov. 1. Lateral view of plant; 2. A portion of the same (dorsal view) ; 3. A portion of the same (ventral view); 4. T. S. of stem; 5-7. cells of leaf from apex, middle and base, respectively; 8, 9. Underleaves with rhizoids; 10. Apex of underleaf; and 11. Rhizoid.

of the underleaf and dorsally each pair of leaf connate at antical ends, 1.8-2.2.mm long, 2.4 -3.1 mm wide, ovate, apex bifid with smooth margins; cells thin-walled and trigonous, 15-27 ×15-27 μm at apex, 10-39 ×15-35 μm in the middle and 19-55 ×15-27 μm at the base. Underleaves large, 1.3-1.8 mm long,1.1-1.5 mm broad, orbicular, shortly bifid at apex, margins smooth, rarely toothed at the base, cells 18-45 ×22-41 μm, relatively smaller, 13-27 ×13-23 μm at base, connate with the adjoining lateral leaves at basal margin on both sides. Rhizoids arising from the base of underleaves, hyaline and branched at the tip. Fertile plants not seen.

Type specimen deposited in LWU: 8396/1978 (Holotype) *Heteroscyphus udarii* sp. nov. Legit: S. C. Srivastava, U. S. Awasthi and Adarsh Kumar, Loc: Sukia, Darjeeling (E.H.), India, Date 13.5.78, Habitat: on bark, in association with *Lejeunea* sp. *Bazzania* sp. and mosses. Det: S. C. Srivastava and Abha Srivastava; LWU: 2992/1978 (Syntype), Legit: S. C. Srivastava, U. S. Awasthi and Adarsh Kumar, Loc.: Darjeeling (E. H.), India, Det. S. C. Srivastava and Abha Srivastava; LWU: 8958/1972 (Syntype), Legit: R. Udar and party, Loc.: Tonglu (E. H.), India, Date: 13.5.72, Det.: S. C. Srivastava and Abha Srivastava.

Other specimens examined—G 000563 Original (Typus) *Chiloscyphus inflatus*, 24918, N. W Himalaya, 12000 ft., 5/1894. Leg.: J. S. Gamble; G 003733 (Typus) *Chiloscyphus tener* St. n. sp., China, Schensi, Giraldi, interlevier 1804; G 12175 (Typus) *Chiloscyphus beschereli* St. Herb. mus. Paris, Japcnia Kominato 2 IV 1894; G 000561 (Typus) *Chiloscyphus gollani* St. n. sp. Brycthcca E. Levier, Hepaticae Indiae orientalis, Curante, Cl. W. Gollan lectae, 3828, Mussoorie (N. W. Himalaya) Mossy falls, under deep shade, 5600 ft., 14 Sept. 1900, Legit. W. Gollan; G 11479 (Typus) *Chiloscyphus gammianus* St. Hab. Sitong, Elev. 1500 ft., Date 26.1.1898, Coll. G. A. Gammie; G 000562 (Typus) *Chiloscyphus himalayensis* St. n. sp. No. 299, N. W. Himalaya Dehradun, Prope. Mussoorie 6-7000 ft., 2 Jan 1892, Legit: T. J. Duthie.

Discussion

Unfortunately fertile plants of *H. udarii* were not found in the present collection, but the vegetative features of this taxon alone are highly distinctive. This species is characterized by laterally compressed plants having ovate and bifid leaves and underleaves with smooth margins. The underleaves are orbicular and connate at their basal margins by the adjoining lateral leaves. *H. udarii* shows resemblance with *Heteroscyphus conjugatus* (Mitt.) Engel & Schuster, and *Heteroscyphus tener* (St.) Schiffner, in connation of the underleaf with the adjoining lateral leaves at the base and in dorsal connation of leaves at their antical ends but it can be easily distinguished from them in the structure of leaves and underleaves.

The chief difference between *H. conjugatus* and *H. udarii* is the presence of unlobed leaves and underleaves with prominent dentitions at the margins in the former (Engel & Schuster, 1984) and bifid leaves and underleaves with smooth margins in the latter. *Heteroscyphus tener* differs in having entire and unlobed leaves and bifid underleaves with prominent dentitions.

In addition to the above characters *H. udarii* can also be differentiated from *H. conjugatus* and *H. tener* in nature of leaf cells which are of *deflexifolia* type (having knot-like trigones) in *H. conjugatus* and *H. tener* and of *hypnoides* type (with tri-radiate trigones) in *H. udarii* (Carl, H. 1931).

During the monographic study of the subfamily Lophocoleoideae, we have examined the authentic specimens of *Chiloscyphus inflatus* St. which show more or less identical

characters of the genus *Heteroscyphus*. Therefore, this species now is referred to *Heteroscyphus*, *H. inflatus* (St.) Srivastava & Srivastava comb. nov. This species can be differentiated from *H. udarii* on the basis of leaves (sometimes underleaves also) being unlobed and orbicular in contrast to bifid and ovate leaves in *H. udarii*.

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