

Occurrence of *Ganguleea angulosa* (Broth. & Dix.) Zand. in India

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Manuscript received: 08 September 2015

Accepted for publication: 14 September 2015

ABSTRACT

Bansal P., Srivastava A. & Nath V. 2015. Occurrence of *Ganguleea angulosa* (Broth. & Dix.) Zand. in India. Geophytology 45(2): 273-276.

The paper describes the occurrence of *Ganguleea angulosa* (Broth. & Dix.) Zand. for the first time from Gangetic Plains of India, where it was found growing over stony walls and bricks in Lucknow district, Uttar Pradesh. Previously the species was reported under the name *Weisiopsis angulosa* (Broth. & Dix.) Hilp. from Himalayan regions only. A brief description of the species along with status of *Weisiopsis* and *Ganguleea* is described.

Key-words: *Ganguleea angulosa*, *Weisiopsis*, Gangetic Plains, Himalayas.

INTRODUCTION

Pottiaceae is the most dominant erect moss family of India. Its species represent more than 10% of the moss species known from the whole world (Buck & Goffinet 2000) and are widespread in all the major phytogeographical regions. The family has seven subfamilies, six tribes, about 1457 species and many infraspecific taxa. Zander (1989) reported seven new genera namely *Chenia*, *Dolotortula*, *Ganguleea*, *Hilpertia*, *Sagenotortula*, *Saitoa* and *Stonea* under family Pottiaceae. It has emerged as an important moss family in recent times with some workers (Zander 1993, 1996) performing extensive studies on the members of this family. Vashistha (1998) reported 36 genera and Lal (2005) listed 6 more genera, viz. *Ganguleea*, *Hymenostyliella*, *Pseudocrossidium*, *Scopelopila*, *Syntrichia* and *Tuerckheimia* under this family. Aziz

and Vohra (2008) provided an account of 29 genera with 130 species from India.

Genus *Weisiopsis* was introduced by Brotherus (1921) and it comprises 8 valid species worldwide (Van der Wijk et al. 1969) which show limited distribution in the Himalayas, China, Central and South Africa, Central and South America and none of the species is of wide distribution (Gangulee 1969-1972). There is only one species, i.e. *W. angulosa* (Broth. & Dix.) Hilp. in Asia. During the collection of bryophytes the plants of *Ganguleea angulosa* (Broth. & Dix.) Zand. was collected from Lucknow (Gangetic Plains). Extensive literature survey within India (Gangulee 1969-1972, Dandotiya et al. 2011) revealed that the species was reported by previous workers as *Weisiopsis angulosa* mainly from Sikkim, Darjeeling (Eastern Himalaya) and Almora (Western Himalaya). Zander (1989) changed

the name of genus from *Weisiopsis* to *Ganguleea* in honour of H. C. Gangulee. Thus the present study of its occurrence in Gangetic Plains extends its distribution within India. A brief description of the species is provided here along with ecological remarks.

MATERIAL AND METHODS

The study is based on the plant specimens collected from Lucknow district, Uttar Pradesh growing on soil covered stony walls and bricks in association with *Barbula* sp. Morphological characters of plants were examined under a stereo-zoom dissecting microscope. Size and shape of leaves were examined under a compound microscope. All measurements were made from wet material. Laminal width was measured at the broadest part of the leaf, costal width in the lower third and plant length refers only to the gametophyte. Digital microphotographs were taken with Nikon (012980) camera.

TAXONOMIC OBSERVATION

Ganguleea angulosa (Broth. & Dix.) Zand.,
Phytologia 65: 427. 1989.

Plate 1, figures 1-11

Description: Plants in a loose turf, very small in size, 2.5-3 mm long, unbranched, yellowish-green above, brown to blackish-brown below, rosulate. Stems about 1.2-2 mm long, transverse section of stem rounded elliptical to triangular, central strand absent. Leaves erecto-patent, incurved and tubular enrolled when dry but not much contorted, spreading when moist, spathulate to oblong-elliptical, somewhat convex, 1.8-2.2 mm in length, 0.8-1.2 mm wide at the wider upper part, upper lamina broadly channeled and form a narrower spathulate base, margins incurved, completely entire and unbroken; apex broadly rounded and obtuse with a small mucro or apiculus; base very narrow, constricted above the insertion. Costa narrow, slender at leaf tip and becomes suddenly very wide (46-65 μm) at leaf base, subpercurrent to short-excurrent as a sharp mucro; superficial cells rounded quadrate, bulging ventrally, dorsally elongate, 2-4 rows

of cells across costa ventrally at mid-leaf, costal transverse section circular, stereid band strong and circular in shape. Apical laminal cells rounded-quadrate to hexagonal, 7.3-10.9 \times 8.4-12.5 μm , lumens usually rounded, walls evenly thickened, superficially strongly bulging ventrally, nearly flat dorsally; median cells rounded to slightly elongated, 8.9-12.5 \times 8.4-12.5 μm with typical mamillate tumescent development; basal cells thin walled and smooth, rectangular to elongated at extreme leaf base, 36.4-39.9 \times 12.5-14.5 μm , narrower towards margin.

Ecology and distribution: *Ganguleea angulosa* (Broth. & Dix.) Zand. occurs commonly on stony walls in south-eastern Brazil, Nepal and India. In India, the species was previously reported from Sikkim, Darjeeling and Almora as *Weisiopsis angulosa*. Present study reveals its luxuriant growth on soil surface of stony rocks/bricks at an altitude of 128 m in association with species of *Barbula* thus extending its distribution in Gangetic Plains.

Specimen examined: India: Gangetic Plains, Lucknow district, University of Lucknow, 26°51'N; 80°55'E, alt. 128 m, on stony walls and bricks, 26 September 2014, leg.: P. Bansal, s.n. (LWG).

DISCUSSION

Ganguleea is a rarely collected monotypic genus found on soil over stony wall/bricks, rock in the Himalayas of India and Nepal, and also collected in a mountainous region of south-eastern Brazil. Like *Anoetangium*, *Molenaia* and *Pleurochaete*, this genus bears rather highly modified perichaetial leaves at the ends of very short branches and shows considerable resemblance to *Weisiopsis*, reflected in the combination *Weisiopsis angulosa* (Broth. & Dix.) Hilp., mainly in the leaves with narrow base, colliculate ventral surface, incurved margin and very strong and rounded stereid band in the section of costa. It is assumed that the genus *Ganguleea* may be derived from that genus through loss of the stem central strand, further narrowing of the leaf base, loss of peristome, and development of pleurocarpy (Zander 1989).

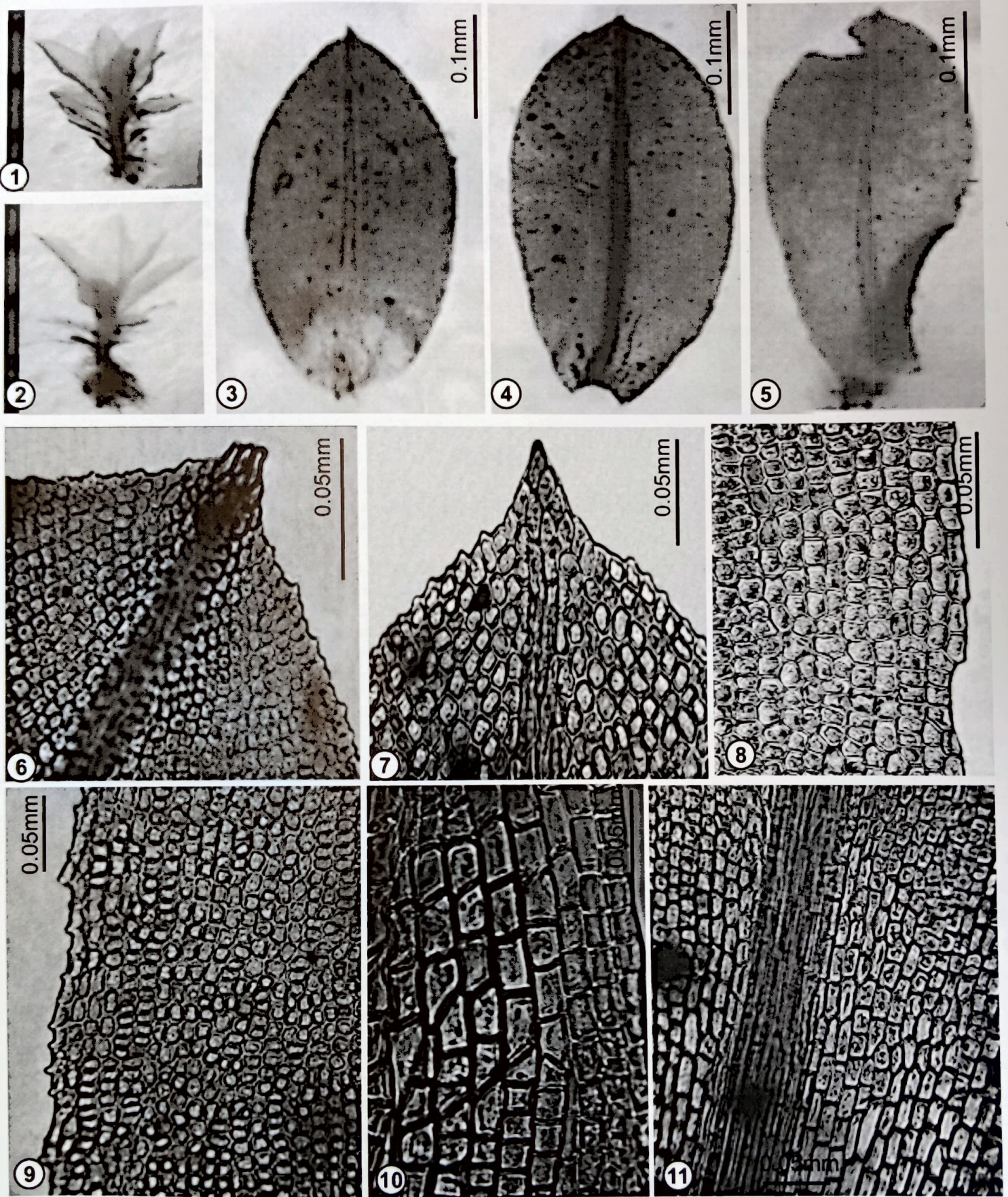


Plate 1

1-11. *Ganguleea angulosa* (Broth. & Dix.) Zand. 1-2. Plants. 3-5. Leaves. 6-7. Apical laminal cells with an apiculus. 8. Middle laminal cells. 9. Middle laminal cells near margin. 10. Basal laminal cells. 11. Basal laminal cells near costa.

ACKNOWLEDGEMENT

The authors are thankful to the University Grants Commission, New Delhi for financial assistance.

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