NOTE

Thuidium recognitum (Hedw.) Lindb. var. *delicatulum* (Hedw.) Warnst – a Moss New to Indian Bryoflora

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ABSTRACT: *Thuidium recognitum* belonging to Musci under family Thuidiaceae is reported for the first time from India. The specimens collected on the way to Dikhu river, Mokokchung, North Eastern hills, Nagaland highly resemble with the variety of *T. recognitum* var. *delicatulum* in acute stem leaf with top conical leaf papillae, dentate costa ending below tip. It is an addition to bryoflora of India, but has its restricted distribution in eastern Himalaya.

KEY WORDS: Eastern Himalaya, India, moss, new record, Thuidiaceae, *Thuidium*.

INTRODUCTION

Genus *Thuidium* Bruch, Schimper & Gümbel, a pleurocarpous moss of moist temperate region belonging to family Thuidiaceae was established by Bruch *et al.* (1836-1866). It is a cosmopolitan genus with about 158 valid species all over the world (Gangulee, 1978). As far as number of species pertaining to this genus in India is concerned, different workers have different opinions. Robinson (1968) reported 16 species of this genus from Himalaya, whereas Gangulee (1978) reported 18 species from various part of the country. Later on Vohra (1983) reported 20 species from India. Watanabe (1991) reported 14 species of this genus from Asia, of which 12 are from India. Recently, Lal (2005) provided a checklist of Indian mosses and reported 24 species of this genus from India.

Revisionary work on *Thuidium* has been carried out in Japan and adjacent regions (Watanabe, 1972), South of the Sahara Desert (Touw, 1976, 2001), Western Melanesia (= Eastern Malesia) (Norris and Koponen, 1985), Australasia (Touw and Haak, 1989) and North America (Crum, 1999). In India, Gangulee (1978) synonymised *T. delicatulum* under *T. recognitum* (Hedw.) Lindb. var. *delicatulum* (Hedw.) Warnst, also, Kuo and Chiang (1987) and Noguchi *et al.* (1991) retained the status of *T. recognitum* var. *delicatulum* as such and synonymised *T. delicatulum* under it. However, Kürschner and Erdağ (2005) treated *Thuidium delicatulum* (Hedw.) Mitt. and *T. recognitum* as separate species.

In this paper, the authors followed the concept of Gangulee (1978), Kürschner and Erdağ (2005), Kuo and Chiang (1987) and Noguchi *et al.* (1991), and described *delicatulum* at varietal level of *T. recognitum*. It is a new record for the bryoflora of India, though restricted in eastern Himalaya.

MATERIALS AND METHODS

The plants grow on moist soil on the way to Dikhu river, Mokokchung, Nagaland, and they were collected in August, 2008 associated with *Hypnum subimponens* Lesq. ssp. *ulophyllum* (C. Muell.) Ando and *Leucobryum nilghiriense* C. Muell. The specimens have been deposited in the Bryophyte Herbarium, National Botanical Research Institute, Lucknow (LWG).

TAXONOMIC TREATMENT

Thuidium recognitum (Hedw.) Lindb. var. ***delicatulum*** (Hedw.) Warnst, Bot. Centralbl., 5: 185 (1881).

Fig. 1

Hypnum delicatulum Hedw., *Spec. Musc.*: 260 (1801); *Thuidium delicatulum* (Hedw.) Mitt., *J. Linn. Soc. Bot.*, 12: 578 (1869) nom. illeg.; *Thuidium viride* Mitt., *Trans. Linn. Soc. London Bot.* ser. 2, 3: 188 (1891); *Thuidium uliginosum* Card., *Bull. Soc. Bot. Genève*, sér. 2, 3: 283 (1911); *Thuidium planopteris* Sak., *Bot. Mag. Tokyo*, 57: 349 (1943); *Thuidium tetracladioides* Sak., *Bot. Mag. Tokyo*, 60: 89 (1947); *Thuidium yezoanum* Sak., *Bot. Mag. Tokyo*, 60: 89 (1947); *Thuidium iyoense* Sak. in Oti, *Bot. Mag. Tokyo*, 63: 81 (1950); *Thuidium xanthobasis* Sak., *Bot. Mag. Tokyo*, 64: 199 (1951); *Thuidium tetracladioides* var. *xanthobasis* (Sak.) T. Inoue, *Misc. Bryol. Lichenol.* 12: 4 (1957); *Thuidium recognitum* auct. non. (Hedw.) Lindb., Noguchi, *J. Hattori Bot. Lab.* 20: 285 (1958).

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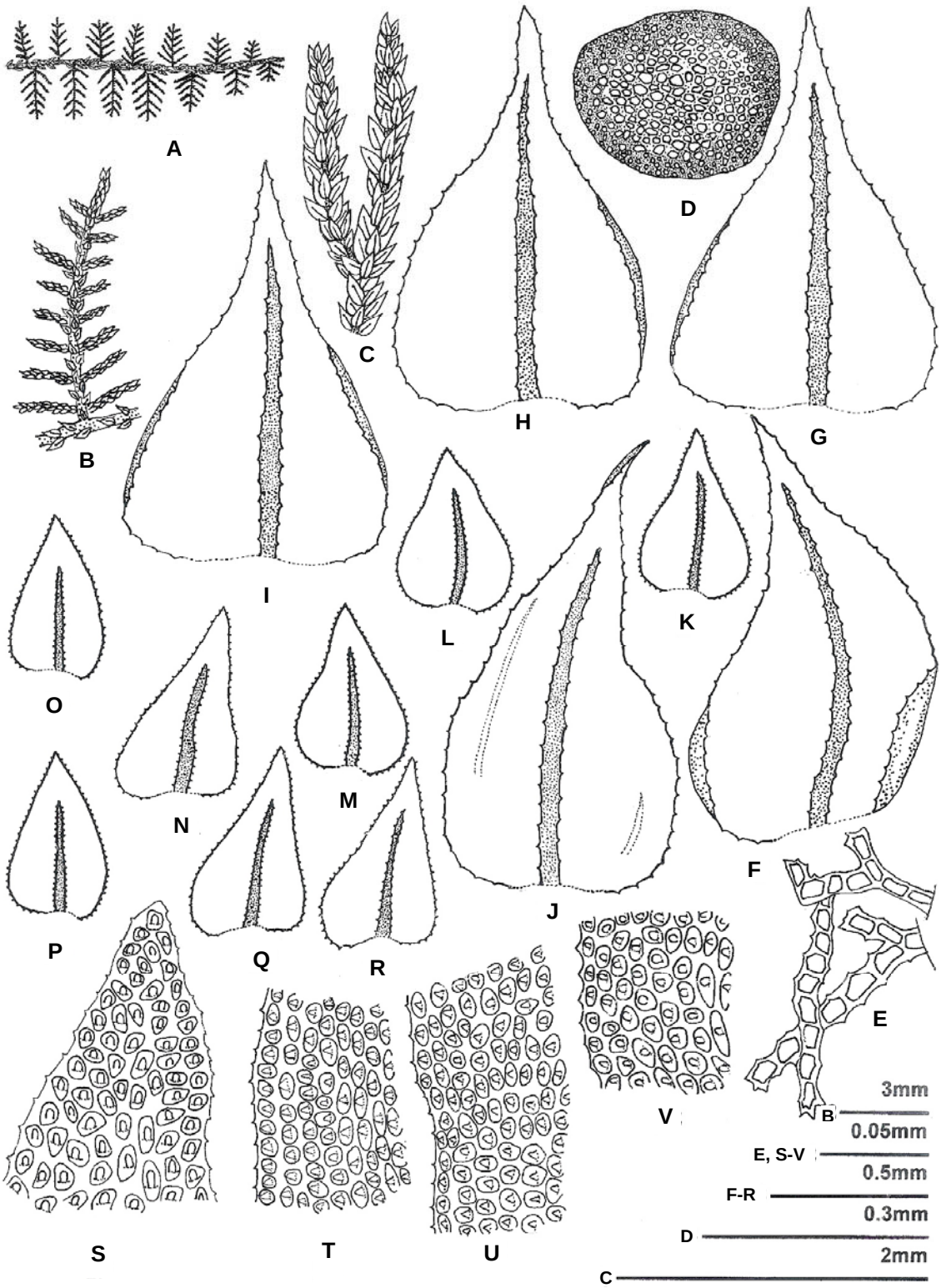


Fig. 1. ***Thuidium recognitum*** **(Hedw.) Lindb. var.** ***delicatulum*** **(Hedw.) Warnst. A: Plant (diagrammatic). B: Habit. C: Portions of plant. D: Cross section of stem. E: Paraphyllia. F-J: Stem leaves. K-R: Branch leaves. S: Apical cells of stem leaf. T: Median cells of stem leaf. U: Median cells of branch leaf. V: Basal cells of branch leaf.**

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Plants large, ±robust, forming light – green to yellowish to brownish mats. Stems prostrate, creeping, up to 12 cm long, bipinnately branched. Paraphyllia abundant at or near cell ends, papillose, the terminal cell usually acuminate, rarely obtuse or bifurcate, with 2-3 large, divergent papillae. Stem leaves erect when dry, widely ovate – lanceolate, 1.05-1.32 × 0.67-0.72 mm, abruptly acuminate. Margin sharply toothed. Costa stout, ending in acumen below tip, dentate. Cells pellucid, 12.5 × 8.3 µm, unipapillose. Few rows of cells at base larger, rectangular, 16.7 × 8.34 µm. Branch leaves dense, erectopatent, concave, ovate – lanceolate, 0.5 × 0.3 mm, with acute tip. Leaf margin crenulate, costa ending below tip, leaf cells with single and sharp papillae. Sporophytes not seen.

Specimens examined: India: Eastern Himalaya, Nagaland, Mokokchung, on way to Dikhu river, 06.08.2008, Coll. by: *V. Nath*, 248857B, 248858B (LWG).

DISCUSSION

T. recognitum (Hedw.) Lindb. var. *delicatulum* (Hedw.) Warnst is allied to *T. orientale* Mitt. ex Dix. in most morphological features such as habit, leaf colour, leaf shape etc. but differs in having short, broad, abruptly acuminate stem leaves with recurved margins and dentate costa; paraphyllia with lateral papillae at the cell ends. However, *T. orientale* has erect or erect-spreading, ovate – lanceolate stem leaves with branched, filamentous, papillose paraphyllia. The species also resembles in most of the characters of *T. glaucinum* (Mitten) Bosch & Lacoste but differs in structure of costa and paraphyllia. In *T. glaucinum* costa ends below the tip and shows a tendency of bifurcation at tip and paraphyllia branched, lanceolate to filiform papillose. The Nagaland specimens show major resemblance in the characters of *T. recognitum* (Hedw.) Lindb. var. *delicatulum* (Hedw.) Warnst as described by earlier workers (Watanabe, 1972; Gangulee, 1978; Vohra, 1983) though some minor variations in the size of plants, leaves etc. which may be due to different ecological and geographical conditions.

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印度蘚類植物的新紀錄 – 鉤葉羽蘚（*Thuidium recognitum* (Hedw.) Lindb. var. *delicatulum* (Hedw.) Warnst）

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摘要：本文報導屬於蘚類羽蘚科的鉤葉羽蘚首次於印度被發現。這份標本採集於在那加蘭邦莫戈格瓊的迪庫河，與鉤葉羽蘚一樣莖葉為銳尖形，莖葉上具有頂端圓椎狀的乳突，其葉主脈為鋸齒狀延伸未達葉尖。該種為印度苔蘚誌的新增補，但僅侷限分布於喜馬拉雅的東部。

關鍵詞：東喜馬拉雅、印度、蘚類、新紀錄、羽蘚科、羽蘚屬。

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