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Cover: Emperor Tamarin *Saguinus imperator*: a look into a better world through the mustache lens – mixed media illustration. © Maya Santhanakrishnan.



Physcomitrium eurystomum Sendtn. (Funariaceae): a rare species recorded for Assam, India

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Abstract: In this study, distributional record of the moss *Physcomitrium eurystomum* Sendtn. for the state of Assam is established for the first time. Taxonomic description and illustration of the same, based on specimens collected from Kamrup and Morigaon districts of the state are provided.

Keywords: Collection, cotton, distribution, exploration, flora, habitat, Indo-Burma hotspot, Kamrup, moss, specimen.

The moss genus *Physcomitrium* (Brid.) Brid. (Funariales: Funariaceae) has 80 species spread across wet and cool areas of the world (Bansal & Srivastava 2017) and 13 species belonging to this genus were reported from India (Dandotiya et al. 2011). Eastern India and the Gangetic Plains have been reported to be home to seven different species of this genus (Gangulee 1974). Six species within the genus were found in Eastern Himalaya and Punjab (Gangulee 1974; Lal 2005), followed by the Gangetic Plains and western Himalaya with five species each (Gangulee 1974; Alam 2013; Schwarz 2016), four species from the Western Ghats (Daniels 2010; Schwarz 2016; Bansal & Srivastava 2017). Five species of the genus—*Physcomitrium acuminatum*, *P. brevinervis*, *P. japonicum*, *P. pulchellum*, and *P.*

repandum—were reported from the state of Assam (Dandotiya et al. 2011).

Physcomitrium eurystomum Sendtn. was reported from eastern Himalaya by Lal (2005), but the precise location of its occurrences was not specified. Manju et al. (2023) reported this rare species from the Western Ghats of Kerala stated “It is also known to occur in Lower Bengal and Assam in northeastern India and Parasnath Wildlife Sanctuary in Jharkhand in central India (Saha & Singh 2020)”. However, Saha & Singh (2020) never reported the species from Assam. In India, the species is known from Hoogli & Burdwan in West Bengal, Kumaon in Uttarakhand (Gangulee 1974), Jharkhand (Saha & Singh 2020), Kerala (Manju et al. 2023), Banswara (Rana 2020), and Manipur (Dandotiya et al. 2011; Govindaparyi et al. 2012; Asthana et al. 2021). Though Schwarz (2016) listed this species from Assam, but without any specific locality and literature or specimen reference. The present collection of *Physcomitrium eurystomum* from the Cotton University campus and the vicinity of Chandubi lake of Kamrup and Ahatguri of Morigaon district of Assam, therefore, for the first time authentically establishes its record from the state.

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Image 1. *Physcomitrium eurystomum* Sendtn: A—Habit | B—C—Single plant with Sporophyte | D—E—Leaves | F—Sporophyte | G—Capsule with operculum | H—Apical leaf portion | I—Basal leaf cells | J—Operculum | K—Calyptra | L—Median leaf cells | M—Dehiscent Capsule enlarged view | N—O—Spores. © Twinkle Chetia.

In the present communication, detailed illustrated description of the species is provided with notes on its habitat and distribution within and outside.

MATERIALS AND METHODS

Extensive bryofloristic exploration in the Kamrup district since 2020 till 2023 was conducted. The sporophyte-bearing plants of *Physcomitrium eurystomum* were collected from the study area, where these species grew abundantly from November to February. The specimens were collected and field observations were recorded based on the methodology provided by Glime (2017) and digital photographs of the habit and habitat were taken using a digital camera (Nikon, D-5600). The parts of the plant were dissected using a Stereo Zoom dissecting microscope, and further study was carried out using compound light microscope, and their size were measured using an Ocular micrometer (ERMA) by calibrating with a known scale provided by a Stage micrometer (ERMA) to ensure the accuracy of the measurement. Taxonomic literature (Rana 2020; Saha & Singh 2020; Manju et al. 2023) were consulted to determine the identity of the species. Voucher specimens were prepared following Glime & Wagner (2017). One set of the specimens are kept in the Herbarium of the Department of Botany, University of Delhi (DUH) and the duplicates in the Herbarium of the Department of Botany, Cotton University.

RESULTS

Taxonomic enumeration

Physcomitrium eurystomum Sendtn., Denkschr. Bayer Bot. Ges. Regensburg 3: 142. 1841; Bansal & Alka Srivast., Caryologia 70(2): 121. 2017; Saha & D. Singh, Indian J. Forest. 43(4): 343. 2020.

Small moss, grows in groups or open tufts, 3–7 mm long, bright green when young, yellowish-green at maturity, and turns light to dark brown in herbarium. Stems simple, short, erect, slender, base with many rhizoids. Rhizoids brownish, few at older part of stem, many at leaf base and ventral surface. Leaves frequently clustered at stem ends, oblong-obovate, rosulate, erecto-patent to erect-spreading when moist, shrunk when dry, larger at upper stems, 3.0–3.5 × 1.0–1.4 mm, smaller at lower stems, 1.0–1.7 × 0.3–0.7 mm, acute or shortly apiculate at apex; margins serrulate in the upper part, entire in the basal part; apical-leaves 40–60 × 18–27 µm, median-leaves 35–70 × 20–25 µm, leaf cells hexagonal to oblong-hexagonal to elliptic-hexagonal; basal cells large, 90–135 × 20–40 µm, rectangular; marginal cells sublinear, narrow elongated, 140–150 ×

10–12 µm; costa strong, slender, yellowish, extending to the apex or short excurrent. Setae light yellowish to yellowish-brown, 1600–1750 × 120–125 µm, somewhat flexuose, slender. Capsules subspherical, short pyriform, green when young, reddish brown when mature, 1.1–1.3 × 0.9–1 mm, mouth wide, neck short; operculum rostellate, conical convex, c. 0.8 mm in diameter; annuli narrow; peristome absent; calyptra c. 2 mm, inflated-mitrate, long-rostrate, conical, easily dropping off before the capsules reached their full maturity. Spores irregularly spherical, spinulose papillose, blackish-brown, 26–32 µm in diameter.

Habitat: The species was observed in shady, moist, muddy soil in association with grasses, and herbs.

Distribution: India [West Bengal (Hoogli, Burdwan), Uttarakhand (Kumaon) (Gangulee 1974); Jharkhand (Parasnath WS) (Saha & Singh 2020); Kerala (Iduki district) (Manju et al. 2023); Rajasthan (Banswara) (Rana 2020); Assam—present study; Manipur (Dandotiya et al. 2011; Govindaparyari et al. 2012; Asthana et al. 2021), Belarus (Maslovsky 2005), Bulgaria (Sabovljević et al. 2001), Hungary (Papp et al. 2010), Great Britain (Hodgetts 2011), Montenegro (Stešević et al. 2020), Romania (Sabovljević et al. 2001), Slovenia (Sabovljević et al. 2001), and Turkey (Sabovljević et al. 2001).

Specimens examined: INDIA. Assam: Kamrup, Chandubi, 25.507°N, 91.2292°E, 11 September 2021, T. Chetia 113 (DUH!, Herbarium of Department of Botany, Cotton University); Kamrup Metro, Cotton University, 26.186°N, 91.7500°E, 26 December 2022, T. Chetia 259 (DUH!, Herbarium of Department of Botany, Cotton University); Morigaon, Ahatguri Natua Gaon, 26.2657°N, 92.3160°E, 30 December 2022, T. Chetia & H. Roy 260 (Herbarium of Department of Botany, Cotton University!).

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