



# Extended distribution of an endemic variety *Glochidion zeylanicum* var. *paucicarpum* Chakrab. & N.P. Balakr. (Phyllanthaceae) from Assam, India

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## Abstract

*Glochidion zeylanicum* var. *paucicarpum* Chakrab. & N.P. Balakr., an endemic variety of family Phyllanthaceae, was recorded for the first time in Assam. The species was collected while working on the taxonomic study of the genus *Glochidion* in Assam. After a rational evaluation of published work on distribution, this variety was previously recorded only from Andaman and Nicobar Islands, Bay of Bengal, India and reported as an endemic variety under the species *G. zeylanicum* (Gaertn.) A.Juss. But the present study revealed that its occurrence in Kokrajhar district set extended distribution records for Assam including northeast India. The present communication deals with thorough taxonomic descriptions, phenology, habitat and ecology, distribution, threat status, and photographs, including a distribution map of the taxa for better taxonomic identity. Although the present study area recorded less population of the plant, the plant has been commonly used as medicine by the local community. Based on the threat status in the present work, the plant can be assigned to an endangered category. The present communication recorded an extended occurrence of the plant in Assam, so further population study of the plant in other regions of India is also needed.

**Keywords** *Glochidion* · Phyllanthaceae · New distribution · Endemic · Assam

## Introduction

The genus *Glochidion* J.R.Forst. & G.Forst., belonging to the tribe Phyllanthaceae was one of the large genera of the family Phyllanthaceae with about 320 species and distributed mainly in tropical Asia to Northern Australia & Polynesia, with a few species in Madagascar and tropical America (Chakrabarty and Gangopadhyay 1995; Hoffmann et al. 2006; Chakrabarty and Balakrishnan 2018). In India, it comprises of 22 species and 13 varieties (Balakrishnan et al. 2012; Chakrabarty and Balakrishnan 2018). A total of 16 species of the genus were reported by Kanjilal et al. (1940) in “Flora of Assam” from the erstwhile Assam.

The name *Glochidion* was first given by J. R. Forster and G. Forster in ‘Characteres Generum Plantarum’ (1776) and the generic word “*Glochidion*” came from the Greek word “*Glochis*” which signifies the extension of anther connectives of a female flower (Chakrabarty and Gangopadhyay 1995). Members of *Glochidion* are found predominantly in grasslands, evergreen forests, *sal* forests, deciduous forests, subtropical forests, hilly places, swampy areas along stream sides, and roadside areas. They are generally shrub or large trees, drooping branched having either glabrous or hairy plant bodies, inflorescences exhibit axillary to supra-axillary with lobed and unlobed capsules. The genus comprises of many species and varieties and has been popularly known for its medicinal value in India (Chakrabarty and Balakrishnan 2018).

While exploring the field survey, a voucher specimen of the member *Glochidion* was collected. The present communication reported the presence of *Glochidion zeylanicum* var. *paucicarpum* Chakrab. & N.P. Balakr. in Assam for the first time. The specimen was distributed in Andaman and Nicobar Island, India and it was reported as an endemic

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variety of *Glochidion zeylanicum* (Gaertn.) A. Juss., also unreported in Flora of Assam (Kanjilal et al. 1940; Chakrabarty and Balakrishnan 2018). The present communication provides the evaluation of the morphological characteristics, habitat and ecology, phenology, and threat status along with the notes and photographs.

## Materials and methods

A thorough field survey was conducted in different places of Assam including some national parks, reserve forests, and wildlife sanctuaries likewise, a field survey was carried out between May 2022 and January 2023 in the forest area of Owabari village, near the Ultapani Forest Range of Kokrajhar district, Assam. Before conducting the field survey, approval was taken from Assam State Biodiversity

Board (ASBB) and PCCF Wildlife Warden, Panjabari, Assam. During the survey, ethnobotanical uses of the specimen were also gathered by interrogating local peoples of the study area. Under a Leica EZ4W stereo-zoom microscope and simple microscope, morphological evaluation of the specimen was carried out. Following a detailed review of herbarium sheets available at the herbaria (CAL), the specimens were further identified with the aid of relevant literature (Chakrabarty and Balakrishnan 2004, 2018; Balakrishnan and Chakrabarty 2007). Literature on the taxonomy of *Glochidion*, revision work on *Glochidion*, and information on the endemic status of the taxa were gathered from standard databases such as ResearchGate, Scopus, Academia.edu, PubMed, and Google Scholar published from 1984 to 2020 using the keywords such as *Glochidion*, Taxonomy of *Glochidion*, New record of *Glochidion* and *Glochidion zeylanicum*. Information on geographical distributions was compiled from regional floras, original

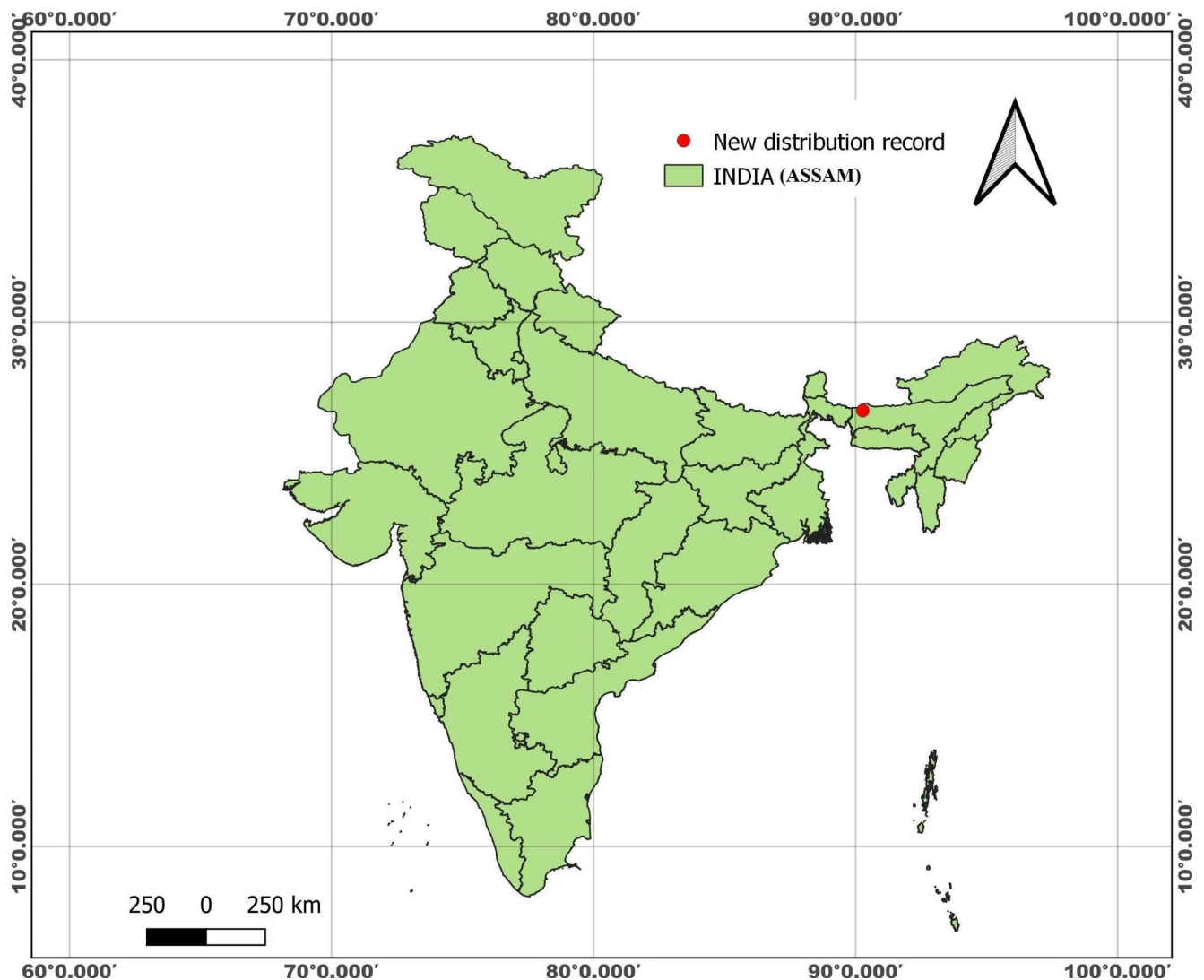


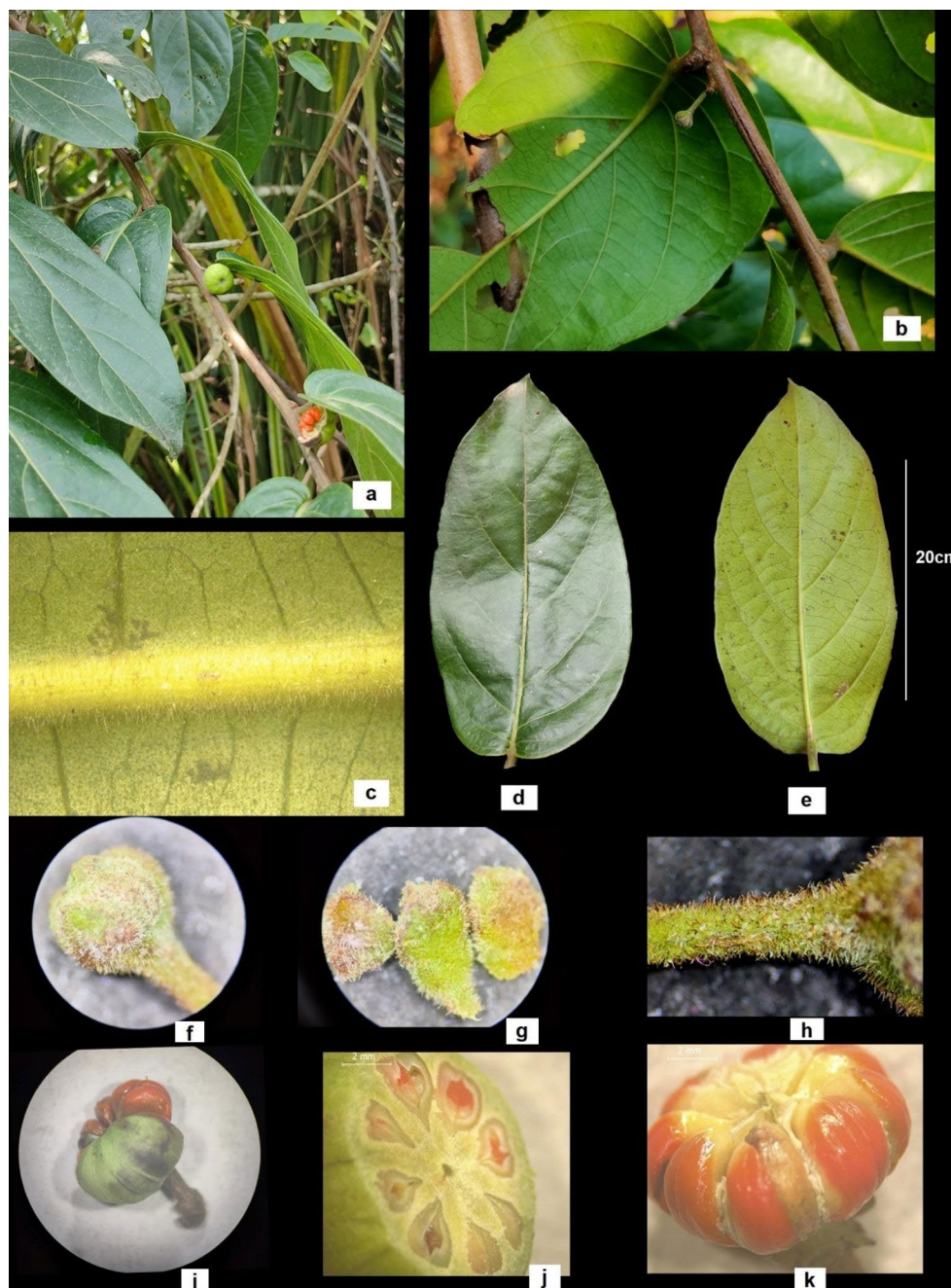
Fig. 1 Distribution record of *Glochidion zeylanicum* var. *paucicarpum* in Assam

species descriptions, and databases (GBIF, IPNI, Plants of the World Online, and WFO plant list). Scientific names and synonyms were validated through [www.plantsoftheworldonline.org](http://www.plantsoftheworldonline.org). A voucher specimen of the collected taxa was prepared by following the standard methods of Jain and Rao (1977) and Clark (1986) and the specimen was deposited at Bodoland University Botanical Herbarium (BUBH), Bodoland University, Kokrajhar, Assam.

## Results

After careful taxonomic evaluation and scrutiny of authentic literature (Chakrabarty and Balakrishnan 2004, 2018; Balakrishnan and Chakrabarty 2007) and critical examination of the herbarium specimens available at CAL, the specimen was identified as *Glochidion zeylanicum* var. *paucicarpum* Chakrab. & N.P. Balakr. which is a new distributional record to Assam (Fig. 1).

**Fig. 2** *Glochidion zeylanicum* var. *paucicarpum* Chakrab. & N.P. Balakr. **a:** habit character; **b:** inflorescence; **c-e:** close view of leaves (upper and lower surface); **f:** female flower; **g:** sepals; **h:** pedicillate of female flower; **i:** a capsule; **j:** t.s. of a capsule; **k:** seeds



## Taxonomic treatment

***Glochidion zeylanicum* var. *paucicarpum*** Chakrab. & N.P. Balakr. in J. Econ. Taxon. Bot. 28: 123, t. 1. 2004; N.P. Balakr. & T. Chakr., Fam. Euph. India 354. 2007; T. Chakr. & N.P. Balakr., Indo-Bur. Phy. 252. 2018 (Fig. 2).

Monoecious; shrub or medium size tree, branched, branchlets dark green to brown, entirely pubescent; bark dark brown outside, whitish yellow or brownish red inside. Leaves alternate, simple, smooth, densely pubescent on the lower surface, coriaceous, thick, broad, elliptic, ovate, lanceolate, 6–22 × 4–8 cm, acute at apex, obtuse, truncate, symmetric rarely oblique, rounded at base, petiolate, stipulate, green, margin entire, veins reticulate, lateral nerves 6–10 per side; petioles 0.9–1 cm long; stipules triangular, 0.4 cm long. Inflorescences supra-axillary, few-flowered, pedunculate. Male flowers white, pubescent. Female flowers single, supra-axillary, pedicellate, 1 cm long, green, brown; sepals 3, 0.3–0.5 cm; ovary subglobose, 4–8 locular, 0.9–1 cm long, pubescent, yellow-green; style persistent, columnar, conical, 0.1 cm, green, brown, tomentose. Capsules subglobose, pedicellate, tomentose, unlobed, bilobulate, 8 locular, 1.5–2 × 1–1.5 cm, single in each axil, green or light yellow-green at young, green and slightly purplish red at the top at mature; seeds orange to red.

**Flowering** December – March.

**Fruiting** April – August.

**Habitat and Ecology** The specimen was found in semi-evergreen and moist deciduous forests, primary forests, swampy areas, and streamside areas at about 76 m altitude. All the varieties of *Glochidion zeylanicum* viz., *G. zeylanicum* var. *zeylanicum*, *G. zeylanicum* var. *arborescens*, *G. zeylanicum* var. *tomentosum* also were found growing a sufficient amount in the area. The locality usually receives heavy rainfall from April to September. The soil type of the locality is usually alluvial soil exhibiting sandy loam to clay loam.

**Distribution** India (Andaman & Nicobar Islands) — endemic, Assam (reported in the present study).

**Specimen Examined: INDIA. ASSAM:** Kokrajhar District, Owabari, Daolur dwisa, near Ultapani Forest Range (N 26°37.131' E 090°18.784'), 29 May 2022, *P. Brahma* 010 (BUBH); Andaman & Nicobar Islands, Middle Andaman Island, Jarawa Reserve, ATR, 1 km before Dhani Nala, 17 Aug. 2002, *T. Chakrabarty* 19,160 A (*holotype* CAL!, CAL0000022754: image!) 19,160 B, C, D, E (*isotypes* CAL!, CAL0000022739: image!, CAL0000022740:

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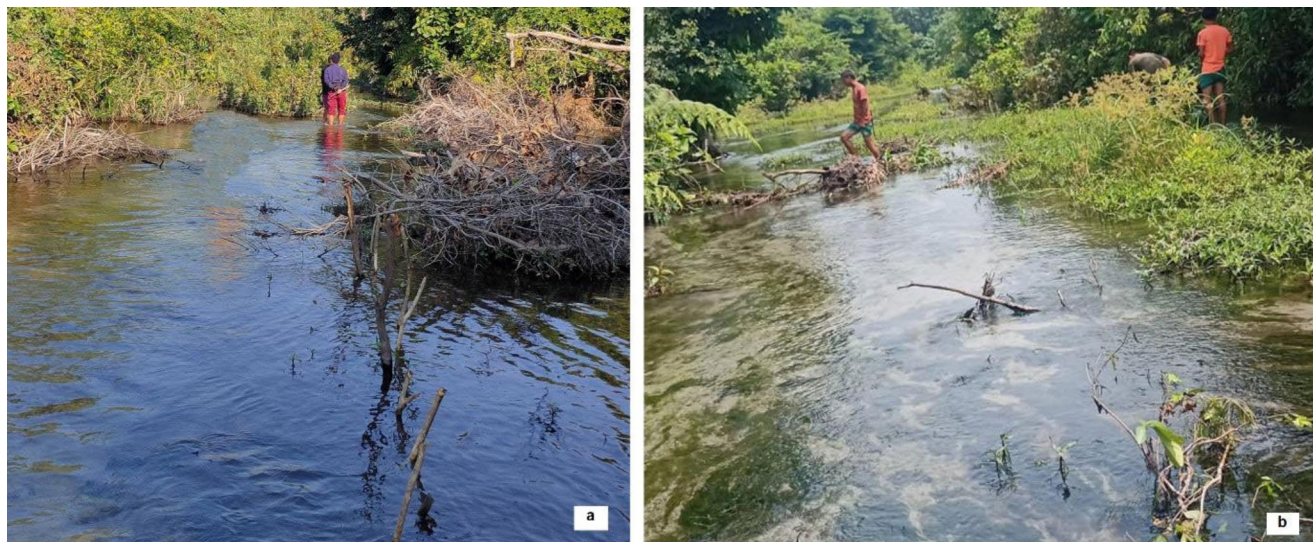
**Uses** The powder of leaves and young shoots are mixed with water and used in the treatment of skin diseases. Branches are also used as firewood by the Bodo community of the study area.

**Notes** This is the first report of this specimen from Assam including North-East India. *G. zeylanicum* has a total of four varieties including itself viz., *G. zeylanicum* var. *zeylanicum*, *G. zeylanicum* var. *arborescens*, *G. zeylanicum* var. *tomentosum* and *G. zeylanicum* var. *paucicarpum*. The specimen closely approaches *G. zeylanicum* var. *tomentosum* by its hairy plant body and the similarity of their morphological structure of the capsule but differs by its individual capsule in each axil and single female inflorescence in the axil.

**Threat status** Only 10–15 individuals were observed in the locality during the survey. Moreover, the majority of its habitat disturbances are caused by anthropogenic activities (Fig. 3), such as intensive deforestation, cutting of trees for the purpose of catching fish by the villagers of the locality, and ensuing deterioration. *G. zeylanicum* var. *paucicarpum* has not yet been included in the IUCN Red List and red data book of Indian Plants (Nayer and Sastry 1987-90). But based on the IUCN red list criteria (IUCN 2022) we suggest the specimen in the endangered category.

## Conclusion

Chakrabarty and Balakrishnan first collected *G. zeylanicum* var. *paucicarpum* from Andaman & Nicobar Islands Middle Andaman Island, Jarawa Reserve and reported it as endemic to this area. But the present study confirms the *G. zeylanicum* var. *paucicarpum* as a new distributional record to Assam including northeast India as well as a new addition to the flora of Assam. *G. zeylanicum* itself is a complicating species that exhibits vast variations including *G. zeylanicum* var. *paucicarpum* throughout its area of distribution and it requires further consequential population studies.



**Fig. 3** Effect of anthropogenic activities in the study site (Fig. **a & b**): habitat disturbances (fish catching method by the villagers & deforestation)

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## Declarations

**Conflict of interest** The authors assert that they do not have any conflict of interest to declare.

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