Extended distribution of Lycianthes biflora (Lour.) Bitter (Solanaceae) in Eastern Ghats, India

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Short Report

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Abstract

Lycianthes biflora (Lour.) Bitter, hitherto known only from northeastern India, is now reported for the first time from the Eastern Ghats based on a collection from the Similipal Biosphere Reserve of Odisha. The present report confirms the range extension of this species further to Eastern Ghats from northeastern region of the country. A detailed taxonomic description, ecology, phenology, distribution, field and dissected floral parts and T.S. of immature fruit photographs were provided for easy identification.

Introduction

The Eastern Ghats, stretching approximately 1,750 km along the eastern coast of Indian Peninsula, is a crucial ecological zone that harbors diverse flora and varied vegetation types including moist deciduous, dry deciduous, dry evergreen, evergreen, semi-evergreen, scrub jungles and savannah reflecting as one of the biodiversity region in India [1]. Geographically, the Eastern Ghats serve as a vital phytogeographical link between the Himalayas and the Southern Peninsula, facilitating plant migration and exchange. This connectivity highlights their importance not only for local ecosystems but also for broader ecological processes in India [2]. Because of its varied climate and topography, Eastern Ghats contribute to its rich species diversity, making it as a significant area for conservation.

Lycianthes (Dunal) Hassl. is the third largest genus of the family Solanaceae with 156 species after *Solanum* L. with 1233 species and *Cestrum* L. with 230 species [3]. *Lycianthes* species differ greatly in habit from small shrubby forms that can be fairly herbaceous, and rarely vines. Most of the *Lycianthes* species are found in the Americas, Asia, Australia, New Guinea and the islands of the Pacific, chiefly concentrated in Mexico and Central America, but none of the species is native to Africa, Europe, North America or North of Mexico [4]. *Lycianthes* was previously considered under the genus *Solanum*, however, recent phylogenetic research has shown that *Lycianthes* is more closely related to the genus *Capsicum* L. (the bell peppers) than to *Solanum*, despite sharing some similar features like poricidal anthers [4, 5, 6].

The family Solanaceae is characterized by moopodial and later sympodial growth pattern with trichomes of varying types, colors and hair densities [7, 8]. All native species of *Lycianthes* have terete stems with varying levels of pubescence. Inflorescences in all species of *Lycianthes* usually arise from the leaf axils and frequently form tiny fascicles with a small number of flowers. *Lycianthes* and *Solanum* are clearly distinguished from one another by their axillary flower arrangement. The calyx of *Lycianthes* species are mostly unlobed and cup shaped forming appendages in the margin [9, 10].

During the floristic exploration in Similipal Biosphere Reserve of Odisha, India, the authors came across a specimens of *Lycianthes* at an elevation of 785m (21^{o}49’35.13” N and 86^{o}30’57.29” E), which showed resemblances with *Solanum* species in morphological aspects except the cup shaped calyx with ten calyx tooth. Later, the field photographs of each part of the plant and the morphological photographs of each character was taken under Carl Zeiss Stemi 305 microscope. The noted morphometric characters

were cross checked against the available relevant literature, floras for confirmation of its identity [4–5, 9–15]. Critical examination of the specimen revealed its identity as *Lycianthes biflora* (Lour.) Bitter. As per literature survey, only one species of *Lycianthes* i.e. *Lycianthes neesiana* (Wall. ex Nees) D'Arcy & Z. Y. Zhang was reported earlier from Odisha [16], but so far the occurrence of *L. biflora* is never been reported either from Eastern Ghats or Odisha. Therefore, this report becomes a new distributional record for the flora of Eastern Ghats. Additionally, the habitat, phenology, ecology, distribution, nomenclature, botanical description, field photographs were provided for easy identification of the species.

Materials and Methods

Study area

The field exploration was carried out in Odisha, situated in Northern portion of Eastern Ghats during the period of June 18, 2024 to October 21, 2024. The species of family Solanaceae was encountered at an elevation of 785m in Sabarabasa ($21^{o}49'35.13''$ N and $86^{o}30'57.29''$ E) of Similipal Biosphere Reserve. The morphometric analysis of the specimen was carried out and the characters were recorded. By scrutiny of available relevant literature, floras, the morphological characters were compared with pertinent literature for confirmation of its identity [4–5, 9–15]. The plant species was identified by the corresponding authors and the voucher specimen was deposited in the Herbarium of Department of Botany, Maharaja Sriram Chandra Bhanja Deo University, Baripada, Odisha with Voucher Specimen No.-NOU/3442.

Taxonomic treatment

Lycianthes biflora (Lour.) Bitter, Abh. Naturwiss. Vereins Bremen 24: 461. 1920.*Solanum biflorum* Lour., Fl. Cochinch. 1: 129.1790. (Fig. 1).

Perennial Herb, 60–70 cm high, Stems angular, without prickles, puberulous. Leaves opposite, 3–15× 3.5–6cm, unequally paired, ovate-elliptic, base cuneate, margins entire to sinuate, apex acuminate, lateral nerves 4–6 pairs, green; petiole 0.8–2.5cm, flat or terete. Flowers solitary, arising directly from stem or base of the leaf, or 2–6 floweres in axillary fascicles, 7.5-8mm long cyclic, hypo- or perigynous, pedicellate; pedicel 1–1.5cm long, puberulous. Calyx cup-shaped, c. 2.5 × 3 mm, 10-toothed; teeth minutely-triangular, awn-like, c. 1mm long, green, pubescent. Corolla purplish-white, green at centre, shiny, 5-lobed; lobes broadly lanceolate, c. 5 ×4 mm, ciliate and purple at margins, acute at apex. Stamens 5, c. 4mm long; filaments 0.5–1mm long, white, glabrous, adnate to the corolla base; anthers basifixed, c. 0.3× 0.1cm, yellow, poricidal. Ovary superior, ovoid, c. 1.1mm long, glabrous, bicarpellary; carpels 6–8mm long; ovules many in each locule; stigma 0.1mm, capitate, green; style 5–7mm long, usually exerted beyond anthers, glabrous; style 5–7mm long, usually exserted beyond anthers, glabrous; stigma capitate, c. 0.1mm, green. Berries globose, glabrous, green when young.

Specimen examined

India, Odisha, Mayurbhanj, Similipal Biosphere Reserve, *Sabarabasa* (21^{o}49’35.13” N and 86^{o}30’57.29” E) 24.08.2024 SC Sahu, S Priyadarshini, S Tudu & JK Jena 3442 (Herbarium of Department of Botany, MSCB University, Baripada, Odisha).

Phenology

August–September

Ecology

A single population of 3 plants were found growing in semi-evergreen forest near stream at an elevation of 785m.

Distribution:

India

North-East India [3, 15].

Global

Bangladesh, Borneo, Cambodia, China Southeast to South-Central, Japan, Java, Laos, Myanmar, Malaya, Nepal, New Guinea, Philippines, Thailand, Taiwan, Vietnam [4].

Eastern Ghats

Odisha (Present report)

Declarations

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Conflict of interest: The authors declare no conflict of interest.

Data availability

All data generated or analyzed during this study are included in this published article.

Code availability

Not applicable

Authors Contribution

Conceptualization: Sifan Priyadarshini & Sudam Charan Sahu; Methodology: Sifan Priyadarshini & Sudam Charan Sahu; Formal analysis and investigation: Sifan Priyadarshini, Sabita Tudu, Jeevan K. Jena & Sudam Charan Sahu, Writing - original draft preparation: Sifan Priyadarshini; Writing - review and editing: Sifan Priyadarshini, Sudam Charan Sahu, Prakash C.Gogineni & Sudhansu Sekhar Dash; Funding acquisition: Sudam Charan Sahu, Resources: Sudam Charan Sahu, Supervision: Sudam Charan Sahu

Ethical Approval

The plant samples collected during field exploration are duly permitted and approved by the Govt. of Odisha. All the guidelines were followed as per the University research ethics for collection and documentation.

Permission statement

Permission has been taken from Principal Chief Conservator of Forests and Chief Wildlife Warden, Govt. of Odisha for plant sample collection (Order no. 13447/4WL-343/2023).

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Figures

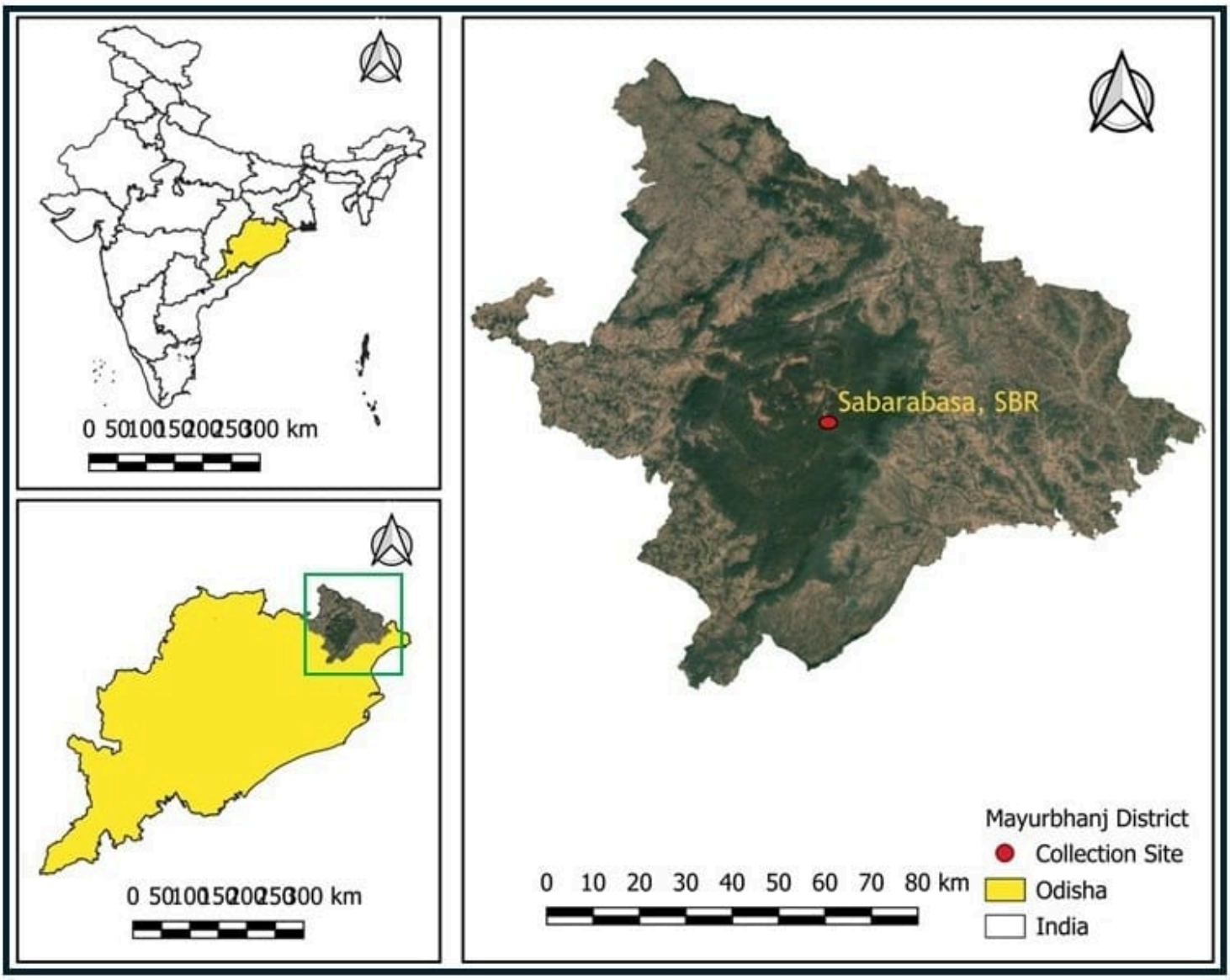

Figure 1

Occurrence map of *Lycianthes biflora* (Lour.) Bitter in Similipal Biosphere Reserve, Eastern Ghats

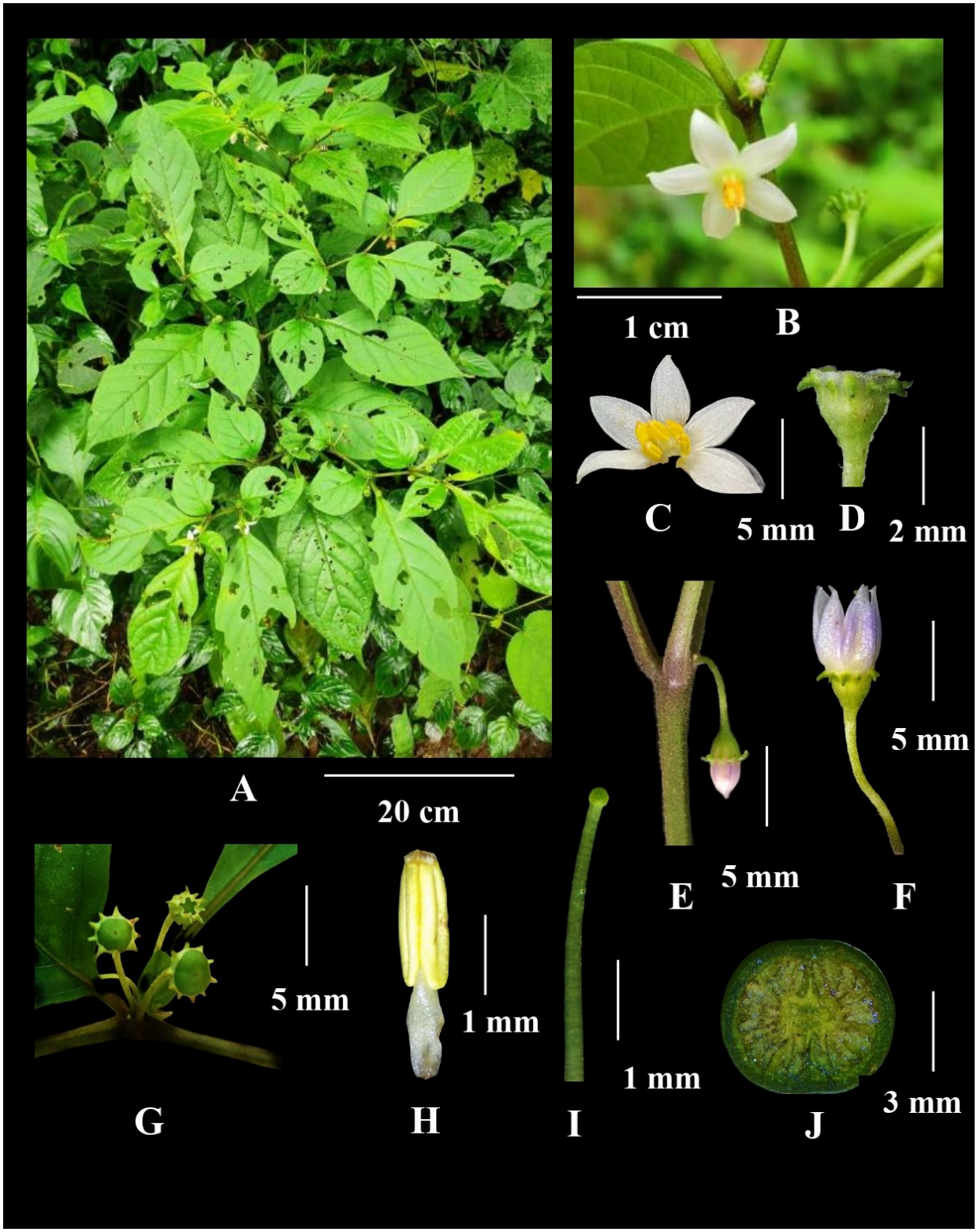

Figure 2

Fig. 1 *Lycianthes biflora* (Lour.) Bitter **A** Habit **B** Flowering twig **C**Corolla lobes with stamens **D** Calyx **E** Flower bud arising from main stem **F** A Flower **G** Young fruits with 10-toothed calyx **H** Stamen **I** Style with stigma **J** T. S. of Immature fruit.