

Impatiens pseudolaevigata Gogoi, B. B. T. Tham & Lidén (Balsaminaceae): a new record to the flora of Bhutan

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Abstract. *Impatiens pseudolaevigata* Gogoi, B. B. T. Tham & Lidén was collected in August 2019 from the broadleaved forest of Zhemgang district, and is reported as new to the flora of Bhutan. Detailed descriptions, remarks on ecology, field notes, and images of the species are provided.

Key words: Balsaminaceae, Bhutan, *Impatiens*, ecology, Zhemgang, new species

1. Introduction

The genus *Impatiens* L. (Balsaminaceae) consists of 1113 accepted species (POWO 2023), distributed mostly in the tropical, subtropical, and northern temperate regions (Chen *et al.* 2007; Sharma *et al.* 2019). In Bhutan, the genus is represented by 27 species (Grey-Wilson 1991; Wangchuk *et al.* 2020; Gyeltshen *et al.* 2023), mostly distributed in the subtropical, warm broadleaved and temperate forests, but a few species extend its home range to coniferous forests. Except for the recent new record of *Impatiens sikkimensis* Govaerts & Chakrab. and discovery of a new species, *Impatiens darachuensis* P. Gyeltshen, W. Adamowski & Phuntsho, no work on this genus in Bhutan has been published since the account in the *Flora of Bhutan* more than 30 years ago (Grey-Wilson 1991).

During a recent botanical expedition to various parts of Shingkar Gewog (village block) in Zhemgang District in August 2019, we encountered a few patches of an interesting *Impatiens* species growing in the shady and moist areas of broadleaved forests. Sufficient field notes, photographs and specimens of the species were

collected for examination. After our detailed analysis of its morphological characteristics and reviewing the related taxonomic publications (Hooker 1904-1906, 1910; Grey-Wilson 1991; Chen *et al.* 2007; Gogoi *et al.* 2017) as well as meticulous examination of the herbarium specimens available in the herbaria K, E, and CAL, we identified it as *I. pseudolaevigata* Gogoi, B. B. T. Tham & Lidén. It is a recently described new species from Arunachal Pradesh (Gogoi *et al.* 2017), regarded so far as endemic to India. The present record from Bhutan shows its extended distribution and new habitat, as compared to the type locality. Its detailed morphological description and information on phenology, ecology, distribution, conservation status, and photographs are provided based on the collected specimens. The voucher specimens are deposited at the National Herbarium (THIM), National Biodiversity Centre, Thimphu, Bhutan.

2. Taxonomic description

Impatiens pseudolaevigata Gogoi, B. B. T. Tham & Lidén, *Phytotaxa* 313 (2): 227-230. 2017.

Type: India. Arunachal Pradesh, West Kameng, Nichifu, 1800 m, 22 Oct 2014, R. Gogoi & B.B.T. Tham 21965 (holotype CAL, isotype CAL, ASSAM).

Description: Perennial herbs up to 70 cm tall, underground stems swollen, 6-15 cm × 2-3 cm, consisting of several protuberances with adventitious roots. Aerial stems sparsely branched, glabrous, green to purplish-brown; nodes with several internodes, basal internodes 7-13 cm apart. Leaves mainly in the upper portion of the stem, alternate; petioles 0.6-3.0 cm long, green to brownish-green, petiole base exstipulate; lamina elliptic, 6-15 cm × c. 2.5-5.0 cm, apex narrowly acuminate, base cuneate, glabrous, margin crenate, setose between teeth, lateral veins in 5-8 pairs, subopposite. Inflorescences axillary, pendent; peduncles 0.8-2.2 cm long, purplish or green, glabrous, 2-3-flowered, bud green. Flowers yellowish to reddish-orange, with or

without reddish-orange nerves; pedicels c. 2.0-2.5 cm long, green, glabrous. Bracts orbicular to broadly ovate, 1.0-1.2 cm × 1.4-1.6 cm, apex thick, prominent, mucronate, cucullate, glabrous, green, caducous, margin entire. Lateral sepals 4, outer pair large and similar to bract, inner pair small, inconspicuous; outer sepals orbicular, 1.7-2.2 cm × 1.4-1.8 cm, concave, apex similar to bracts, green, margin entire, obscurely 7-9-veined; inner sepals white to greenish-white, 1.5 mm wide at base, constricted into terete, 4-5 mm long, membranous. Lower sepal sub-bucciniform constricted into a spur, c. 2.0-2.2 cm long, 1.8-2.1 cm deep, yellow to pale yellow, with or without red veins inside; spur 1.8-2.4 cm long, c. 3.0-3.5 mm wide, incurved, whitish, slightly swollen at apex. Dorsal petal broadly ovate to sub-orbicular, c. 2.0-2.4 cm × 1.8-2.1 cm, apex thickly acute, slightly crested towards apex, yellow, margin entire. Lateral

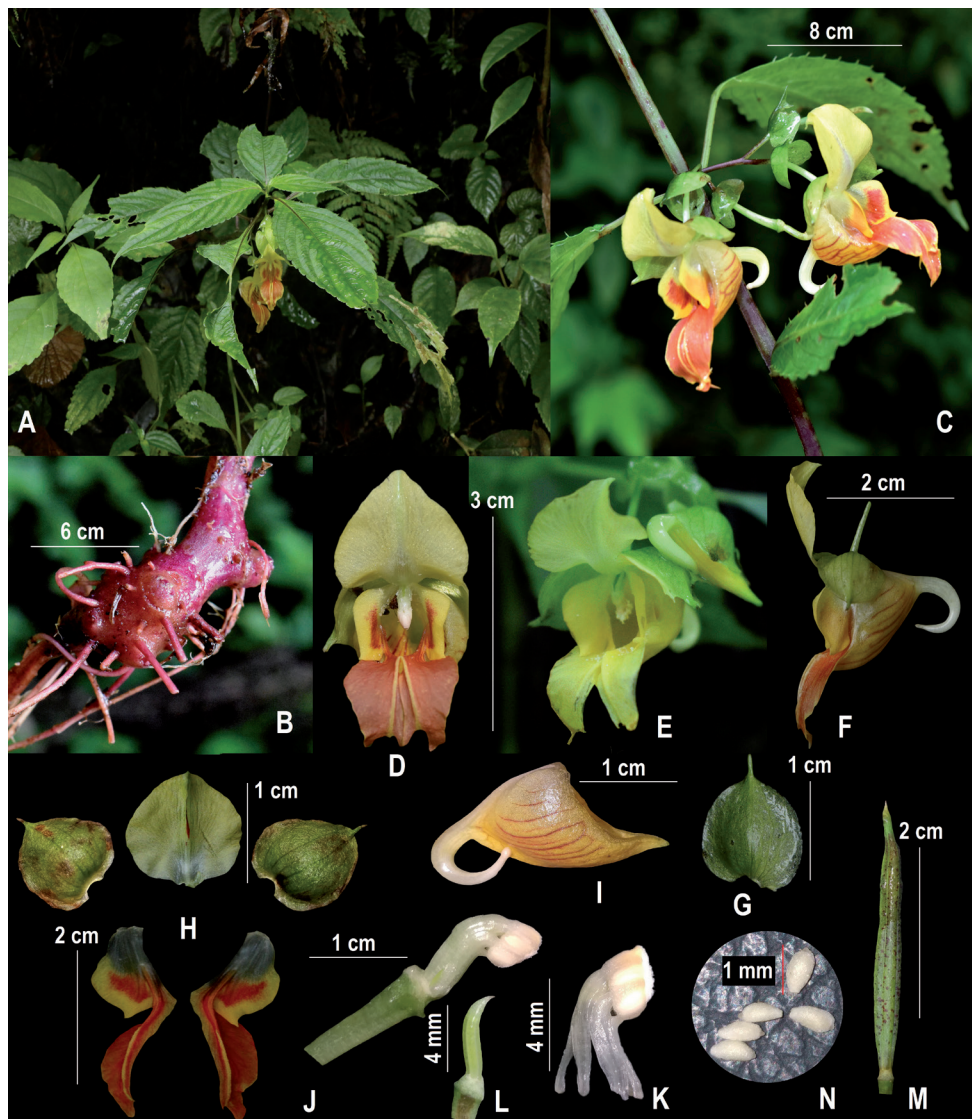


Fig. 1. *Impatiens pseudolaevigata* Gogoi, B.B.T.Tham & Lidén

Explanations: A – habit, B – underground stem, C – inflorescence attached to stem, D-F – flowers, G – bract, H – lateral sepals and petals, I – lower sepal, J – pedicel and stamens, K – stamens, L – ovary, M – capsule, N – seeds

united petals c. 3.0-3.2 cm long, reddish with yellow margin or pure yellow and whitish base, bilobed, lobes unequal; basal lobe obovate, 13-16 mm × 7-8 mm, oblique, yellow with a central reddish-orange blotch, dorsal auricle absent, apex acute; distal lobe unevenly dolabriform, 18-23 mm × 6-7 mm, apex acute. Stamens 5, encircling ovary, c. 6.0-7.5 mm long, anther lobe obtuse, filament narrow at base and broader apically, flat. Ovary oblong, 6-7 mm long. Capsule cylindrical or fusiform, c. 3.0-3.6 cm long, 4-5 mm wide, pale green, surface brownish-red spotted, glabrous, ridged; seeds numerous, oblong or obovate, c. 1.5-2.0 mm × 0.5-0.7 mm, white (Fig. 1).

Phenology: Flowering and fruiting in July-August.

Ecology: This species prefers moist soil in the shady areas in the warm and cool broadleaved forests at elevations of 1280-2625 m. The associated species include *Pouzolzia hirta* Blume ex Hassk., *Pilea scripta* (Buch.-Ham. ex D. Don) Wedd., *Streptolirion volubile* Edgew., *Carpesium nepalense* Less., *Swertia bimaculata* (Siebold & Zucc.) Hook. f. & Thomson ex C. B. Clarke, *Melissa axillaris* (Benth.) Bakh. f., *Persicaria nepalensis* (Meisn.) Miyabe, *Persicaria hydropiper* (L.) Delarbre, *Oenanthe javanica* (Blume.) DC., *Dichroa febrifuga* Lour., and *Begonia flaviflora* Hara.

Distribution: India (Arunachal Pradesh) and new to Bhutan (Fig. 2).

Specimens examined: Bhutan, Zhemgang, Shingkar, Dongteythang, 27°09'11.058"N,

90°52'55.014"E, elevation 1863 m, 3 August 2019, *P. Gyeltshen & S. Jamtsho* 20 (THIM).

Notes: Gogoi *et al.* (2017) reported that the population in Arunachal Pradesh is stable, with many individuals facing no threats. In Bhutan, several colonies of the species were found in 5 different locations in the warm and cool broadleaved forests inside Biological Corridor-4, consisting of more than 200 individuals. Currently, no threats and habitat degradation have been observed in the field. However, both the habitat and the population are likely to be threatened by road widening, urbanization, clearing of forests for agriculture, and plantation of trees in the future (Gogoi & Sherpa 2021). Based on the aforementioned knowledge and information, it has been classified as Vulnerable [D1] (Gogoi & Sherpa 2021).

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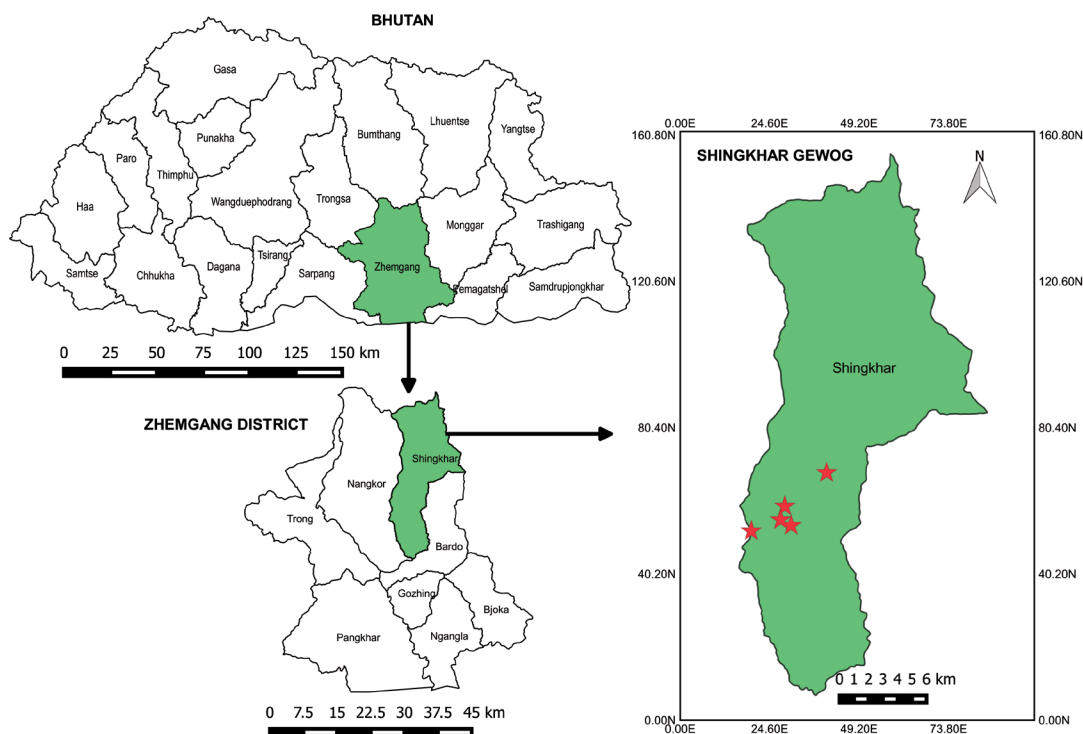


Fig. 2. Distribution map of *Impatiens pseudolaevigata* Gogoi, B. B. T. Tham & Lidén in Zhemgang district in Bhutan

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