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## Lectotypification of the name *Impatiens toppinii* Dunn, a new addition of the species for flora of India

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### Abstract

*Impatiens toppinii* Dunn (Balsaminaceae) was re-collected after a century from Arunachal Pradesh, India. The species was earlier known only from Kachin hills, Myanmar. A lectotype is designated, a detailed description from live material and coloured illustrations for easy identification are provided.

### Introduction

*Impatiens toppinii* Dunn (Balsaminaceae) was named in honour of Major Sidney Miles Toppin who worked with persistent determination and success at the elucidation of the genus *Impatiens* of Northwest and Northeast Frontiers of India (Toppin 1920). While posted in Chitral (Pakistan) and Northern Burma, Major Toppin applied his spare time to the collection and study of plants which he regularly communicated with Sir J. D. Hooker. After his death on 24<sup>th</sup> September 1917 during World War I, his herbarium samples were bequeathed to the Royal Botanical Garden, Kew. Among his collection, 139 sheets belong to genus *Impatiens* which were being accompanied by type-written descriptive notes and in some cases by coloured sketches of the flower that were almost ready for publication and it would appear that several of them represent undescribed species (*Kew Bulletin*, 1918, p. 156).

In 1920 the paper entitled 'Notes on the Balsams of Chitral and the Kachin Hills' was published with a few additions as were necessary by Mr. S. T. Dunn B. A., assistant for India in the Herbarium at Kew (Toppin 1920). The paper dealt with a total of 27 species of *Impatiens* including 6 newly described species. The present authors referred to 'The Plant List' (<http://www.theplantlist.org/>) for checking the authenticity of names of these six newly described taxa. Only the names of *I. kamtilongensis* Toppin and *I. porphyrea* Toppin were considered as accepted and also recorded in 'Flora of China' (Yilin et al 2008). Status of the remaining four species were marked as unresolved. The study of subsequent literature on *Impatiens* (Grey-Wilson 1989, 1991; Huang 2006; Pusalkar and Singh 2010, Govaerts and Chakrabarty 2011; Li et al. 2011; Utami 2011; Dessai and Janarthanam 2011; Bhaskar 2012; Gogoi and Borah 2013a, b, 2014; Gogoi et al. 2013) reveals that the other four species were not recorded or collected by any further researchers except mentioned in the check list prepared by Smithsonian National Museum of Natural History for plants of Myanmar (<http://persoon.si.edu/myanmar/checklistNames.cfm>).

During a recent plant exploration and survey tour to Kamlang Wildlife sanctuary under Botanical Survey of India's annual action plan project 'Flora of Lohit district and Kamlang Wildlife Sanctuary' few *Impatiens* species were collected. After critical examination and subsequent literature study accompanied by examination of herbarium samples deposited at K, one plant collected during this survey was identified as *Impatiens toppinii* Dunn, being discovered for the first time from India. Earlier it was only described in the original publication from Kachin Hill, Myanmar (Burma) (Toppin 1920) without mentioning the type. Hence a lectotype is designated here from Toppin's original collection (Fig. 1) along with morphological description and coloured illustrations (Figs 2, 3) based on fresh plant material to enable the field botanists, foresters, environmentalists, herbalists, etc. to identify the species in the field.

*Impatiens toppinii* Dunn, *Bulletin Miscellaneous Information Kew.* 10: 353 (1920).

Lectotype (designated here): Myanmar, Kachin hill, Sinlum; at 4000–5500 ft, anno 1911, S.M. Toppin 2781(K694915!); isolectotype (K694913!, K694914!, K694916–K694919!).

Annual herb, to 60 cm tall, unbranched or sometime branched; stem terete, green, slightly ridged on upper portion, slightly pubescent apically, rooting from lower nodes, nodes not swollen. *Leaves* alternate, 4–11.5 cm long, 2–4 cm wide, exstipulate; petiole 1–3 cm long; lamina ovate, elliptic to broadly elliptic, with two filiform glands at base of lamina, with base cuneate, margin crenate (setose between teeth), apex acuminate, lower surface whitish green, upper surface green, pubescent, lateral veins 6–8 pairs. *Inflorescence* axillary, also arise from lower nodes, 1–2(or 3) flowered; peduncle 1.5–4 cm long; pedicel 1–2.5 cm long, light green; bract lanceolate, c. 5 mm long, situated at base of pedicel, persistent until flowering. *Sepals*: lateral sepals 2, narrowly ovate, acuminate, c. 1.3 × 0.6 cm, glabrous, *lower sepal* bucciniform/funnel shaped, pinkish white with prominent pink veins, mouth to 2 × 1 cm wide, slightly beaked, tapering in a long semicircular whitish yellow spur, to 2.5 cm long, tip bifid; *dorsal petal* pink, ovate, 1.5 × 1.2 cm, dorsally with horn like keel; *lateral united petals* to 2.5 × 1.1 cm (whole), pink with white base, *basal lobe* triangular with blunt apex, *distal lobe* 1.6 × 1.2 cm, dolabriform, apex acute, auricle present at the base, whitish pink, to 4 × 2.5 mm; *stamen* to 7 mm long; anther lobe obtuse. *Capsule* to 1.5 × 0.7 cm, turgid at middle, ridged, glabrous, green; *seeds* many, to 2 mm long, c. 1.2 mm diam., greenish white, surface papillose.

**Phenology:** Flowering and fruiting June – July

**Distribution and habitat:** *Impatiens toppinii* was found growing at an elevation of 450 m near the periphery of Kamlang Wildlife Sanctuary, Lohit district of Arunachal Pradesh, India where three populations of more than 200 individuals were observed; earlier its distributional record was Sinlum, Kachin Hills, Myanmar (Toppin 1920).

**Other specimens examined:** India: Arunachal Pradesh, Lohit district, periphery of Kamlang Wildlife Sanctuary, 450 m asl. (27°44'27.27"N 96°23'32.58"E), S. Borah 34430, 10 Jun 2014 (ARUN, ASSAM, CAL).

### Lectotypification

Since the type collection (*Toppin 2781*) consists of several elements (mounted on seven separate sheet, as held at K; refer above), one sheet (K694915) has been selected as the lectotype. This sheet was examined by Dunn and closely matches the protologue, including the illustration (Toppin 1920). Since the remaining K sheets of this collection were also examined by Dunn and match the protologue, they are here designated as isolectotypes.

### Conclusion

Detailed morphological observation, comparison with other herbarium specimens at K, supported by literature survey proved that the recently collected balsam species from near the Kamlang Wildlife Sanctuary (India) to be *Impatiens toppinii* Dunn, representing a new distributional record from India. Since the type collection consisted on several elements, a lectotype is designated here.

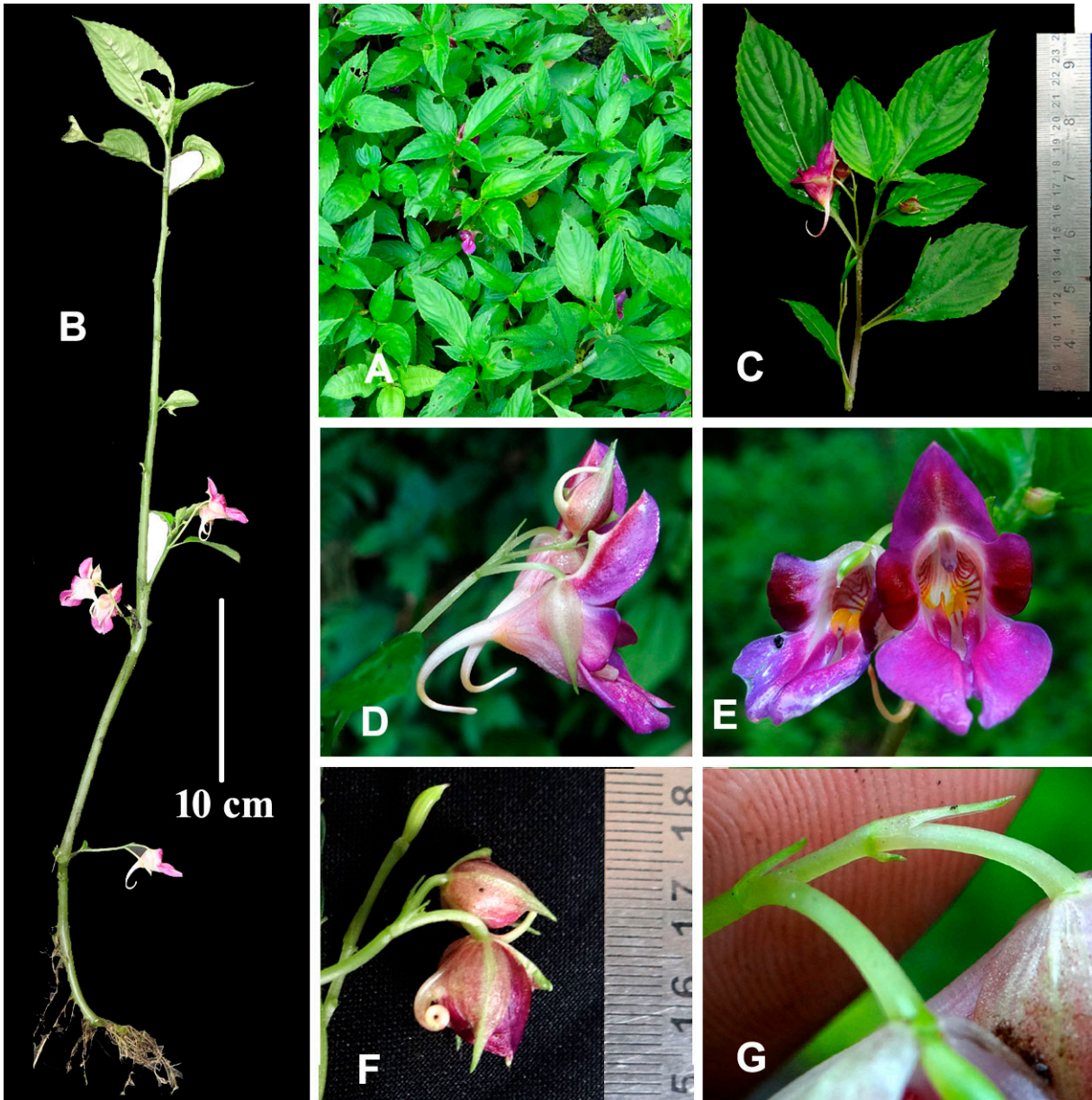
### Acknowledgments

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**Fig. 1.** Lectotype of *Impatiens toppinii* Dunn, *Toppin* 2781, (K694915!) © The Board of Trustees of the Royal Botanic Gardens, Kew. Reproduced with the consent of the Royal Botanic Gardens, Kew.

**Fig. 2. (below)** A, Habit; B, Individual plant; C, Flowering twig; D, Side view of flower; E, Front view of flower; F, Flower bud; G, Pedicel with flower. Image: S. Borah



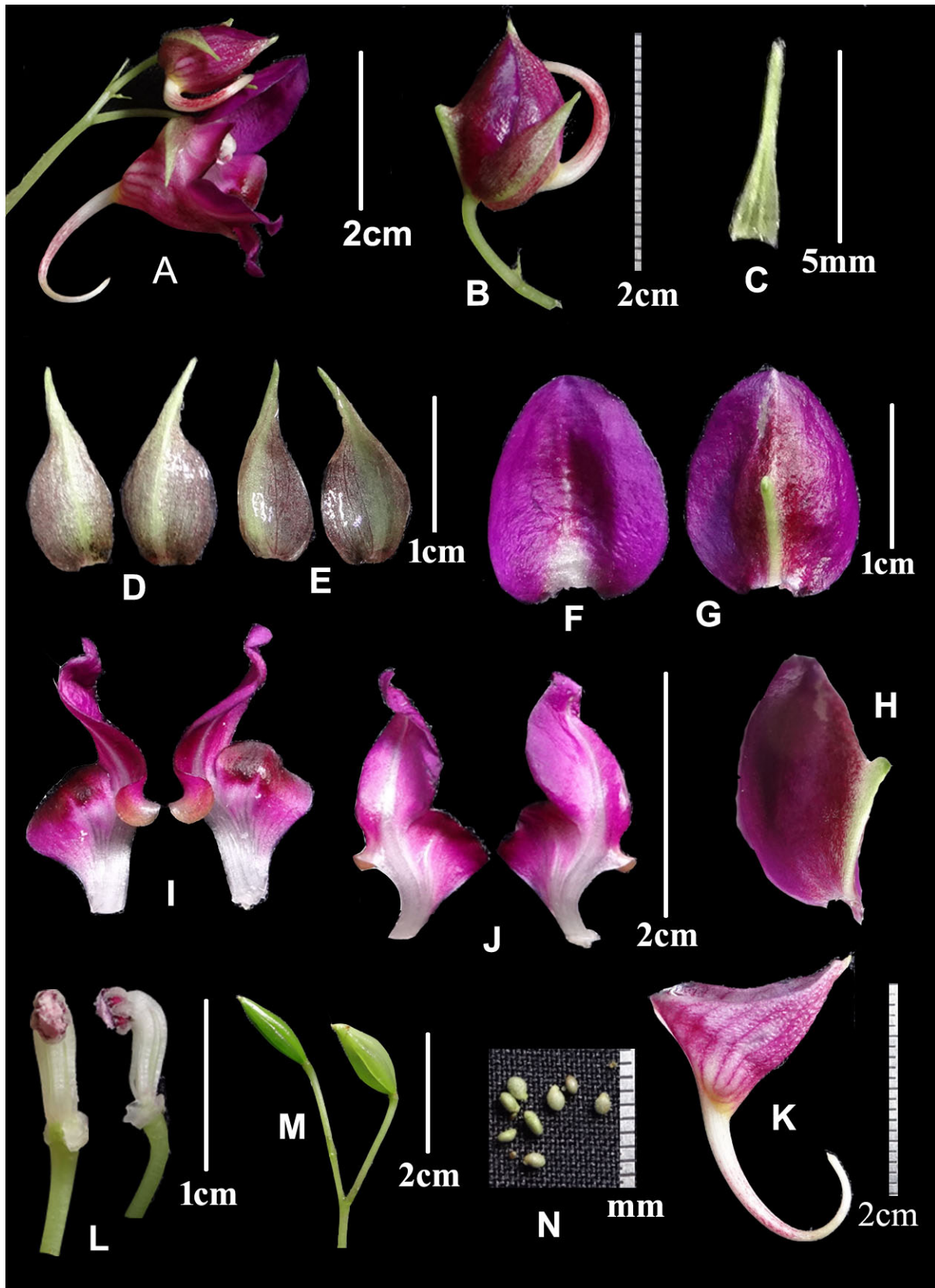


Fig. 3. A, Flower; B, Flower bud; C, Bract; D, Lateral sepal (Dorsal); E, Lateral Sepal (Ventral); F, Dorsal petal (Ventral); G, Dorsal petal (Dorsal); H, Dorsal petal (Side View); I, Lateral united petals (Ventral); J, Lateral United petals (Dorsal); K, Lower sepal with spur; L, Androecium; M, Fruit with pedicel; N, Seeds. Image: S. Borah

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