Lectotypification and amended description of two species of *Impatiens* (Balsaminaceae) from Northeast India

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पूर्वोत्तर भारत से संग्रहित *इंपेशियंस* (बालसेमिनेऐसी) की दो जातियों का लेक्टोटिंपिफिकेशन एवं संशोधित वर्णन

राजीब गोगोई, सौरवज्योति बोरा

सारांश

पूर्वी हिमालय के इंपेशियंस जातियों पर किये गये महत्वपूर्ण शोध से पता चलता है कि *इंपेशियंस सिट्रीना* हुक. एफ एवं *इंपेशियंस ट्रोपियोलिफोलिया* ग्रिफ. एक्स एक्स हुक एफ के लेक्टोटाइपीफाइड करने की आवश्यकता है। अतएव प्रस्तुत शोध पत्र में इसका लेक्टोटाइप, सजीव संग्रहण से विस्तृत वर्णन का उद्धरण एवं सहज निर्धारण के लिए रंगीन छायाचित्र रेखांकन उपलब्ध करवाया गया है।

ABSTRACT

Critical examination and literature survey on *Impatiens* species of Eastern Himalaya revealed that *Impatiens citrina* Hook. f. and *I. tropaeolifolia* Griff. ex Hook. f. need to be lectotypified. So lectotypes are designated, detailed descriptions from live material and coloured illustrations for easy identification are provided.

Keywords: Anjaw, Arunachal Pradesh, Balsaminaceae, *Impatiens, citrina, tropaeolifolia* Lectotypification, Lohit, Nagaland

INTRODUCTION

The genus *Impatiens* with about 1000 species worldwide is one of the largest and most perplexing genera of vascular plants. Indian subcontinent with more than 250 species is considered as one of centres of diversity of genus *Impatiens* (Bhaskar 2012, Gogoi & al. 2018). The taxonomy of *Impatiens* L. (Balsaminaceae) is complex, as it is difficult to work out on mounted specimens due to the tender and polymorphic nature of the flowers. Because of this, this otherwise interesting genus has not been given

sufficient attention in south and southeast Asia, although this region is a major centre of evolution of wild balsams (Ruchisansakun & al. 2015, Shajita & al. 2016, Yu & al. 2016, Gogoi & al. 2018).

The unusual variability of flower colours and shapes has attracted attention of many botanists, including Joseph Dalton Hooker, who had worked on the group with octogenarian enthusiasm and published many new species. Hooker (1875) presented the species of *Impatiens* of Indian sub-continent in an organised way in "Flora of British India". While working on the *Impatiens* of Eastern Himalaya the

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authors found that two species: *Impatiens citrina* Hook.f. and *I. tropaeolifolia* Griff. ex Hook.f. were described without mentioning the type. Hence a lectotype is designated for each name here from the original collections based on which above-mentioned species were described.

TAXONOMY

Impatiens citrina Hook.f. in Rec. Bot. Surv. India 4: 17 1905; Vivek. & al. in Hajra & al., Fl. India 4: 132.1997; Balsams of Eastern Himalaya: 67. 2018. (Plate 1 & 2).



Plate 1. Scanned image of proposed lecototype of *Impatiens citrina* Hook.f., *Griffith* 1235 (K000694584 image!) © The Board of Trustees of the Royal Botanic Gardens, Kew. Reproduced with the consent of the Royal Botanic Gardens, Kew.

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Lectotype (designated here): Mishmi Hill, Arunachal Pradesh, India; *Griffith* 1235 (K000694584 image!).

Annual semi-succulent herbs, to 70 cm tall, stem slightly ribbed in upper portions, nodes slightly swollen, lower portion of the stem reddish. Leaves confined mainly to the upper part of the stem, alternate but upper leaves in whorl; petiole 1.5–3.5 cm, base with stipule, glandular, 2

mm long; lamina elliptic, $3.0-11.0 \times 2.5-4.0$ cm, glabrous, green on both sides, base cuneate to attenuate, apex acute to acuminate, margins crenate, basal crenations with glands, veins 5-8 pairs. Inflorescence axillary, racemose, equal or exceeding the leaves, peduncle to 12 cm, upper side reddish, lower green, to 10 flowered. Flower yellow, pedicel to 2.2 cm, green, bract at the base, navicular, acuminate at apex, 6×4 mm, green. Lateral sepals 2,



Plate 2. Impatiens citrina Hook.f.: a. flowering twig with flowers, b. inflorescence with bud, flower and capsule, c. dorsal view of flower, d. bract, e. lateral sepals, f. lower sepal, g. dorsal petal (ventral view), h. dorsal petal (dorsal view), i. lateral united petals, j. stamens, k. capsule, l. opened capsule, m. seeds.

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ovate, 3×2 mm, oblique, greenish yellow, apex acuminate. Lower sepal navicular, yellow, to 3 cm, tapering into a spur, mouth beaked, beak to 3 mm, spur filiform, to 2.5 cm, slightly upcurved. Dorsal petal yellow, suborbicular, 1.0×0.6 cm, apex curved outward, acuminate. Lateral united petals yellow, bilobed, unequal, slightly clawed, to 2.4 cm (whole); basal lobe triangular, bend upward, to 1.3 cm long; distal lobe elongated dolabriform. Stamens to 3 mm tall. Capsule clavate, to 1.6×0.2 cm, ribbed, green; seeds many, subglobose with brown-greyish spots, papillate (Plate 2).

Flowering and Fruiting: July to October.

Distribution: Endemic to Lohit and Anjaw district, Arunachal Pradesh. Commonly found in shady forest margins and open roadsides from above Parasuram Kund to Chaglagam via Hyuliang and Tidding in evergreen subtropical forest, 1000–1950 m, in association with I. arguta, Elatostema sessile, Pilea anisophylla, Pollia hasskarlii, Polygonum chinensis, Begonia palmata, Commelina paludosa etc.

Specimens examined: Arunachal Pradesh, Lohit district, Tidding, 500–1500 m, 06.07.2012, R. Gogoi & S. Borah 24664 (CAL! ARUN! ASSAM!); Tidding, Lohit district, 500–1500 m, 16.05.2013, R. Gogoi & S. Borah 20447 (ARUN! ASSAM!); Lohit, Tidding, 03.06.2012, R. Gogoi & S. Borah 24603 (ASSAM); Brahma Kund (falls under present day Lohit district), s.d., W. Griffith 1235, K000694584 (K).

Impatiens tropaeolifolia Griff. ex Hook.f., Fl. Brit. India 1(3): 472. 1875; Vivek. & al. in Hajra & al., Fl. India 4: 221. 1997; Gogoi & al., Balsams of Eastern Himalaya : 179. 2018. (Plate 3 & 4).

Lectotype (designated here): Mishmi Hill, Arunachal Pradesh, India; *Griffith* 1246 (K000694761 image!)

Perennial succulent herbs, to 60 cm tall, stem slightly winged, transparent pinkish, nodes swollen. Leaves mainly confined to upper portion of the stem, petiole glabrous, green, to 2.2 cm, stipule absent; blade ovate to elliptic, sometimes slightly oblique, $4.8-10.6 \times 2.4-4.5$ cm, upper side hairy, base acute to cuneate, apex acuminate, margin serrate, bristle between teeth, veins 6-9 pairs. Inflorescence axillary, 6-7 cm long, peduncle 2.5-3.0 cm, pubescent, 2- flowered, bud green. Flower

yellow, pedicel to 2 cm, hairy; bract at the base, ovate, 5×2 mm, green. Lateral sepals 2, obliquely ovate, light green, $0.8-1.0 \times 0.5-0.6$ cm, apex acuminate. Lower sepal bucciniform, constricted into a spur, 3.0–3.5 cm (whole), mouth 1.5-1.8 cm, slightly beaked, yellow with red veins inside; spur curved, 2.0–2.4 cm long, tip slightly bulbous, bifid, reddish. Dorsal petal orbicular, $1.4-1.5 \times 1.3-1.6$ cm, yellow, dorsally ridged, reddish spots in the ridge, apex emarginate. Lateral united petals yellow, bilobed, subequal, 2.5-3.0 cm (whole), shallowly clawed, claw whitish transparent; basal lobe dolabriform, $1.0-1.2 \times$ 0.9-1.0 cm; distal lobe $1.5-2.0 \times 1.0-1.2$ cm, dolabriform, apex acute to acuminate, auricle present, to 2×3 mm, yellow, entire. Stamens upright, anther lobes pinkish to light purple, slightly curved, filaments to 7 mm, anther lobe to 3 mm. Capsule short fusiform, green, ribbed, $1.8-2.0 \times 0.5-0.8$ cm; seeds many, black or brown, 2 mm across.

Flowering and Fruiting: July to September.

Distribution: Arunachal Pradesh (Lohit & Anjaw District), Nagaland, endemic. Moist shady locations in the forest margins and along the stream banks.

Specimens examined: Arunachal Pradesh, Anjaw District, Chaglagam, 1400 m, 07.09.2012, R. Gogoi & S. Borah 21825; Chaglagam, 1500 m, October, 2011, R. Gogoi 21509; Arunachal Pradesh, Anjaw District, Chaglagam, 1400 m, 06.09.2012, R. Gogoi & S. Borah 21812 (ARUN & CAL); Mishmi Hills, W. Griffith 1246 (K000694761).

NOTE ON LECTOTYPIFICATION

The description of *I. citrina* Hook.f. was based on Griffith's collection from Mishmi Hill (present day Lohit district) of Arunachal Pradesh, a voucher specimen housed at K (Plate 1). The herbarium sheet includes annotations by Hooker and closely matches the protologue of the species. As no type was designated by Hooker, the specimen collected by Griffith from Mishmi Hill, Arunachal Pradesh, India housed at 'K' with barcode (K000694584 image!) has been designated here as the lectotype of *I. citrina* Hook.f.

I.tropaeolifolia Griff. ex Hook.f. was described by Hooker based on a collection made by Griffith from Mishmi Hill, Arunachal Pradesh, India. The only herbarium specimen based on which the species was described is housed at Kew (K) Herbarium with annotations by Hooker, also

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Plate 3. Scanned image of proposed lectotype of *Impatiens tropaeolifolia* Griff. ex Hook.f., *Griffith* 1246 (K000694761) © The Board of Trustees of the Royal Botanic Gardens, Kew. Reproduced with the consent of the Royal Botanic Gardens, Kew.

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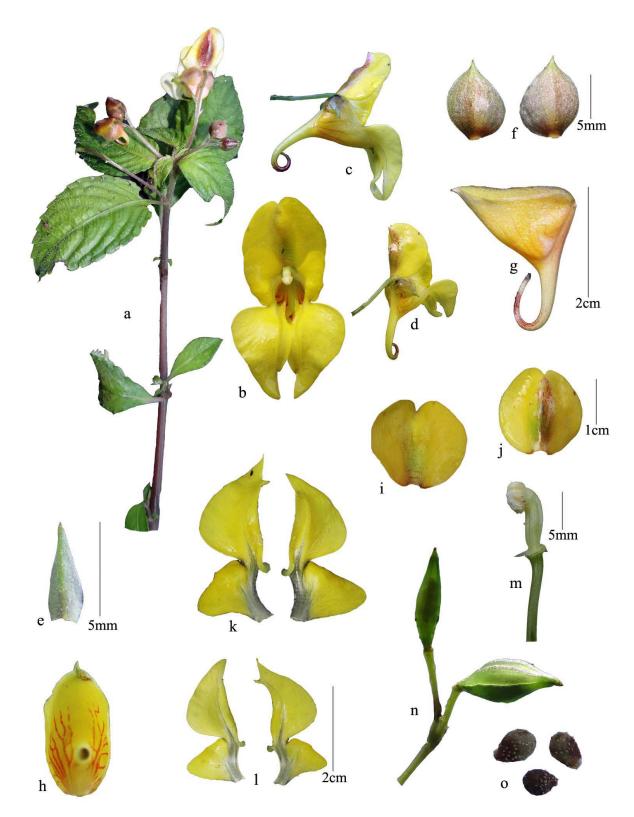


Plate 4: *Impatiens tropaeolifolia* Griff. ex Hook.f.: **a.** flowering twig, **b.** frontal view of flower, **c.** lateral view of flower, **d.** back view of flower, **e.** bract, **f.** lateral sepals (dorsal view), **g.** lower sepal, lateral view, **h.** lower sepal (inside with red venation), **i.** dorsal petal (ventral view), **j.** dorsal petal (dorsal view), **k.** lateral united petals (ventral view), **l.** lateral united petals (dorsal view), **m.** pedicel with androecium, **n.** capsules, **o.** seeds.

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closely matches the protologue (Plate 3). As no type was designated in the protologue the original specimen studied by Hooker (K000694761 image!) was designated here as lectotype.

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