Impatiens lohitensis, a New Species of *Impatiens* (Balsaminaceae) from Arunachal Pradesh, India

R. Gogoi[1*] and S. Borah[1]

1. Botanical Survey of India, Arunachal Pradesh Regional Centre, Senki View, Itanagar-791111, Arunachal Pradesh, India. Second author's email: souravjyotiborah@gmail.com
** Corresponding author. Email: rajibbsi@yahoo.co.in*

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ABSTRACT: A new species of *Impatiens* (Balsaminaceae), *I. lohitensis* R. Gogoi & S. Borah is described and illustrated from Arunachal Pradesh, India. It is close to *I. siculifer* Hook.f. and *I. stenantha* Hook.f. but differs in perennial nature, bigger elliptic leaves, green flower bud without awn, bigger sized flower, green bigger floral bract, lateral sepals navicular, abaxial midvein of upper petal thickened, much longer spur, two red blotch at throat and bigger size of linear capsule.

KEY WORDS: Arunachal Pradesh, *Impatiens*, India, new species.

INTRODUCTION

Impatiens L., a member of Balsaminaceae, is a fascinating group of plants for its wide diversity in colour and shape of the flowers. There are *ca.* 1000 species of *Impatiens* in the world distributed mainly in tropical and subtropical Africa, some species in temperate Asia with a probable centre of origin in South China (Chen, 2007; Mabberley, 2008). In India there are 203 species of *Impatiens* recorded of which 137 species are endemic (Vivekananthan et al., 1997; Swaminathan, 2001). But subsequently some more species have been discovered and added to the *Impatiens* flora of India by some authors, such as Pusalkar and Singh (2010), Dessai and Janarthanam (2011) and Narayanan et al. (2011).

While working for the Flora of Anjaw District, Arunachal Pradesh under the annual action plan project of Botanical Survey of India, authors have collected one perennial robust species of *Impatiens* with showy yellow flowers. After critical study and perusal of literature, e. g., Hooker and Thomson (1860), Hooker (1874, 1875, 1908, 1908a), Grey-Wilson (1989, 1991), Vivekananthan (1997), Swaminathan et al. (2001), Chen et al. (2007), Yu et al. (2007), Cong et al. (2008), Pusalkar and Singh (2010), Dessai and Janarthanam (2011), Narayanan, (2011) and Yuan et al. (2011). it revealed that it is an hitherto undescribed species having close affinity with *I. siculifer* Hook.f and *I. stenantha* Hook.f.. Hence this species is described herein as a new species with illustrations.

TAXONOMIC TREATMENT

Impatiens lohitensis R. Gogoi & S. Borah ***sp. nov.***
Figs. 1A–I & 2A–M

I. lohitensis differs from *I siculifer* Hook.f. in elliptic bigger leaves, green flower bud without awn, bigger sized flower, bigger floral bract, much longer spur, two red blotch at throat, bigger size of linear capsule; from *I. stenantha* Hook.f. in robust perennial nature, large leaf with more lateral veins, flower bud green without awn, double the size of flower with two red blotch at throat, lateral sepals navicular, abaxial midvein of upper petal thickened, double the length of straight spur with green tip, much bigger size of lateral united petals and capsule.

Type (here designated): INDIA, Arunachal Pradesh, Lohit District, after Udayak Pass way to Tidding, ±1000 m, 27/May/2011, *R. Gogoi 24533A*-CAL (holotype), *24533B-D* ASSAM & *24533E-F* ARUN (isotype).

Perennial succulent herbs, up to 1m tall, stem greenish with pink or purplish spots, terete, slightly ridged, nodes swollen. Leaf alternate, petiole 1–5.2 cm long, green, purple spots on dorsal side, blade elliptic, 8.5–26 × 4.1–11.5 cm, glabrous, base cuneate to obtuse, apex acuminate, margin crenate, setose between teeth, stipule present, glandular, 2 mm raised, veins 10–16 pairs, subopposite. Inflorescence axillary, racemose, peduncle 5.5–12 cm long, base swollen, green, 5 to 7 flowered, green in bud. Flower bisexual, yellow, two red blotch in throat, pedicel 1.4–1.8 cm, green. Bracts at the base of the pedicel, navicular, ovate, large, green, caducous, margin reddish, acuminate at apex, midvein prominent, glabrous. Lateral sepals 2, navicular, oblong, *ca.* 1 × *ca.* 0.5 cm, apex acuminate, margins transparent, membranous. Lower sepal (lip) yellow at front part, 3–4.6 cm long, mouth beaked, beak 2 mm, spur reddish, 2–3.2 cm long, linear-filiform, straight, curved when young, tip bifid, green. Upper petal (standard) yellow, sub orbicular, *ca.* 1.5 × *ca.* 1.5 cm, apex emarginate, beaked, dorsal side with mild ridge,

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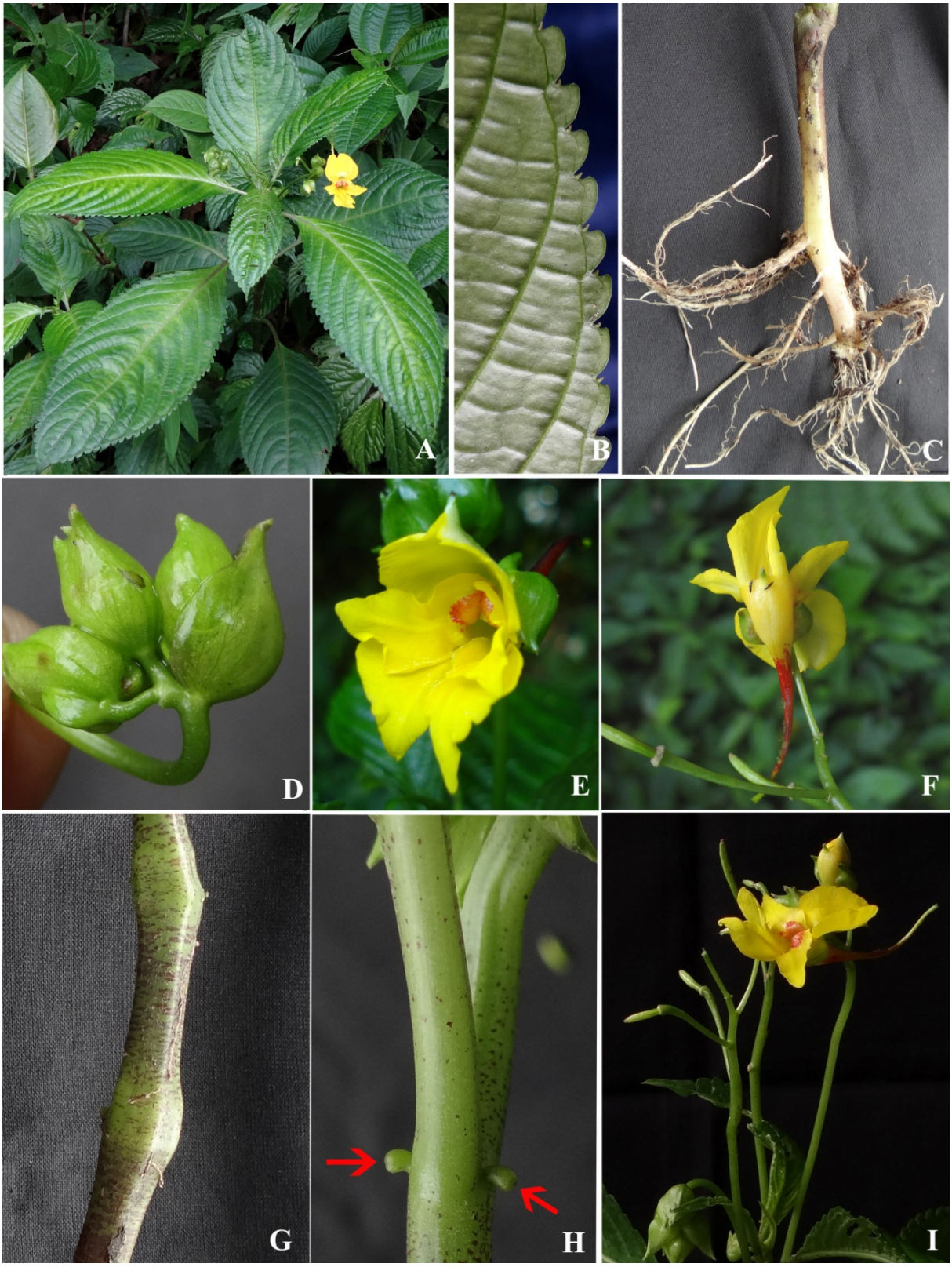


Fig. 1. Morphological features of *Impatiens lohitensis* R. Gogoi & S. Borah. A: Habit of the plant. B: Leaf margin. C: Root system. D: Flower bud. E: Front view of young flower. F: Dorsal view of flower. G: Stem with swollen nodes. H. Glandular stipules. I: Inflorescence.

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slightly raised. Lateral united petals (wings) yellow, bilobed, subequal, red blotch in the base of the basal lobe, both apex of the lobes acuminate, *ca.* 3 × *ca.* 1.6 cm (whole), breadth of basal lobe *ca.* 7 mm, not clawed, breadth of distal lobe *ca.* 4 mm, , base appendaged, appendage 2 mm long. Stamen 5, united, enclosing ovary, upright 6 mm long, anther obtuse. Capsule linear, green, 5 ridged, 2.8–3.2 cm long, tip and base reddish, slightly constricted at 60 % above; seeds subglobose, white, brown when dry, surface mild papillose.

Flowering & Fruiting: May–August.

Habitat: Moist shady locations in forest margins of Tropical Forest.

IUCN conservation status: Not evaluated, during the collection it was noticed that this plant is confined within an area of only 4 sq. Km. with few populations.

Distribution: India: Arunachal Pradesh: Lohit District, after Udayak Pass way to Tidding.

Etymology: The species is collected from Lohit district of Arunachal Pradesh, hence the species epithet is given for its place of origin.

Ecology: The species grows along the side of the stream in the down part of shady hilly slops in association with *Elatostema sessile* Forst., *Pilea anisophylla* Wedd., *Impatiens siculifer* Hook.f., *Pollia hasskarlii* Rao Rolla, *Polygonum chinensis* Houtt., *Begonia palmata* D. Don, *Commelina paludosa* Blume, *Steudnera colocasiaefolia* C. Koch. etc.

Specimens examined: INDIA: Arunachal Pradesh: Arunachal Pradesh, Lohit District, after Udayak Pass way to Tidding, ±1000 m, 27/May/2011, *R. Gogoi 24533* (Type specimens); Arunachal Pradesh, Lohit District, after Udayak Pass way to Tidding, ±1000m, 03/July/2012, *R. Gogoi & S. Borah 24602* (ARUN).

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LITERATURE CITED

Chen, Y.-L., C., S. Akiyama and H. Ohba. 2007. *Impatiens*. In: Wu, Z.-Y., P. H. Raven and D.Y. Hong (eds.), Flora of China, **12** (Hippocastanaceae through Theaceae): 43–113. Science Press, Beijing & Missouri Botanical Garden Press, St. Louis, USA.

Cong, Y.-Y., K.-M. Liu, X.-Z. Cai, and S.-Z. Tian. 2008. *Impatiens fugongensis* (Balsaminaceae), a new species from Yunnan, China. Bot. Stud. **49**: 161–165.

Dessai, J. R. N. and M.K. Janarthanam. 2011. The genus *Impatiens* (Balsaminaceae) in the northern and parts of central Western Ghats. Rheedea **21**: 23–80

Grey-Wilson, C. 1989. The *Impatiens bicornuta* and its allies. Studies in Balsaminaceae: VII. Kew Bull. **44**: 61–66.

Grey-Wilson, C. 1991. *Impatiens* L. In: A.J.C. Grierson & D.G. Long (eds.), Flora of Bhutan, **2**: 82–104. Royal Botanic Garden, Edinburgh, UK.

Hooker, J. D. 1874. *Impatiens* L. Flora of British India, **1**: 440–464. L. Reeve & Co., London, UK.

Hooker, J. D. 1875. *Impatiens* L. Flora of British India, **1**: 465–483. L. Reeve & Co., London, UK.

Hooker, J. D. 1908. An Epitome of the British Indian species of *Impatiens*. Rec. Bot. Surv. India **4**: 1–58.

Hooker, J. D. 1908a. Les Especes Du Genre "*Impatiens*", Nouvelles Archives du Museum d'histoire Naturelle. ser **4**: 10: 246. Masson et Cie, Paris, France.

Hooker, J. D and T. Thomson. 1860. Precursores ad Floram Indicum-Balsaminaceae. J. Linn. Soc. **4**:106–157

Mabberley, D. J. 2008. The Plant book-A Portable Dictionary of Plants. Cambridge University Press, Cambridge, UK.

Narayanan, M. K., R., N. Anilkumar, R. M. Raj, M. Sivadasan and A.H. Alfarhan. 2011. A New scapigerous species of Impatiens (Balsaminaceae) from India. J. Plant Taxon **18**: 141–148

Pusalkar, P. K. and D. K. Singh. 2010. Three New Species of *Impatiens* (Balsaminaceae) from Western Himalaya, India. Taiwania **55**: 13–23

Swaminathan, M. S., K. Vivekananthan and V. J. Nair. 2001. "Impatiens" in Singh, N. P. and D. K. Singh (eds.), Floristic diversity and conservation strategies in India, vol. **IV**. pp. 2139–2157. Botanical Survey of India, Kolkata, India.

Vivekananthan, K., N. C. Rathakrishnan, M. S. Swaminathan and L. K. Ghara. 1997. Balsaminaceae. In Hajra, P.K. et al. (ed.), Flora of India **4**: 95–229. Botanical Survey of India, Kolkata, India.

Yu, S.-X., Y. Chen and H.-N. Qin. 2007. *Impatiens angulata* (Balsaminaceae), a new species from Guangxi, China, Nordic J. Bot. **25**: 27–30.

Yuan, Y.-M., Y. Song and X.-J. Ge. 2011. *Impatiens qingchengshanica* (Balsaminaceae), a unique new species from China and its phylogenetic position. Bot. Stud. **52**: 225–230.

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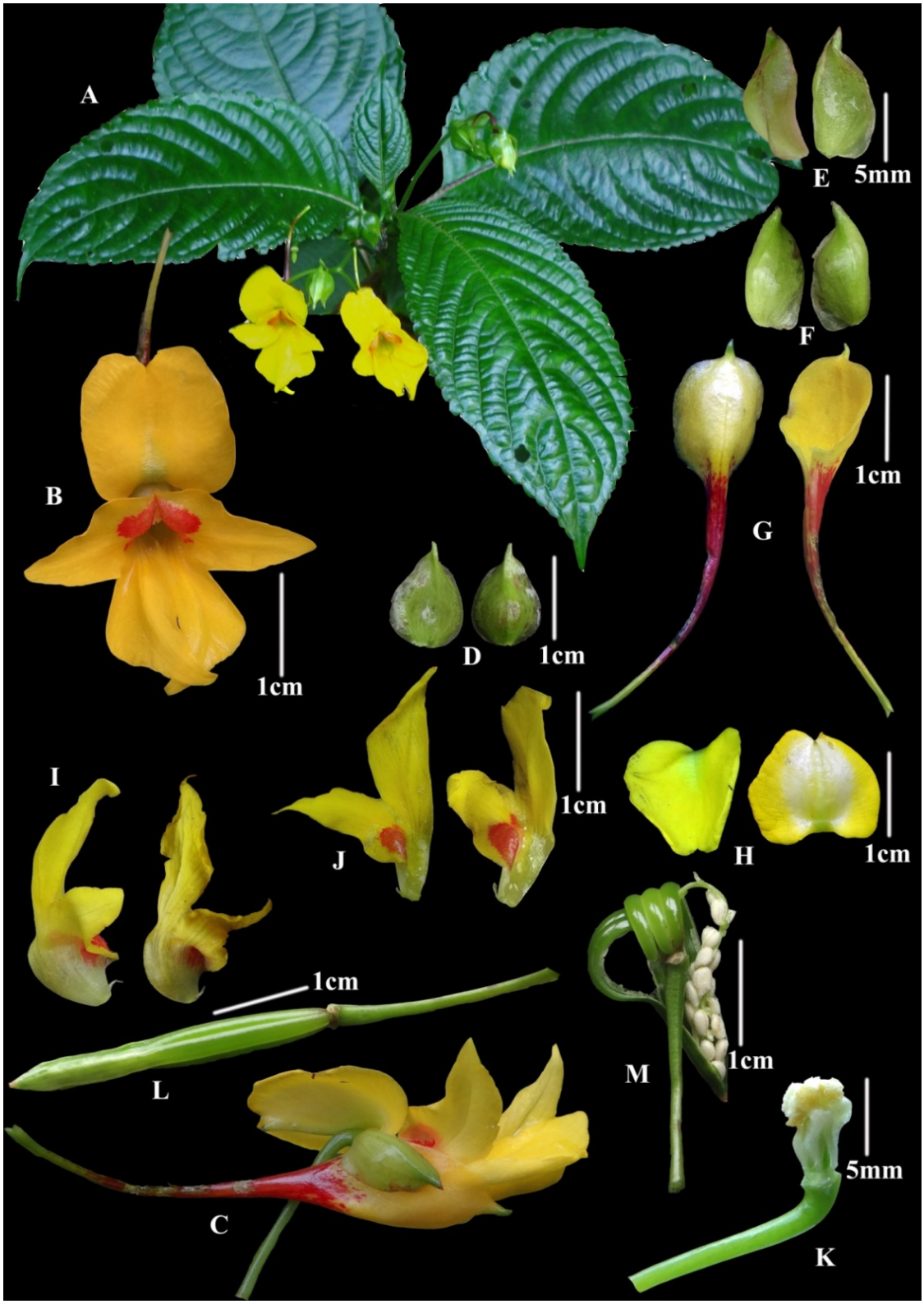


Fig. 2. Floral parts of *Impatiens lohitensis* R. Gogoi & S. Borah. A: Flowering twig. B: Single flower. C: Lateral view of flower. D: Dorsal and ventral view of bract. E: Ventral view of lateral sepals. F: Dorsal view of lateral sepals. G: Lower sepal (lip). H: Upper petal (standard). I: Dorsal view of united petals (wing). J: Ventral view of united petals. K: Androecium. L: Capsule. M: Dehiscing capsule.

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Table.1 Comparison of distinguishing characters of *Impatiens lohitensis* with *Impatiens siculifer and Impatiens stenantha.*

Impatiens lohitensis	*Impatiens siculifer*	*Impatiens stenantha*
Perineal herbs up to 1 m tall.	Annual herbs up to 1 m tall.	Annual herbs up to 60 cm tall.
Petiole 1–5.2 cm.	Petiole 1.5–3 cm.	Petiole 1.5–3.5 cm.
Leaf elliptic, 8.5–26 × 4.1–11.5 cm; lateral veins 10–16 pairs.	Leaf ovate-lanceolate or elliptic-lanceolate, 5–20 × 2.5–5 cm, lateral veins 5–11 pairs.	Leaf lanceolate or elliptic ovate, 7–15 × 3–5 cm; lateral veins 7–9 pairs.
Inflorescence axillary.	Inflorescence axillary.	Inflorescence axillary or terminal.
Flower bud green, without awn.	Flower yellow, with long awn.	Flower bud reddish, awned.
Flower *ca.* 4 cm, yellow, throat with two red blotch.	Flower *ca.* 3 cm, yellow, throat without blotch.	Flower 1.5–2.5 cm, yellow, throat with reddish spots.
Lateral sepals 2; navicular, *ca.* 10 × 5 mm.	Lateral sepals 2; narrowly oblong, *ca.* 4 × 0.5 mm.	Lateral sepals usually 2, sometimes 4; oblong-lanceolate, small, 3–5 × 2–2.5 mm.
Lower sepal (lip) 1–1.5 cm; spur 3–4.6 cm.	Lower sepal (lip) *ca.* 2 cm; spur *ca.* 1.5 cm.	Lower sepal (lip) 0.7–1 cm; spur 1.5–1.8 cm.
Upper petal (standard) *ca.* 1.5 × 1.5 cm, abaxial midvein thickened.	Upper petal (standard) *ca.* 7 × 6 mm, abaxial midvein not thickened.	Upper petal (Standard) *ca.* 8 × 5 mm, abaxial midvein not thickened.
Lateral united petals (wings) 2.5–3 cm long, with one appendage at base, 2 mm long; distal lobe not recurved or twisted.	Lateral united petals (wings) *ca.* 2.3 long, without appangage at base, distal lobe twisted.	Lateral united petals (wings) 1.5–1.8 cm long, without any appendage at base; distal lobe recurved or twisted.
Capsule 2.8–3.2 cm long.	Capsule *ca.* 2 cm.	Capsule 1.2–2 cm long.

來自印度阿魯納恰爾邦的鳳仙花屬（鳳仙花科）新種

R. Gogoi[(1*)] and S. Borah[(1)]

1. Botanical Survey of India, Arunachal Pradesh Regional Centre, Senki View, Itanagar-791111, Arunachal Pradesh, India. Second author's email: souravjyotiborah@gmail.com
** Corresponding author. Email: rajibbsi@yahoo.co.in*

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摘要：本文提供了鳳仙花屬（鳳仙花科）新種*Impatiens lohitensis* R. Gogoi & S. Borah之描述與手繪圖。本種採自印度的阿魯納恰爾邦。

關鍵詞：阿魯納恰爾邦、鳳仙花屬、印度、新種。

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