



Impatiens paramjitiana, a new species of Balsaminaceae from Arunachal Pradesh, India

R. GOGOI* & S. BORAH

Botanical Survey of India, Arunachal Pradesh Regional Centre, Senki View, Itanagar-791111, India. *E-mail: rajibbsi@yahoo.co.in

Abstract

A new species *Impatiens paramjitiana* is described and illustrated from Siang valley of Arunachal Pradesh, India. This species is similar to *I. apsis* Hook. f. in general floral shapes but differs having spirally arranged leaves, shallowly serrate leaf margins, deep purple flowers, lateral sepals purple, capsule turgid at the middle.

Key words: Arunachal Pradesh, Siang, *Impatiens*, *Balsaminaceae*, new species

Introduction

Impatiens Linnaeus (1753: 937) is the largest among the two genera of *Balsaminaceae*, with more than 900 species distributed worldwide except in Latin America (Chen *et al.* 2008), with most species in Africa and Asia and with a probable centre of origin in South China (Yuan *et al.* 2004, Janssens *et al.* 2007, Chen *et al.* 2008, Mabberley 2008). About 250 species are found in China (Yu *et al.* 2007, Cai *et al.* 2008, Chen *et al.* 2008). In India there are 203 species of *Impatiens* recorded, of which 137 species are endemic (Vivekananthan *et al.* 1997, Swaminathan *et al.* 2001). However, several species have been discovered and added to the *Impatiens* flora of India (e.g., Pusalkar & Singh 2010, Dessai & Janarthanam 2011, Bhaskar 2012, Gogoi & Borah 2013).

Recently, in an expedition to Siang Valley of Arunachal Pradesh under the Annual Action Plan Project of Botanical Survey of India, the first author collected one perennial species of *Impatiens* with characteristically shiny velvety leaves and showy purple flowers. After examination of the species and study of the literature (Hooker & Thomson 1860, Hooker 1874, 1875, 1908a, 1908b, 1909, 1910, Toppin 1920, Grey-Wilson 1989, 1991; Vivekananthan *et al.* 1997, Swaminathan *et al.* 2001, Huang 2003, Huang *et al.* 2006, Chen *et al.* 2008, Yu 2012, Yu *et al.* 2007, Cong *et al.* 2008, Pusalkar & Singh 2010, Dessai & Janarthanam 2011, Narayanan *et al.* 2011, Yuan *et al.* 2011, Bhaskar 2012, Gogoi & Borah 2013), it has been found that the present collection belongs to a hitherto undescribed species having affinity with the Chinese species *I. apsis* Hook.f. (1911: 2972). Hence it is described here as a new species with illustrations based on living material.

Impatiens paramjitiana Gogoi & Borah, *sp. nov.* (Fig. 1 and 2)

Similar to *I. apsis* Hook. f. (1911: 2972) in general floral shapes but differs having spirally arranged leaves, shallowly serrate leaf margins, deep purple flowers, lateral sepals purple, capsule turgid at the middle.

Type:—INDIA. Arunachal Pradesh: West Siang district, crossing the Army camp towards Daporijo from Along, 300–400 m, 1 August 2013, R. Gogoi 30538 (holotype CAL!, isotypes ASSAM!, ARUN!).

Perennial non succulent herbs, unbranched or sparsely branched, to 70 cm tall. Stem terete, slightly ridged, purplish; nodes not swollen. Leaf confined to upper portion of the stem, spirally arranged; petiole 1.5–10 cm long, purple, with few pairs of filiform glands; stipule absent; lamina 2.5–12 × 1–6 cm, simple, elliptic, glabrous, shiny, velvety; veins to 12 pairs, sub-opposite, main vein purplish at base; base cuneate; apex acute to slightly acuminate; margin crenate, setose between teeth. Inflorescence axillary; single flowered, peduncle 2–2.5 cm long, pink; bract ca. 0.7 × 0.5 cm, ovate, situated at the base of the pedicel, persistent, green. Sepals: lateral sepals 2, ca. 0.8 × 0.6 cm, obliquely ovate, glabrous, purple; transparent, membranous; lower sepal navicular, tapering in to a spur, white with purple streaks, to 1.5 cm deep, mouth slightly beaked, beak to 1 mm, spur to 2.5 cm, linear straight to slightly bending in ward, tip white. Petals: dorsal petal ca. 1.2 × 0.8 cm, ovate, apex acute to slightly emarginated, non beaked, shallowly cucullate, purple; lateral united petals

Etymology: The species is named after Dr. Paramjit Singh, distinguished Indian scientist and director, Botanical Survey India for his contribution to Indian plant taxonomy.

Conservation status:—*Impatiens paramjitiana* is assessed as Critically Endangered (CR) according to the IUCN Red List criteria (IUCN 2010). There was only a small population found road side of about 50 individuals. The habitat is disturbed heavily by urbanization and agricultural activities.

Notes: *Impatiens paramjitiana* does not have close affinity to any of the Indian *Impatiens* but is close to the Chinese species *I. apsis* Hook. f. (1911: 2972) in general floral shape. It differs significantly from the latter species in its spirally arranged leaves, shallowly serrated leaf margins, deep purple flowers, lateral sepals purple, capsule turgid at the middle (Table 1). On the other hand, one species from neighbouring Myanmar, *I. pritchardii* Toppin (1920: 360), also shows some superficial similarity with the new species, but *I. paramjitiana* is different from the later in having velvety leaves, single deep purple flower in each peduncle, navicular lip with straight spur (Table 1).

TABLE 1. Morphological differences among *Impatiens paramjitiana*, *Impatiens apsis* and *Impatiens pritchardii*.

Characters	<i>Impatiens paramjitiana</i>	<i>Impatiens apsis</i>	<i>Impatiens pritchardii</i>
Leaf	Spirally arranged, margins shallowly serrated.	Alternate, margins deeply serrated	Spirally arranged, margins shallowly serrated
Peduncle	Single flowered	Single flowered	Two flowered
Flower	Deep purple	White or greenish white	Reddish-yellow
Lateral sepals	Deep purple	Green	Whitish
Lower sepal (lip)	Navicular	Navicular	Bucciniform
Spur	Long straight	Slightly curved	Prominently curved
Capsule	Turgid at the middle	Linear	Turgid at the middle

Acknowledgements

The authors thank Dr. Wojciech Adamowski, University of Warsaw, Poland; Dr. Seng Xiang Yu, Chinese Academy of Sciences, Beijing, China for determination of the species as new, Dr. K.N. Gandhi, HUH, Harvard, USA for his helpful suggestions in preparation of the manuscript and also to Dr. Subir Bandhupadhyaya, CNH, Kolkata for going through the manuscript and Dr. H.A. Barbhuiya, Scientist, BARC, Mumbai for preparation of the line drawings.

References

- Bhaskar, V. (2012) *Taxonomic Monograph on Impatiens L. (Balsaminaceae) of Western Ghats, South India: The Key Genus for Endemism*. Centre for Plant taxonomic study, Bangalore, 283 pp.
- Cai, X.Z., Liu, K.M. & Tian, S.Z. (2008) *Impatiens rupestris* (Balsaminaceae), a New Species from Hunan, China. *Novon* 1: 9–11. <http://dx.doi.org/10.3417/2007068>
- Chen, Y.L., Akiyama, C.S. & Ohba, H. (2008) *Impatiens*. In: Wu, Z.-Y., Raven, P.H. & Hong, D.Y. (Eds.) *Flora of China*, vol. 12. Science Press, Beijing & Missouri Botanical Garden Press, St. Louis, USA, pp. 43–113.
- Cong, Y.Y., Liu, K.M., Cai, X.Z. & Tian, S.Z. (2008) *Impatiens fugongensis* (Balsaminaceae), a new species from Yunnan, China. *Botanical Studies* 49: 161–165.
- Dessai, J.R.N. & Janarthanam, M.K. (2011) The genus *Impatiens* (Balsaminaceae) in the Northern and parts of central Western Ghats. *Rheedea* 21: 23–80.
- Gogoi, R. & Borah, S. (2013) *Impatiens lohitensis*, a new species of *Impatiens* (Balsaminaceae) from Arunachal Pradesh, India. *Taiwania* 58: 15–19.
- Grey-Wilson, C. (1989) The *Impatiens bicornuta* and its allies. *Studies in Balsaminaceae: VII. Kew Bulletin* 44: 61–66. <http://dx.doi.org/10.2307/4114645>
- Grey-Wilson, C. (1991) *Impatiens* L. In: Grierson, A.J.C. & Long, D.G. (Eds.) *Flora of Bhutan*, vol. 2. Royal Botanic Garden, Edinburgh, UK, pp. 82–102.
- Hooker, J.D. (1874) *Impatiens* L. In: Hooker, J.D. (Ed.) *Flora of British India*, vol. 1. L. Reeve & Co., London, UK, pp. 440–464. <http://dx.doi.org/10.5962/bhl.title.678>

- Hooker, J.D. (1875) *Impatiens* L. In: Hooker, J.D. (Ed.) *Flora of British India*, vol. 1. L. Reeve & Co., London, UK, pp. 465–483.
<http://dx.doi.org/10.5962/bhl.title.678>
- Hooker, J.D. (1908a) An Epitome of the British Indian species of *Impatiens*. *Records of Botanical Survey of India* 4: 1–58.
- Hooker, J.D. (1908b) Les Especies Du Genre “*Impatiens*”. *Nouvelles Archives du Museum d’histoire Naturelle*. ser 4 10: 246.
- Hooker, J.D. (1909) *Impatiens morsei* Hk.f. In: Prain, D. (Ed.) *Hooker's Icones Plantarum Series 4*, vol. 9. Dulau & Co., London, UK, tab. 2874.
<http://dx.doi.org/10.5962/bhl.title.16059>
- Hooker, J.D. (1910) Indian species of *Impatiens*. Generis *Impatiens* species Indicae novae et minus rite cognitae a Cl. A. Meebold detectae. *Bulletin Miscellaneous Information, Kew* 1910: 291–300.
<http://dx.doi.org/10.2307/4111723>.
- Hooker, J.D. (1911) *Impatiens*. In: Prain, D. (Ed.) *Hooker's Icones Plantarum Series 4*, vol. 10. Dulau & Co., London, UK, tab. 2951–2975.
<http://dx.doi.org/10.5962/bhl.title.16059>
- Hooker, J.D. & Thomson, T. (1860) Precursores ad Floram Indicum-Balsaminaceae. *Journal of the Proceedings of the Linnean Society. Botany* 4: 106–157.
- Huang, S.H. (2006) *Balsaminaceae*. In: Wu, C.Y. (Ed.) *Flora Yunnanica*, vol. 16. Science Press, Beijing, pp. 66–156.
- Huang, S.H., Shui, Y.M. & Chen, W.H. (2003) New taxa of *Impatiens* from Yunnan. *Acta Botanica Yunnanica* 25: 261–280.
- IUCN (2010) *IUCN Red List Categories and Criteria (Version 3.1)*. Prepared by the IUCN Species Survival Commission, Gland, Switzerland, 30 pp.
- Janssens, S., Geuten, K., Viaene, T., Yuan, Y.-M., Song, Y. & Smets, E. (2007) Phylogenetic utility of the AP3/DEF K-domain and its molecular evolution in *Impatiens* (Balsaminaceae). *Molecular Phylogenetics and Evolution* 43: 225–239.
<http://dx.doi.org/10.1016/j.ympev.2006.11.016>.
- Linnaeus, C. (1753) *Species plantarum*. L. Salvius, Stockholm, 1200 pp.
<http://dx.doi.org/10.5962/bhl.title.669>
- Mabberley, D.J. (2008) *The Plant book – A Portable Dictionary of Plants*. Cambridge University Press, Cambridge, UK, 1040 pp.
- Pusalkar, P.K. & Singh, D.K. (2010) Three New Species of *Impatiens* (Balsaminaceae) from Western Himalaya, India. *Taiwania* 55: 13–23.
- Swaminathan, M.S., Vivekananthan, K. & Nair, V.J. (2001) *Impatiens*. In: Singh, N.P. & Singh, D.K. (Eds.) *Floristic diversity and conservation strategies in India*, vol. 4. Botanical Survey of India, Kolkata, India, pp. 2139–2157.
- Toppin, S.M. (1920) Notes on the Balsams of Chitral and the Kachin Hills. *Bulletin of Miscellaneous information, Kew* 10: 345–367.
<http://dx.doi.org/10.2307/4118598>
- Vivekananthan, K., Rathakrishnan, N.C., Swaminathan, M.S. & Ghara, L.K. (1997) Balsaminaceae. In: Hajra, P.K., Chakraverty, R.K., Dixit, R.D., Mondal, M.S. & Chatterjee, U. (Eds.) *Flora of India*, vol. 4. Botanical Survey of India, Kolkata, India, pp. 95–229.
- Yu, S.X. (2012) *Balsaminaceae of China*. Peking University Press, Beijing, China, 215 pp.
- Yu, S.X., Chen, Y. & Qin, H.N. (2007) *Impatiens angulata* (Balsaminaceae), a new species from Guangxi, China. *Nordic Journal Botany* 25: 27–30.
http://dx.doi.org/10.1111/j.0107-055X.2007.00049_18.x
- Yuan, Y.M., Song, Y. & Ge, X.J. (2011) *Impatiens qingchengshanica* (Balsaminaceae), a unique new species from China and its phylogenetic position. *Botanical Studies* 52: 225–230.
- Yuan, Y.-M., Song, Y., Geuten, K., Rahelivololona, E., Wohlhauser, S., Fischer, E., Smets, E. & Küpfer, P. (2004) Phylogeny and biogeography of Balsaminaceae inferred from ITS sequences. *Taxon* 53: 391–403.
<http://dx.doi.org/10.2307/4135617>