



Impatiens xanthinoides (Balsaminaceae), a new species from Yunnan, China

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Abstract

Impatiens xanthinoides (Balsaminaceae) *sp. nov.* from Yunnan Province, China is described and illustrated. This species is similar to *I. xanthina* and *I. fugongensis* in plant height, golden-yellow flowers, lateral sepals 2, stamen 5 with obtuse apex, and 5-carpellate ovary. However, it differs with that two species in the lower sepal obconic with red striae, dorsal petal glabrous, the lateral united petals stipitate with fan-shaped, apex acute lower lobes, and fusiform capsule. The detailed morphological characters, diagnostic comparisons, habitat and micromorphology of seeds and pollen grains under scanning electron microscope (SEM) are presented. According to the IUCN Red List Categories and Criteria, *I. xanthinoides* is assessed as Critically Endangered (CR B1a; B1b(ii)) because of its limited distribution range and decline of mature individuals.

Key words: Balsaminaceae, China, *Impatiens xanthinoides*, IUCN Red List, new species

Introduction

The family Balsaminaceae consists of two genera, the monotypic genus *Hydrocera* Blume ex Wight & Arnott (1834: 140) and the prolific genus *Impatiens* Linnaeus (1753: 937). The latter contains two subgenera, *I. subg. Clavicarpa* and *I. subg. Impatiens*; *I. subg. Impatiens* is further subdivided into seven sections (Yu *et al.* 2015). *Impatiens* is annual or perennial herb with flowers that exhibit a remarkable diversity. It has over 1000 species worldwide (Grey-Wilson 1980a). Most species are distributed in the highlands and mountains of tropical and subtropical Africa (including Madagascar), and also in parts of temperate Asia, Europe and North America (Grey-Wilson 1980a, b, Chen 2001, Fischer 2004). In China, *Impatiens* includes over 260 species (except varieties) (Chen 2001, Chen *et al.* 2007, Li *et al.* 2011, Dong *et al.* 2012, Yu 2012, Cong *et al.* 2013, Zhang *et al.* 2014), with the majority restricted to the southwestern China, especially in Yunnan, Sichuan, Xizang (Tibet), Guizhou and Guangxi. However, the high diversity and insufficient fieldwork on *Impatiens* suggest that additional new species are awaiting our discovery.

During a botanical survey in Western Yunnan in 2007, an unusual species of *Impatiens* was collected by Dr. G. W. Hu. Its golden-yellow flowers are most similar to those of *I. xanthina* H. F. Comber (1934: 248). But its dorsal petal is galeiform, and without purple (or red) dot at base, lateral united petals are stipitate. These characters make it differ from *I. xanthina* obviously. But our primary studies could not give a correct scientific name to this species. In 2011, another field survey was carried out specially for this plant in the place where we found it for the first time and its neighboring areas. Through this field investigation, we found this species only distributed along several streams in the Tongbiguan Natural Reserve within an area less than 100 km². Several herbarium specimens were prepared and materials were fixed in a formalin-acetic-alcohol (FAA) solution for further study. Pollen morphology and seed coat micro-morphology have become useful taxonomic characters for *Impatiens*. Micro-morphological characters of pollen grains and seeds using SEM were presented for detailed comparison in addition to morphological studies. After a careful comparison in morphology and micro-morphology with its closely related species, and consulting the literature (Chen 2001, Cai *et al.* 2007, Chen *et al.* 2007, Cong *et al.* 2008), the species described here was confirmed to be new to science.