Impatiens tianlinensis (Balsaminaceae), a new species from Guangxi, China

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Abstract

Impatiens tianlinensis S. X. Yu & L. J. Zhang, a new species of the Balsaminaceae from Cenwang Laoshan Mountain, Tianlin County, Guangxi Region, is described and illustrated. This species closely resembles I. apalophylla and I. clavigera var. auriculata in having racemose inflorescences, 4 lateral sepals, hammer-shaped capsules and ellipsoid seeds, but differs in having sessile glanduliferous petioles, few-flowered inflorescences, incurved spur, yellow lower sepal without reddish patches, yellowish petals and lower sepal, and acuminate dorsal petal apex. The molecular data, from nuclear ribosomal and plastid genes, as well as pollen characters also support that the species is new to science.

Key words: Balsaminaceae, molecular data, new species, phylogeny, pollen character

Introduction

The family Balsaminaceae contains two genera currently recognized, the small Hydrocera Wight & Arnott (1834: 140) and Impatiens Linnaeus (1753: 937) with over 1000 species (Grey-Wilson 1980, Fischer 2004). Impatiens is distributed throughout tropical Africa, India, South-west Asia, South China and Japan, with a few species spreading into the north temperate zone of Europe, Russia, China and North America (Grey-Wilson 1980).

There are about 270 species known in China (Chen 2001, Chen et al. 2007, Yu 2012), and their majority are restricted to southwest China: Yunnan, Sichuan, Guizhou, Xizang (Tibet) and Guangxi. As in many other genera, several new species are discovered within these regions each year, such as Begonia of Begoniaceae (Ku et al. 2008, Peng et al. 2012, 2013), Lagarosolen of Geserinaceae (Xu et al. 2008), Pararuellia of Acanthaceae (Chen et al. 2009), Aspidistra of Asparagaceae (Lin et al. 2013) and Codonopsis of Campanulaceae (Wang & Hong, 2014).

During a taxonomic revision of Impatiens in Guangxi Region, the first author encountered several specimens of a species thought to be new to science. Further studies confirmed that it can be readily distinguished from related taxa, based on morphological (including palynological) and molecular characters.

Materials and Methods

Molecular methods:—In total, 152 species of Impatiens were sampled to represent different evolutionary patterns of the genus. Three species: Hydrocera triflora (L.) Wight & Arnott (1834: 140) (Balsaminaceae), and Marcgravia umbellata Linnaeus (1753: 503) (Marcgraviaceae) and Norantea guianensis Aublet (1775: 554) (Marcgraviaceae) were included as outgroups based on the results of Yuan et al. (2004), Janssen et al. (2006) and Yu et al. (2015). All sequences were downloaded from GenBank except I. clavigera Hook. f. (1908: 2863) var. auriculata Huang S.H. (2003: 277) and I. tianlinensis, which were newly generated for this study with accession numbers KT321312 for ITS, KT321311 for atpB-rbcL and KT321313 for trnL-F, respectively. Vouchers and GenBank accession numbers are listed in Table S1.

Three molecular markers were used: ITS (ITS-1, 5.8S, and ITS-2), atpB-rbcL and trnL-F region (trnL intron, and