



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

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ABSTRACT: *Impatiens plicatisepala* C. Y. Zou, Yan Liu & S. X. Yu (Balsaminaceae), a new species from Ziyuan County Guangxi, China, is described and illustrated. It is closely related to *Impatiens davidii* Franchet and *Impatiens dicentra* Franchet ex J. D. Hooker, all of them having 1-flowered inflorescence and basal lobe of lateral united petals with a filamentous hair. This new species has unique characters and differs from its relatives by plicated sepals, rugose seeds and two bracts in different shapes.

KEY WORDS: Balsaminaceae, China, *Impatiens*, *Impatiens davidii*, *Impatiens dicentra*, morphology, new species, taxonomy.

INTRODUCTION

The genus *Impatiens* Linnaeus is a member of the family Balsaminaceae and is one of the most species-rich genera of angiosperms (Grey-Wilson, 1980). *Impatiens* species grow chiefly in mesic or wet conditions. It comprises more than 1000 species distributed mainly in the Old-World tropics and subtropics (Grey-Wilson, 1980; Fischer, 2004). Thereinto, more than 270 species are distributed in China (Chen, 2001; Chen *et al.*, 2007; Yu, 2012), but subsequently more species have been discovered and added to the *Impatiens* flora of China by some authors, such as *Impatiens tianlinensis* S. X. Yu & L. J. Zhang (Zeng *et al.*, 2015), *Impatiens guiqingensis* S. X. Yu (Yu *et al.* 2016), *Impatiens damingensis* S. X. Yu, C. Y. Xia & H. P. Deng (Xia *et al.*, 2019), *Impatiens maculifera* S. X. Yu & Chang Y. Xia (Xia *et al.*, 2019) and *Impatiens gongchengensis* Z.C. Lu, B. Pan & Yan Liu (Lu *et al.*, 2020).

During the field exploration in 2016, we collected some *Impatiens* plant. In researching these specimens, we discovered that one specimen collected from Ziyuan County, Guangxi is morphologically distinct from any other known species that. The next year, we carefully observed and measured the morphological characters again in the field. After studying the morphology, especially plicated sepals, rugose seeds and lower bracts linear, upper bracts broadly ovate, we concluded that this species is indeed new to science as described below.

TAXONOMIC TREATMENT

Impatiens plicatisepala C. Y. Zou, Yan Liu & S. X. Yu, *sp. nov.* 褶萼鳳仙花 Figs. 1 & 2

Type: CHINA. Guangxi: Guilin City, Ziyuan County, Guali Town; shade and damp places, Alt. 1462 m, 24 September 2016, Chun-Yu Zou and Ying Qin, 450329160809024LY (holotype: IBK, isotype: PE).

Diagnosis: *Impatiens plicatisepala* differs from *I. davidii* and *I. dicentra* in the stipitate glands at leaf base, the dimorphic bracts (one linear, the other broadly ovate), the broadly ovate and abaxially plicate lateral sepals, and the ellipsoid and rugose seeds.

Plants annual, 40 cm tall. Stem erect, slightly ridged, branched, glabrous, nodes swollen in lower part. Leaves alternate, leaf blade ovate or ovate-lanceolate, 5–12 × 2.5–4.5 cm, base cuneate, margin crenate-serrate, with 2–4 stipitate glands at basal margin or without glands, apex acute, acuminate, or caudate-acuminate, petiole 1–4 cm. Inflorescences in upper leaf axils, 1-flowered, peduncles 0.5–1.5 cm. Pedicels 2-bracteate, lower bracts linear, upper bracts broadly ovate. Flowers yellow, large, to 4 cm deep. Lateral sepals 2, broadly ovate, ca. 1.6 × 1.2 cm, yellow-green, margin entire, apex mucronulate, abaxially plicated. Lower sepal red striate, saccate, abruptly narrowed into a hooked spur; spur ca. 8 mm, 2-lobed. Dorsal petal red striate, broadly ovate, ca. 1.2 × 1.8 cm, abaxial midvein green cristate. Lateral united petals clawed, 2.5–3.5 cm, 2-lobed; basal lobes oblong, small, apex acuminate or caudate with a filamentous hair; distal lobes dolabriform, large, apex obtuse, auricle inflexed. Stamens 5, filament linear, short, slightly swollen above. Ovary fusiform. Capsule linear, ca. 2.5 cm, apex rostellate. Seeds ellipsoid, rugose.

Distribution and habitat: At present *Impatiens plicatisepala* is only discovered in Ziyuan County in northern Guangxi, China. It grows directly in open or partly shaded moist places, along streams and muddy places, between 1000–1500 m.

Phenology: Flowering and fruiting from July to October.

Etymology: The specific epithet ‘*plicatisepala*’ is named according to the characteristic of plicated lateral sepals.

Additional specimens examined (paratype): CHINA. Guangxi: Ziyuan County, Liang-shui Town, shade and damp places, 1071 m, 25 Sep. 2016, Chun-Yu Zou and Jing Liu. 450329160925002LY (IBK).

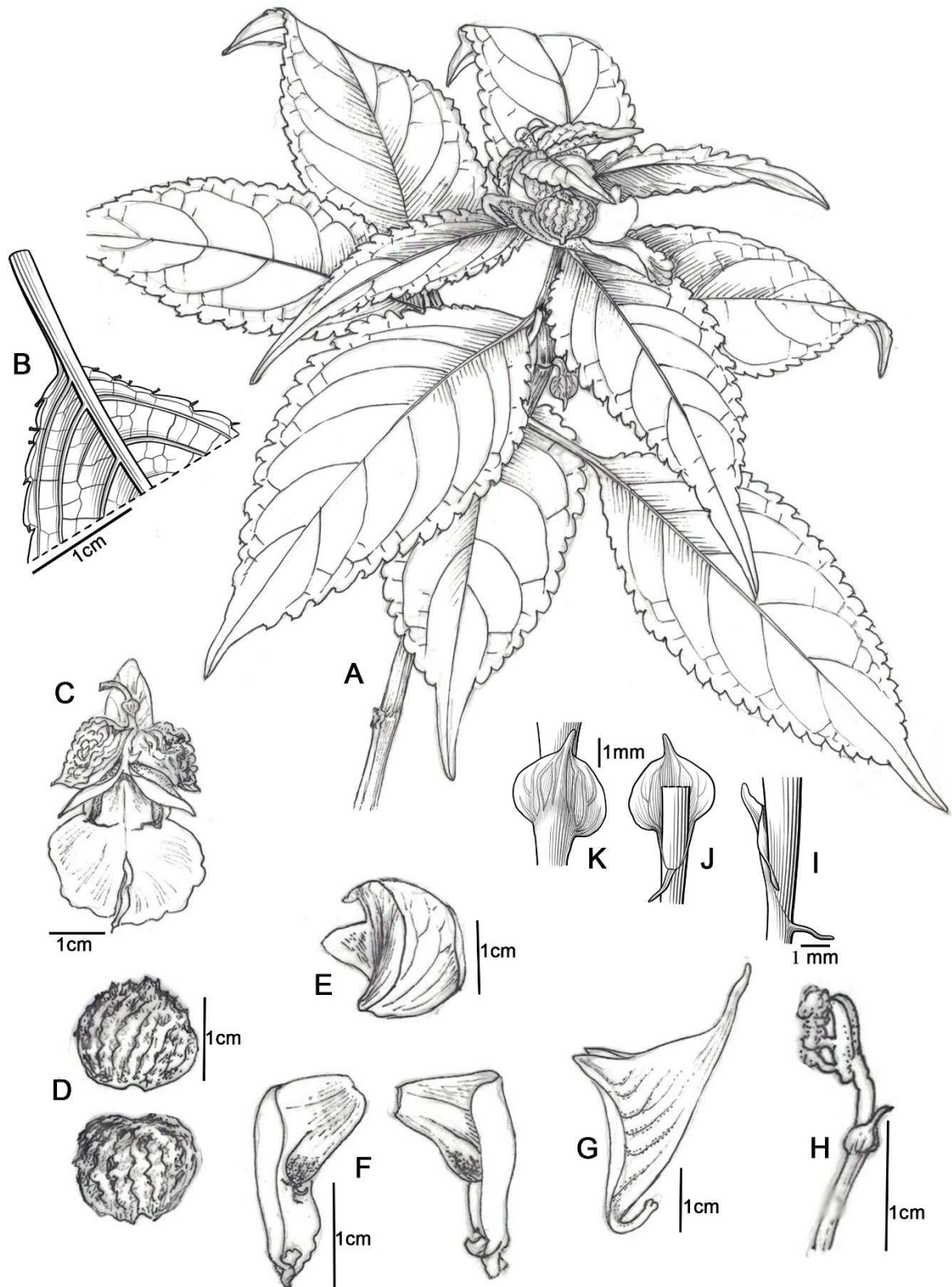


Fig. 1. *Impatiens plicatisepala* C.Y. Zou, Yan Liu & S.X. Yu **A.** Flower branch, **B.** Leaf base dorsal view with stipitate glands, **C.** Flower, front view, **D.** Lateral sepals, **E.** Dorsal petal, lateral view, **F.** Lateral united petals, **G.** Lower sepal, lateral view, **H.** Stamens and pistils. **I.** Bracts, lateral view, **J.** Bracts, front view, **K.** Bracts, dorsal view.

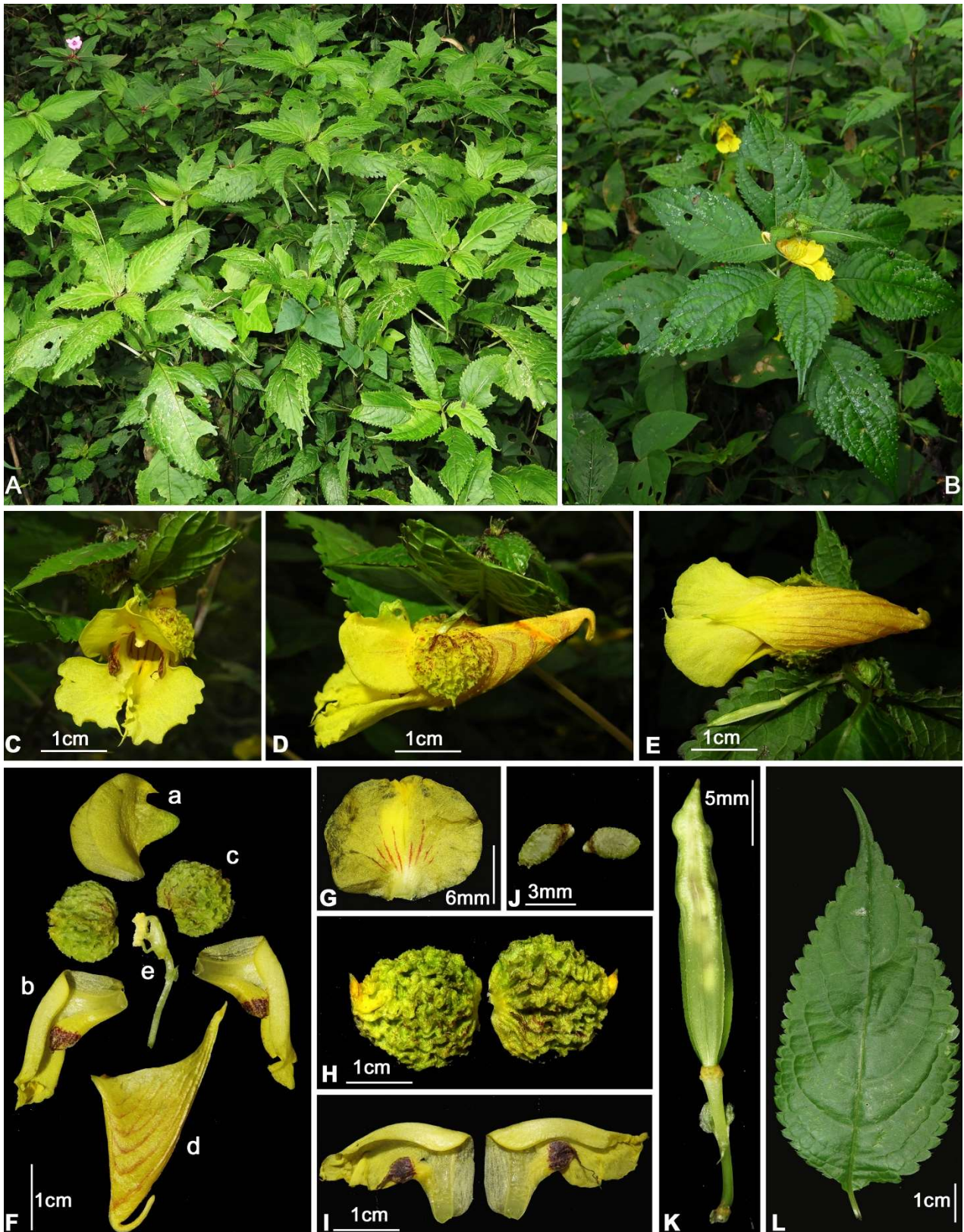


Fig. 2. *Impatiens plicatisepala* C. Y. Zou, Yan Liu & S. X. Yu **A.** Habitat, **B.** Habit, **C.** Flower, front view, **D.** Flower, lateral view, **E.** Flower, bottom view, **F.** Dissected floral parts, **a.** dorsal petal, **b.** lateral united petals, **c.** lateral sepals, **d.** lower sepal, **e.** stamens, **G.** Dorsal petal, adaxial view, **H.** Lateral sepals, **I.** Lateral united petals, **J.** Seeds, **K.** Capsule, **L.** Leaf.

**Table 1.** Comparison of diagnostics of *Impatiens plicatiseppala*, *I. davidii* and *I. dicentra*.

Character	<i>I. plicatiseppala</i>	<i>I. davidii</i>	<i>I. dicentra</i>
Leaves	ovate or ovate-lanceolate	elliptic	ovate or ovate-lanceolate
Stipitate glands in leaf base	2–4 stipitate glands or without glands	without glands	few stipitate glands
Bracts	2-bracteate, one linear, another broadly ovate	2-bracteate, ovate-lanceolate	1-bracteate, ovate
Lateral sepals	broadly ovate, 1.6 × 1.2 cm, abaxially plicated	broadly ovate, ca. 1 × 0.5–0.6 cm, 9-veined	broadly ovate-orbicular, margin coarsely dentate
Margin of lateral sepals	entire	entire	coarsely dentate
Vein number of lateral sepals	9-plicated	9-veined	midvein carinate
Upper petals	oblong, apex acuminate or caudate with a filamentous hair	oblong, apex acuminate or caudate	lanceolate, apex with a filamentous long hair
Lower petals	dolabriform, apex obtuse	dolabriform, apex obtuse	lanceolate, apex with a filamentous long hair
Shape of seeds	ellipsoid	subglobose	oblong or orbicular
Surface of seeds	corrugate	smooth	reticulate

Note: *Impatiens plicatiseppala* has 1-flowered inflorescences, yellow flowers, 2-lobed short spur, 5-carpellate ovary, linear capsule and ellipsoid seeds. On the basis of these characters, *I. plicatiseppala* is placed in *Impatiens* subgen. *Impatiens* sect. *Impatiens* (Yu et al., 2016). *I. plicatiseppala* is similar to *Impatiens davidii* Franchet (1883) and *Impatiens dicentra* Franchet ex J. D. Hooker (1908). These three species all have 1-flowered inflorescence and basal lobe of lateral united petals with a filamentous hair. It's notable that the latter character is found only in a small group of *Impatiens* plants, proving these species to be related to each other and making them distinct. *I. plicatiseppala* can be clearly distinguished from the latter two species by stipitate glands in leaf base, one bract linear, another broadly ovate, lateral sepals broadly ovate and abaxially plicated, seeds ellipsoid and rugose. More detailed morphological dissimilarities between *I. plicatiseppala* and its related species are presented in Table 1.

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