
Impatiens oblongipetala (Balsaminaceae), a New Species from Yunnan, China

Cong Yi-Yan and Liu Ke-Ming*

Department of Botany, College of Life Science, Hunan Normal University, Changsha, 410081, Hunan, People's Republic of China. *Author for correspondence: lkming8@yahoo.com.cn

ABSTRACT. A new species of *Impatiens* L., *I. oblongipetala* K. M. Liu & Y. Y. Cong (Balsaminaceae), from Yunnan Province, China, is described and illustrated, including its seed and pollen micromorphologies. This species is similar to *I. lecomtei* Hook. f. and *I. weihsiensis* Y. L. Chen, but differs by the white to slightly pink lateral sepals, the white lower sepal without purple striae, and the lateral united petals with apically retuse distal lobes.

Key words: Balsaminaceae, China, *Impatiens*, IUCN Red List, Yunnan.

Impatiens L. is the larger of two genera in the Balsaminaceae, with more than 900 species worldwide (Chen et al., 2008), and it occurs in tropical and subtropical mountains. Most of the species have very restricted distributions (Fischer & Rahelivololona, 2002). About 246 species of *Impatiens* (not including varieties) are distributed in China (Jin & Ding, 2002; Huang, 2006; Cai et al., 2008; Chen et al., 2008; Cong et al., 2008), of which 112 are found in Yunnan. This may suggest that a Chinese center for species diversity within the genus may be found in Yunnan.

Gaoligong Mountain National Nature Reserve lies in northwestern Yunnan Province, China. The reserve has been well protected by virtue of its remote location, and it is one of the richest biological resource areas in the world. There have been 4303 seed plant species and varieties recorded from Gaoligong Mountain National Nature Reserve (Li et al., 2000), including approximately 30 *Impatiens* species. In 2006, field expeditions were conducted to survey *Impatiens* and its biodiversity in the Gaoligong reserve. Several of the resulting collections could not be identified satisfactorily to existing species within *Impatiens*. After consulting the relevant literature (Chen, 1986; Akiyama et al., 1991; Huang, 2006; Chen et al., 2008) and numerous herbarium specimens (including those in PE and KUN), this taxon is proposed here as a new species.

MATERIALS AND METHODS

Mature pollen grains and seeds from fresh capsules and flowers of the holotype specimen of the new

species (Liu Ke-Ming & Cong Yi-Yan 791376) were observed. Dried pollen grains and seeds from the holotype specimen were mounted on stubs with double-sided adhesive tape and sputter-coated with a layer of gold using the JFC-1600 Auto Fine Coater (JEOL, Ltd., Tokyo, Japan). These coated materials were then examined and photographed using the JSM-6360LV scanning electron microscope (JEOL, Ltd.). Polar lengths and equatorial diameters were then measured from 25 pollen grains and 25 seeds that were randomly chosen. Micromorphological characters were described for pollen (Walker & Doyle, 1975; Wang & Wang, 1983) and seeds (Liu et al., 2004), respectively.

Impatiens oblongipetala K. M. Liu & Y. Y. Cong, sp. nov. TYPE: China. Yunnan: Fugong Co., Gaoligong Mtn. Natl. Nature Reserve, 2850 m, 98.8114°E, 26.6797°N, in moist bush, 8 Oct. 2006, Ke-Ming Liu & Yi-Yan Cong 791376 (holotype, HNNU; isotypes, HNNU [4], MO). Figures 1, 2.

Species *Impatiens lecomtei* Hook. f. et *I. weihsiensis* Y. L. Chen similis, sed ab eis sepalis lateralibus minoribus albis usque leviter roseis, sepalo inferiore albo estriato 6–7 mm profundo, lobis terminalibus petalorum lateralium majoribus oblongis vel suboblongis apice retuso differt.

Annual herb, 55–110 cm tall; stems erect, slender, branched, sparsely glandular-hairy. Leaves alternate; petioles 5–25 mm on basal leaves, gradually shortening to subsessile apically; leaf blade oblong, ovate-oblong, or oblong-lanceolate, 4.5–9 × 2.4–4 cm, membranous, pinnately veined with 5 to 8 secondary pairs, blade base cuneate, or apical blades subrounded or slightly cordate, margin crenate to serrate, teeth mucronate, apex caudate to acuminate. Inflorescences in upper leaf axils, 1-flowered, rarely 2-flowered; peduncles erect, 7–15 mm; pedicels bracteate at middle or above; bracts persistent, ovate, ca. 4 mm, apex acute. Flowers pale rose pink, 33–38 mm; lateral sepals 2, white to slightly pink, orbicular, 6–9 mm diam., entire, base slightly oblique, abaxial midvein narrowly thickened, otherwise 7-veined;

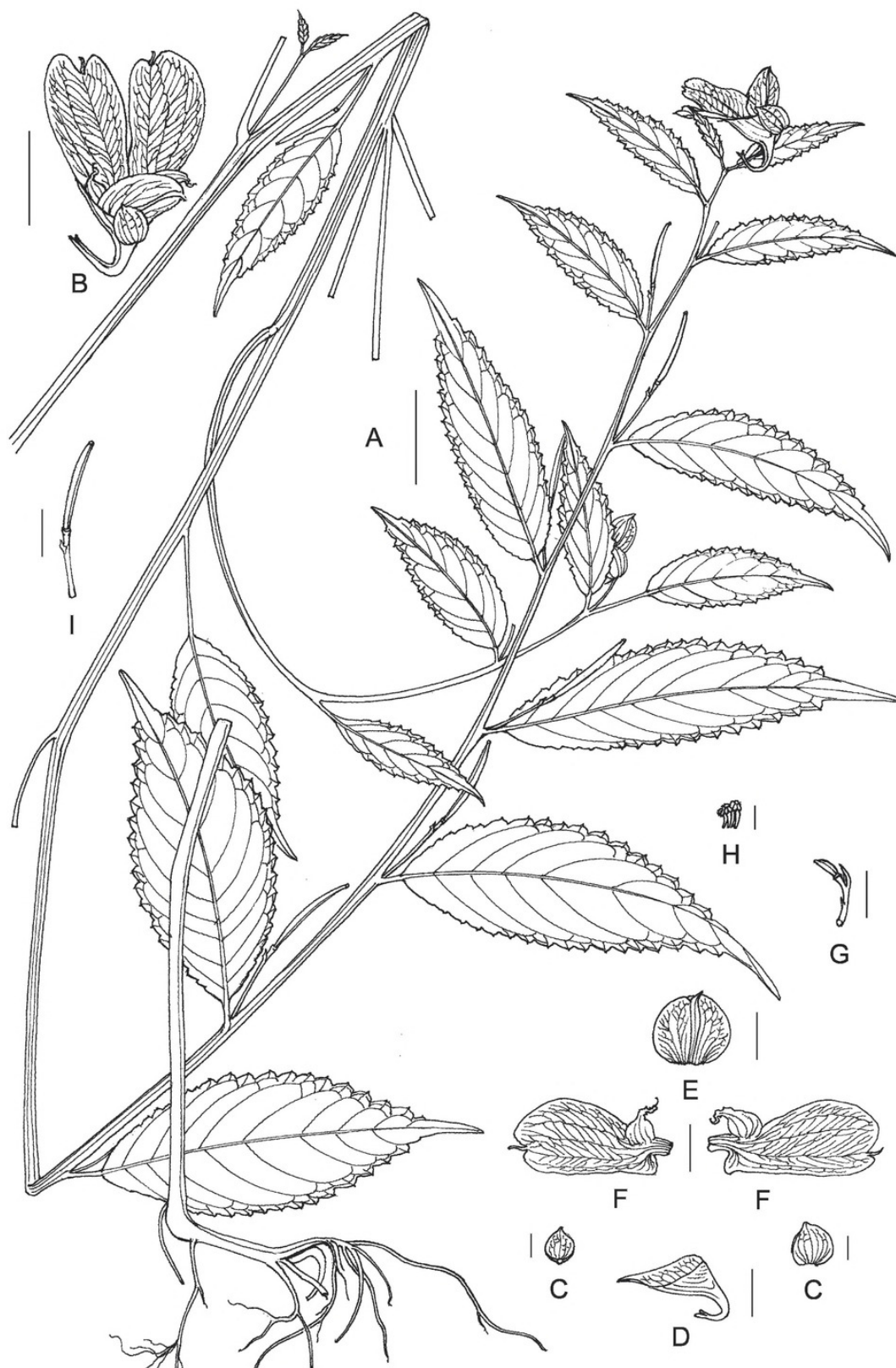


Figure 1. *Impatiens oblongipetala* K. M. Liu & Y. Y. Cong. —A. Fertile plant habit. —B. Flower, lateral view. —C. Lateral sepal. —D. Lower sepal. —E. Dorsal petal. —F. Lateral united petals. —G. Gynoecium. —H. Androecium. —I. Fruit. Scale bars: A, B = 2 cm; C, H = 5 mm; D–G, I = 1 cm. Drawn from the holotype, Liu & Cong 791376 (HNNU).

lower sepal white, broadly funnellform, 6–7 mm deep excluding the spur, mouth 16–18 mm wide, base narrowed into an incurved spur; spur 13–15 mm, 2-lobed, lobe 1–1.5 mm; dorsal petal broadly ovate-

flabellate, 10–17 mm diam., abaxial midvein narrowly cristate; lateral united petals clawed, 32–37 mm, 2-lobed; basal lobes (upper petals) small, broadly ovate, 5–7 × 4–5 mm, petal apex with a 3–4 mm filamentous

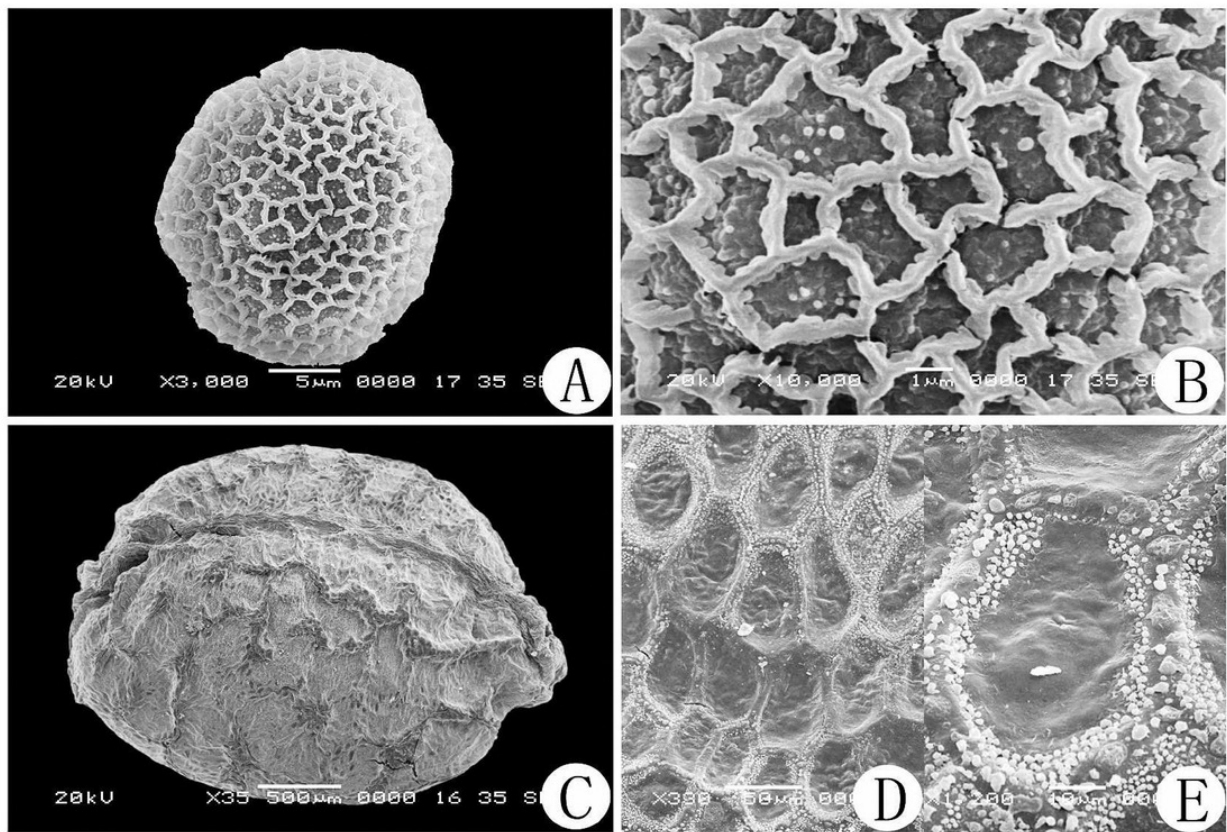


Figure 2. Pollen and seed micromorphology of *Impatiens oblongipetala* K. M. Liu & Y. Y. Cong. —A. Entire pollen grain. —B. Pollen sexine with reticulate ornamentation. —C. Intact seed. —D. Seed epidermis with reticulate ornamentation. —E. Seed epidermis, showing microgranules on muri. Vouchered from the holotype, *Liu & Cong* 791376 (HNNU).

extension; distal lobes (lower petals) large, 28–32 × 15–17 mm, oblong or suboblong, apex retuse with a ca. 2 mm seta; abaxial auricle inflexed, 3.5–4 mm; stamens 5, filaments linear, ca. 4.5 mm; anthers ovoid, apex obtuse; ovary 5-carpellate, fusiform, 3.5–4 mm. Capsule linear, 18–29 × 2–2.5 mm, apex long acuminate, 5-valved.

Palynology. Pollen grains are subellipsoid, 4-colpate, with a polar:equatorial ratio of 22.73–28.18:18.19–20.91 μm (Fig. 2A). The pollen sexine reveals irregularly reticulate ornamentation, and granulate protrusions can be seen under high magnification (Fig. 2B).

Seed micromorphology. Seeds are ellipsoid or subellipsoid, yellow-brown in color, with a polar:equatorial ratio of 3.5–3.9:2.5–3 mm (Fig. 2C). The outer periclinal wall of the epidermal cells of the seed coat slightly bulges to form reticulate ornamentation (Fig. 2D); some microgranules on the muri can be seen under high magnification (Fig. 2E).

Distribution and habitat. *Impatiens oblongipetala* was noted to grow in damp undergrowth at 2700–2850 m elevation in Fugong County in northwestern

Yunnan Province, China; the new taxon is known only from the type locality.

IUCN Red List category. *Impatiens oblongipetala* is not common in Fugong County, and it is known only from the strictly protected core zone of Gaoligong Mountain National Nature Reserve. Therefore, we recommend that the taxon be considered of Least Concern (LC), according to IUCN Red List criteria (IUCN, 2001).

Phenology. The new species was observed to flower and fruit from August to October.

Etymology. The specific epithet is from the Latin “oblongipetala” and refers to the oblong distal lobes of the lateral united petals.

Morphological notes. *Impatiens oblongipetala* is similar to *I. lecomtei* Hook. f. and *I. weihsiensis* Y. L. Chen in having pink flowers, the basal lobes of the lateral united petals each bearing an apical long filamentous extension, and the distal lobes of the lateral united petals with an apical seta. However, the new species is readily distinguished from the latter two by the white to slightly pink lateral sepals 6–9 mm diam.; the lower sepal that is white, less deep, and without purple striae; and the distal lobes of the

Table 1. Morphological comparison of *Impatiens oblongipetala*, *I. lecomtei*, and *I. weihsiensis*.

Characters	<i>I. oblongipetala</i>	<i>I. lecomtei</i>	<i>I. weihsiensis</i>
Inflorescences	1-flowered, rarely 2-flowered	1-flowered	1-flowered
Lateral sepals	white to slightly pink, 6–9 mm diam.	green or purple, 10–15 mm diam.	purple, 11–12 mm diam.
Lower sepal	white, without purple striae, 6–7 mm deep excluding the spur, mouth 16–18 mm wide; spur 13–15 mm, lobe 1–1.5 mm	pale yellow, with purple striae, 20–25 mm deep excluding the spur, mouth 19–25 mm wide; spur ca. 9–10 mm, lobe 3–3.5 mm	pale yellow, with purple striae, 17–18 mm deep excluding the spur, mouth 20–21 mm wide; spur 7–8 mm, lobe 2.7–3.2 mm
Dorsal petal	broadly ovate-flabellate, 10–17 mm diam., margin entire	orbicular, 18–22 mm diam., margin entire	orbicular, 11–13 mm diam., margin 4- or 5-denticulate on one side
Lateral united petals	clawed; distal lobes 28–32 × 15–17 mm, oblong or suboblong, apex retuse, with a seta	± clawed; distal lobes 19–22 × 8–11 mm, dolabriform, apex entire, with a seta	± clawed; distal lobes 18–20 × 9–10 mm, orbicular-dolabriform, apex entire, with a seta

lateral united petals that are larger, oblong or suboblong, and apically retuse. A more detailed comparison of these three species is presented in Table 1.

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