Impatiens katjae, a New Species of *Impatiens* (Balsaminaceae) from Central Myanmar

Nobuyuki Tanaka

Department of Botany, National Museum of Nature and Science, Amakubo 4-1-1, Tsukuba, Ibaraki 305-0005, Japan. Author for correspondence: nobuyuki_tanaka@kahaku.go.jp

Mu Mu Aung

Forest Research Institute (FRI), Forest Department, Ministry of Natural Resources and Environmental Conservation, Yezin, Nay Pyi Taw, Myanmar.

Jaap Jan Vermeulen

JK Art and Science, Lauwerbes 8, 2318 AT, Leiden, The Netherlands.

Abstract. A new species, *Impatiens katjae* Nob. Tanaka & J. J. Verm. (Balsaminaceae), from Mandalay Region, central Myanmar, is described and illustrated. This species is similar to *I. oblongata* Ruchis. & Niet in floral morphology, but differs in having distinctly smaller flowers, 2-flowered axillary inflorescences, much paler pinkish-white flowers, two lateral sepals, and a spurless lower sepal. This new species is assigned to *Impatiens* L. subg. *Impatiens* sect. *Uniflorae* Hook. f. & Thomson.

Key words: Balsam, Burma, *Impatiens*, IUCN Red List, limestone, Mandalay, Myanmar, new taxon, taxonomy.

The genus *Impatiens* L. (Balsaminaceae) consists of more than 900 species distributed mainly in tropical Africa and Southeastern Asia, and occasionally in North America, Europe, and East Asia (Grey-Wilson, 1985; Mabberley, 2017). Most species are narrow endemics (Fischer & Rahelivololona, 2002).

Myanmar is known as the "floristic blank" among continental Southeast Asian countries (Tanaka, 2005). It is located at the crossroads between South Asia, East Asia, and Indochina, with influences from each adjacent region (Middleton et al., 2019). Since Kress et al. (2003) recorded 47 species of *Impatiens* from Myanmar, many new species have been described (Tanaka et al., 2015; Ruchisansakun et al., 2017, 2018a; Yang et al., 2017). A recent revision of *Impatiens* in Myanmar recognized 65 species (Ruchisansakun et al., 2018b). Since then, another new species, *I. megacalyx* Y. H. Tan & H. B. Ding, was described (Ding et al., 2019), bringing the number up to 66.

Recently, Yu et al. (2015) proposed a new classification system of *Impatiens* based on morphological and phylogenetic analysis. They divided the genus *Impatiens* into two subgenera, *Clavicarpa* S. X. Yu ex S. X. Yu & Wei Wang and *Impatiens*, and further subdivided the latter subgenus into seven sections: *Semeiocardium* (Zoll.) S. X. Yu & Wei Wang, *Tuberosae* S. X. Yu & Wei Wang, *Racemosae* Hook. f. & Thomson, *Impatiens*, *Scorpioidae* S. X. Yu & Wei Wang, *Fasciculatae* X. S. Yu & Wei Wang, and *Uniflorae* Hook. f. & Thomson.

During a survey in the Mandalay Region, central Myanmar, in 2016, the third author collected a very small-flowered *Impatiens* species. After morphological analysis of dried and spirit materials, we find that this species belongs to subgenus *Impatiens* sect. *Uniflorae* because of its 5-carpellate ovaries and short fusiform fruits. Within this group, it partially resembles *I. oblongata* Ruchis. & Niet and *I. decurva* Ruchis. & S. B. Janssens, both of which were also recently described from Myanmar. Floral morphology, especially the shape of the lateral united petals, most closely resembles that of *I. oblongata*, even if the latter species has a spurless flower. On the other hand, it also resembles *I. decurva* in its small habit and spurless flower, but *I. decurva* differs in that the lower petal apex is white and unequally bilobed, and the dorsal petal is hood-shaped. Additionally, the leaves of *I. decurva* are congested toward the stem apex. Both of those species were described with good illustrations and photographs in the original protologue (Ruchisansakun et al., 2018a). The recently collected species is apparently not identical with either; therefore, we describe it here as *I. katjae* Nob. Tanaka & J. J. Verm.

Impatiens katjae Nob. Tanaka & J. J. Verm., sp. nov. TYPE: Myanmar. Mandalay Region: Meiktila District, Thazi Township, limestone range, N of Pyinyaung, STC-APACHE concession, south part, 20°52′17.39″N, 96°24′31.02″E, 700–750 m, 16

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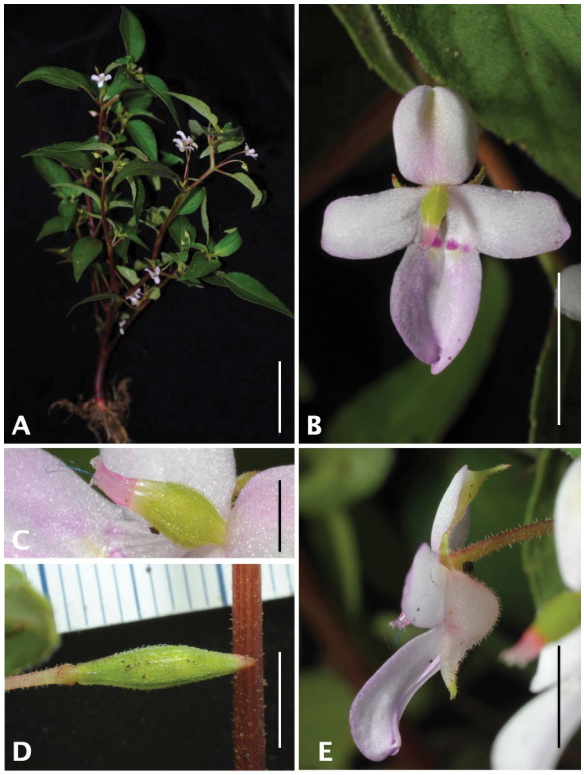

Figure 1. *Impatiens katjae* Nob. Tanaka & J. J. Verm. —A. Habit. —B. Front view of flower. —C. Gynoecium. —D. Fruit. Scale bars: 5 cm for A, 5 mm for B, 2 mm for C, 3 mm for D, and 4 mm for E.

Aug. 2016, *J. J. Vermeulen 3959* (holotype, L!; isotypes, RAF!, TNS!). Figures 1, 2.

Diagnosis. *Impatiens katjae* Nob. Tanaka & J. J. Verm. differs from *I. oblongata* Ruchis. & Niet in its usually 2-flowered inflorescences (vs. 1-flowered), distinctly smaller flowers (0.7–1.2 cm long vs. 1.9–2 cm long in *I. oblongata*) that are pale pink (vs. purple), 2 lateral sepals (vs. usually 2 to 4 in *I. oblongata*), and spurless lower sepal. *Impatiens katjae* differs from *I. decurva* Ruchis. & S. B. Janssen in its leaf lamina pilose on both surfaces (vs. abaxially glabrous), flowers with the pairs of lateral united petals loosely adherent (vs. widely diverging) and the margin of each of the lower petals entire (vs. unequally bilobed).

Terrestrial or lithophytic, annual herbaceous plant, 20–25 cm tall. *Stems* erect, 1–3 mm diam., usually richly branched, reddish, sparsely pubescent. *Leaves* alternate, aggregated toward the end of the stem; petiole 0.5–1.5 cm, pubescent, green with a dark reddish tinge; lamina ovate to elliptic, 2–4.5 × 0.7–1.4 cm; apex attenuate; base cuneate to attenuate; margin shallowly serrate with mucronate teeth and with 1.5–2-mm-long red hairs along margin near base; both surfaces pilose, adaxial surface bright green, abaxial surface pale green; lateral veins 4 to 5 pairs. *Inflorescences* axillary, usually 2-flowered fascicles, rarely 1-flowered, erect; bracts persistent, green, ensiform, 1–1.5 × 0.3–0.5 mm, puberulous; pedicels 1.5–2 cm, 0.2 mm diam., reddish purple to reddish green, puberulous. *Flowers* 7–12 × 10 mm, 3 mm deep, pale pink to white, with 4 reddish pink and 2 yellow spots in center, center 2 of 4 reddish pink spots deeper colored; lateral sepals 2, free, green with slightly reddish margin, lanceolate, 2.5 × 1 mm, apex acute, base truncate, puberulous abaxially; lower sepal white with reddish apex, deeply concave, 5 × 2.5 mm without spreading, 2 mm deep, puberulous abaxially, spurless; dorsal petal white with pale pinkish base, broadly ovate, cucullate, 4–4.5 × 4.5 mm, apex rounded, base rounded, abaxial midvein with keel-shaped crest, crest ca. 2 × 1 mm, green with reddish base, distally puberulous abaxially along the midvein; lateral united petals 5–8.6 mm, the pairs loosely adherent, apex slightly bilobed; upper petals white with slightly pinkish margin, broadly oblong, 4–5.5 × 2.5–2.8 mm, apex truncate to slightly mucronate, base cuneate, glabrous; lower petals pink, oblong, 6 × 2 mm; stamens 5; filaments ca. 1.6 mm; anthers ellipsoid, apex obtuse; ovary superior, 5-carpellate, green, pilose;

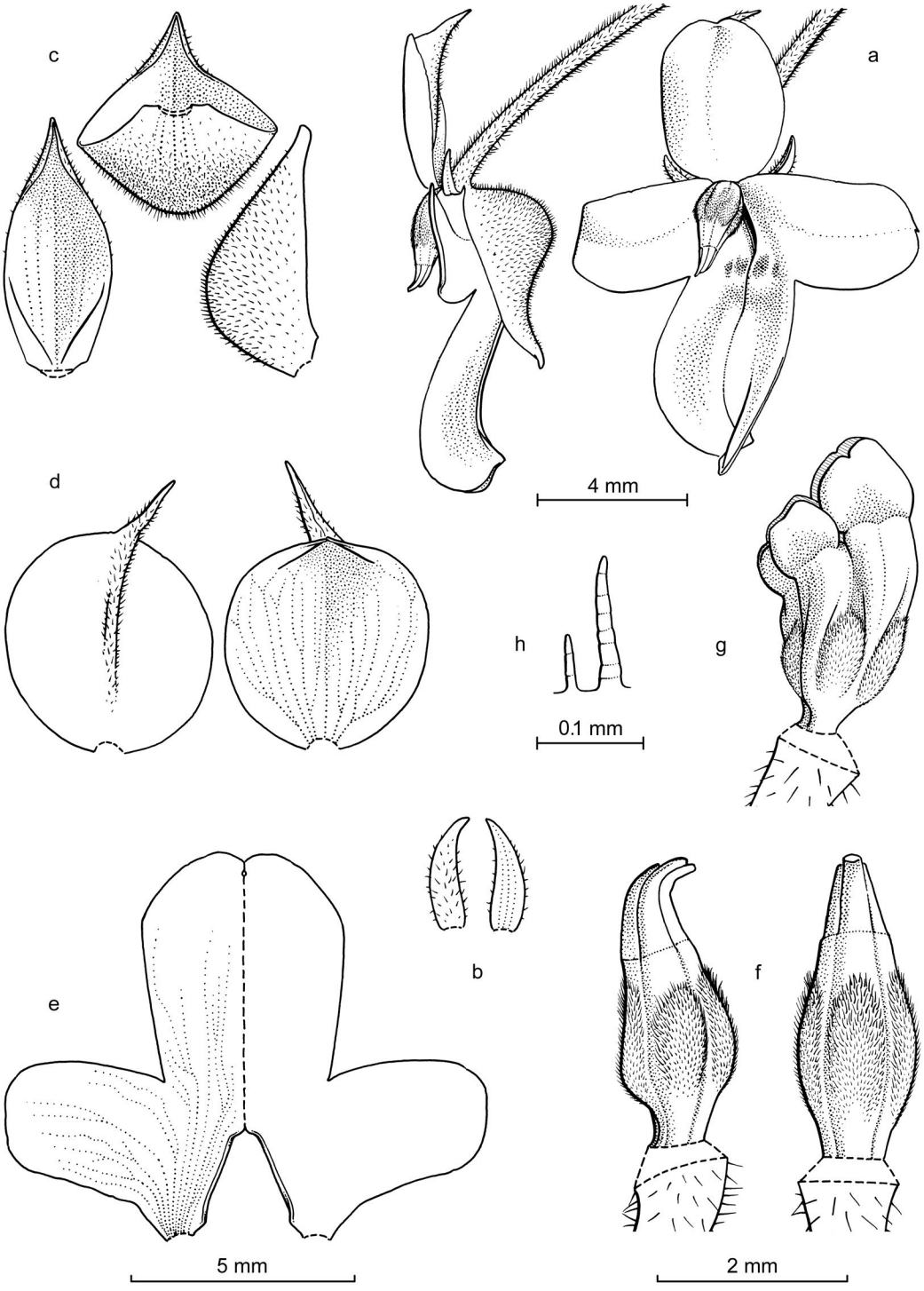

Figure 2. Floral parts of *Impatiens katjae* Nob. Tanaka & J. J. Verm. —a. Front and side view of a flower. —b. Lateral sepals. —c. Lower sepal. —d. Dorsal petal with keel-shaped crest. —e. Lateral united petals. —f. Gynoecium with pedicel. —g. Androecium with pedicel. —h. Hairs on abaxial side of keel-shaped crest of dorsal petal. Scale bars: 4 mm for a–d, 5 mm for e, 2 mm for f, g, and 0.1 mm for h. Drawn by J. J. Vermeulen.

Figure 3. Type locality of *Impatiens katjae* Nob. Tanaka & J. J. Verm. (© 2022 Heibonsha.C.P.C / "ROOTS" Production Partnership, printed with permission.)

placentation axillary; filaments of stigma 1.7–2 mm, white to pink. *Fruits* erect, fusiform, 5–6 × 2 mm at the widest position, pilose.

Distribution and habitat. Thus far, this species is known only from the type locality, north of Pyinyaung, Mandalay Region, in Myanmar (Fig. 3). It has been found growing on limestone range, in open, rocky places in degraded deciduous woodland with open canopy and dense undergrowth of bamboo thickets, at an altitude of 700–750 m.

Etymology. The specific epithet "*katjae*" refers to Mrs. Katja Anker, participant in the survey, who first noticed this new species.

Notes. *Impatiens oblongata* and *I. decurva* are both known from Kalaw, Shan State, ca. 25 km southeast of the type locality of *I. katjae*. These three species partially resemble each other but are all distinguished by several features (Table 1). All three species occur in the central region of Myanmar, although *I. katjae* is found in a limestone range that is geologically not connected to the limestone plateau where the other two have been found. The floral morphology of the lateral united petals and dorsal petal indicates that *I. decurva* is related to *I. florulenta* Hook. f., as also discussed by Ruchisansakun et al. (2018a), rather than *I. katjae*. Further study, especially phylogenetic analyses, may reveal the relationship between these species.

Impatiens katjae has been found only within the boundaries of a quarrying concession; limited attempts to find the species elsewhere have been fruitless. There were mainly two populations, each of hundreds of plants. We feel that it is likely that the species is not endemic to a single locality (i.e., not a site-endemic species, see Vermeulen & Whitten, 1999), because the preferred habitat of the species is more widespread along the 200-km-long limestone range in which the quarry is situated, even if the observation range was less than 5 km^2. It seems unlikely that easy-spreading annual herbs like *Impatiens* would be restricted only to two hilltops with very much degraded vegetation; however, an accurate assessment of its distribution range has to await further investigation. Therefore, the species is assigned a preliminary conservation status of

Table 1. Comparison of morphological characters of *Impatiens katjae* Nob. Tanaka & J. J. Verm., *I. oblongata* Ruchis. & Niet, and *I. decurva* Ruchis. & S. B. Janssen.

	I. katjae	*I. oblongata*	*I. decurva*
Leaf lamina size	2–4.5 × 0.7–1.4 cm	5–7.5 × 1–2 cm	1–4 × 0.5–1.5 cm
Leaf lateral veins	4 to 5 pairs	6 to 7 pairs	3 to 5 pairs
Leaf lamina surface	pilose on both surfaces	pilose on both surfaces	adaxially pilose, abaxially glabrous
Inflorescence	usually 2-flowered	1-flowered	1-flowered
Flower size	7–12 × 10 mm	19–20 × 16–18 mm	10–11 × 8–10 mm
Flower color	pale pink	purple	white
Lateral sepals	2	(2)4	2
Lower sepal	spurless	with 8–12 mm spur	spurless
Pairs of lateral united petals	free, but loosely adherent	free, slightly overlapping	free, diverging
Lower petal apex	entire	entire	unequally bilobed

Data Deficient [DD] according to the IUCN Red List criteria (IUCN, 2012; IUCN Standards and Petitions Committee, 2022).

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