

## Studies of Sino Himalayan *Impatiens* (Balsaminaceae) II. A New Species and a New Form Similar to *Impatiens racemosa* DC. from Nepal Himalaya

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**Abstract** A new species of *Impatiens*, *I. recticalcarata* S. Akiyama (Balsaminaceae), with a new form, f. *alba* S. Akiyama (Balsaminaceae), from the Sino Himalaya region of Nepal, is described and illustrated. *Impatiens recticalcarata* is similar to *I. racemosa* DC. but differs in having the straight spur and the wide, semiovate distal lobes of the lateral united petals and lacks red dots. A comparison table of the species similar to *I. racemosa* in Nepal is given.

**Key words**: Himalaya, *Impatiens*, Nepal, new species, Sino Himalaya.

Since 1983 we have been studying Himalayan *Impatiens* (Balsaminaceae), particularly in Nepal (Akiyama *et al.*, 1991). *Impatiens* is one of the most diversified genera in the Himalaya. In Nepal about 40 species have been recorded (Hara, 1979). During our field surveys in the Sino Himalayan region we noticed that some collections represent species not yet described. During preparation of the treatment of *Impatiens* for the forthcoming Flora of Nepal the first author, Akiyama, became aware of an undescribed species similar to *Impatiens racemosa* DC from Bimtang, collected at 3770 m elevation by Ikeda and Acharya and others in 2008.

The new species, here named *Impatiens recticalcarata*, is characterized by a racemose inflorescence with several small flowers classified as ‘type 1a’ (Akiyama and Ohba, 2000), an inflorescence type shared with *I. racemosa*, but differing from the latter in having a straight spur with a downward pointing apex, yellow or creamy white lateral united petals without red dots, and wide, semiovate (not distinctly bilobed) distal lobes with an acute apex and nearly orbicular basal lobes with rounded apex of the lateral united petals. Terminology for the flowers follows

Akiyama *et al.* (1991) and for the inflorescence Akiyama and Ohba (2000).

***Impatiens recticalcarata* S. Akiyama, sp. nov.**

[Figs. 1–4]

*Impatiens racemosae* DC. similis, sed calcar rectiore et lobis distalibus petalorum unitorum lateralium semilatiovatis apice acutis, nec profunde bilobis bene differt.

Type: Nepal. Manang District, Bimtang–Gho, 28°37′44″N 84°28′21″E, 3770 m (H. Ikeda, S. K. Acharya, T. Kawahara, M. N. Subedi, N. Yamamoto, K. Yano, and M. Watson 20811254, 14 Aug. 2008, KATH-holo, TI, TNS-iso).

Plants 40–85 cm tall. Stem branched, glabrous. Leaves alternate, petiolate or sessile distally; petiole to 2 cm long, usually with glands at base; leaf blade ovate to narrowly ovate, 4.5–5.5 × 1.5–2 cm, base attenuate, margin crenate-serrate with dense short glandular hairs (and/or glands), apex acuminate, both surfaces glabrous, upper surface green, lower surface slightly glaucous. Inflorescences in axils of distal leaves, standard racemes, ascending, to 4 cm long, 5 or 6(–8)-flowered; peduncle to 2 cm long, glabrous;

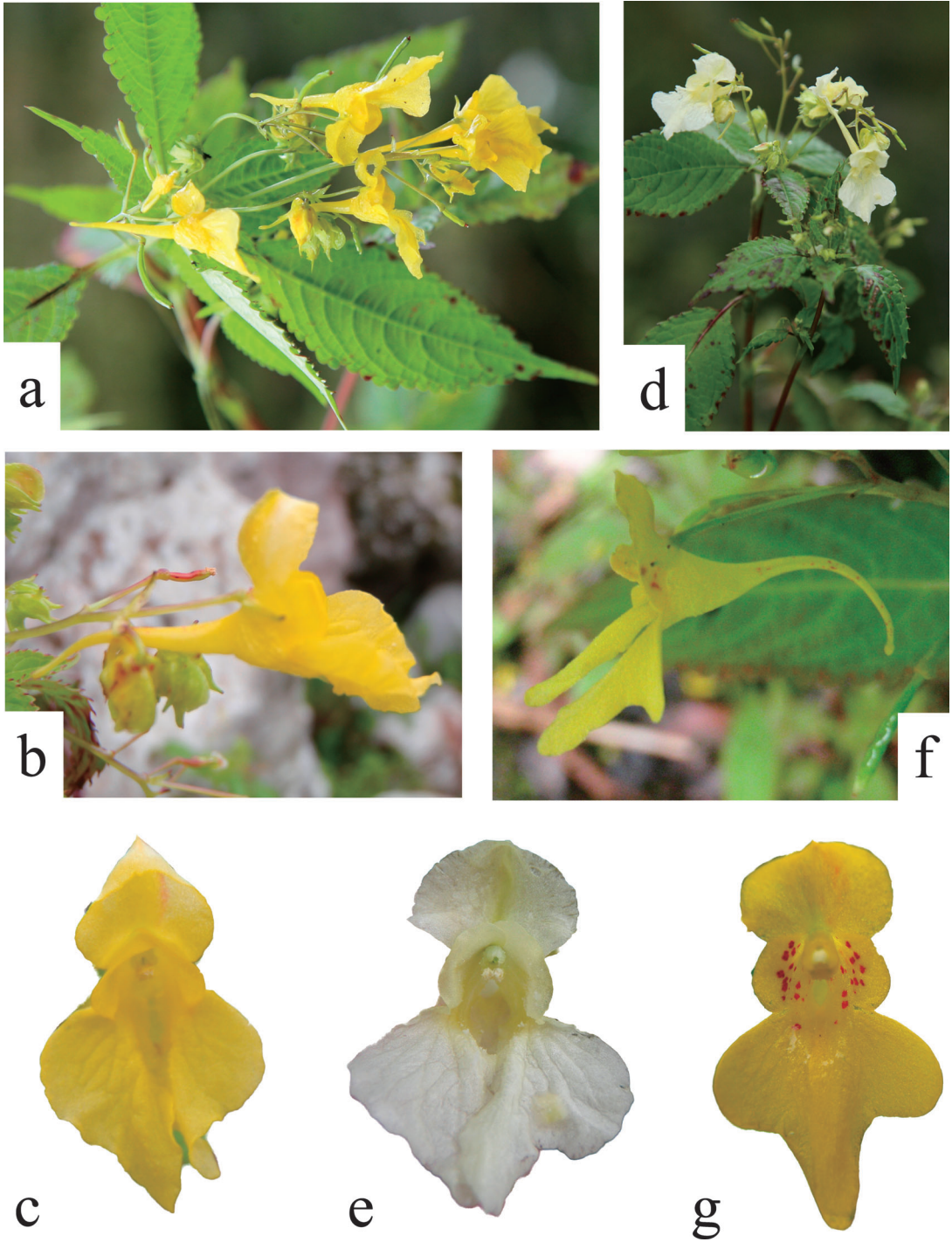


Fig. 1. *Impatiens recticalcarata* S. Akiyama f. *recticalcarata* (a–c), *I. recticalcarata* S. Akiyama f. *alba* S. Akiyama (d, e), and *I. racemosa* DC. (f, g). a–e: In Bimtang, on 14 Aug. 2008. f: In Philim, on 29 July 2008. g: In Gho, on 15 Aug. 2008.



Fig. 2. Isotype of *Impatiens recticalcarata* S. Akiyama (H. Ikeda, S. K. Acharya, T. Kawahara, M. N. Subedi, N. Yamamoto, K. Yano, and M. Watson 20811254, 14 Aug. 2008, TNS).

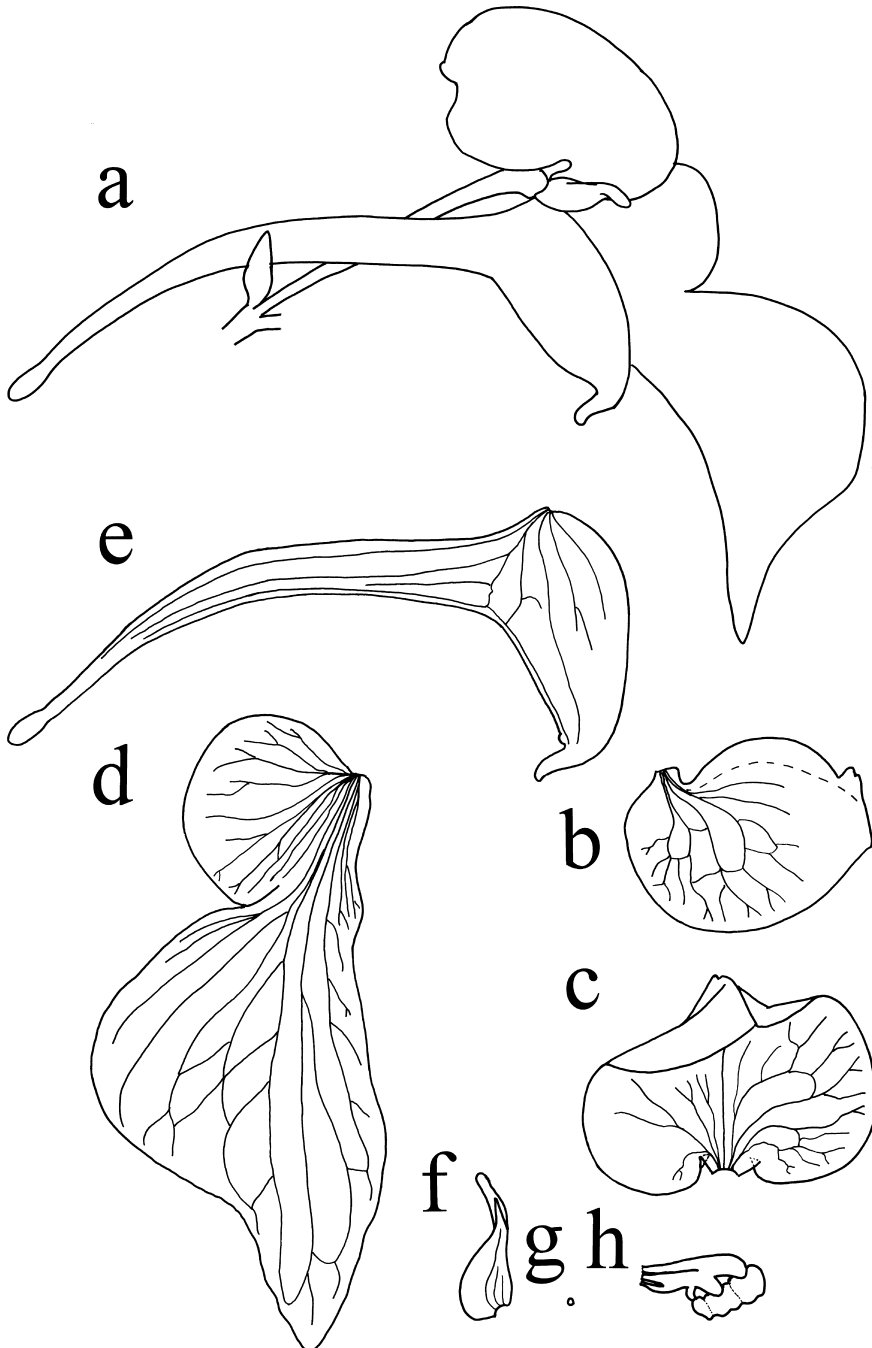


Fig. 3. *Impatiens recticalcarata* S. Akiyama (H. Ikeda, S. K. Acharya, T. Kawahara, M. N. Subedi, N. Yamamoto, K. Yano, and M. Watson 20811254, 14 Aug. 2008, TNS). a: Flower (lateral view). b: Dorsal petal (folded). c: Dorsal petal (opened). d: Lateral united petals. e: Lower sepal. f: Lateral sepal (outer). g: Lateral sepal (inner). h: Anthers. All  $\times 4$ .

pedicels ca. 6–8 mm long, glabrous, with a bract at base; bracts persistent, ovate, ca. 2.5 mm long, apex acute.

Flowers yellow (f. *recticalcarata*) or creamy white (f. *alba*), without red dots, ca. 2.5 cm deep, ca. 2.2 cm long. Lateral sepals 2 or 4, inner ones minute or absent, outer ones ovate, ca. 4 mm long (including elongated apex), apex long acuminate, awned. Lower sepal yellow or creamy white without reddish veins, navicular with long straight spur with downward oriented apex, ca. 18 mm in overall length. Dorsal petal yellow or creamy white, compressed, elliptic, ca. 7 mm long, ca. 9 mm wide when flattened, distinctly cucullate, apex obtuse or slightly retuse, midvein

slightly thickened on outside and minutely projected near apex. Lateral united petals yellow or creamy white, without red dots, ca. 17 mm long; basal lobe nearly orbicular, ca. 5.5×5 mm, apex rounded; distal lobe widely ovate, ca. 13×8 mm, apex acute, not distinctly bilobed, margins slightly undulate; appendage indistinct. Filaments linear, slightly hooked at apex; anthers ovoid, connective glabrous. Ovary linear. Flowers in August.

Habit: On mossy wet rocks beside streams.

Distribution: Nepal. Manang District, Bimtang (known only from the type locality).

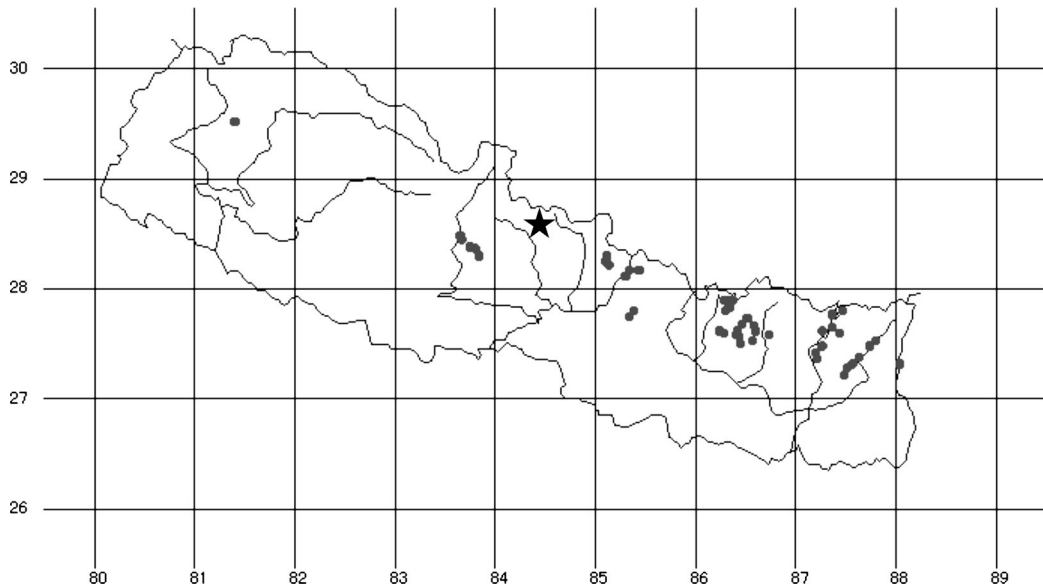


Fig. 4. Distribution of *Impatiens recticalcarata* S. Akiyama (★) and *I. racemosa* DC. (●) in Nepal.

Table 1. Comparison among a new species, *Impatiens recticalcarata*, *I. racemosa*, and *I. radiata*.

	<i>I. recticalcarata</i>	<i>I. racemosa</i>	<i>I. radiata</i>
Inflorescence	uninterrupted raceme	uninterrupted raceme	interrupted raceme
Flower color	yellow or creamy white without red dots	yellow with red dots	pale purplish white with red dots
Basal lobe of lateral united petals	nearly orbicular	obovate	widely obovate
Distal lobe of lateral united petals	widely semiovate with acute apex	bilobed with obtuse apex	bilobed with obtuse apex
Spur	straight with downwardly oriented apex	curved downward	straight

f. **alba** S. Akiyama, forma nov. [Figs. 1 d, e]  
 Floris albis, cetera ut in typo.

Type: Nepal. Manang District, Bimtang–Gho, 28°37'44"N 84°28'21"E, 3770 m (H. Ikeda, S. K. Acharya, T. Kawahara, M. N. Subedi, N. Yamamoto, K. Yano, and M. Watson 20811255, 14 Aug. 2008, KATH-holo, TI, TNS-iso).

Habit: On mossy wet rocks beside streams.

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*Impatiens recticalcarata* belongs to the group we refer to as the *I. racemosa*-group, which includes *I. racemosa*, *I. radiata*, and allied species. *Impatiens racemosa* is common in the Nepal Himalaya. *Impatiens radiata*, also common in the region, resembles *I. racemosa* but differs in having interrupted racemes and pale purplish white flowers with a straight spur. *Impatiens recticalcarata* is also related to *I. radiata* in having a straight spur and often white flowers, but differs in the uninterrupted inflorescences, yellow or creamy white lateral united petals, and the wide semiovate distal lobes with an acute apex and the nearly orbicular basal lobes with rounded apex of the lateral united petals. The differences between these three species is summarized in Table 1. A considerable number of species belonging to the *I. racemosa*-group occurs in China, but the composition of this group is still controversial.

It is very interesting that some individuals of *I. recticalcarata* in the same locality have yellow flowers and others have creamy white flowers. In

*Impatiens* it is very rare to have different flower colors within a single species.

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