

Further Notes of *Impatiens* (Balsaminaceae) from Yunnan, China

By

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Abstract Five new species, *Impatiens wuchengyihii*, *I. luchunensis*, *I. maguanensis*, *I. clavigeroides* and *I. linearisepala* are described from S Yunnan, China. Two species, *I. kamtilongensis* and *I. porphyrea*, are first reported from China (S Yunnan).

Akiyama *et al.* (1995a) published a note of *Impatiens* from SW Yunnan, China with four new species and two new records. A number of interesting *Impatiens* were collected also from S Yunnan by S. K. Wu (the third author), X. Cheng, Y. P. Yang, J. Murata, T. Sugawara, T. Kawahara & H. Nagamasu in 1994 and by S. K. Wu, Y. M. Shui, Y. P. Yang, L. H. Liu, J. H. He, J. Murata, H. Nagamasu, T. Sugawara, X. Chen & N. Murakami in 1995. This paper aims to describe five new species and two new records from China in their collections.

1) *Impatiens kamtilongensis* Toppin, Kew Bull. 1920: 356 (1920).

[Fig. 1: 1a–g]

Plants ca. 30 cm tall, apical part of stem with dense patent hairs. Leaves alternate, distributed throughout and somewhat aggregated in apical part, with glandular petiole 3–5 cm long or sessile in upper leaves; lamina widely elliptic to elliptic, 9–12 cm long, 4.5–5.5 cm wide, apex acute, base attenuate, margin crenate, sparsely pubescent on both surfaces.

Inflorescences racemose, ca. 2 cm long, axillary, usually from the upper leaf axils, ascending, with 2 (or 3) flowers. Peduncle ca. 2 cm long, densely pubescent. Pedicel ca. 1.5 cm long, densely pubescent, with a bract at base. Bract linear, ca. 8 mm long, pubescent, persistent.

Flowers yellow with reddish patches, ca. 3 cm long, ca. 4 cm deep. Lateral sepals 2, ovate, ca. 9 mm long, apex acuminate, hairy. Lower sepal yellow, navicular, constricted into a spur, ca. 1.8 cm long, ca. 1.2 cm deep (excluding

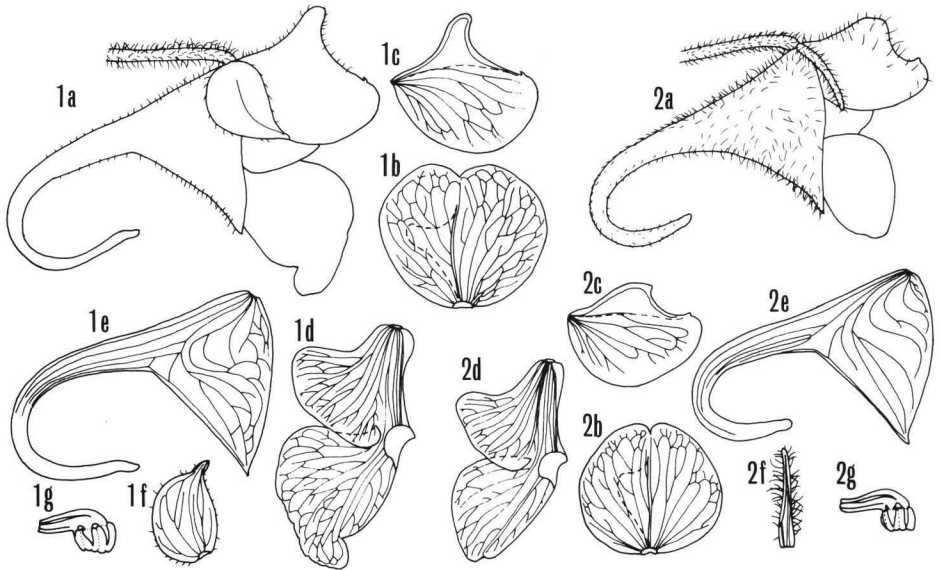


Fig. 1. 1: *Impatiens kamtilongensis* Toppin. (S. K. Wu *et al.* 2659, T1). 2: *I. wuchengyi* S. Akiyama *et al.* (S. K. Wu *et al.* 2457, T1). 1a, 2a: Flower. 1b, 1c, 2b, 2c: Dorsal petal. 1d, 2d: Lateral united petals. 1e, 2e: Lower sepal. 1f, 2f: Lateral sepal. 1g, 2g: Stamens. All: $\times 1.5$.

spur), pubescent on outer surface; spur ca. 2.4 cm in overall length, incurved. Dorsal petal yellow, nearly orbicular, ca. 1.4 cm long, ca. 1.8 cm wide, apex retuse, with a crest-like appendage ca. 4 mm high, sparsely pubescent on outer surface. Lateral united petals yellow with reddish patches, ca. 2.5 cm long; the basal lobe widely triangular-obovate, ca. 1.2 cm long, ca. 1.2 cm wide, apex truncate; the distal lobe semi-orbicular, ca. 1.5 cm long, ca. 1.1 cm wide, apex oblique retuse; ventral appendage reniform and inflexed. Stamens 5, anthers without appendage. Chromosome number $2n=14$ (Sugawara *et al.* in press).

Distr. Burma and Yunnan.

Specimens examined. China, Yunnan, Maguan, Gu-ling-quing, 1700–1900 m (S. K. Wu *et al.* 2659, Aug. 17, 1994, KUN, T1); Xiao-cun-zi, 1050 m (S. K. Wu *et al.* 2678, Aug. 18, 1994, KUN, T1).

Impatiens kamtilongensis was described from Burma by Toppin (1920). This is the first report from China (Yunnan). The species is similar to *I. mengtzeana*, distributed throughout Yunnan except north and northeast parts (Akiyama *et al.* 1995b) and characterized by the large yellow flowers with or without reddish patches (Akiyama *et al.* 1995a), but differs by the densely pubescent peduncle and pedicel.

2) *Impatiens wuchengyihii* S.Akiyama, H.Ohba & S.K.Wu, sp. nov.

[Fig. 1: 2a–g]

A Impatiens kamtilongensis Toppin sepalis lateralibus linearibus nec ovatis et floribus aliquantum minoribus differt.

Plants more than 30 cm tall. Leaves alternate, with pubescent, glandular petiole 5–7 cm long, or nearly sessile in upper leaves, lamina widely elliptic to elliptic, 9–15 cm long, 4–7 cm wide, apex acute, base attenuate, margin crenate, sparsely pubescent on both surfaces.

Inflorescences racemose, 3–4 cm long, axillary, from the upper leaf axils, ascending, usually with 2 flowers. Peduncle 2–3.5 cm long, densely pubescent. Pedicel 1–1.5 cm long, densely pubescent, with a bract at base (or sometimes near base). Bract linear, 4–6 mm long, densely pubescent, persistent.

Flowers yellow with reddish patches, ca. 2 cm long, ca. 3.5 cm deep. Lateral sepals 2, linear, ca. 1 cm long, densely pubescent. Lower sepal yellow, with reddish veins, navicular, constricted into a spur, ca. 1.8 cm long, ca. 1.2 cm deep (excluding spur), pubescent on outer surface; spur ca. 2 cm in overall length, incurved. Dorsal petal yellow, orbicular, ca. 1.2 cm long, ca. 1.4 cm wide, apex retuse, with crest-like appendage ca. 3 mm high, pubescent on outer surface. Lateral united petals yellow with reddish patches, ca. 2.1 cm long; the basal lobe widely triangular-obovate, ca. 1.2 cm long, ca. 1 cm wide, apex truncate; the distal lobe semi-orbicular, ca. 1.2 cm long, ca. 8 mm wide, apex slightly retuse; ventral appendage reniform and inflexed. Stamens 5, anthers without appendage. Fruit narrowly ovoidal in young. Chromosome number $2n = 14$ (Sugawara *et al.* in press).

Distr. Yunnan (Luchun).

Specimen examined. China, Yunnan, Luchun, Mt. Huanglianshan, Hydrologic Station, 1700–1900 m (S. K. Wu *et al.* 2457, Oct. 23, 1995, KUN-holotype, TI-isotype).

The species is named in honor of Professor Wu Chengyih, for his great contributions to Chinese flora. This species is quite similar to *I. kamtilongensis* but distinguishable from the latter by the linear lateral sepals against ovate one and relatively small flowers. In *Impatiens* the shape of lateral sepals is constant and stable.

Impatiens wuchengyihii is morphologically similar to both *I. mengtszeana* and *I. kamtilongensis*; all have racemes with usually two relatively large yellow flowers and navicular lower sepals. By these characters the three species are well distinguishable from all other species; here *I. mengtszeana*-group is provided for further discussion of the infrageneric system.

3) ***Impatiens luchunensis*** S.Akiyama, H.Ohba & S.K.Wu, sp. nov.

[Fig. 2: 1a–g]

In habitu *Impatiens sicutifera* Hook.f. maxime similis, sed ab illa lobis distalibus petalorum unitorum lateralium obstipe curvatisque anguste ellipticis et 4 nec 2 sepalis lateralibus bene differt.

Plants ca. 40 cm tall. Leaves alternate, with petiole 2–3 cm long or sessile in upper leaves; lamina elliptic, 6–9 cm long, 2.5–3 cm wide, apex acute, base attenuate, margin crenate, nearly glabrous on both surfaces.

Inflorescences racemose, straight, ascending, axillary, from upper leaf axils, with (1 or) 2 flowers. Peduncle 1.5–3 cm long, glabrous. Pedicel 1–1.2 cm long, glabrous, with a bract at base. Bract ovate, ca. 4 mm long, apex acute, not caducous.

Flowers yellow, ca. 2 cm long, ca. 2.5 cm deep. Lateral sepals 4; outer ones ovate, ca. 4 mm long, apex acute, herbaceous; inner ones minute, ca. 1 mm long, membranaceous. Lower sepal yellow, navicular, tapering into a long recurved spur, ca. 10 mm long, ca. 26 mm deep including spur. Dorsal petal ovate, ca. 9 mm long, ca. 7 mm wide when flattened, slightly cuculate, without crest-like appendage. Lateral united petals yellow, ca. 19 mm long; the basal lobe ovate, ca. 9 mm long, ca. 4 mm wide; distal lobe curved narrowly elliptic, ca. 14 mm long, ca. 3 mm wide, apex rounded, with very narrow slightly inflexed appendage. Stamens 5, anthers without appendage. Style glabrous. Fruit linear (?). Chromosome number $2n=18$ (bimodal) (Sugawara *et al.* in press).

Distr. Yunnan (Luchun).

Specimen examined. China. Yunnan, Luchun, Mt. Huanglianshan, Sha-du-ya-kou, 1900–2500 m (S. K. Wu *et al.* 2475, Oct. 26, 1995, KUN-holotype, TI-isotype).

This species belongs to *I. drepanophora*-group (Akiyama *et al.* 1995a), and differs from *I. sicutifer* Hook.f. by having the curved narrowly elliptic distal lobe of the lateral united petals and 4 lateral sepals.

4) ***Impatiens maguanensis*** S.Akiyama, H.Ohba & S.K.Wu, sp. nov.

[Fig. 2: 2a–f]

Ex affinitate *Impatiens sicutifera* Hook.f. et *I. luchunensis* S.Akiyama *et al.* bracteis cadentibus; ab hac floribus majoribus ad 3 (nec 1.5–2) cm longis et calcari recto nec conspicue curvato prodeunte; ab illa lobis distalibus petalorum unitorum lateralium falcatis 1.8–2 (nec ca. 1.4) cm longis et sepalis lateralibus interioribus 4 (nec ca. 1) mm longis diversa.

Plants ca. 40 cm tall. Leaves alternate, somewhat aggregated in apical part, with petiole 2–3.5 cm long or nearly sessile in upper leaves; lamina widely elliptic, ca. 8–11 cm long, 4–6 cm wide, apex acute, base attenuate, margin crenate, nearly glabrous on both surfaces.

Inflorescences racemose, ca. 6 cm long, axillary from the upper leaf axils,

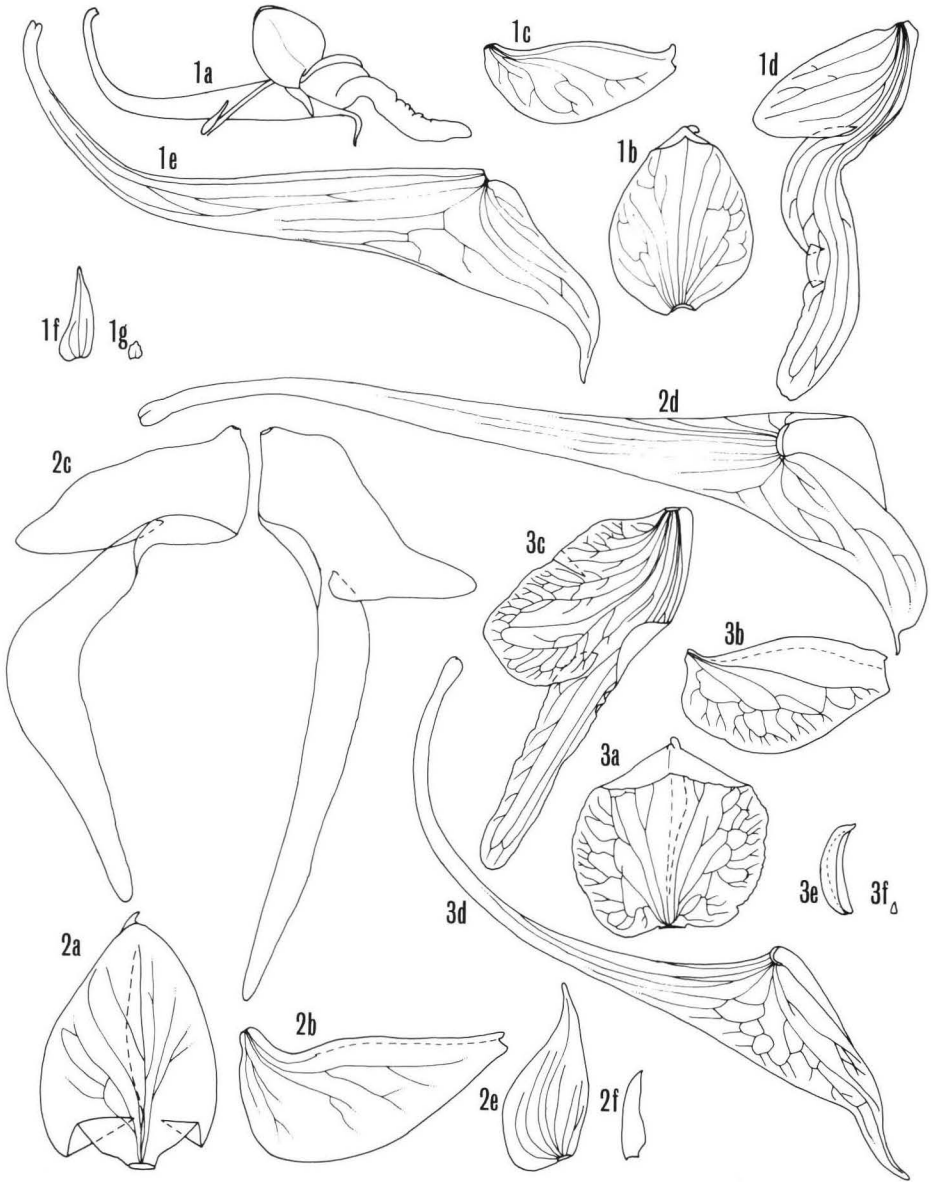


Fig. 2. 1: *Impatiens luchunensis* S.Akiyama et al. (S. K. Wu et al. 2475, T1). 2: *Impatiens maguanensis* S.Akiyama et al. (S. K. Wu et al. 2658, T1). 3: *Impatiens porphyrea* Toppin (S. K. Wu et al. 2452, T1). 1a: Flower. 1b, 1c, 2a, 2b, 3a, 3b: Dorsal petal. 1d, 2c, 3c: Lateral united petals. 1e, 2d, 3d: Lower sepal. 1f, 1g, 2e, 2f, 3e, 3f: Lateral sepal (1f, 2e, 3e: outer, 1g, 2f, 3f: inner). 1a: $\times 1.5$, others: $\times 3$.

straight, ascending, with 2–4 flowers. Peduncles ca. 4 cm long, glabrous. Pedicel 1.5–2 cm long, glabrous, with a bract at base. Bract narrowly ovate, ca. 5 mm long, apex acute, caducous.

Flowers yellow, ca. 3 cm long, ca. 4 cm deep. Lateral sepals 4; outer ones ovate, apex acute, 8–9 mm long, herbaceous; inner ones narrowly ovate, 4 mm long, membranaceous. Lower sepal yellow, navicular, tapering into a long straight (rarely slightly curved) spur, ca. 1.2 cm long, ca. 3.2 cm deep including spur. Dorsal petal ovate, ca. 1.2 cm long, ca. 8 mm wide when flattened, without crest-like appendage. Lateral united petals, yellow, ca. 2.8 cm long; the basal lobe narrowly ovate to narrowly elliptic, 1.3–1.4 cm long, 3–4 mm wide, apex rounded; the distal lobe falcate, 1.8–2 cm long, ca. 3 mm wide, with inflexed narrow appendage. Stamens 5, anthers without appendage. Style glabrous. Fruits linear (?). Chromosome number $2n=18$ (bimodal) (Sugawara *et al.* in press).

Distr. Yunnan (Maguan).

Specimen examined. China. Yunnan, Maguan, Gu-ling-quing, 1700–1900 m (S. K. Wu *et al.* 2658, Aug. 17, 1994, KUN-holotype, TI-isotype).

This species belongs to *I. drepanophora*-group. Being similar to *I. siculifer* and *I. luchunensis*, it differs by having caducous bract and from the former by the large flowers attaining 3 cm long and the straight spur, and from the latter by the falcate, long distal lobe of the lateral united petals and the 4 mm long inner lateral sepals.

5) ***Impatiens porphyrea*** Toppin, Kew Bull. 1920: 363 (1920). [Fig. 2: 3a–f]

Plants 1–2 m tall. Leaves alternate, somewhat aggregated in apical part, with glabrous petiole 0.5–2 cm long or sessile in upper leaves; lamina elliptic, ovate or lanceolate, 7–15 cm long, 2.5–6 cm wide, apex acute, base attenuate, margin crenate, nearly glabrous on both surfaces.

Inflorescences racemose, 6–8 cm long, axillary, from upper leaf axils, straight, ascending, with 3–5 flowers. Peduncle 3–5 cm long, glabrous. Pedicel ca. 2 cm long, glabrous, with a bract at base. Bract ovate, 3–4 mm long, apex acute, persistent.

Flowers dark red-purple, ca. 2 cm long, ca. 3 cm deep. Lateral sepals 4; outer ones navicular, ovate or lanceolate, 4–5(–8) mm long, apex acute; inner ones minute, less than 1 mm long, membranaceous. Lower sepal dark red-purple, navicular, tapering into a slightly recurved spur, ca. 1.3 cm long, ca. 2.5 cm deep including spur. Dorsal petal orbicular, somewhat cuculate, ca. 1 cm long, ca. 1 cm wide when flattened. Lateral united petals dark red-purple, ca. 2 cm long; the basal lobe oblong-rotundate to rotundate, ca. 1.2 cm long, ca. 5 mm wide, apex rounded; the distal lobe loriform, ca. 1.2 cm long, ca. 3 mm wide. Stamens 5, anthers without appendage. Style glabrous. Fruit linear. Chromosome number $2n=18$ (bimodal) (Sugawara *et al.* in press).

Distr. Burma (Kachin Hills) and Yunnan.

Specimens examined. China. Yunnan, Luchun, Mt. Huanglianshan, Hydrologic Station, 1700–1900 m (S. K. Wu *et al.* 151, Oct. 18, 1995, KUN, TI; 2448 & 3210, Oct. 22, 1995, KUN, TI; 2452, Oct. 23, 1995, KUN, TI).

This species was described from Kachin Hills by Toppin (1920). This is the first report from Yunnan, China. The species of the *Impatiens drepanophora*-group has principally yellow flowers, but there are some species with purplish flowers. One of them is *I. porphyrea*.

6) *Impatiens clavigeroides* S.Akiyama, H.Ohba & S.K.Wu, sp. nov.

[Fig. 3: 1a–h]

A Impatiens clavigera Hook.f. sepalis lateralibus exterioribus longioribus usque ad ca. 1.5 (non 1.2) cm et antheris appendicula membranacea evolutis differt.

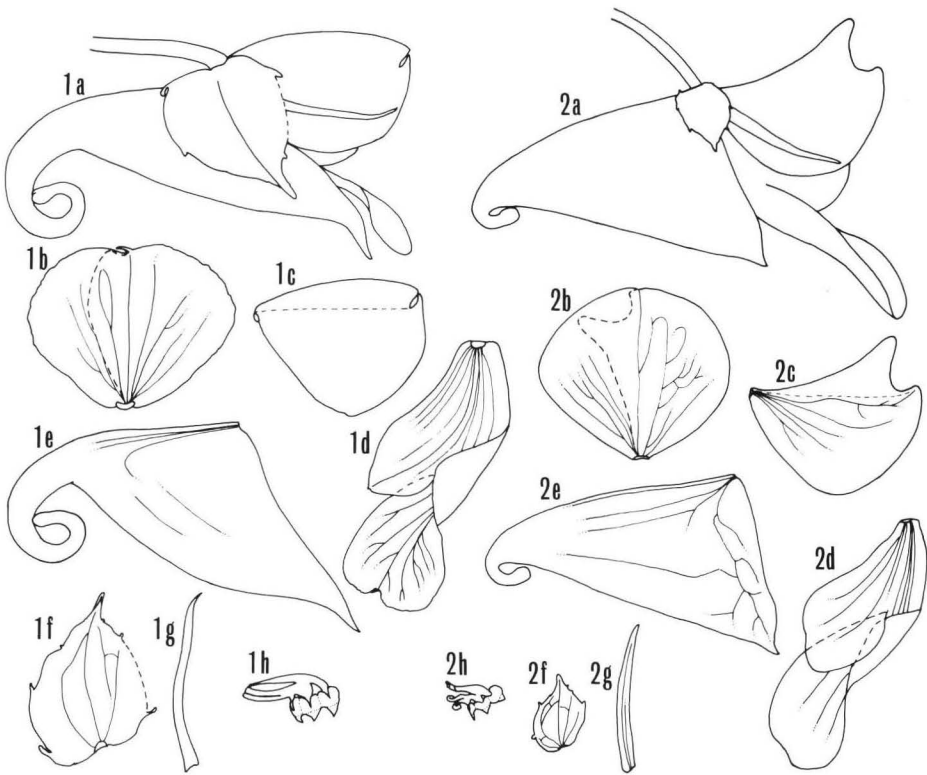


Fig. 3. 1: *Impatiens clavigeroides* S.Akiyama *et al.* (S. K. Wu *et al.* 2403, TI). 2: *Impatiens linearisepala* S.Akiyama *et al.* (S. K. Wu *et al.* 2652, TI). 1a, 2a: Flower. 1b, 1c, 2b, 2c: Dorsal petal. 1d, 2d: Lateral united petals. 1e, 2e: Lower sepal. 1f, 1g, 2f, 2g: Lateral sepal (1f, 2f: outer, 1g, 2g: inner). 1h, 2h: Stamens. All: $\times 1.5$.

Plants ca. 45 cm tall. Leaves alternate, distributed upper part of stem, with petiole 3.5–5 cm long or nearly sessile in upper leaves; lamina elliptic, 9–12 cm long, 3.5–4 cm wide, apex acute to acuminate, base attenuate, margin crenate, nearly glabrous on both surfaces.

Inflorescence racemose, axillary, from upper leaf axils, pendulous beneath subtending leaf, usually with 2 flowers and few aggregated small flower buds (?). Peduncle ca. 1.5 cm long, glabrous. Pedicel ca. 1.5 cm long, glabrous, with a bract at base. Bract ovate, 5–7 mm long, apex acute, not caducous.

Flowers pale yellow, ca. 2 cm long, ca. 4 cm deep. Lateral sepals 4 (2 pairs); outer ones asymmetrically widely ovate, ca. 1.5 cm long, ca. 1.2 cm wide, apex acute, margin with glands; inner ones linear, ca. 1.8 cm long. Lower sepal pale yellow with reddish veins, bucciniform, constricted into a spur, ca. 2.4 cm long, ca. 1.7 cm deep (excluding spur); spur ca. 8 mm long (ca. 2 cm long in overall length), incurved at apex. Dorsal petal pale yellow with reddish veins, widely obovate, ca. 1.6 cm long, ca. 2 cm wide when flattened, apex slightly retuse with a appendage, ca. 2 mm high. Lateral united petals pale yellow with reddish veins, ca. 2.8 cm long; the basal lobe narrowly obovate, ca. 1.8 cm long, ca. 7 mm wide, apex acute; the distal lobe obovate, ca. 1.3 cm long, ca. 1 cm wide, apex retuse; ventral appendage large, inflexed. Stamens 5, anthers with membranaceous appendages, connective glabrous. Chromosome number $2n = 34$ (Sugawara *et al.* in press).

Distr. Yunnan (Luchun).

Specimen examined. China, Yunnan, Luchun, Mt. Huanglianshan, Hydrologic Station, 1700–1900 m (S. K. Wu *et al.* 2403, Oct. 22, 1995, KUN-holotype, TI-isotype).

This species is similar to *I. claviger* Hook.f. but differs by the longer outer lateral sepal (ca. 1.5 cm long) and the anthers with membranaceous appendages.

Impatiens claviger described from Tonkin (in Hook., Ic. Pl. 29: t. 2863, 1908) is characterized by the many flowered peduncles shorter than the leaves, by the large (4–5 cm) pale yellow flowers, by the inner sepals longer than the outer ones (1.7 cm long). In Yunnan *I. claviger* is not yet found, but two similar species described here, *I. clavigeroides* and *I. linearisepala*, were collected.

7) *Impatiens linearisepala* S.Akiyama, H.Ohba & S.K.Wu, sp. nov.

[Fig. 3: 2a–h]

Ex *Impatienti clavigera* Hook.f. sepalis lateralibus exterioribus brevioribus ca. 7 (non 12) mm longis et antheris appendicula membranacea evolutis diversa. A *Impatienti clavigeroides* S.Akiyama *et al.* sepalis lateralibus exterioribus brevioribus (nec 15 mm longis), petalo dorsali conspicue cristati-appendiculato, lobis basalibus eorum unitorum lateralium apice rotundatis bene differt.

Plants ca. 30 cm tall. Leaves alternate, distributed upper part of stem, with

glabrous petiole 1–2.5 cm long (shorter in upper leaves); lamina elliptic, 7–9 cm long, 2.5–3.5 cm wide, apex acute, base attenuate, margin crenate, nearly glabrous on both surfaces.

Inflorescences racemose, axillary, from the upper leaf axils, pendulous beneath subtending leaf, with 1 or 2 flowers aggregated. Peduncle 2–2.5 cm long, glabrous. Pedicel ca. 1 cm long, glabrous, with a bract at base. Bract ovate, ca. 5 mm long, apex acute, not caducous.

Flowers pale greenish yellow, ca. 3 cm long, ca. 4 cm deep. Lateral sepals 4 (2 pairs); outer ones asymmetrically ovate, ca. 7 mm long, ca. 5 mm wide, apex acute; inner ones linear, ca. 1.4 cm long. Lower sepal pale greenish yellow, bucciniform, constricted into a spur, ca. 1.9 cm long, ca. 2.5 cm deep (excluding spur); spur ca. 4 mm long, incurved. Dorsal petal pale greenish yellow, nearly orbicular, ca. 1.7 cm long, ca. 1.9 cm wide when flattened, apex rounded, with a crest-like appendage, ca. 5 mm high. Lateral united petals pale greenish yellow, ca. 2.6 cm long; the basal lobe oblong-obovate, ca. 1.6 cm long, ca. 8 mm wide, apex rounded; the distal lobe oblong-obovate, ca. 1.7 cm long, ca. 8 mm wide, apex slightly retuse; ventral appendage large, inflexed. Stamens 5, anthers with membranaceous appendages, connective glabrous. Chromosome number $2n = 36$ (Sugawara *et al.* in press).

Distr. Yunnan (Maguan).

Specimen examined. China, Yunnan, Maguan, Gu-ling-quing, 1700–1900 m (S. K. Wu *et al.* 2652, Aug. 17, 1994, KUN-holotype, TI-isotype).

Impatiens clavigeroides from Mt. Huanglianshan has the dorsal petal with indistinct appendage, the basal lobe of the lateral united petals with acute apex, and the larger outer lateral sepals (ca. 1.5 cm long). On the other hand, *I. linearisepala* from Gu-ling-quing has the dorsal petal with conspicuous crest-like appendage, the basal lobe of the lateral united petals with rounded apex, and the smaller outer lateral sepals (ca. 7 mm long). The chromosome numbers of these species are $2n = 34$ and $2n = 36$, respectively. This species and *I. clavigeroides* differ from *I. claviger* by having membranaceous appendages in anthers.

These three species are unique in having the inner lateral sepals longer than the outer ones and share bucciniform lower sepals with short conspicuously incurved spur. By these features a species group, *I. claviger*-group, is here proposed. The species of the group are distributed from South Yunnan to Tonkin.

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