

A TAXONOMIC REVISION OF *BEGONIA VEITCHII* (BEGONIACEAE)

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A taxonomic revision of *Begonia veitchii* Hook.f. is presented. Two taxa are newly recognised as synonyms of *Begonia veitchii*: *B. baumannii* Lemoine and *B. clarkei* Hook.f. Additionally, two infraspecific taxa are newly described and illustrated: *Begonia veitchii* var. *machupicchuensis* Tebbitt, which is endemic to the Cusco Department of Peru, and *B. veitchii* var. *lanatifolia* Tebbitt, which is endemic to Chuquisaca Department, Bolivia. *Begonia veitchii*, as well as four taxa recognised as synonyms of *B. veitchii* – *B. baumannii*, *B. rosaeiflora* Hook.f., *B. coriacea* A.DC. and *B. clarkei* – are lectotypified. A key, descriptions, distribution map and illustrations are provided for all the recognised infraspecific taxa of *Begonia veitchii*.

Keywords. Argentina, *Begonia* sect. *Australes*, Bolivia, Peru.

INTRODUCTION

Our studies of *Begonia veitchii* Hook.f. of section *Australes* show that, like the type species of its section – *Begonia micranthera* Griseb. (see Tebbitt *et al.*, 2018), it is an atypical *Begonia*. Both these species have relatively large distributions, are unusually variable in their morphology, and often occur in seasonally dry locations. This is in stark contrast to most of the 1900-plus species of *Begonia* (Hughes *et al.*, 2015, and continuously updated), which are narrow endemics, are relatively morphologically uniform, and inhabit perpetually humid locations (Tebbutt, 2005).

Fieldwork, combined with herbarium-based studies, has shown that *Begonia veitchii* should be more broadly circumscribed than previously recognised, and that the species has a far larger distribution than currently recorded. In contrast to Smith & Schubert (1941), who recognised the species as a narrow endemic of Peru's Apurímac and Cusco Departments (with a questionable occurrence in Bolivia), we recognise the species as being widespread and often locally common in the Andean region of Peru and Bolivia, where it is recorded from approximately 12°32'S in Peru's Huancavelica and Cusco

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Departments (e.g. *Tovar* 250, *Tebbitt* 798) to 21°28'S in Bolivia's Chuquisaca Department (e.g. *Tebbitt* 762), as well as occurring in a single location in Salta Department, Argentina (Martín *et al.*, unpublished data). Delfini (2017) and the *Flora Argentina: flora vascular de la República Argentina* online database (Instituto de Botánica Darwinion, no date) also record *Begonia tominana* Golding, which both Jørgensen *et al.* (2014) and we recognise as a synonym of *B. veitchii*, as occurring in Jujuy Department, Argentina. Our examination of the cited voucher specimen (*Kiesling et al.*, 5486 [SI]) has, however, found that this record is in error, because the specimen represents *Begonia micranthera*. During fieldwork conducted in Argentina's Jujuy, Salta and Tucumán Provinces in January 2017 and 2019, the first author did not encounter *Begonia veitchii*, suggesting that in Argentina it has a much more limited distribution than in Peru and Bolivia.

Begonia veitchii, as recognised here, encompasses a great deal of variation, and in several areas there are local ecotypes, as confirmed by our field observations and collections. In Peru, the pattern of variation found between these numerous ecotypes is especially complex, with few of them being distinguishable by synapomorphies; instead, each population is typically characterised by a distinct combination of characters. Among the characters that vary in this way are the presence or absence of an aerial stem, the amount of hair on the stem and leaf undersurfaces (ranging from glabrous to densely hairy), the presence or absence of a glaucous bloom on the upper leaf surface, the colour of the leaf lower surface (ranging from whitish green, to green, to burgundy), the depth of vein impression (varying from very shallowly to deeply impressed), flower colour (which can be white, pink, orange or scarlet), flower orientation (ranging from erect to drooping), the shape of the styles (varying from bifid with well-developed branches to distinctly flattened, and broadly cuneate but not branched), the presence or absence of bracteoles, and the shape of the fruit wings. Several different combinations of these characters occur, and each population contains plants having a certain combination of these and other such features, with almost all the different possible combinations occurring when all the populations are observed collectively.

A previous misunderstanding of this pattern of variation led to problems with the recognition of *Begonia veitchii*, and the publication of several superfluous species names. This was largely the result of taxa being described based on limited material, and usually solely from cultivated plants, without reference to the range of natural variation. Many of these taxa were described in the mid to late 1800s, a time when collectors working for British nurseries were actively introducing Andean tuberous begonias into cultivation. These collections were used in hybridisation programmes that would eventually produce the *Begonia* × *tuberhybrida* group, which has since become one of the commercially most successful of all cultivated *Begonia* groups (Tebbitt, 2005). Taxa described based only on very limited cultivated material include *Begonia baumannii* Lemoine, *B. clarkei* Hook.f. and *B. rosaeflora* Hook.f., as well as *B. veitchii* Hook.f. An additional species, *Begonia coriacea* A.DC. (a replaced synonym of *B. tominana*), was similarly described based on a single herbarium collection, but in that case two wild-collected herbarium specimens were used as the basis of the description.

Adding to the confusion, in recent decades the name *Begonia veitchii* has been used very narrowly to refer to a specific group of populations located on and around the archeological ruins at Machu Picchu (e.g. see Bartholomew, 1983; Del Sante & Huamán Chang, 2011), even though these plants, apart from having scarlet flowers, do not precisely match the type of *B. veitchii*, namely *Pearce s.n.* housed at Kew, or the original concept of Joseph Hooker's species. These populations, although clearly part of the variation that makes up *Begonia veitchii*, are distinct in a few minor but significant ways. They differ from the type and all other material of *Begonia veitchii* recognised here in having tepals that project forwards so that their male and female flowers appear somewhat tubular (versus usually saucer- to bowl-shaped or rarely bell-shaped). The inner pair of tepals of the male flowers are each folded lengthways for a short distance from the apex, and both the male and the female flowers are unusually small for *Begonia veitchii*. These plants are here newly recognised as *Begonia veitchii* var. *machupicchuensis* Tebbitt. Although the name *Begonia veitchii* has tended to have been used in the past for these plants on and around the ruins of Machu Picchu, multiple names have been used to refer to those populations we recognise here as *Begonia veitchii* var. *veitchii*, as indicated by the long list of synonyms recognised for that taxon.

Begonia veitchii var. *lanatifolia* Tebbitt is also newly described. This variety is known only from two locations in Bolivia: Cerro Chataquila (Chuquisaca Department) and Parque Nacional Torotoro (Potosí Department). The variety grows at both sites in similar conditions, in open habitat near the summit of low mountains, which for a *Begonia* represents a remarkably dry habitat. This variety is uniquely characterised by an indumentum of lanate hairs on both the leaf blade undersurfaces and the ovaries, and by its rib-like ovary wings.

In addition to the recognition of these two new infraspecific taxa, the taxonomy of *Begonia veitchii* is here revised to better account for the observed pattern of variation by reducing two species to synonymy with this species. These taxa – *Begonia clarkei* and *B. baumannii* (along with the name *B. odoratissima* hort., which Chevalier, 1926, published as a synonym of *B. baumannii*) – fit the pattern of local ecotypic variation mentioned previously, and each lack synapomorphies.

As recognised here, *Begonia veitchii* is readily distinguished from most other species of section *Australes* by its symmetrical leaf blades, with all but the two Argentinian endemics *B. sleumeri* L.B.Sm. & B.G.Schub. and *B. tafiensis* Lillo having asymmetrical leaf blades. Both *Begonia sleumeri* and *B. tafiensis* are readily distinguished from *B. veitchii*. *Begonia sleumeri* is a much smaller plant, never growing above 5 cm tall and with leaf blades 1.4–4.6 cm in diameter (whereas *B. veitchii* is 5–30 cm tall with leaf blades 2–21 cm in diameter). *Begonia tafiensis* is easily distinguished from all other species in section *Australes*, including *B. veitchii*, by its distinct stolon-like side branches that are more slender than the main stem and lack leaves except at their apices. The male flowers of *Begonia tafiensis* are also unique among those of tuberous Andean *Begonia* species in that the inner pair of the four tepals point downwards at a 15–30° angle.

Despite the similarity of the leaves of the three species, *Begonia veitchii* shares greatest overall morphological affinity with *B. micranthera*. Usually these two species are readily

distinguishable, but *Begonia veitchii* can occasionally be difficult to distinguish from *B. micranthera* subsp. *albonervia* Tebbitt, especially as they overlap in distribution within Bolivia and their leaf shape can be reniform-orbicular in both. Leaf morphology is, however, the clearest distinguishing feature, because *Begonia veitchii* has symmetrical leaves that lack a distinct apex, whereas those of *B. micranthera* (including subsp. *albonervia*) are asymmetrical and have a distinct apex.

TAXONOMIC TREATMENT

Key to the infraspecific taxa of Begonia veitchii

- 1a. Tepals projecting forwards and perianth somewhat tubular; inner pair of tepals of male flowers folded lengthways for a short distance from the centre of the apex, tepals scarlet; male tepals 1.5–2 cm wide; female tepals narrowly ovate to ovate
4. *B. veitchii* var. *machupicchuensis*
- 1b. Tepals usually spreading and perianth saucer- to bowl-shaped or rarely tepals projecting forwards but then perianth bell-shaped; inner pair of tepals of male flowers never folded lengthways, tepals white, pink, orange or scarlet; male tepals 1.9–4.1 cm wide; female tepals usually elliptic to broadly obovate, spatulate or orbicular, rarely ovate _____ 2
- 2a. Leaf blade undersurface and ovaries densely lanate (the hairs initially white but turning brown when the plant is handled or dried); ovary wings usually all rudimentary and rib-like _____ **3. *B. veitchii* var. *lanatifolia***
- 2b. Leaf blade undersurface and ovaries usually glabrous to sparsely pubescent, occasionally moderately pubescent, the hairs when present never lanate; ovary wings all fully developed, or occasionally the smallest of the three wings rudimentary and rib-like but the other two fully developed _____ **2. *B. veitchii* var. *veitchii***

Species descriptions

1. *Begonia veitchii* Hook.f., Gard. Chron. I: 734 (1867). – Type: Perú, on hills from Cuzco to Ayacucho, 11–12,000 ft, from Habaspamba, i 1867, *R. Pearce* s.n. (lecto K! [K000252023], here designated).

Begonia tominana Golding, Phytologia 47: 295 (1981), pro nom. nov. *Begonia coriacea* A.DC., *nom. illegit.* Ann. Sci. Nat. Bot. IV, 11: 122 (1859). – Type: Bolivia, Dep. Chuquisaca, Prov. Tomina, Pomabamba, xii 1845 to i 1846, *H. A. Weddell* 3791 (lecto P! [barcode P00482209], here designated; isolecto P! [barcode P01900758]).

Begonia clarkei Hook.f., Bot. Mag. 93: t. 5675 (1867). – Type: Bolivia, [Dep. La Paz], Prov. Larecaja, viciniis Sorata, cerro del Iminapi, 2650–2800 m, 16 ii 1858, *G. Mandon* 1090 (lecto K! [barcode K000252024], here designated; isolectos BM!, F!, G! [barcode G00034147], G-BOISS!, GH! [barcode 0057802], K! [barcode K000252025], NY!

- [barcode NY01085842], P! [3], RB! [barcode RB00536678], S! [barcode S07-9359], US! [barcode 00313506], W! [2 barcodes: W0013092, W18890113269]), **syn. nov.**
Begonia rosaeflora Hook.f., Bot. Mag. 93: t. 5680 (1867). *Begonia veitchii* var. *rosaeflora* (Hook.f.) Voss, Vilm. Blumengärtn., ed. 3, 1: 354 (1894). – Type: plate in J. D. Hooker, Bot. Mag., 93: t. 5680, 1867 (lecto, here designated).
Begonia baumannii Lemoine, Jardin 4: 273 (1890) (*'B. baumannii'*). – Type: plate in Lemoine, Jardin 4: 273 (1890) (lecto, here designated), **syn. nov.**
Begonia odoratissima hort., J. Soc. Natl. Hort. France, IV, 27: 265 (1926), pro syn.
Begonia baumannii Lemoine, **nom. illeg.**
Begonia barborckae J.J.Halda, Acta Mus. Richnov., Sect. Nat. 14, 4: 105 (2007). – Type: Bolivia, Dep. Chuquisaca, Prov. Oropeza, wet vertical rocks near Challcha, 2900 m, 18 xi 2007, J. J. Halda JH07111801 (holo PR no. 11970).

Caulicent or acaulescent herb, often with a 1–5 cm long subterranean portion of stem. Aerial portion of stem when present up to 30(–40) cm tall. *Leaves* usually 3–6, but in some populations up to 12; petiole oriented in same direction as the main vein of blade, 1.2–26 cm long, glabrous to densely pubescent; blade symmetrical, transversely reniform-orbicular to orbicular, base very shortly funnel-shaped, and from there flaring out and becoming flat towards the margins or leaf funnel-shaped throughout, 3.5–13 × 5–21 cm, the apex indistinct, subcoriaceous to coriaceous, upper surface glossy, usually green, occasionally grey-green or glaucous-green, sometimes with a purple margin, or upper surface rarely purple with green veins and a purple margin, usually glabrous to moderately pubescent, lower surface whitish green, green or burgundy, usually sparsely to densely pubescent along veins, and the interveinal regions glabrous, or occasionally sparsely pubescent throughout, rarely the entire undersurface tomentose, villous or lanate. *Male flowers*: tepals spreading or projecting forwards, white, pink, orange or scarlet, outer pair narrowly to broadly ovate, elliptic, obovate-elliptic or elliptic-orbicular, 1.7–4.8 × 1.5–3.5 cm, inner pair ovate, elliptic, elliptic-obovate, obovate, broadly obovate, broadly spatulate, or orbicular-obovate, 2–5.4 × 1.5–4.1 cm. *Female flowers*: bracteoles absent or present, when present oblong-elliptic, c.1 × 0.4–0.5 cm; tepals with same orientation and colour as males, outer two narrowly ovate to ovate, elliptic to obovate or broadly obovate, 1.1–3 × 0.8–2.8 cm, inner three elliptic, oblong-elliptic, obovate to broadly obovate or broadly spatulate, 1–3 × 0.6–3.2 cm; ovary glabrous to densely covered with hairs, usually unequally 3-winged, sometimes one or both of the shorter wings reduced to ribs or occasionally all three wings rib-like; styles bifid, branches ± erect to spreading and stigmatic papillae arranged in a once-spiralled band, or styles flattened, and broadly cuneate, truncate and undulate, with the stigmatic papillae in a band along the upper margin and the branches either absent to rudimentary or well developed and then the stigmatic papillae arranged in a spiral band along branches as well as along upper margin of flattened style. *Fruiting peduncle* to 56 cm long.

Phenology. Flowering November to early April.

Distribution and habitat. Eastern Andean foothills of Peru (Aurimac, Ayacucho, Cusco, Huancavelica and Puno), Bolivia (Chuquisaca, Cochabamba, La Paz, Potosí and Santa

Cruz) and northern Argentina (Salta) (see Fig. 2). *Begonia veitchii* grows at elevations from 1445 to 4065 m (and possibly up to 4200 m [Tupayachi & Galiano 866]). The species' upper altitude limit is remarkably high for *Begonia*, being the upper limit for the entire genus. The only other *Begonia* to reach an altitude of 4000 m is *B. tafiensis*, an Argentinian member of section *Australes*. *Begonia veitchii* grows in a wide range of situations, including open sunny and often seasonally dry locations, as well as perpetually moist and shady locations. *Begonia veitchii* is most commonly found in low, open vegetation on sloping rocky ground or cliffs, but also occurs on artificial stonework, the rocky margins of streams, pre-puna and pastureland, and although usually growing in full sun, the species can sometimes occur in all these niches under the cover of forest or scrub.

Begonia baumannii is reduced to synonymy with *B. veitchii* because neither the short description of this taxon nor the accompanying plate (Lemoine, 1890) includes features that distinguish it from *B. veitchii*. Lemoine (1890) described this taxon based on cultivated material grown from seeds collected by Dr Sacc in Cochabamba, Bolivia (Sacc, 1886) and first cultivated at the nursery of Émile Napoléon Baumann in Bollwiller, France (Wittmack, 1891). Lemoine did not designate a type specimen, nor does he appear to have preserved a herbarium specimen of his new species. The plate that accompanies the original description is therefore designated here as the lectotype of *Begonia baumannii*. The only herbarium material of this cultivated stock that appears to have been preserved is a single specimen that had been grown at the Royal Botanic Gardens, Kew, and deposited in Kew's herbarium in 1896, after it had been used to illustrate Hooker's treatment of *Begonia baumannii* in *Curtis's Botanical Magazine* (Hooker, 1897). This herbarium material fits within the general variation found in *Begonia veitchii*, although, as Hooker (1897) previously noted, it is unusual (but not unique) in having styles that are flattened, unbranched and cleft, with the stigmatic papillae in a band along the upper margin.

Begonia clarkei was described based on a plant in cultivation that had originated in Peru (Hooker, 1867b). Because no material of this cultivated plant appears to have been preserved, the collection, Mandon 1090, is designated here as the lectotype of *Begonia clarkei*. This collection is the only one that Hooker (1867b, Table 5675) cites, stating that the cultivated material he describes as *Begonia clarkei* was "apparently the same as a plant gathered by Mandon, near Sorata, in the Bolivian Andes, at an elevation of eight to nine thousand feet, of which specimens, without name, are preserved in the Hookerian Herbarium." This specimen is very similar to Hooker's (1867b) description of *Begonia clarkei*, differing only in its glabrous stems and leaves and more symmetrical leaf shape. It is worth noting that Hooker (1867d), in his original publication of *Begonia veitchii*, considered Mandon's collection from near Sorata to represent *B. veitchii*. Even once he recognised the distinction of Mandon's collection from *Begonia veitchii* (Hooker, 1867a, Table 5675), he describes it as "A very nearly allied species ... [that is] ... more caulescent, and has a glabrous scape, with larger stipules and bracts". When additional wild populations are considered, it is not possible to separate the two taxa on the basis of these characteristics. Accordingly, *Begonia clarkei* is synonymised here with *B. veitchii*.

In Smith & Schubert's (1941) account of *Begonia* for Macbride's *Flora of Peru*, *B. clarkei* is listed as a synonym of *B. cinnabarina* Hook., but in Smith & Wasshausen (1984), *B. clarkei* is reinstated as a species distinct from *B. cinnabarina*. In neither account is an explanation of these taxonomic changes provided. It is assumed that the former change was in error, because these two taxa are very distinct.

It is also possible that *Begonia fulgens* Lemoine is synonymous with *B. veitchii*. However, application of this name is unclear, because there is no preserved material available and the description of the taxon is very brief and lacks an accompanying illustration (Lemoine, 1893). This taxon was described based on a cultivated plant from northern Bolivia, grown at Lemoine's nursery in Nancy, France (Lemoine, 1893). Although the brief description of the plant largely fits *Begonia veitchii* var. *veitchii*, the occurrence of either five or six petals in the female flowers does not (*B. veitchii* always has five female tepals) and suggests that this plant might be an artificial hybrid, because none of the tuberous *Begonia* species from Bolivia have been observed to show this pattern of variation.

Begonia rosaeiflora is here lectotypified. This taxon was described based on a plant in cultivation, which was said to be closely related to *B. veitchii* but differing in its "stouter red petioles and scapes, and in the broader rounder leaves with very deeply impressed veins (and hence bullate upper surface), in the broad obtuse stipules and bracts, in the villose scape, in the blunt bracteoles close under each flower, in the more numerous flowers which are of a pale red, ... and in the acute wing of the ovary" (Hooker, 1867c). Plants matching those described as *Begonia rosaeiflora* were located during fieldwork (Tebbutt 811) in the vicinity of Limbani (Puno Department, Peru), although the majority of individuals in their populations had pure white flowers rather than the pale red flowers described by Joseph Hooker. Presumably, Richard Pearce introduced only the red-flowered variant because he thought it of greater horticultural merit. Although the plants in the vicinity of Limbani were relatively distinct, especially because they had bracteoles (which are uncommon in *Begonia veitchii*), neighbouring populations spanned the morphological characteristics seen in these populations and those seen in other local variants of *B. veitchii*. We therefore follow Smith & Schubert (1945) in treating this taxon as a synonym of *Begonia veitchii*.

Joseph Hooker did not designate a type of *Begonia rosaeiflora* (Hooker, 1867c), nor are there any specimens presently in the Kew herbarium (or elsewhere) of this taxon that could have been observed by Hooker at the time he described *Begonia rosaeiflora*. Accordingly, Table 5680, which accompanies Hooker's original description of this taxon in *Curtis's Botanical Magazine* (Hooker, 1867c), is designated here as the lectotype of *Begonia rosaeiflora*.

2. *Begonia veitchii* Hook.f. var. *veitchii*. Fig. 1.

Acaulescent or occasionally caulescent herb, aerial stem when present up to 30(–40) cm tall; leaf undersurfaces and petioles usually glabrous to moderately pubescent, rarely densely pubescent and then hairs tomentose or villous, never lanate, ovaries, upper portion of stem, peduncles and outer surfaces of tepals usually glabrous, or upper portion of stem rarely tomentose. *Leaves*: blade transversely reniform-orbicular to orbicular, 3.5–13 × 5–21 cm, margin lacking lobes or with rounded to subtriangular lobes,

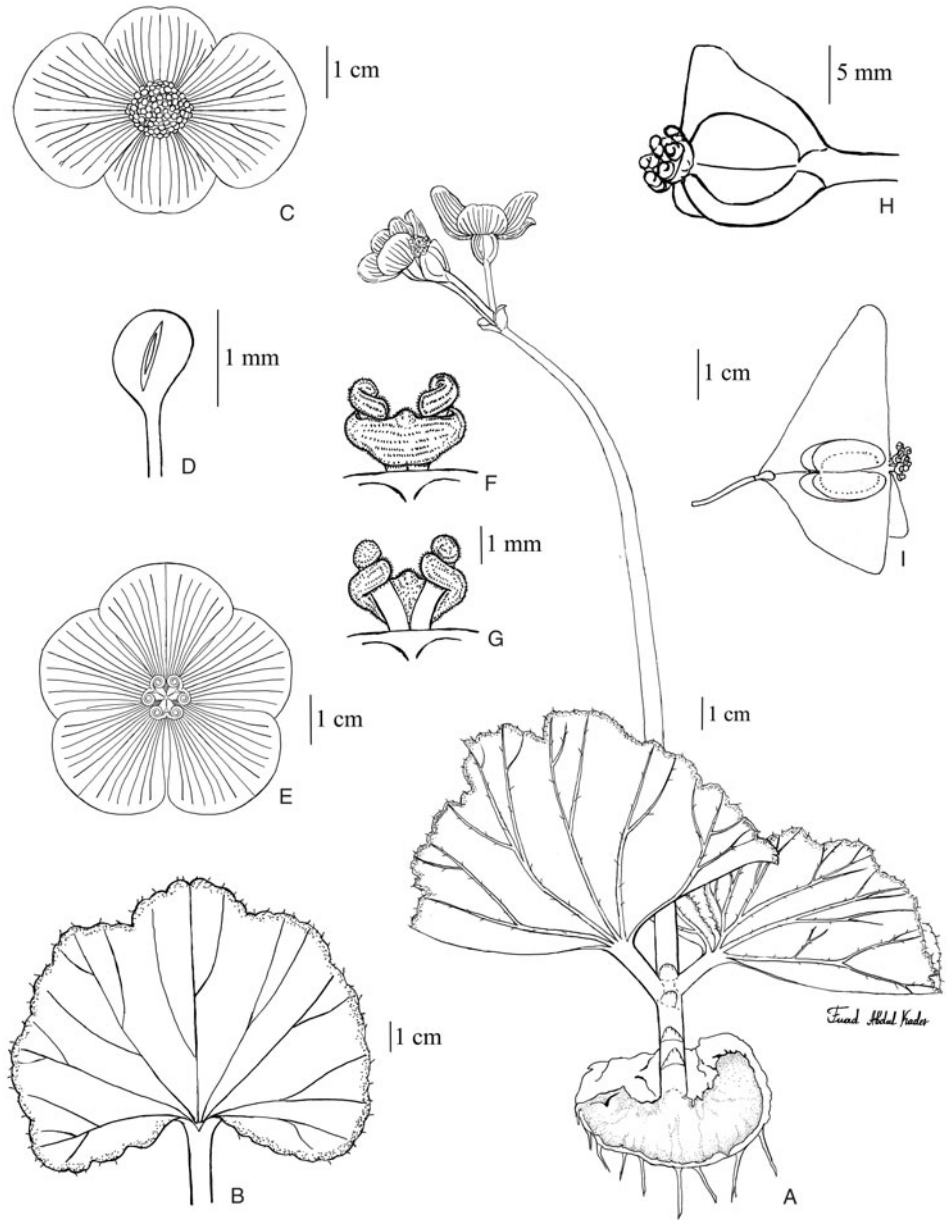


FIG. 1. *Begonia veitchii* Hook.f. var. *veitchii*. A, Habit; B, leaf (flattened, upper surface); C, male flower (front view); D, stamen (side view); E, female flower (front view); F, style and stigma (front view); G, style and stigma (rear view); H, ovary (side view); I, mature dehiscent fruit (side view). (A–H drawn by Fuad Abdulkader, based on *Tebbitt* 734; I drawn by Adèle Rossetti Morosini, based on *Mandon* 1090).

0.3–1.5 cm deep. *Male flowers*: tepals usually spreading and perianth saucer- to bowl-shaped, rarely projecting forwards so that perianth bell-shaped, white, pink, orange or scarlet, outer pair usually ovate, broadly ovate, or elliptic, occasionally obovate-elliptic, $2.2\text{--}4.8 \times 2.1\text{--}3.5$ cm, inner pair usually elliptic, elliptic-obovate, obovate, broadly obovate, or occasionally ovate, $2.2\text{--}5.4 \times 2.1\text{--}3.2$ cm. *Female flowers*: bracteoles usually absent, occasionally present; tepals same orientation and colour as males, outer two usually elliptic or obovate to broadly obovate, occasionally ovate, $2\text{--}3 \times 1.2\text{--}2.8$ cm, inner three elliptic or obovate, occasionally broadly obovate, $2.1\text{--}3.2 \times 1.2\text{--}2.7$ cm; ovary body ellipsoid to obovoid, $0.6\text{--}1.5 \times 0.4\text{--}1.3$ cm, unequally 3-winged, the smallest wing sometimes rib-like; styles bifid, branches \pm erect to spreading and stigmatic papillae arranged in a once-spiralled band, or styles flattened, and broadly cuneate, truncate and undulate, with the stigmatic papillae in a band along the upper margin and the branches either absent to rudimentary or well developed and then the stigmatic papillae arranged in a spiral band along branches as well as along upper margin of flattened style. *Seeds* ellipsoid, $434\text{--}636$ μm long, $224\text{--}405$ μm wide; collar region occupying one-half to one-third of seed length; operculum nipple-shaped, $41\text{--}82$ μm long; testa cells 4–7 along long axis of seeds; cuticle of collar and testa cells pitted or lacking pits, covered with undulated striae, the striae of the collar cells 3–25 μm long, a few patches present where striae are less pronounced.

Phenology. Flowering and fruiting from November to April.

Distribution and habitat. Eastern Andean foothills of Peru (Apurimac, Ayacucho, Cusco, Huancavelica and Puno), Bolivia (Chuquisaca, Cochabamba, La Paz, Potosí and Santa Cruz) and Argentina (Salta) (Fig. 2). *Begonia veitchii* grows at 1750–4065 m (and possibly down to 700 m [Vargas 12300] and up to 4200 m [Tupayachi & Galiano 866]), although most abundantly between 3500 and 4000 m. The species grows in a wide range of sites but is typically found in open sunny situations in low, open vegetation on sloping rocky ground or cliffs. It also frequently occurs on artificial stonework, the rocky margins of streams, pre-puna and pastureland, and can sometimes occur under the cover of forest or scrub. Colour photographs of *Begonia veitchii* var. *veitchii* in habitat appear in Tebbitt 2015a and 2015b.

Additional specimens examined. ARGENTINA. **Salta**: Dep. Santa Victoria, Cerro Bravo, Abra el Queñoal, 2730 m, 30 xi 2015, C. Martín 2103 (SI).

BOLIVIA. Without further locality, M. Bang 1862 (E, F [2], GH [2], K, NY [3], W, Z). **Chuquisaca**: Prov. Jaime Zudáñez, Hills behind Icla, $19^{\circ}25'S$, $64^{\circ}40'W$, 3581 m, 16 i 2013, M. C. Tebbitt 760 (USZ); Prov. Oropeza, Comunidad Cajamarca, c.27 km de la ciudad de Sucre, $18^{\circ}57'S$, $65^{\circ}23'W$, R. J. Gutiérrez 71 (HSB); Prov. Oropeza, 29 km from Sucre on road to Ravelo, $21^{\circ}28'S$, $64^{\circ}12'W$, 1752 m, 8 i 2013, M. C. Tebbitt 761 (USZ). **Cochabamba**: Prov. E. Arze, road from Anzaldo to Mollepujro, 10 km from Anzaldo, $17^{\circ}53'S$, $65^{\circ}55'W$, 2950 m, 6 iii 1980, J. G. Hawkes, J. P. Hjerting & I. Avilés 6543 (C); Prov. Ayopaya, Puente San Miguel, above Liriuni on the Cochabamba–Vizcachas road, c.25 km NNW of Cochabamba (air dist.), $17^{\circ}10'S$, $66^{\circ}25'W$, 3800 m, 9 iv 1963, D. Ugent 4791 (GH, NY); Prov. Cercado, Sacaba, steep slope above Río Hura Hura, c.1300 m beyond the junction with Quebrada Kulhu, 3400 m, 17 iii 1994, N. P. Ritter 639 (GH, MO); Prov. Quillacolla, the road from Quillacollo to Comunidad Malpaso, c.50 m from Río Jankho Khala, Cordillera del Tunari, 3600 m, 5 iii 1994, N. P. Ritter 555 (GH, MO); Liriuni, about 8 km NW

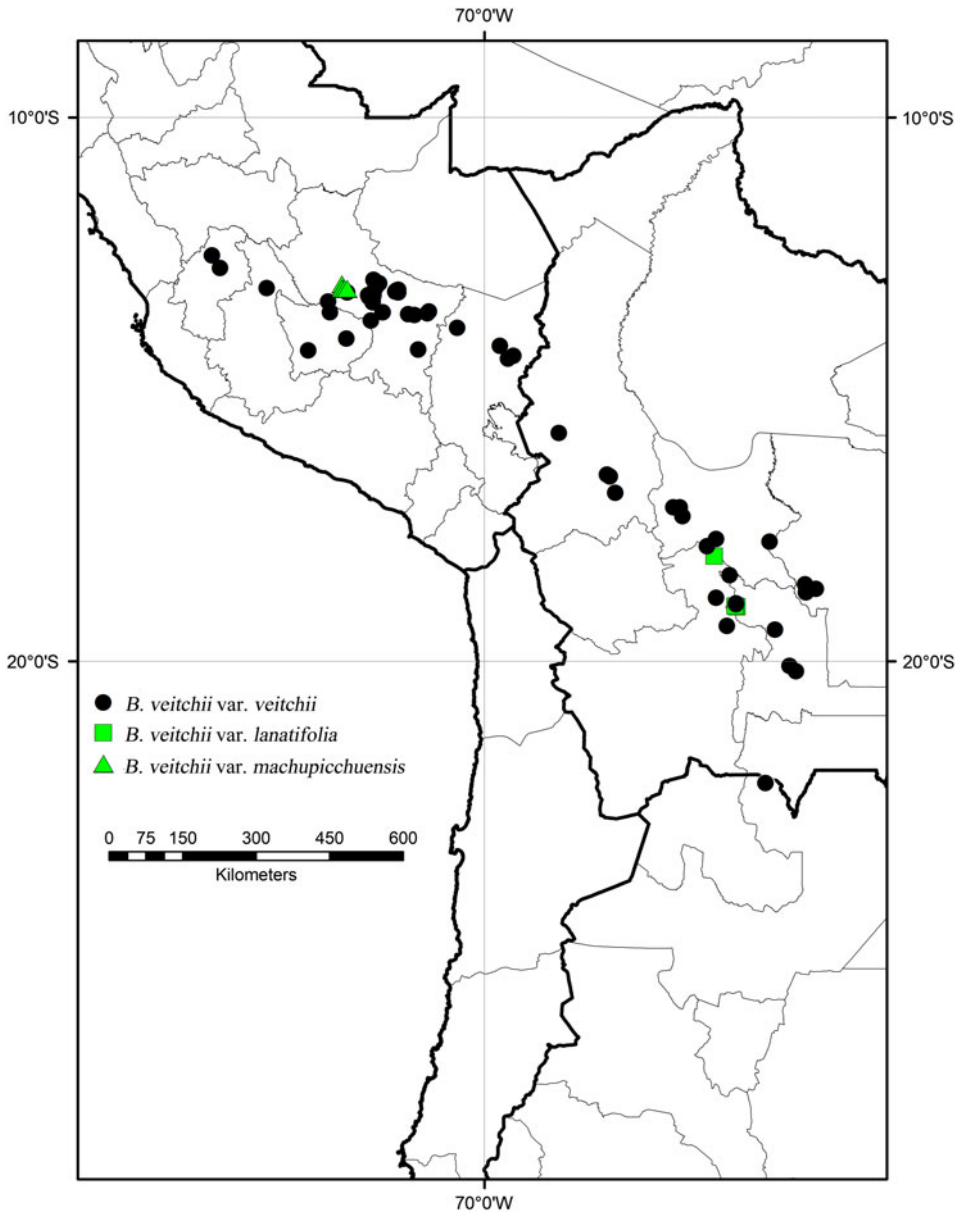


FIG. 2. Distributions of *Begonia veitchii* Hook.f. var. *veitchii* (circles), *B. veitchii* var. *lanatifolia* Tebbitt (squares) and *B. veitchii* var. *machupicchuensis* Tebbitt (triangles).

of Quillacolla, 4000 m, 21 ii 1947, *H. C. Cutler & M. Cardenas* 9058 (F, GH); Quillacollo, 5–6 km above Morochata on ascent out of valley on road to Vinto, 3400 m, 28 i 2001, *J. R. I. Wood & D. J. Goyder* 17024 (K); Prov. Quillacolla, 21.7 km from Quillacolla on road to Morochata, Puente San Miguel, 17°20'S, 66°22'W, 3750 m, 27 i 1971, *J. G. Hawkes, J. P. Hjerting, P. J. Cribb & Z. Huamán* 4277 (C), 6470 (C); Sivingani Village and pass between Vila Vila and Cochabamba, 17°45'S, 65°45'W, 10,000 ft, 24 iii 1950, *W. M. A. Brooke* 6230 (BM); Anzaldo–Cochabamba, s.c. 2340 (GH). **La Paz:** Prov. Caranavi, Choro, above the Cocapata River about 100 miles NW of Cochabamba, across the Tunari range, 10,000 ft, 18 i 1950, *W. M. A. Brooke* 6009 (BM, NY); Prov. La Paz, Franz Tamayo, Apolobamba, Puina, 14°35'S, 69°07'W, 3747 m, 24 iv 2008, *J. Quisbert, J. Gutiérrez, C. Miranda & A. Noa* 930 (MO); La Paz–Calacoto 73 kms, hacia el este, via Lambate, cerca al pueblo, 3600 m, 12 xii 1982, *S. G. Beck* 7786 (NY, SI, US); Ingenio del Oro, ix 1886, *H. H. Rusby* 680 (CAS, E, F, GH, NY [3], P, W); Prov. Larecacha, 15 km from Sorata on road to Tacacoma, on rock face, *J. G. Hawkes* et al. 5011 (C [2]); cerca de Sorata–Pacajes–La Paz, *M. Cardenas* 4831 (LIL); Prov. Loayza, Río Yunga, Yunga (Poroma Camp), along the Río Yunga between Quiraya and Estancia Poroma, c.19 km NNE of Luribay, 16°54'S, 67°36'W, 3380–3500 m, 23 xii 1987, *M. A. Lewis* 871727 (MO); Prov. Saavedra, Curva, above village of Charazani, 15°07'S, 69°03'W, *W. E. Carter* 142 (F); Sud Yungas, 19.8 km E of pass between Mururata and Illimani, 16°34'S, 67°45'W, 3500 m, 14 iii 1986, *J. C. Solomon* 15138 (MO). **Potosí:** Colavi, [19°21'0''S, 65°33'0''W], *M. Cárdenas* 3848 (GH, LIL); Bolivian Plateau, 1891, *M. Bang* 1016 (BM, E, GH [2], K, MO, NY [3], W); Prov. Chayanta, Ocuri, 7 kms. hacia Ravelo–Sucre, 3950 m, 6 iii 1931, *S. G. Beck* 6183 (NY, US). **Santa Cruz:** Prov. Hernando Silas, Primera Sección Monteagudo, Cantón Fernandez, comunidad Vallecito, 20°11'S, 64°17'W, 2390 m, 11 i 2007, *M. Jiménez, J. Villalobos & O. Apaza* 588 (MO); Prov. Manuel María Caballero, Comarapa, 17°48'S, 64°46'W, 2971 m, 16 i 2012, *M. C. Tebbitt* 734 (MO, USZ); Prov. Vallegrande, ruta del Che c.15 km S of the town of Vallegrande, 2628 m, 11 i 2012, *M. C. Tebbitt* 719 (MO, USZ); Prov. Vallegrande, San Lorenzo, 18°40'S, 63°55'W, 11 i 2012, *M. C. Tebbitt* 712 (MO, USZ); Prov. Vallegrande, 18°44'S, 64°06'W, 2727 m, 12 i 2012, *M. C. Tebbitt* 723 (USZ).

PERU. **Apurímac:** Prov. Abancay, cuesta de Abancay, 3400–3600 m, 18 xi 1966, *C. Vargas C.* 018308 (CUZ); Prov. Abancay, 17 km. from Abancay on road from Cuzco, 3200 m, 17 iv 1971, *J. G. Hawkes, J. P. Hjerting, P. J. Cribb & Z. Huamán* 5215 (C); Prov. Abancay, Ñacchero [Abancay], 3000 m, 14 i 1950, *C. Vargas C.* 8979 (CUZ); Prov. Abancay, Socllaccasa Pass, on trail Abancay–Cuzco, near summit, 3500 m, 10 xi 1935, *J. West* 3818 (GH); Prov. Abancay, [Lambrama District], Soccospampa, Matará, 2600 m, 1 xii 1941, *C. Vargas C.* 2285 (CUZ); Prov. Amaraes, Dist. Challhuanca, c.1 km beyond Challhuanca towards Caraybamba, steep hillside in narrow valley, 9500 ft, 6 i 1962, *S. G. E. Saunders* 766 (K); Prov. Grau, Cotabambas (Alrededores), 3500 m, 1 iii 1946, *C. Vargas C.* 5669 (CUZ). **Ayacucho:** Prov. La Mar, Aypacorral, camino a Uras, distr. San Miguel, 3100–3180 m, 4 iv 2005, *J. Roque* 4709 (USM); Pampa de Chupas, 10 ii 1968, *J. Soukup* 5513 (US [2]). **Cusco:** Prov. Anta, cuesta de Limatambo, 3500–3200 m, 24 xii 1948, *C. Vargas C.* 7485 (CUZ, US); Prov. Anta, Chinchaypujio to Apurímac, 2900 m, 21 xii 1965, *C. Vargas C.* 017019 (CUZ); Prov. Anta, ruta de Chinchaypujio, 3400 m, 21 i 1970, *C. Vargas C.* 21697 (CUZ); Prov. Anta, bajando a Chinchaypucyo, 3550 m, 21 xii 1965, *C. Vargas C.* 017011 (CUZ); Prov. Calca, Yanatile District, Above intersection of roads coming from Amparaes, Quebrada Honda and Lares, along road to Amparaes, 12°59'S, 72°02'W, 3659 m, 5 i 2015, *M. C. Tebbitt* 798 (E, MOL); Prov. Calca, Dist. Lares, Choquecancha, Manto, Bosque Humedo, 13°00'S, 72°01'W, 3161 m, 20 ii 2005, *L. Valenzuela & E. Suclli* 5053 (MO); Prov. Calca, Lares, Yerbabuenayoc, 3225–2918 m, 23 v 1967, *C. Vargas C.* 011968 (CUZ); Prov. Calca, Amparaes, Centre of town around bridge SW from Cuzco and S of town, 3330–3400 m, 13 xii 1986, *P. Núñez* 6616 (CUZ, USM), 6691 (CUZ, MO, USM), 6736 (MO); Prov. Calca, Lares District, Pampacôrral between Calca and Lares, 13°08'S, 72°00'W, 3660 m, 5 i 2015, *M. C. Tebbitt* 795 (E, MOL); Entrada al valle Lares, *J. Soukup* 24 (F); Prov. Calca, Kachin area (probably districts of Lares and Kachin), Kachin, immediate vicinity of town center,

G. Sallo & E. Franquemont 216 (F); Prov. Canas, laderas de Layo Langui, 3900 m, 5 i 1973, *C. Vargas C.* 22489 (CUZ); Prov. Canchis, al este de Sicuani, margen derecha del río, 14°16'S, 71°13'W, *P. Núñez* 8919 (MO); Prov. Canchis, Sicuani, banks of streams in warm valley, 11,000 ft, i 1934, *D. Stafford* 262 (K); Prov. Cusco, San Jerónimo District, Road from Cusco to Paruro, 13°35'S, 71°52'W, 3570 m, 14 i 2015, *M. C. Tebbitt* 824 (E, MOL); Prov. La Convención, entre Rosalina y Quellouno, 700 m, 9 x 1958, *C. Vargas C.* 012300 (CUZ); Prov. La Convención, Dist. Santa Teresa, Choquequiraw, San Ignacio Matorral, 13°13'S, 72°31'W, 3250 m, 7 iii 2005, *E. Suelli, J. Farfán, V. Chama, C. Astete, J. Latorre & N. Anaya* 2186 (MO); Prov. La Convención, Santa Teresa, Choq'ekiraw, 13°23'S, 72°52'W, 3270 m, 18 v 2004, *L. Valenzuela, C. Calatayud, J. Farfán, Y. Vizcardo & A. Reynaga* 3538 (US); Prov. Paruro, Huanca-Húanca, 3450 m, 19 i 1942, *C. Vargas C.* 2391 (CUZ, GH); Prov. Paucartambo, Kosñipata District, Road from Paucartambo to Manu National Park, 13°10'S, 71°35'W, 3088 m, 13 i 2015, *M. C. Tebbitt* 819 (E, MOL); Prov. Paucartambo, Acjanaco Parque Nacional Manu, 3550–3450 m, 3 iii 1991, *A. Cano E.* 4550 (USM), 4551 (USM); Prov. Paucartambo, Kosñipata District, Road from Paucartambo to Manu National Park, 13°12'S, 71°38'W, 3440 m, 13 i 2015, *M. C. Tebbitt* 818 (E, MOL); Prov. Paucartambo, Valle del Pilcopata, near Accanaco Pass, turnoff to Tres Cruces, degraded puna just above ceja, 13°13'S, 71°35'W, 3500 m, 15 xii 1983, *R. B. Foster & T. Wachter* 7542 (MO, NY, USM); Prov. Paucartambo, "Achanccaraya", Hacienda Churu, *F. L. Herrera* 1042 (US); Prov. Paucartambo, Tres Cruces, Parque Nacional Manu, 3500–3600 m, 7 iii 1991, *A. Cano E.* 4636 (CUZ, F, USM); Prov. Paucartambo, Hurisanpilla, Cenyayocc, 3800 m, 7 xii 1950, *C. Vargas C.* 9954 (CUZ); Prov. Paucartambo, km 111, steep roadside slopes, montane cloud forest, 3075 m, 8 xii 1978, *J. L. Luteyn & M. Lebrón-Luteyn* 6407 (NY); Prov. Paucartambo, Alturas de Jesús María Parque Nacional Manu, 3730 m, 14 ix 1990, *A. Cano E.* 4356 (USM); Prov. Quispicanchi, 95 km above Quincemil on the Río Marcapata, *M. T. Madison* 1032 (GH); Prov. Quispicanchi, Marcapata District, Between Ocongate and Marcapata, 13°36'S, 71°03'W, 4000–4020 m, 8 i 2015, *M. C. Tebbitt* 806 (E, MOL); Prov. Quispicanchi, Ocongate District, Road to Marcapata, close to village of Ocongate, 13°37'S, 71°24'W, 3597 m, 8 i 2015, *M. C. Tebbitt* 804 (E, MOL); Prov. Quispicanchi, Ocongate District, Between Ocongate and Marcapata, km 70.8, 13°38'S, 71°17'W, 3916 m, 8 i 2015, *M. C. Tebbitt* 805 (E, MOL); Prov. Quispicanchi, Tio, 2200 m, 19–20 x 1950, *C. Vargas C.* 9693 (CUZ); Prov. Quispicanchi, San Palo District, Quebrada de San Pablo, Pajonal, 14°71'S, 71°20'W, 3500–3600 m, 4 ii 2004, *G. Calatayud & E. Suelli* 2068 (MO); Prov. Urubamba, Machu Pichu, a 110 km de Cusco entre Hidroeléctrico del 107 al km 112 en Machu Pichu y Aguas Calientes, 13°09'S, 72°31'W, *P. Núñez* 8686 (MO); Prov. Urubamba, Huayllabamba, Yanacocha, Quellococho, 13°16'S, 72°2'W, 3950–4406 m, 17 ii 2006, *L. Valenzuela, J. Farfán, E. Suelli, I. Huamantupa, R. Ayerbe* 5977 (US); Prov. Urubamba, NW from Cusco, Huayocari to Yanacocha, on top of the mountain, 13°16'S, 72°04'W, 14 ii 1987, *P. Núñez, W. Galiano, A. Aréstegui & A. Tupayachi* 6990 (CUZ, MO); Prov. Urubamba, lower end of Quebrada Pumahuanca, a deep side-valley of Río Urubamba, c.2–4 km NW of Urubamba, 3200–3600 m, 31 xii 1962, *H. H. Iltis, C. M. Iltis, D. Ugent & V. Ugent* 1004 (US); Prov. Urubamba, Pampacahua, a 95 km de Cusco, entre el km 95 y 107 del ferrocarril Cusco-Quillabamba, 13°18'S, 72°07'W, 2300 m, 6 xi 1987, *P. Núñez & E. Bengoa* 8575 (MO); Prov. Urubamba, Huayllabamba, Laguna Yanacocha y Kello ccocho, 13°21'S, 72°03'W, 3800–4200 m, 8 i 1989, *A. Tupayachi & W. Galiano* 866 (MO); Prov. Urubamba, Chincheros, trail from Chinchero plaza to Antakillqa hillside, 13°24'S, 72°3'W, 3600 m, 13 i 1982, *E. W. Davis, E. Franquemont, C. Franquemont, S. King & C. Sperling* 1443 (USM); Prov. Urubamba, Quishuarniyoc, 2860 m, 12 ii 1971, *C. Vargas C.* 22174 (CUZ). **Huancavelica:** Motcca, 4 km SE of Conaica, 3400–3450 m, iii 1951, *O. Tovar* 250 (UC, US); Yauli, 3500 m, 11 iii 1939, *H. E. Stork & O. B. Horton* 10871 (F, K). **Puno:** Prov. Carabaya, Macusani, road from Ollachea to Macusani, 13°52'S, 70°30'W, 3800 m, 1 ii 2000, *M. Weigend & K. Weigend* 2000/109 (NY, USM); Prov. Carabaya, Ollachea District, Road between Macusani and Ollachea, 13°53'S, 70°30'W, 3856 m, 11 i 2015, *M. C. Tebbitt* 816 (E, MOL), 817 (MOL); Prov. Carabaya, Jurojuro (San Gabán), 3900–2500 m, 29 xii 1947, *C. Vargas C.* 6850

(CUZ); Prov. Sandia, Cuyocuyo District, between Cuyocuyo and Sandia, 14°26'S, 69°34'W, 3912 m, 10 i 2015, *M. C. Tebbitt* 812 (E, MOL); Prov. Sandia, 2–6 km S of Limbani, 3550–3650 m, 11–12 v 1942, *R. D. Metcalf* 30460 (G, GH, LIL [2], MO, UC, US); Prov. Sandia, Limbani District, Road to Limbani (from Crucero), 14°12'S, 69°43'W, 4065 m, 10 i 2015, *M. C. Tebbitt* 811 (E, MOL); Prov. Sandia, Limbani, on the walls of the ancient terraces, rocks etc., *J. C. Vargas C.* 9633 (F); Prov. Sandia, Sandia District, Road directly above town of Sandia, 14°23'S, 69°28'W, 2172 m, 11 i 2015, *M. C. Tebbitt* 815 (E, MOL); Prov. Sandia, alrededores Sandia, 2250 m, 25 i 1964, *C. Vargas C.* 15093 (CUZ).

CULTIVATED. Royal Botanic Gardens, Kew, ex Peru, 21 ix 1910, collected by *Folger for Sanders s.n.* (K); Received from Sanders & Sons Nursery, *s.c. s.n.* (K).

3. *Begonia veitchii* var. *lanatifolia* Tebbitt. var. nov.

Begonia veitchii var. *lanatifolia* is distinguished from other infraspecific taxa of *B. veitchii* Hook.f. var. *veitchii* in having densely lanate leaf blade undersurfaces, petioles and ovaries, and rudimentary rib-like ovary wings. – Type: Bolivia, Dep. Chuquisaca, Prov. Oropeza, Santuario de Chataquilla hacia Punilla, c.12 km (prepuna), 19°00'S, 65°22'W, 3303 m, 25 ii 2007, *E. Cervantes* 137 (holo MO!, iso HSB!). **Fig. 3.**

Acaulescent or occasionally caulescent herb, aerial stem when present to 30 cm tall; usually leaf undersurfaces, petioles and ovaries lanate, and upper portion of stem, peduncles and outer surfaces of tepals with a moderate cover of short white hairs, or occasionally leaf undersurfaces and petioles with a moderate cover of short white hairs and other plant surfaces sparsely pubescent or glabrous. *Leaves*: blade transversely reniform-orbicular, 4–8.5 × 7.1–15.5 cm, margin usually with rounded to triangular lobes 0.5–1 cm deep. *Male flowers*: tepals spreading, never projecting forwards, perianth bowl-shaped, pink, outer pair usually elliptic to elliptic-orbicular, occasionally obovate-elliptic, 2.3–4 × 1.9–3.3 cm, inner pair broadly spatulate, broadly obovate or orbicular-obovate, 2.2–4.3 × 2.2–4.1 cm. *Female flowers*: bracteoles absent; tepals same orientation and colour as males, outer two elliptic to broadly obovate, 1.9–2.5 × 1.8–2 cm, inner three broadly spatulate to broadly obovate, 1.8–3 × 1.8–3.2 cm; ovary body obovoid, 1.1–1.4 × 0.6–1.1 cm, wings usually all rib-like, occasionally unequally 3-winged; styles bifid, branches ± erect, stigmatic papillae arranged in a once-spiralled band. *Seeds* not examined.

Phenology. Flowering in January and February.

Distribution and habitat. Known only from two semi-arid mountaintops in Bolivia. It occurs on Cerro Chataquilla, near the town of Sucre (Chuquisaca) and at Parque Nacional Torotoro (Potosí) (see **Fig. 2**). The variety is locally common between 3300 and 3670 m and grows in full sun in open areas or in slightly more sheltered locations next to large rocks or large rosettes of *Puya*. Photographs of the variety and its habitat taken at Cerro Chataquilla appear in Tebbitt (2014), and photographs of the variety taken at Torotoro appear in Lara Rico & Huaylla Limachi (2008).

Additional specimens examined. BOLIVIA. **Chuquisaca**: Prov. Oropeza, Cerro Chataquilla between Punilla and Chaunaca, 3600 m, 24 ii 1996, *J. R. I. Wood* 10779 (K); Prov. Oropeza, Cerro Chataquilla,

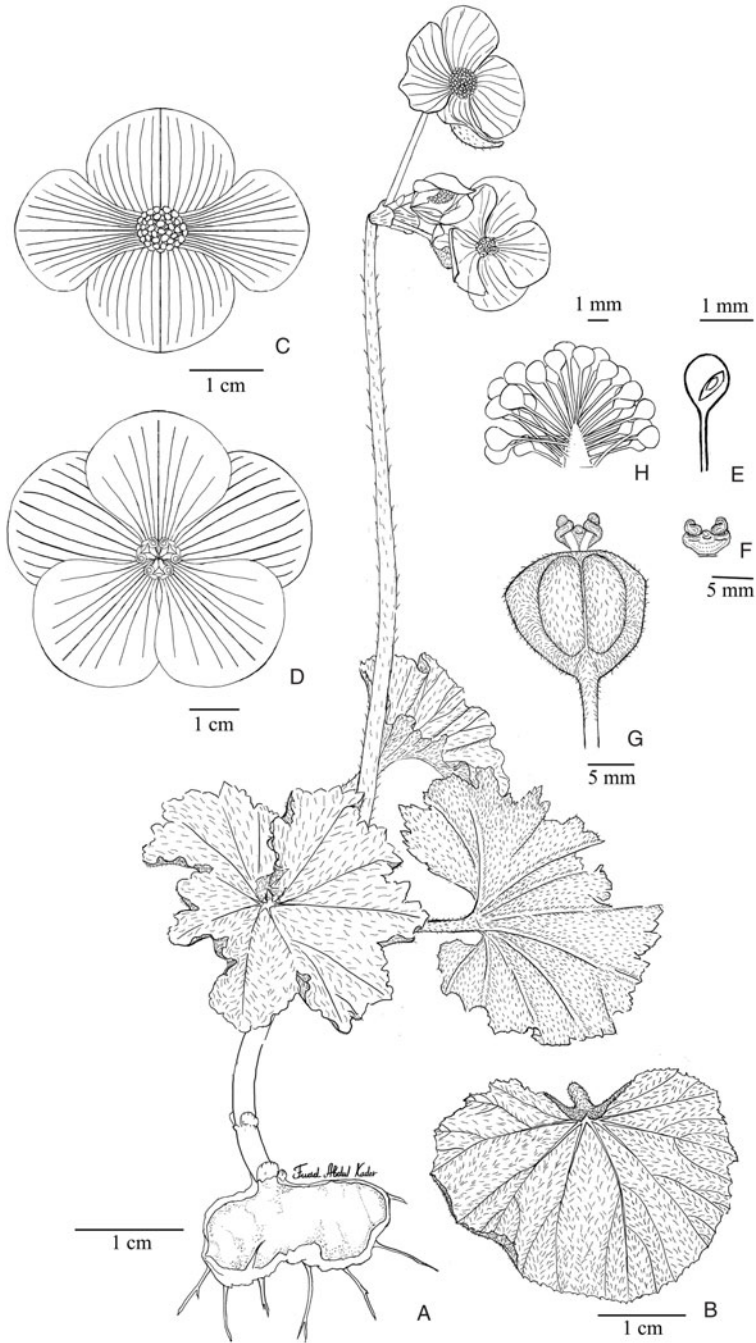


FIG. 3. *Begonia veitchii* Hook.f. var. *lanatifolia* Tebbitt. A, Habit; B, leaf (upper surface); C, male flower; D, female flower; E, stamen (side view); F, style and stigma; G, ovary; H, androecium (lateral section). (Drawn by Fuad Abdulkader, based on Tebbitt 738).

18°58'S, 65°24'W, 3670 m, 4 i 2013, *M. C. Tebbitt* 739 (USZ); Prov. Oropeza, Summit area of Cerro Chataquila, 18°59'S, 65°24'W, 3607 m, 4 i 2013, *M. C. Tebbitt* 738 (USZ).

In typical open habitat locations plants of *Begonia veitchii* var. *lanatifolia* are very distinct. They lack an aerial stem and have a dense cover of lanate hairs on the leaf undersurfaces, petioles and ovaries, whereas the upper portion of the stem, peduncles and outer surfaces of the tepals have a moderate cover of short white hairs. These hairs become brown when handled or when the plant is pressed, and probably protect the plant from the high levels of ultraviolet radiation found on its mountaintop habitat. These plants, growing in exposed conditions, are also distinguished from all other variants of *Begonia veitchii* in having all three of their ovary wings reduced to ribs. Occasionally, however, plants may be found growing in less exposed situations, in the shelter of large boulders, and then they can sometimes have an aerial stem up to 30 cm tall, and their leaf undersurfaces, petioles and ovaries are either lanate or the leaf undersurfaces and petioles have only a moderate cover of short white hairs and the other plant surfaces are sparsely pubescent or glabrous. Likewise, in such sheltered situations the ovary wings may be either rib-like or fully formed. Even though plants in sheltered locations are relatively similar to *Begonia veitchii* var. *veitchii*, even these can be distinguished either by having a lanate covering of hairs on their leaf undersurfaces or by having rib-like wings.

4. *Begonia veitchii* var. *machupicchuensis* Tebbitt, var. nov.

Begonia veitchii var. *machupicchuensis* is distinguished from other infraspecific taxa of *B. veitchii* Hook.f. var. *veitchii* in having forward-projecting tepals and a somewhat tubular perianth, its inner pair of tepals of male flowers each folded together lengthways for a short distance from the centre of the apex, and usually smaller male tepals (1.5–2 cm wide versus 1.9–4.1 cm wide). – Type: Perú, Cusco Region, Cusco Department, Prov. La Convencion, Santa Teresa District, Road from Santa Theresa, overlooking hydroelectric station, 13°08'S, 72°35'W, 1615 m, 7 i 2015, *M. C. Tebbitt* 802 (holo MOL!, iso E!). **Fig. 4.**

Acaulescent or occasionally caulescent herb, aerial stem when present to 35 cm tall; upper portion of stem, leaf undersurfaces and petioles tomentose, ovaries, peduncles and outer surfaces of tepals usually glabrous. *Leaves*: blade transversely reniform-orbicular to orbicular, 6–10.5 × 11–19 cm, margin with triangular lobes, lobes 0.5–2 cm deep. *Male flowers*: tepals projecting forwards and perianth somewhat tubular, scarlet, outer pair narrowly ovate to ovate and slightly concave, 1.7–2.7 × 1.5–1.8 cm, inner pair obovate with the two sides folded together for a short distance from the centre of the apex, 2–3.1 × 1.5–2 cm. *Female flowers*: bracteoles absent; tepals same orientation and colour as males, outer two narrowly ovate to ovate, 1.1–1.9 × 0.8–1.3 cm, inner three oblong-elliptic, 1.8–2.5 × 1–1.2 cm; ovary body ellipsoid or obovoid to broadly obovoid, 0.7–1.4 × 0.7–1.2 cm, unequally 3-winged, wings never reduced to ribs; styles bifid, branches erect, stigmatic papillae arranged in a once-spiralled band. *Seeds* not examined.

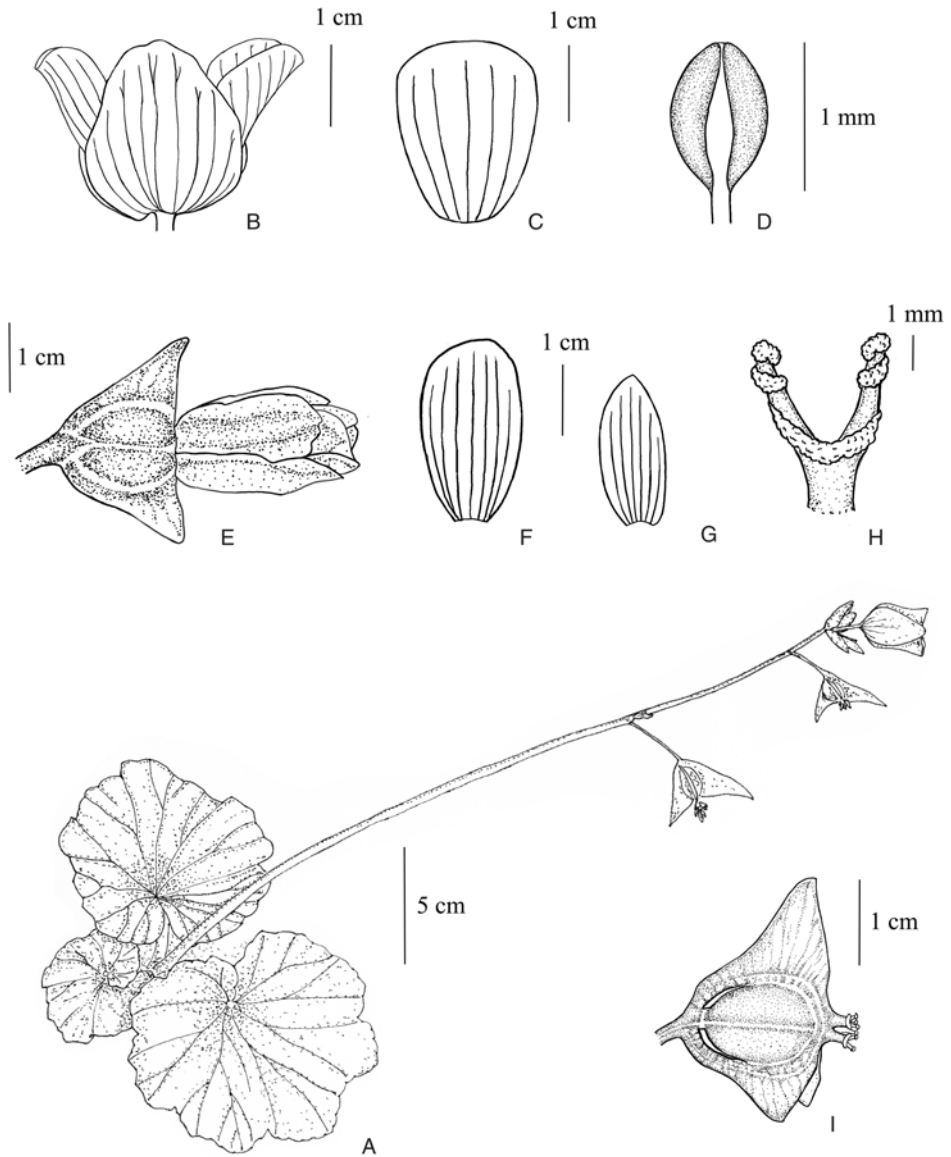


FIG. 4. *Begonia veitchii* var. *machupicchuensis* Tebbitt. A, Habit; B, male flower (side view); C, inner male tepal (flattened), D, stamen (front view); E, female flower (side view); F, outer female tepal; G, inner female tepal; H, style and stigmas; I, mature dehiscent fruit. (A drawn by Mark Tebbitt, based on Tebbitt 802; B–I drawn by Fuad Abdulkader, based on Tebbitt 802.)

Phenology. Flowering September to early March, with a peak from November to January.

Distribution and habitat. *Begonia veitchii* var. *machupicchuensis* is a narrow endemic restricted to the vicinity of the archeological site of Machu Picchu (La Convención and Urubamba Provinces of Cusco Department), Peru (see Fig. 2). It occurs both at Machu Picchu and on the surrounding mountains, where it is locally common at an altitude of 1445 to 3400 m. This variety often grows on open rocky banks and in the fissures of natural rock outcrops and ancient stonework (see front cover of *The Begonian* vol. 50 [July to August] 1983), but it is also found on grassy slopes and sometimes in primary or secondary forest with *Alnus acuminata* Kunth, *Citharexylum* B.Juss., *Clethra* L., *Escallonia* Mutis ex. L.f. and *Podocarpus* L'Hér. ex Pers.

Additional specimens examined. PERU. **Cusco:** Prov. La Convención, Santa Teresa District, Road from Santa Maria to Santa Theresa, c.4–5 km from Santa Maria, 13°04'S, 72°37'W, 1445 m, 6 i 2015, M. C. Tebbitt 801 (E, MOL); La Convención, Dist. Santa Teresa, Puente Carrilluchayoc, 13°09'S, 72°34'W, 1980 m, 19 i 2008, J. Farfán & V. Chama 1946 (MO); Prov. La Convención, Ruinas incasicas de Machupic, 2300 m, 30 ix 1937, C. Vargas C. 536 (CUZ, F); Prov. Urubamba, Dist. Machu Picchu, Pampacahua, 13°07'S, 72°16'W, 2465 m, 24 i 2005, L. Valenzuela, E. Suclli. J. Farfán, V. Chama & N. Anaya 4778 (MO); Prov. Urubamba, Machu Picchu, 2300 m, 6 xi 1984, *Exp. Cient. Univ. Varsovia Polonia* 7 (USM); Prov. Urubamba, along trail to ruins of Machu Picchu, 2300 m, 24 ix 1936, J. West 8025 (GH, MO); Valle de Urubamba, Macchupicchu, F. L. Herrera 3275 (US); Prov. Urubamba, Macchu Pichu, 1970 m, 12 xi 1937, D. Stafford 1065 (BM, K); Prov. Urubamba, Macchu Pichu, near Cuzco, 2400 m, 18 xi 1947, R. Ferreyra 2679 (F, GH, MO, US [2], USM); Prov. Urubamba, Machu Pichu, a 107 km de Cusco, 13°09'S, 72°31'W, 2900 m, 26 x 1987, P. Núñez 8411 (MO); Prov. Urubamba, alrededores de Machu Picchu, top part of Inca Ruins and between stones of some walls, 2600 m, 17 ix 1959, H. G. Barclay 9276 (MO).

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