



Taxonomic notes on the Philippine endemic *Begonia colorata* (Begoniaceae, section *Petermannia*)

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Abstract

Recent exploration in Mt. Ararat, Bayugan City, Agusan del Sur resulted in a collection initially identified as *Begonia bolsteri*, a poorly known Philippine endemic species first described over a century ago. Examination of the types of this species and the type of *B. colorata* led us to the conclusion that these names represent the same taxon, and we place them in synonymy under the earlier name of *B. colorata* and designate lectotypes for both names. In this paper, we provide a comprehensive description for the species and photographs to facilitate easy identification.

Keywords: Agusan del Sur, Mindanao, taxonomy, tropical botany, typification

Introduction

Begonia Linnaeus (1753: 1056), is comprised of 1,899 species distributed in tropical and subtropical regions of the world (Tebbutt 2005; Hughes *et al.* 2015–). With 132 species recorded, the Philippines is one of the centers of *Begonia* species diversity (Hughes 2008; Rubite 2013; Hughes *et al.* 2015–). *Begonia* sect. *Petermannia* (Klotzsch 1854) de Candolle (1859: 128) is the most species-rich section in Asia with currently 416 known species (Moonlight *et al.* 2018), with 65 species recorded so far under this section for the Philippines (Rubite 2013; Hughes *et al.* 2015–). Members of this section are characterized by a usually cane-like habit, protogynous inflorescences, and pistillate flowers with three-locular ovaries each with a bilamellate placenta (Lin *et al.* 2017).

Materials of an interesting *Begonia* belonging to the diverse sect. *Petermannia* were collected during an excursion by the first two authors in the province of Agusan del Sur, island of Mindanao, Philippines in March 2018. After examination of its morphology and comparison with protologues and digitized type specimens of *Begonia* sect. *Petermannia* species from the Philippines, we found it matched with *Begonia bolsteri* Merrill (1911: 387). This discovery prompted us to update the description for this species, provide photographs to aid identification and to provide updated information on its geographical distribution. Our investigation caused us to notice the similarity between *B. bolsteri* and a species currently in *Begonia* sect. *Baryandra* de Candolle (1859: 122), *B. colorata* Warburg (1904: 51), which is known only from the type gathering. Although *B. colorata* was previously placed in *Begonia* sect. *Diploclinium* (Lindley 1846: 319) de Candolle (1859: 129) (Doorenbos *et al.* 1998; Hughes 2008) and recently included in a recircumscription of *Begonia* sect. *Baryandra* de Candolle (1859: 122) (Rubite *et al.* 2013), examination of the type and protologue shows this to be erroneous, and that it belongs in sect. *Petermannia* and is actually synonymous with the later described *B. bolsteri*. We can find no characters to uphold *B. bolsteri* and *B. colorata* as separate species, and here put them in synonymy, with the earlier name *B. colorata* taking priority and becoming the accepted name.

Materials and methods

Fresh plant materials were collected during botanical excursions in March 2018 at Agusan del Sur, island of Mindanao, Philippines. The specimen was deposited in University of Santo Tomas Herbarium (USTH). The descriptions of vegetative and reproductive characters are based on living plants, spirit collection of flowers and dried herbarium specimens. The species description follows the style of Rubite (2013) and Peng *et al.* (2017), and using plant terminology of Beentje (2010).

Taxonomic treatment

Begonia colorata Warburg (1904: 51). Type:—PHILIPPINES. Mindanao, Sibulan, July 1888, Warburg 14633 (lectotype B[B100238148!] designated here) Fig. 1.

= *Begonia bolsteri* Merr. (1911: 387) *syn. nov.* Type:—PHILIPPINES. Mindanao, Province of Surigao, in damp shaded places, elev. 75 m, April 1906, *Bolster 310* (lectotype B[100238109!], designated here; isoelectotypes K[000761015!], PNH [112576-image!], US [00115258-image!]).

Plant perennial, monoecious, terrestrial. **Stem** unbranched, erect at the apex, lower portion repent, rooting at the nodes, maroon, 15–30 cm tall by 0.3–0.5 cm in diameter, glabrous. **Stipules** oblong–obovate, 0.7–1 cm long, reddish brown, membranaceous, apex acuminate. **Leaves** alternate; **petiole** 6–13 cm long, succulent, terete, red; **lamina** oblong ovate to narrowly ovate, 5.5–8 cm × 2–5 cm, inequilateral, slightly membranaceous, dull green with distinct pale grey green stripes at the midrib, sometimes lacking the pale variegation and having a dark mottled pattern, base obliquely cordate, both lobes rounded, apex attenuate to acuminate, margin irregularly and coarsely dentate, ciliate; **venation** palmate–pinnate, midrib prominent, *ca.* 3 major lateral veins on the either side of the midrib, other primary veins branching dichotomously. **Inflorescences** terminal or axillary, 4–5 cm long, few-flowered, female flowers basal, male flowers distal; **peduncle** maroon, 3–4.5 cm × 1.5–2 cm; **bracts** membranaceous, lanceolate, 0.5–0.8 cm × 0.2–0.3 cm, apex acuminate. **Staminate flowers** pink; **pedicels** 5–8 mm long, glabrous; **tepals** 2, orbicular to reniform, 4.5–5 mm × 5–6 mm, apex obtusely rounded, the **stamens** 20–25; **anthers** narrowly obovoid, 0.8–1 mm long, apex obtuse, filaments 1–1.5 mm long. **Pistillate flowers** pink; **pedicel** 5–10 cm long, glabrous; **tepals** 5, broadly ovate, 7–8 mm × 5 mm, margin entire, apex obtuse; **ovary** trigonous–ellipsoid, pink with greenish coloration, 1–1.2 cm × 0.4–0.5 cm (wings excluded), 3-locular, placentation axile; 3-winged, wings equal, rounded to triangular, 10–12 mm × 5–6 mm; **styles** 3, golden yellow, *ca.* 4–5 mm long, bifid, apically forked; **stigmas** in a spiral band and papillose all around. **Capsule** recurved horizontally, pedicel 1–1.1 cm long, capsule 10–13 mm × 5–6 mm (wings excluded), glabrous.

Distribution:—PHILIPPINES. Biliran, Mindanao, Luzon, Visayas (Pelser *et al.* 2011; Hughes *et al.* 2015–), Fig. 2.

Ecology:—Growing in damp areas under a semi-open to closed canopy in primary and secondary forest at an elevation of 75–700 m asl.

Phenology:—Observed flowering and fruiting in the field from March to April.

Proposed conservation status:—There are nine localities known for this species, including the historic type localities, with each locality have a single population in a limited area, giving an area of occupancy of <<20 km². These populations are prone to the effects of anthropogenic activities such as grazing and conversion of forest land to agriculture. Following the Red List criteria of the IUCN Standards and Petitions Subcommittee (2017), *Begonia colorata* is hereby proposed as “Vulnerable” (VU D2).

Additional specimens examined:—PHILIPPINES. **Mindanao:** Agusan del Sur, Bayugan City, Mt. Ararat, 603 m, 28 March 2018, *Naive & Alejandro 001/2018* (USTH); Agusan del Norte, Cabadbaran, 870 m, 18 December 2007, *Rubite 491* (HAST); Agusan del Norte, Mt. Babasalon, 950 m, 7 August 2006, *Rubite 320* (HAST); Surigao Province, April 1918, *Ramos 34458* (B[100238108], BM, K, P, US[00328373]); Surigao Province, April 1925, *Wenzel 3230* (K). **Visayas:** Leyte Province, Cabalian, May 1922, *Lopez 40807* (P, US[00328374]). **Biliran:** Biliran, June 1914, *McGregor 18796*, (US[00328376]). **Luzon:** Sorsogon, Mt. Bulusan, April 1916, *Elmer 15886* (BM, BO, K, L, US[00328375]).

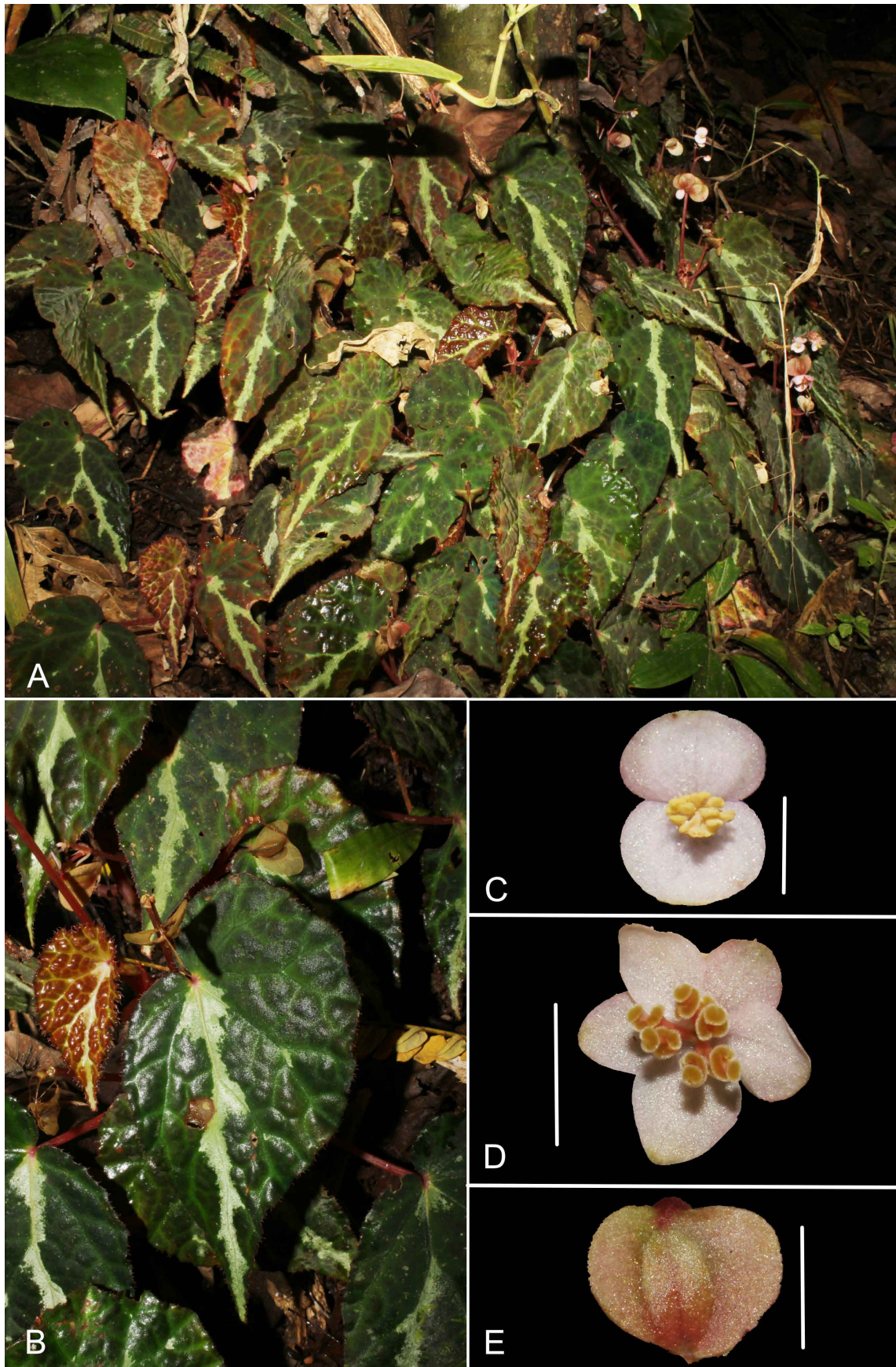


FIGURE 1. *Begonia colorata* Warb. A, Habit; B, Detail of leaf; C, Staminate flower, scale bar 5 mm; D, Pistillate flower, scale bar 5 mm; E, Capsule, scale bar 1 cm. Photos by MAK Naive.

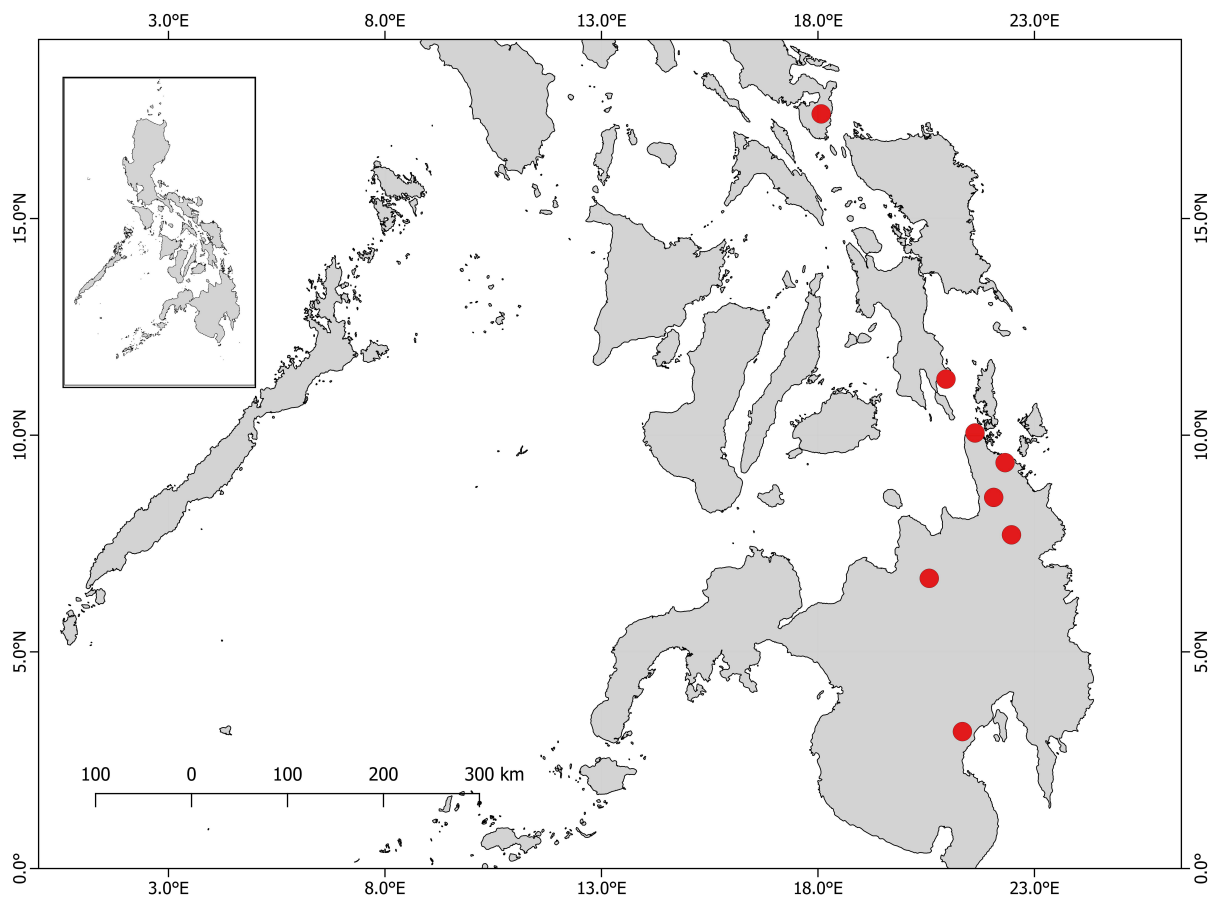


FIGURE 2. Map showing the distribution of *Begonia colorata* across the Philippine archipelago.

Notes:—Currently only a single sheet of the type collection of *B. colorata* made by Warburg in Sibulan is known, however we lectotypify on that sheet here as no holotype was made explicit by Warburg, and other duplicates may yet surface. *Begonia bolsteri* was described by Merrill based on the material collected by Bolster (*Bolsteri* 310) in Surigao Province, Mindanao, of which four syntypes are known (Hughes *et al.* 2015–). Although the sheet in PNH has a ‘type’ label and the species name written in Merrill’s handwriting, following McNeill (2014) this does not count as a designation of a holotype. We take this opportunity to designate the sheet with most fertile material in Berlin as the lectotype of *B. bolsteri*.

In his description, Warburg described *B. colorata* as having a few-flowered terminal inflorescence (*inflorescentiis paucifloris ut videtur terminalibus*), with the male and female flowers separated (*♂ et ♀ separatis*) with the male flowers having two tepals (*sepalis 2 petalis ut videtur 0*). These three characters place the species firmly in sect. *Petermannia*. The leaves are described as ‘*coloratis*’, and from the type specimen the colours Warburg is referring to appear as a mottled pale background with dark patches, with a paler strip down the midrib, which is the same pattern seen on the type of *B. bolsteri*. The slightly sinuate, ciliate leaf margin is also a match between the two types, as is the fruit shape with rounded wings. Our examination of all available material supports our decision to put *B. bolsteri* in synonymy with *B. colorata*, and to change the sectional placement to sect. *Petermannia*.

Acknowledgements

Mark Lloyd Dapar and family are acknowledged for their hospitality during the fieldwork, Krizler C. Tanalgo is thanked for doing the distribution map, and Dr. Luisito T. Evangelista of Philippine National Museum for providing us information on the *Begonia bolsteri* type held at PNH. The first author wishes to thank the Department of Science and Technology—Science Education Institute (DOST SEI) and Department of Science and Technology—Accelerated Science and Technology Human Resource Development Program (DOST-ASTHRPD) for his scholarship grant. The second author is grateful to Philippine Institute of Traditional and Alternative Health Care—Department of Health

(PITAHC-DOH) for the research grant. The Royal Botanic Garden Edinburgh is supported by the Scottish Government's Rural and Environment Research and Analysis Directorate.

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