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Begonia cinnabarina (Begoniaceae): taxonomic clarifications, morphology and distribution; with emphasis on material from Argentina

Begonia cinnabarina (Begoniaceae): aclaraciones taxonómicas, morfología y distribución; con énfasis en material de Argentina

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ABSTRACT

The current work aims to expand the knowledge on *Begonia cinnabarina* in Argentina through a morphological description, data about its geographical distribution and habitat, including photos, line drawings, and a map. In addition, is provided a key to differentiate *B. cinnabarina* from morphologically similar species of northwestern Argentina.

Keywords — Argentine flora; Salta; South America; taxonomy.

RESUMEN

El presente trabajo tiene como objetivo ampliar el conocimiento sobre *Begonia cinnabarina* en Argentina a través de una descripción morfológica, datos de su distribución geográfica y el hábitat que ocupa, incluyendo fotografías, dibujos y un mapa. Además, se provee de una clave para diferenciar *B. cinnabarina* de las especies morfológicamente similares del noroeste argentino.

Palabras clave — Flora argentina; Salta; Sudamérica; taxonomía.

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INTRODUCTION

Begonia L. is one of the largest genera of flowering plants, containing a little over 2,000 species, with its taxa widely distributed in tropical and subtropical regions of the Americas, Africa and Asia (Hughes *et al*., 2015). Zuloaga *et al*. (2008) and Delfini (2017) recognize 16 species from Argentina. More recently, *B. veitchii* Hook. f. was added to the flora based on a new record from Salta Province (Tebbitt *et al*., 2019). The Argentinian records of *B. tominana* Golding (currently treated as a synonym of *B. veitchii* [Tebbitt *et al*., 2019]) from Jujuy and Tucumán Provinces (Zuloaga *et al*., 2008; Delfini, 2017) represent misidentifications of *B. micranthera* (Tebbitt *et al.*, 2019). On the other hand, the taxonomic status of two taxa that were also recently revised resulted in the recognition of two additional current species from Argentina: *B. micranthera* Griseb. var. *fimbriata* L.B. Sm. & B.G. Schub. was synonymized with *B. cinnabarina* Hook. (Tebbitt *et al*., 2018a) and *B. parodiana* L.B. Sm. & B.G. Schub. was synonymized within *B. wollnyi* Herzog (Tebbitt *et. al*., 2018b). All three species mentioned above (i.e. *B. veitchii*, *B. cinnabarina*, and *B. wollnyi*) are restricted to Salta Province within Argentina and they remain poorly studied in that area.

Tebbitt *et al*. (2018a) observed velutinous stems, leaves and peduncles, ovate leaf blades with crenately toothed margins and orange perianths on the type material of *B. micranthera* var. *fimbriata* that allowed them to synonymize this taxon with *B. cinnabarina*. In addition, the species was erroneously reported for the flora of Peru by Smith and Schubert (1941b) since the author considered *B. clarkei* Hook. f. a synonym of *B. cinnabarina*. Years later, Smith & Wasshausen (1984) recognized that *B. clarkei* was a different species from *B. cinnabarina*.

Begonia cinnabarina is a distinctive and attractive species has been widely used as an ornamental plant (Hurtado & Moraes, 2010) and historical parent of several interspecific hybrid cultivars (Tebbitt, 2020). It was originally thought to be endemic to Bolivia (Hooker, 1849). However, since *B. micranthera* var. *fimbriata* was recognized as a synonym of *B. cinnabarina*, this species currently reaches a more southern distribution in Argentina's Salta Province.

In addition to *B. cinnabarina*, six additional species inhabit northwestern Argentina in the province of Salta: the tuberous *B. boliviensis* A. DC., *B. micranthera*, and *B. veitchii*, along with rhizomatous species *B. rubricaulis* Hook. (a geophytic species), *B. wollnyi* and *B. cucullata* Willd. (two non-geophytic species).

The current work aims to expand the knowledge of *B. cinnabarina* in Argentina through an update of its morphological description, geographical distribution, and habitat. It includes photos, illustrations, and a key to morphologically similar species in northwestern Argentina.

MATERIALS AND METHODS

The morphological characters of our own field collections deposited in the LIL herbarium were analyzed, as well as those of the following specimens housed in the F, GH, LIL, MO and UC herbaria.

RESULTS
Taxonomic treatment

Begonia cinnabarina Hook. Bot. Mag. 75, pl. 4483. 1849. (Lectotype: Plate 4483 [as tab.] in W. J. Hooker, Bot. Mag. 75: tab. 4483,1849, designated by Tebbitt *et al*. (2018a) (Figs. 1 and 2).

Begonia aurantiaca hort. ex Planchon, Fl. Serres Jard. Eur. I., 5: 530, pl. 1849, pro syn. *Begonia cinnabarina* Hook., 1849.

Begonia micranthera Grisebach var. *fimbriata* L.B. Smith & B.G. Schub. Darwiniana 5: 98, pl. 9, 1941a. Type: ARGENTINA. Prov. Salta, Dpto. Tartagal, hills back of Tartagal, 400 m asl, 23-II-1937, *West 8413* (holotype: GH! [Barcode: GH00068253]; isotypes: MO! [2-sheets: Barcode: MO-1643427 and MO-313008] UC! [Barcode: UC565008]).

Caulescent herbs with a tuberous base, aerial stem ca. 60 cm tall. Stems erect, little branched, flexuous, robust, puberulent. Leaves petiolate with petioles 8-17 cm long; stipules ovate with apex acuminate; leaf laminas oblique, ovate or subreniform, 10-20 cm long, palmately veined, obtuse, lobed, crenate-serrate, pubescent; Inflorescences with peduncles robust, axillary, 20 cm long, reddish-green or green, 2-6 flowered. Bracts elliptical, 15-18 mm long with apex acute. Staminal flowers with tepals 4, usually obovate, apex rounded to truncate, ca. 25 mm long, never exceeding twice their width, orange-red. Stamens very numerous, free or united in a low torus, anthers short and wide. Pistillate flowers with tepals 5, usually obovate, 25-30 mm long, orange-red; styles 3, bipartite, linear, spiral, with continuous stigmatic tissue; ovary with bilamellar placenta. Capsules very unevenly three-winged, with two narrowly marginiform wings, the third one subdeltoid.

Studied Material.— ARGENTINA. Prov. Salta, Dpto. Orán, La Maroma, 23-I-1945, *Pierotti 57* (LIL); Las Tabillas, camino de Vespucio a San Pedrito, without date, *Schreiter 10886* (F, GH, LIL); Dpto. Santa Victoria, Santa Victoria, without date, *Sleumer 3761* (LIL); Quebrada de San Felipe, without date, *Sleumer 3805* (LIL); Ruta Prov. 19, a 4 km de los Toldos camino a Lipeo, without date, *Morrone et al. 3696* (MO); camino de Toldos a Condado, without date, *Legname & Cuezzo 4107* (LIL); camino de Los Toldos al Lipeo a 12 km de Los Toldos, without date, *Legname & Cuezzo 9875* (LIL); Los Toldos, camino a Parque Nacional Baritú, 20-XII-2009, *Andrada 75* (LIL); Camino de los Toldos a Lipeo, por una senda a la derecha, por el viejo camino a 5 km del Lipeo, 1300 m asl, 10-XII-1973, *Legname & Cuezzo 9865c* (LIL).

Additional studied material from Bolivia.— Bolivia, Dpto. Chuquisaca, Prov. Azurduy, 20°08'S, 064°20'W, 2612 m asl, 10-I-2004, *Huaylla & Guachalla 654* (HS, MO); Prov. Belisario Boeto, 19°07'S 64°13'W, 1684 m asl 23-XII-2008, *Portal*, *Cervantes & Huaylla 878* (HSB, MA, MO); Prov. Hernando Siles, 19°55'S 64°13'W, 1676 m asl, 27-XII-2007, *Nina 29* (HSB, MO); Prov. Luis Calvo, 19°09'S 63°51'W, 1552 m asl, 22-XII-2003, *Carretero, Huaylla, Lozano & Lliully 1150* (HSB, MO); Prov. Sud Cinti, 20°46'S 64°34'W, 2702 m asl, 12-II-2004, *Gutiérrez, Huaylla, Lliully, León, Guachalla*

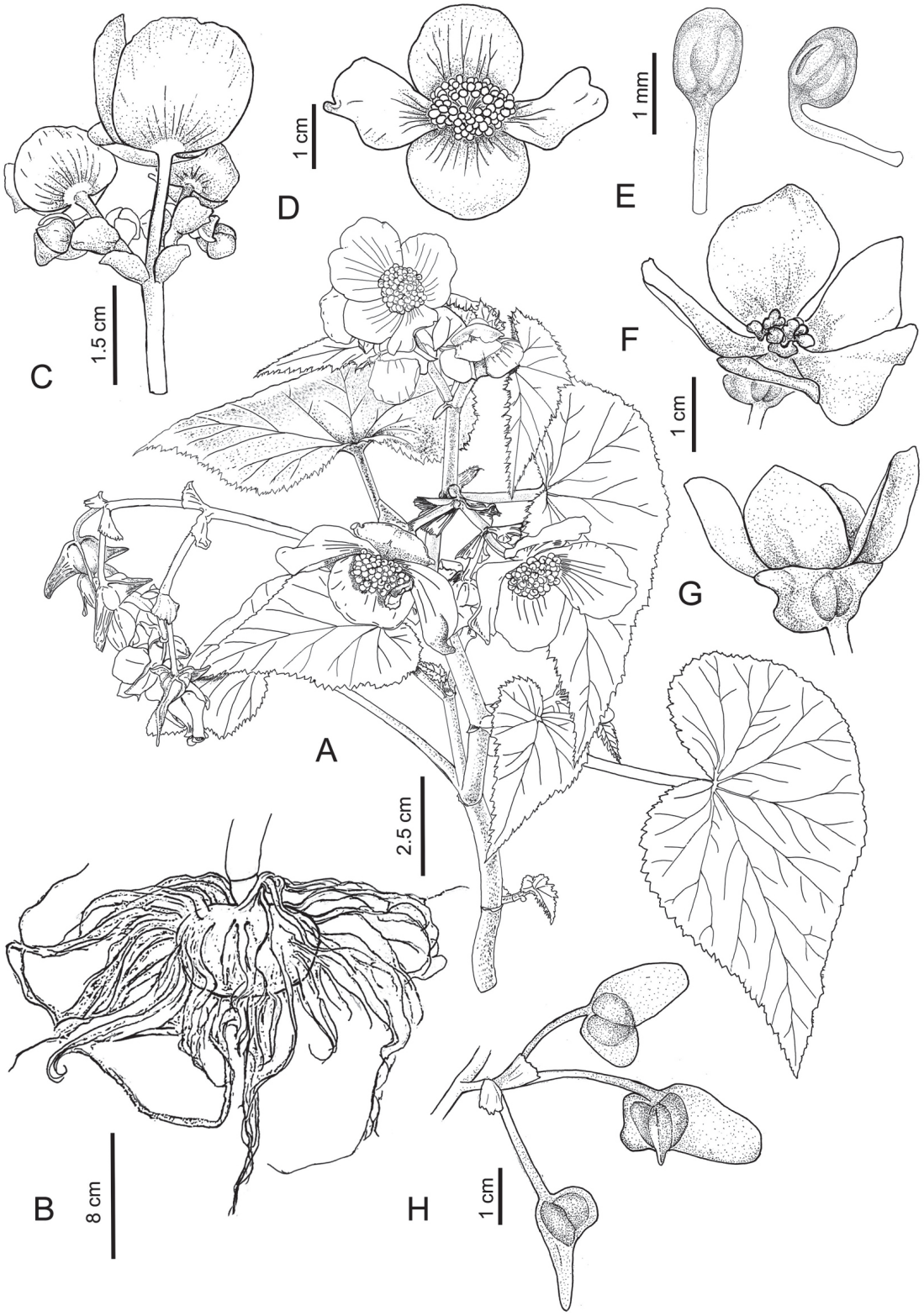

Fig. 1. *Begonia cinnabarina*. A) Plant, terminal part. B) Tuberous base. C) Inflorescence, top view. D) Staminal flower. E) Stamens. F) Pistillate flower. G) Pistillate flower, side view. H) Inflorescence with fruits. (A-B and H, drawn by Alberto Gutiérrez; C-G drawn by Lelia Bordón).

Fig. 2. *Begonia cinnabarina*. A) Plant. B) Inflorescence with pistillate flowers. C) Pistillate flower, front view. D) Pistillate flower, side view. E) Inflorescence with staminal flowers. F) Staminal flower, front view. G) Inflorescence with flowers and fruits. H) Fruit detail. Photos by Alberto Slanis. A, scale = 3 cm; B-H, scale = 1 cm.

& Portal 594 (HSB, MO, NOLS); Prov. Tomina, 19°25'S 64°11'W, 2398 m asl, 21-XII-2005, *Serrano, Villalobos, Lliully, Peñaranda & Lozano 6801* (HSB, MA, MO, NOLS); Dpto. Santa Cruz, Prov. Vallegrande, 18°39'S 63°57'W, 2066 m asl, 06-I-2012, *Tebbitt 705* (USZ); Dpto. Tarija, Prov. Méndez, 21°07'S 64°54'W, 2700 – 3000 m asl, 17-II-2007, *Linneo 924* (MO, NOLS, USZ); Prov. O'Connor, 21°24'S 64°16'W, 0 - 1822 m asl, 14-I-2008, *Villalobos, Portal & Cervantes 1300* (HSB, MA, MO).

Observations.— Type: based on cultivated material collected as seeds by Thomas Bridges in Bolivia and cultivated by Edward Henderson at Pine Apple Place Nursery, London (no material preserved).

In the field, *Begonia cinnabarina* has been observed to hybridize with *B. boliviensis* and *B. micranthera*. The hybrid plants *B. cinnabarina* x *B. boliviensis* located near Los Toldos (Dpto. Santa Victoria, Salta province) presented pubescent leaves that are narrowly ovate and twice longer than wide, and intense orange-red flowers similar to these of *B. cinnabarina*. The hybrid *B. cinnabarina* x *B. micranthera* located near Orán (Dpto. Orán, Salta province) displayed a similar appearance to that of *B. micranthera* but its flowers were different shades of orange-red to almost white.

Key to the species of *Begonia* of northwestern Argentina

Species included in this key are geophytic and caudiciform herbs

1 Stamens united in an elongated column; tepals up to three times their width, apex acute or acuminate ..... *B. boliviensis*
1' Stamens free or united in a low torus; tepals never exceeding twice their width, apex rounded to truncate 2
2 Aerial stem absent 3
2' Aerial stem present 4
3 Styles with 2 branches and stigmas continuous or quasi-continuous .... *B. veitchii*
3' Style multiple-forked and stigmas capitate at their ends ..... *B. rubricaulis*
4 Inflorescence many-flowered; leaves with deep, lanceolate or triangular lanceolate lobes ..... *B. wollnyi*
4' Inflorescence 2 to many-flowered, leaves lacking deep lobes 5
5 Leaf margins shallowly lobed, serrate; tepals yellow, white, pinkish-white or deep pink ..... *B. micranthera*
5' Leaf margins crenate-serrate; tepals orange-red ..... *B. cinnabarina*

Phenology

In northwestern Argentina, *B. cinnabarina* blooms from mid-December to early March, coinciding with the time of greatest rainfall.

Distribution and habitat

Begonia cinnabarina is a native species of Bolivia and northwestern Argentina. In Argentina, this species is found in northern Salta (Santa Victoria and General José de San Martín departments), as well as in the border area between Iruya and Orán departments) and occurs from 1400 to 2500 m asl (Fig. 3). This plant grows in secondary forests dominated by *Podocarpus parlatorei* Pilg. (Podocarpaceae), *Alnus*

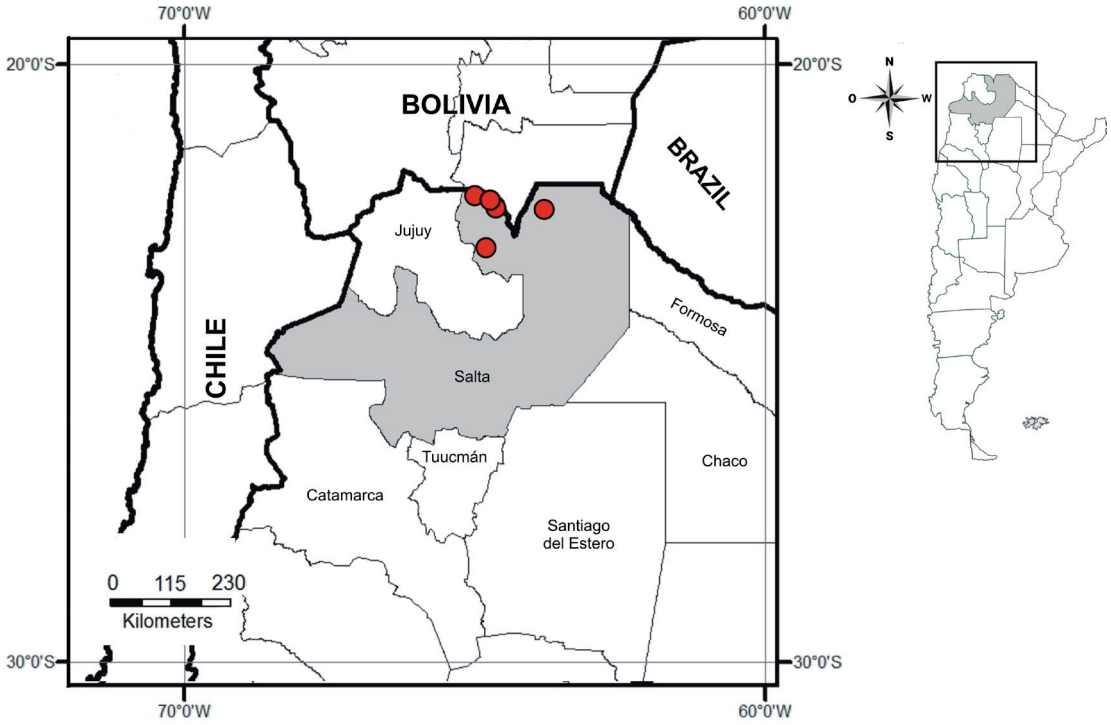

Fig. 3. Map showing the geographical distribution of *Begonia cinnabarina* in Argentina.

acuminata Kunth (Betulaceae) and *Juglans australis* Griseb. (Juglandaceae) as a result of human activities (crop and pasture burning) occurring several decades ago. This area belongs to a sector of the Montane Forest belonging to the phytogeographic province of Las Yungas or Tucumano-Boliviano forest (cloudy forest). It may represent a stable forest sector since it has a high number of species of vascular plants that are not found in other areas of Montane Forest farther south (Brown & Ramadori, 1989). *B. cinnabarina* occurs on moist, silty-sandy soils along the banks of rivers or streams, and often shares its habitat with *B. boliviensis* and *B. micranthera*.

In Bolivia, it is widely distributed, occurring in mountainous regions from 840 to 2900 m asl throughout the humid montane region (Tebbitt, 2020). It is very abundant in the South of Santa Cruz Department (particularly around Vallegrande), and is distributed southwards from there, through the central part of Chuquisaca Department (in the provinces of Azurduy, Belisario Boeto, Hernando Siles and Luis Calvo), to the south of Tarija Department (in the provinces of Eustaquio Méndez and Burdet O'Connor).

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