

Callicarpa gonzalezgomezii (Lamiaceae): a new species from Cuba

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Abstract. *Callicarpa gonzalezgomezii* sp. nov. (Lamiaceae) is described from the ultramafic soils of northern Holguín Province, Cuba. It is closely related to *C. gibaroana*, from which it differs in its shorter petioles and smaller leaf blades with obtuse to rounded apex and adaxial surface glossy in fresh material; tomentose-ferruginous indumentum on young branches, petioles, peduncles and calyxes; pale magenta to lilac corolla (sometimes with blue hues); and in growing on serpentine soils. Its known distribution is limited to the municipality Rafael Freyre, and it is classified as ‘Critically Endangered’ according to its preliminary IUCN assessment. Illustrations and an identification key to all 24 currently recognized Cuban species of *Callicarpa* are provided.

Keywords. Endemism, flora of Cuba, taxonomy, threatened plants, serpentine outcrops.

Resumen. Se describe *Callicarpa gonzalezgomezii* sp. nov. (Lamiaceae), de los núcleos con suelos ultramáficos ubicados al norte de la provincia Holguín, Cuba. La nueva especie es afín a *C. gibaroana* de la cual difiere por tener peciolo más cortos y hojas más pequeñas; el ápice obtuso; el haz brillante en material fresco; indumento ferrugíneo-tomentoso en ramas jóvenes, peciolo, pedúnculos y cáliz; corola magenta claro a lila (a veces con tonalidades azules) y porque crece en suelos serpentínicos. Su distribución conocida está limitada al municipio Rafael Freyre y, de acuerdo con los parámetros establecidos por la IUCN, se clasifica de forma preliminar como en ‘Peligro Crítico’ de extinción. Se presentan, además, ilustraciones y una clave para la identificación de las 24 especies de *Callicarpa* cubanas actualmente reconocidas.

Palabras clave. Endemismo, flora de Cuba, núcleos de serpentina, plantas amenazadas, taxonomía.

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INTRODUCTION

The genus *Callicarpa* L. (Lamiaceae Martinov) comprises between 140 and 170 spp., which are found in the tropical and subtropical regions of Asia, the Pacific Islands, the Americas, Australia and Madagascar (Harley & al. 2004; Li & al. 2016). Based on stamen structure, Chang (1951) established two sections in *Callicarpa*: *Callicarpa* sect. *Callicarpa*, which ranges across both the Old and New Worlds. Its species have staminal filaments that are clearly visible outside the corolla tube and ovoid anthers that open via longitudinal slits. The Asian *C.* sect. *Verticirima* H.-T.Chang, whose species have staminal filaments that are included within the corolla tube (only the anthers are slightly exerted), and oblong anthers that open via apical pores.

Callicarpa was traditionally classified in Verbenaceae J.St.-Hil. (Briquet 1897). However, it was later transferred to Lamiaceae by Cantino & al. (1992), along with other genera of cymose Verbenaceae. This viewpoint was also supported by Harley & al. (2004), Li & Olmstead (2017) and Li & al. (2016), among other authors. Phylogenetic studies have revealed the monophyletic origin of *Callicarpa* in relation to other Lamiaceae groups (Cai & al. 2023), which is why it has been segregated as a monogeneric subfamily. Callicarpoideae Bo Li & Olmstead can be distinguished from other Lamiaceae subfamilies by its peltate or capitate stigma and a drupaceous fruit containing four stony pyrenes (Li & Olmstead 2017; Li & al. 2016).

Recent research has revealed that *Callicarpa* originated in eastern and southeastern Asia. Due to multiple dispersal events (some of them long-distance, transoceanic) and vicariance, it then expanded to the areas it currently occupies (Liu & al. 2022; Cai & al. 2023). The New World *Callicarpa* clade appears to be monophyletic in relation to the Old World clade (Cai & al. 2023), comprising ca. 33 spp. (Li & al. 2016). Cuba is an important centre for the diversification of this genus in the New World. Alain (1957) recognised the presence of 20 species of *Callicarpa* in the Cuban archipelago. This number increased with the description of two more species by Borhidi & Muñiz (1977), and a further species by Baró & Herrera (1994). A complete list of the 23 spp. currently recorded in Cuba can be found in Greuter & Rankin (2022) and Méndez (2024).

During our current revision of the genus for the forthcoming edition of the *Flora de la República de Cuba* (Méndez Santos & al. in prep.), we found some specimens displaying characteristics that distinguished them from all species of *Callicarpa* known to date. A critical examination of these specimens, alongside a study of the relevant literature, revealed that they are morphologically close to *C. gibaroana* Baró & P.Herrera, particularly with regard to their leaves, which are smaller than those of other Cuban species. However, they differ in other characters relating to aspects of leaf morphology, i.e., the indumentum on different parts of the plant, corolla colour, and habitat. These differences, which will be discussed below, led us to describe a new species based on the aforementioned specimens. Furthermore, the last identification key for Cuban species of *Callicarpa*, which was provided by Alain (1957), is now outdated because it does not include the three species that were subsequently reported by Borhidi & Muñiz (1977) and Baró & Herrera (1994), as well as the new species described here. Consequently, the goal of this article is twofold: first, to describe a new species of *Callicarpa* for the flora of Cuba; and second, to update the analytical key for identifying all the Cuban species.

MATERIAL AND METHODS

Approximately 700 specimens of Cuban species of *Callicarpa* deposited in 15 different herbaria (B, G, GH, GOET, HAC, HACC, HAJB, HIPC, HMC, JE, MO, NY, PAL-Gr, S, and US) were studied. Other specimens were consulted either online or via photographs provided by curators from some of the herbaria. Herbarium codes follow Thiers (2024, continuously updated). The population of the new species of *Callicarpa* from Bahía del Naranjo (Holguín) was studied in the field. Photographs were taken using a Canon 77D DSLR camera. The collected specimens were dried, pressed and prepared as herbarium specimens by conventional methods (Bridson & Forman 1991).

Morphological aspects were evaluated, primarily those relating to the leaf and inflorescence. Details that were not visible to the naked eye were studied using a Wild M5A binocular dissecting microscope at up to 100× magnification. Measurements were taken with a calliper. The species' identity was confirmed by comparing their types and descriptions from protologues with those of the related species, as well as by consulting literature (e.g., Alain 1957; Borhidi & Muniz 1977; Baró & Herrera 1994). The description was prepared by examining all available specimens, and the terminology following Stearn (1992). A distribution map was created with Microsoft Bing Maps (<http://www.bing.com/maps>, ©2025 OpenStreetMap) and then processed with Adobe® Photoshop® CC 2019, based on geographic coordinates taken directly in the field and from the labels of the herbarium specimens.

The preliminary conservation status of the new species was assessed following IUCN Red List Categories and Criteria (IUCN Standards and Petitions Subcommittee 2024). The extent of occurrence (EOO) and the area of occupancy (AOO, a 2 × 2 km grid) were calculated using the online software “GeoCAT” (<http://geocat.kew.org>, Bachman & al. 2011).

RESULTS

Taxonomic treatment

Callicarpa L., Sp. Pl.: 111. 1753. Type: *C. americana* L.

Callicarpa sect. *Callicarpa*

Callicarpa gonzalezgomezii I.E.Méndez & Baró, **sp. nov.** Type: CUBA. Holguín province, Rafael Freire municipality, around Bahía del Naranjo, Conuco de Mongo Viñas, 21°06'03"N 75°52'14"W, 25 Jan. 2020, I.E. Méndez & A. Hernández HPC 12372 (holotype: HIPC; isotypes: HAJ, ULV). Fig. 1.



Fig. 1. *Callicarpa gonzalezgomezii* sp. nov.: a, Flowered branch; b, leaf blade, adaxial surface; c, leaf blade, abaxial surface; d, Inflorescence [Cuba, Prov. Holguin, Bahia Naranjo, 23 May 2017, photographs by José Luis Gómez Hechavarría; photographic composition by J.C. Rifa Tellez].

Diagnosis.—*Callicarpa gonzalezgomezii* differs from other Cuban species of the genus *Callicarpa* by its densely ferruginous, tomentose young branches and leaves, and its elliptic to oblong leaf blades, which are 5–15 mm long.

Description.—Shrubs ca. 1 m high, profusely and irregularly branched; young branches densely covered with ferruginous tomentose indumentum, the trichomes short, thick, bulbous-based and radially branched; old branches whitish or cinereous; internodes 1–2 cm long. Leaves decussate; the petiole 0.9–2 mm long, ferruginous tomentose; the blade 5–15 × 4–8 mm, elliptical to oblong; apex and base obtuse to rounded; margin entire, conspicuously revolute to coiled; secondary veins 5 or 6 pairs, depressed above, prominent beneath; adaxial surface bright green when fresh, blackish when dry, almost glabrous, sometimes with scattered trichomes short, thick, bulbous-based, and radially branched; abaxial surface a lighter green and with whitish dots (secretions) when fresh, ferruginous when dry, with short, thick trichomes with a bulbous base and radially branched on the veins (mainly the central one). Cymes axillary, pauciflorous usually with only 3–5 flowers; peduncles 3–6 mm long, shorter than the leaves, ferruginous tomentose; pedicels 1–2 mm long; bracteoles up to 1 mm long, inconspicuous. Flowers hermaphrodite, actinomorphic; the calyx campanulate, 4-dentate, ferruginous tomentose outside, tube 2–4 mm long, teeth 0.5–0.7 mm long, obtuse; the corolla campanulate, light magenta to lilac, sometimes with blue hues, tomentose on the outside, tube 6–8 mm long, teeth 2–4 mm long, obtuse, ciliated along the edge; the stamens 4, exerted, filaments 9–11 mm long, anthers 1–2 mm long, ovoid, opening by longitudinal slits, yellow, thecae parallel; the ovary 4-locular, style gynobasic, pistil 14–15 mm long, stigma peltate. Fruit and seed unknown.

Distribution, habitat, and phenology.—*Callicarpa gonzalezgomezii* sp. nov. is endemic to the Holguín province in the north-eastern Cuba (Fig. 2). According to a classification of the Cuban vegetation (Capote & Berazaín 1984), it grows in the phytogeographic district Holguinense (Borhidi 1991), on ultramafic soils, in thorny xeromorphic thickets on serpentines, between 10 and 450 m above the sea level. Associated species include: *Leucocroton anomalus* Borhidi, *Harpalyce greuteri* R. Rankin & P. A. González, *Randia spinifex* (Roem. & Schult.) Standl., and *Bonellia shaferi* (Urb.) B. Ståhl & Källersjö, among others. Flowering specimens of *C. gonzalezgomezii* sp. nov. have been collected in March, May and October.

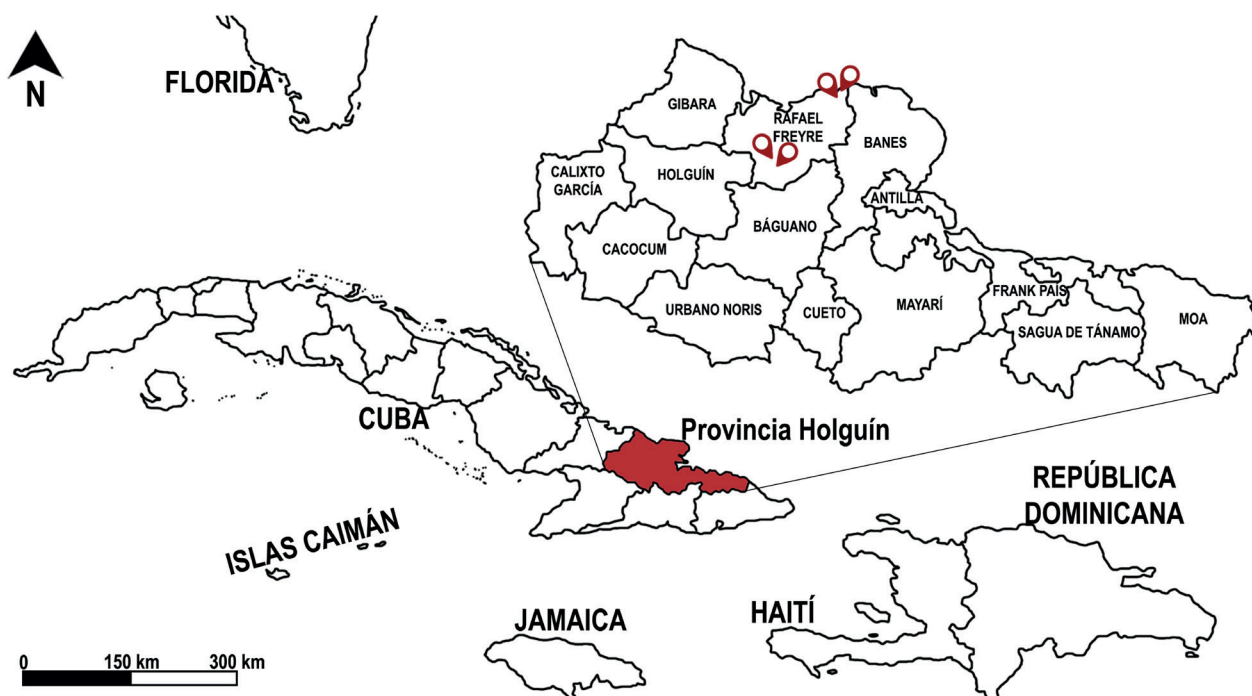


Fig. 2. Distribution map of *Callicarpa gonzalezgomezii* sp. nov. in Holguín Province, Cuba.

Etymology.—The new species is named after Pedro A. González Gutiérrez (b. 1974) and José L. Gómez Hechavarría (b. 1987), who are both professional botanists from the province of Holguín and were the first to recognize the uniqueness of this species.

Additional specimens examined.—CUBA. **Holguín Province:** Municipality Rafael Freire, cuabales de Cerro Galano, 20°55'32"N 76°02'34"W, 7 Dec. 1975, A. Areces J. Bisse, H. Dietrich & L. Lepper HFC 29052 (JE); Loma del Naranjo, al este de la Bahía del Naranjo, (noreste de Rafael Freire [Santa Lucía]) primero y segundo arroyo, [21°06'33"N 75°51'52"W], 17 Oct. 1978, A. Álvarez, J. Bisse, A. Borhidi, L. Catasús, A. López & T. Pocs HFC 38170 (B, HAJB, JE); Melones, falda norte del Cerro Galano, charrascales entre el primer y segundo arroyo, [20°56'10"N 76°02'39"W, 18 Oct. 1978, A. Álvarez, J. Bisse, A. Borhidi, L. Catasús, A. López & T. Pocs HFC 38286 (B, HAJB, JE).

Preliminary IUCN Red List assessment. —*Callicarpa gonzalezgomezii* sp. nov. is a narrowly restricted species, of which only one population (one location) is known to date. Two presence sites have been recorded in Cerro Galano and Bahía del Naranjo. The estimated extent of occurrence (EOO) is 30 km² and the area of occupancy (AOO) is 8 km². It is severely fragmented and in continuous decline, with a deterioration in habitat quality and a reduction in the number of mature individuals. In Bahía del Naranjo, this is due to the development of tourist infrastructure, the presence of invasive species, and forest fires, among other causes. According to the parameters established by the IUCN (2024), *C. gonzalezgomezii* sp. nov. is provisionally categorized here as 'Critically Endangered' (CR) [B1B2ab(ii,iii,v)].

Identification key for the Cuban species of *Callicarpa*

- 1 Abaxial surface of the leaf blade white tomentose 2
- Abaxial surface of the leaf blade glabrous or with a variable indumentum 5
- 2 Inflorescences conspicuously bracteolate; leaf blade linear, oblong-linear or oblanceolate 3
- Inflorescences not as above; leaf blade ovate, obovate, oblong-lanceolate or oblong 4
- 3 Leaves ≤ 2.5 cm long *C. gibaroana* Baró & P.Herrera
- Leaves > 2.5 cm long *C. bucheri* Moldenke
- 4 Adaxial surface of the leaf blade flat, veins thin, slightly depressed on adaxial surface ..*C. shaferi* Britton & P.Wilson
- Adaxial surface of the leaf blade bullate, veins deeply depressed on adaxial surface *C. cubensis* Urb.
- 5 Young branches with small spines, mainly towards the apex 6
- Young branches without spines 12
- 6 Adaxial surface of leaf blade conspicuously pubescent 7
- Adaxial surface of leaf blade lightly white setulose to glabrou 8
- 7 Leaf blade lanceolate to oblanceolate, margin irregularly crenulate-denticulate..... *C. toaensis* Borhidi & O.Muniz
- Leaf blade elliptic, margin regularly crenulate *C. leonis* Moldenke
- 8 Leaf blade mainly coriaceous or subcoriaceous, abaxial surface yellowpubescent 9
- Leaf blade membranous to chartaceous, abaxial surface brown pubescent 10
- 9 Leaf blade elliptical *C. moana* Borhidi & O.Muniz
- Leaf blade linear-oblong to oblong *C. nipensis* Britton & P.Wilson
- 10 Apex of leaf blade acute to acuminate, ferruginous in sicco; inflorescences supra-axillary *C. ferruginea* Sw.
- Apex of leaf blade long acuminate, blackish in sicco; inflorescences axillary 11
- 11 Leaf blade obovate, elliptic or oblong, indumentum of the abaxial surface limited to the midrib *C. wrightii* Britton & P.Wilson
- Leaf blade indistinctly toothed or subentire, abaxial surface glabrous *C. resinosa* C.Wright ex Moldenke
- 12 Leaf blade broadly ovate, membranous, apex acuminate 13
- Leaf blade linear, lanceolate, oblong, obovate to elliptic, coriaceous to cartaceous, apex rounded, obtuse or acute 14
- 13 Inflorescences compact, shorter than the petioles of the leaves that subtend it *C. americana* L.
- Inflorescences lax, longer than the petioles of the leaves that subtend it *C. roigii* Britton
- 14 Abaxial surface of leaf blade yellow, ferruginous or yellowish tomentose 15
- Abaxial surface of leaf blade brown or yellowish-brown tomentose 21
- 15 Leaves 5–14 cm long..... 16
- Leaves 1–4.8 cm long 19
- 16 Leaf blade elliptic, oblong-lanceolate or oblanceolate *C. oblanceolata* Urb.

- Leaf blade linear-lanceolate, obovate or ovate-lanceolate 17
- 17 Leaf blade obovate, base cuneate *C. cuneifolia* Britton & P.Wilson
- Leaf blade linear-lanceolate or ovate-lanceolate, base acute 18
- 18 Leaf blade linear-lanceolate, margin entire, strongly revolute, abaxial surface without conspicuous glands *C. revolute* Moldenke
- Leaf blade ovate-lanceolate, margin dentate, denticulate or crenate, flat, abaxial surface with conspicuous glands *C. fulva* A.Rich.
- 19 Leaf blade ≤ 1.5 cm long, elliptic to oblong, apex obtuse to rounded *C. gonzalezgomezii* sp. nov.
- Leaf blade usually > 2 cm long linear-oblong to oblanceolate, apex acute to obtuse 20
- 20 Apex of leaf blade obtuse, margin entire and noticeably revolute *C. hitchcockii* Millsp.
- Apex of leaf blade acute to rounded, margin crenate-denticulate, slightly revolute *C. lancifolia* Millsp.
- 21 Leaf blade usually > 6 cm long, membranous or cartaceous, elliptic to obovate 22
- Leaf blade < 6.5 cm long, coriaceous or subcoriaceous, mainly oblong, oblong-lanceolate or linear-lanceolate 23
- 22 Leaf blade 8–15 cm long, mainly elliptic, the margin crenate *C. ekmanii* I. E.Méndez & Mabb.
- Leaf blade 6–10 cm long, obovate, margin denticulate *C. crassinervis* Urb.
- 23 Base of leaf blade rounded to subtruncate, abaxial surface brown tomentose *C. grisebachii* Urb.
- Base of leaf blade acute or narrowed, abaxial surface brownish-yellowish *C. areolate* Urb.

DISCUSSION

Callicarpa gonzalezgomezii sp. nov. is the only Cuban species of the genus with leaves measuring ≤ 2.5 cm in length and a ferruginous indumentum on the abaxial surface. It is similar to *C. gibaroana* Baró & P.Herrera (Baró & Herrera 1994), but can be distinguished by a series of diagnostic characters, which were used to write its diagnosis and are summarized in Table 1. Due to its long staminal filaments, noticeably exerted beyond the corolla tube, and its ovoid anthers that dehisce via longitudinal slits, we classify this species into *C. sect. Callicarpa* (sensu Chang 1951). The discovery of this new species confirms Cuba's status as a centre of diversification for *Callicarpa* in the New World. According to Li & al. (2016), 24 of the 33 species that make up the American clade are found in Cuba, 21 of which are endemic to the country. The province of Holguín is also recognized as a centre of diversification of *Callicarpa* within Cuba. Thirteen species are currently known to be represented in this territory, and 12 of them are endemic to Cuba, with a single exception, *C. ferruginea* Sw., which also lives in Jamaica. Fourteen species of *Callicarpa* are established on ultramafic substrates, and almost all of these species are found exclusively on this substrate type.

Table 1. Diagnostic morphological characters to distinguish *Callicarpa gonzalezgomezii* sp. nov. from *C. gibaroana* Baró & P.Herrera.

Characters	<i>Callicarpa gonzalezgomezii</i>	<i>Callicarpa gibaroana</i>
Indumentum on young branches, petioles, peduncles and calyces	Tomentose-ferruginous	Whitish-grayish
Petioles length	0.9–2 mm	3–4 mm
Leaf blades	5–15 $\times$ 4–8 mm; apex obtuse to rounded; the adaxial surface bright when fresh	15–25 $\times$ 4–9 mm; apex acute to obtuse; the adaxial surface dull when fresh
Corolla	Light magenta and lilac, sometimes with blue nuances	Mauve to lilac
Substrate	On soils derived from serpentines	On soils derived from karst

The conservation status of the new species is already extremely compromised—a situation that is not uncommon among Cuban species of this genus—despite the fact that we are introducing it to science for the first time. Final and comprehensive assessments of the threat level for all the species of *Callicarpa* represented in the country have yet to be completed, despite the fact that essential information on some of them remains lacking. However, given the high proportion of endemic taxa in Cuba, many of which with notably restricted distributions, it is anticipated that a significant number could be at risk of extinction. The preliminary IUCN Red List assessment presented here for *C. gonzalezgomezii*

(CR) makes it the sixth species in the genus to be provisionally evaluated and the second to be designated as threatened, as noted by González-Torres & al. (2016).

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AUTHORSHIP CONTRIBUTION STATEMENT

Isidro E. Méndez Santos: Conceptualization, formal analysis, funding acquisition, investigation, methodology, writing – original draft, writing – review & editing. Isora Baró Oviedo: Investigation, writing – review & editing. Alejandro Hernández Peña: Investigation, writing – review & editing.

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