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A new species of *Pentagonia* (Rubiaceae, Dialypetalanthaeae) from Santander, Colombia, with an identification key to the Colombian species

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Abstract. *Pentagonia santanderensis* (Rubiaceae, Dialypetalanthaeae) is described and illustrated from the department of Santander, occurring in the municipalities of Cimitarra, La Belleza, and Landázuri in fragmented forests and primary forest edges associated with water sources. We compare this new taxon with morphologically similar species; the size of its leaves, the magenta coloration of the strongly pleated leaf bases, and the color, indumentum, and size of the corolla, as well as the fruits, are diagnostic characters. This new species increases the number of *Pentagonia* species recorded in Colombia to 23. Based on the IUCN criteria, *P. santanderensis* is assessed as Endangered (EN B2a(ii)b(iii)) due to its restricted distribution and continuing decline in habitat quality.

Keywords: Middle Magdalena Valley, Gentianales, Rubiaceae, Taxonomy.

INTRODUCTION

Pentagonia Benth. is a Neotropical genus of Rubiaceae comprising approximately 50 species, distributed from Central to northern South America. Species of this genus occur in tropical lowland and lower montane rainforests and forest remnants (Cornejo 2009, 2010; Cornejo and Rova 2019). In Colombia, 22 species are currently recorded, including the recent description of *P. plicatifolia* A.F. Majín-L. & M.A.Jaram. (Majín-Ladino et al. 2025), making Colombia the country with the highest species richness for the genus, followed by Ecuador, which has 18 species. Therefore, the high species diversity and endemism in this region make it the main center of diversity for *Pentagonia* (Cornejo and Rova 2019).

This genus belongs to the tribe Dialypetalanthae Reveal (Syn. *Condamineae* Benth. & Hook.f.) (Taylor and Maldonado 2024), and is characterized mainly by monocaulous shrubs, occasionally small trees or trees reaching up to 30 m in height (Andersson and Rova 2004). Leaves are opposite, isophyllous, entire to deeply lobed, or compound in some species (Cornejo 2014, Hammel 2015), with eucamptodromous venation and a striate epidermis; stipules are triangular, erect, and often caducous. Inflorescences are axillary, pedunculate, and arranged in capitate cymes. Flowers are pentamerous and bisexual. The calyx is 5-lobed (imbricate in bud) or spathaceous, persistent in fruit, green or bright red; corollas are infundibuliform, actinomorphic or zygomorphic, white, cream, greenish-white, bright pink, or deep red, glabrous or variously pubescent, and villous internally at the point of stamen insertion. The androecium consists of five (rarely six) stamens, with oblong, basifixed or dorsifixed anthers. The pistil is composed of a bilocular ovary and a style with two oblong or orbicular style branches. The fruits are fleshy or coriaceous berries (Andersson and Rova 2004, Taylor 2024).

In the present study, a new species of *Pentagonia* is described and illustrated. Based on its distinctive morphological features, such as leaves with deeply plicate, magenta-colored bases, and a greenish, pubescent corolla with reflexed lobes, it is proposed here as a new species. This taxon is found in undisturbed forests, the edges of conserved forests, and fragmented forests adjacent to water bodies. This contribution increases the number of *Pentagonia* species in Colombia to 23, reaffirming Colombia's status as the country with the highest diversity in the genus.

MATERIALS AND METHODS

Field collections were made in July and October 2025. Field photos were taken with a Nikon P100 camera. Specimens were preserved in 70% alcohol. Herbarium specimens are deposited at UDBC and UMNGH (herbarium codes follow Thiers 2025). Composite plates were prepared using Adobe Photoshop® 2014.

The description of the species was based on field observations, flower and fruit material preserved in 70% alcohol, and herbarium specimens. Measurements were taken on dried material using a Zeiss Discovery V8 stereomicroscope and a Leica S8 AP0 stereomicroscope. The descriptive terminology and color palette are based on Beentje (2016), and the leaf architecture is based on Ellis et al. (2009). In addition, type specimens in JSTOR Global Plants ([continuously updated](#)) were examined, and the collections of the COL, JBB, UDBC, and UMNGH herbaria were visited; the MO and US collections were reviewed virtually (acronyms follow Thiers 2025).

Conservation status was assessed according to IUCN criteria (2024). Area of occupancy (AOO) and extent of occupancy (EOO) were calculated using the GeoCAT tool (Bachman et al. 2011). AOO was calculated using a predetermined cell width of 2 × 2 km.

TAXONOMIC TREATMENT

Pentagonia santanderensis A.F.Majín-L., Paz-López & M.A.Jaram. **sp. nov.** (Figs. 1, 2).
 TYPE: Colombia, Santander: Municipio de Landázuri. Vereda Miralindo, N: 6° 19' 15.52", W: 73° 43' 34.79", 720 m, [fl, fr], 14 Jul 2025, *Robayo et al. 001* (holotype: UDBC [UDBC52291]!; isotype: UMNGH [UMNGH4803] !). Figs., 1, 3.

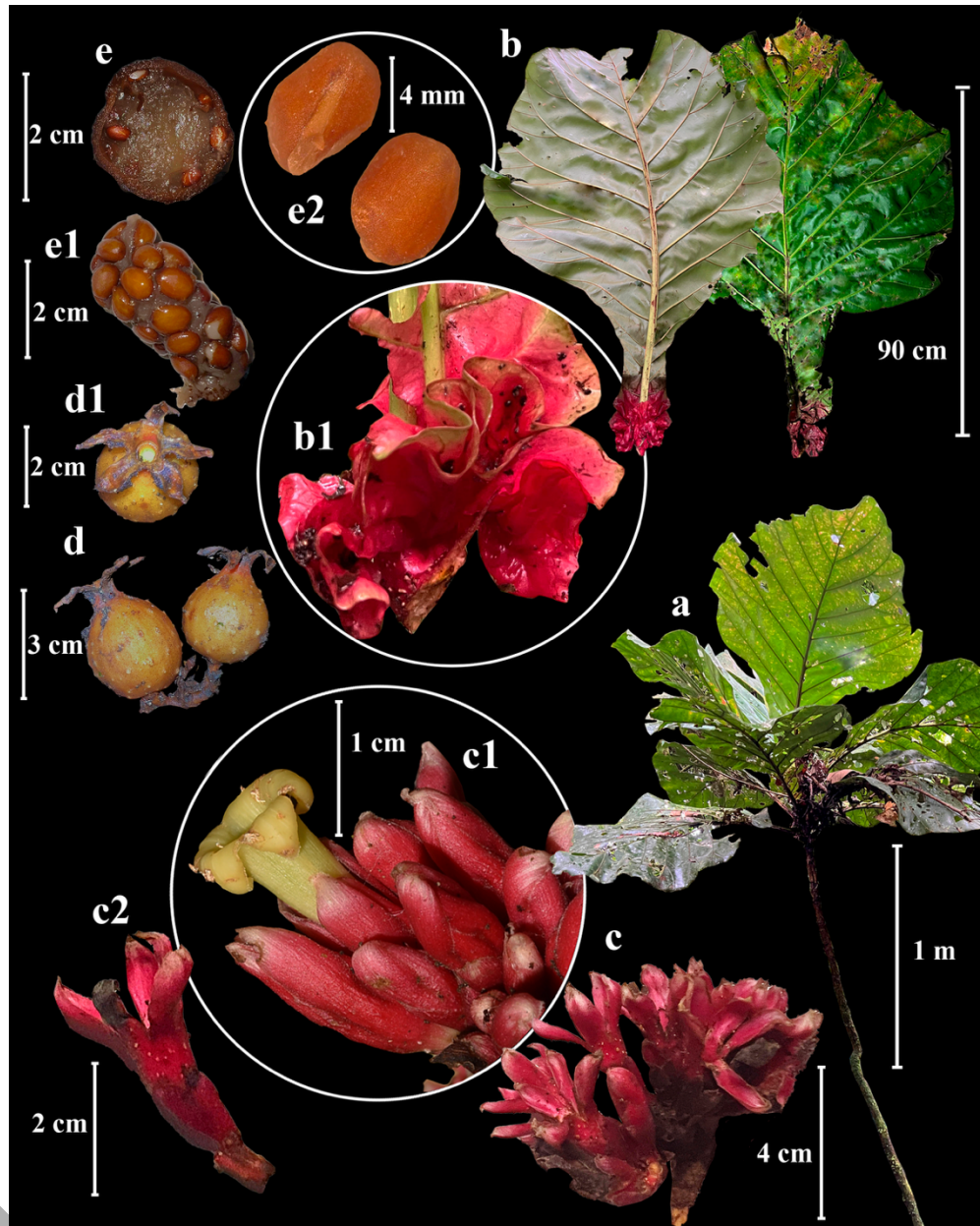


Fig. 1. *Pentagonia santanderensis* A. F. Majín-L., Paz-López & M.A.Jaram. **A.** Habit. **B.** Details of the adaxial surface and abaxial surface of the lamina blade. **C.** Inflorescence. **C1.** Details of corolla. **C2.** Details of calyx. **D.** Fruits. **D1.** Fruit, top view. **E.** Transverse section of fruit. **E1.** Seeds. **E2.** Details of seeds. All photos by C. Paz.

Diagnosis

Pentagonia santanderensis A. F. Majín-L., Paz-López & M.A. Jaram. is found in the Middle Magdalena Valley, the same region as *P. carniflora* Cornejo & Rova and *P. plicatifolia* A.F.Majín-L. & M.A.Jaram. *Pentagonia santanderensis* differs from *P. carniflora* by being smaller trees, 2–3 m tall (vs. up to 12 m tall), having sessile leaves, leaf blades with dense strigose hairs along veins on the abaxial side, and a strongly plicate, magenta leaf base that persists until maturity (vs. having subsessile, glabrous leaves, with smooth and green base), and by having cream greenish corollas with the tube 20–21 mm

long, the lobes 3–5 mm long (vs. corollas with the tube 35–38 mm long with red lobes up to 12 mm long, Fig. 2). *Pentagonia santanderensis* differs from *P. plicatifolia* in having a greenish corolla 20–21 mm long, with reflexed lobes touching the corolla tube and pubescent on the abaxial surface (vs. yellow-cream corolla, 20–24 mm long, with patent, glabrous lobes).

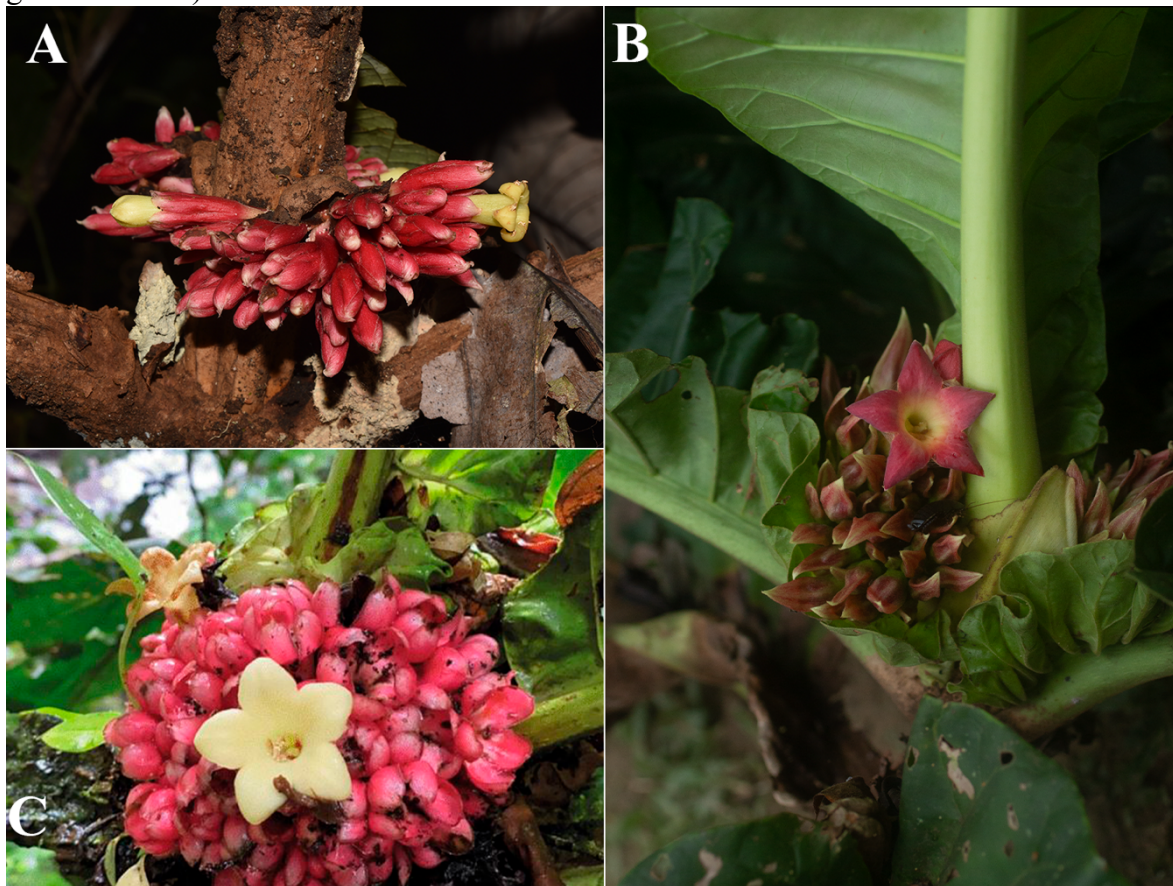


Fig. 2. Inflorescences comparisons. **A** *Pentagonia santanderensis*; **B** *P. carniflora*; **C** *P. plicatifolia*. Photos: **A** Rocío Cortés (2018), **B** Juan P. Alarcón (2024), **C** Andrés F. Majín-Ladino (2024).

Description

Unbranched small tree 2–3 m tall, monocaulous. *Stem* glabrous, quadrangular, four-ridged when dry. *Stipules* brown apically and basally dark magenta in abaxial surface, magenta apically and basally white on adaxial surface, lanceolate, 45–50 × 12–15 mm, keeled, acute at apex, abaxially strigose, and adaxially pubescent towards the margins (Fig. 3D). *Leaves* commonly sessile, or with petioles 3–9 mm long; blades entire, obovate, 63–82 × 50–88 cm, deep green adaxially, and light green on the abaxial surface, drying chartaceous, glabrous on the adaxial surface, densely strigose along the veins on the abaxial surface, base auriculate, deeply plicate, magenta when young and mature, margin light green, prominent, light green (Fig. 1B1), obtuse at apex; secondary veins 11–13 on each side of midrib, prominent, pale on both surfaces. *Inflorescences* congested cymes (Figs. 1C), peduncles 0.95–1.2 cm, glabrescent; each flower subtended by two bracteoles, ca. 8.4–9.8 mm long, oblong-elliptical and cucullate, acuminate at apex, strigose on abaxial surface and glabrescent around margin on adaxial surface, margin ciliate, deep pink–fuchsia. *Flowers*

pedicellate; pedicels 4–5 mm, strigose. Hypanthium ca. 5–6 mm, conical. Calyx deep pink-fuchsia, calyx tube 17–18 mm long (26–28 mm long, fresh), lobes 5, obovate and cucullate, valvate, 7.2–10 mm long (10–15 mm long, fresh), apex acute or acuminate, sparsely strigose on both surfaces, margin ciliate (Figs. 1C2, 3I). Corolla infundibuliform, cream greenish, pubescent on the outside surface and glabrous on the inside surface; tube 20–21 mm long (24–27 mm long, fresh) (Figs. 1C1, 3E); lobes deltoid, 3–5 mm long (6–7 mm long, fresh), reflexed. Stamens inserted slightly below the middle of the corolla tube, basally villous; filaments 11–12 mm long, anthers 3–4 mm long with dehiscing longitudinally. Style ca. 13–15 mm, branches 2–3 mm long. *Fruit* berry, orbicular to ovate, 1.0–1.4 × 0.8–0.9 cm, green when immature, pale yellow when mature, surface with granules, crowned by the persistent calyx (Figs. 1D, 3L). *Seeds* compressed, ovate-ellipsoid, 1.5–2 mm long (Figs. 1E).

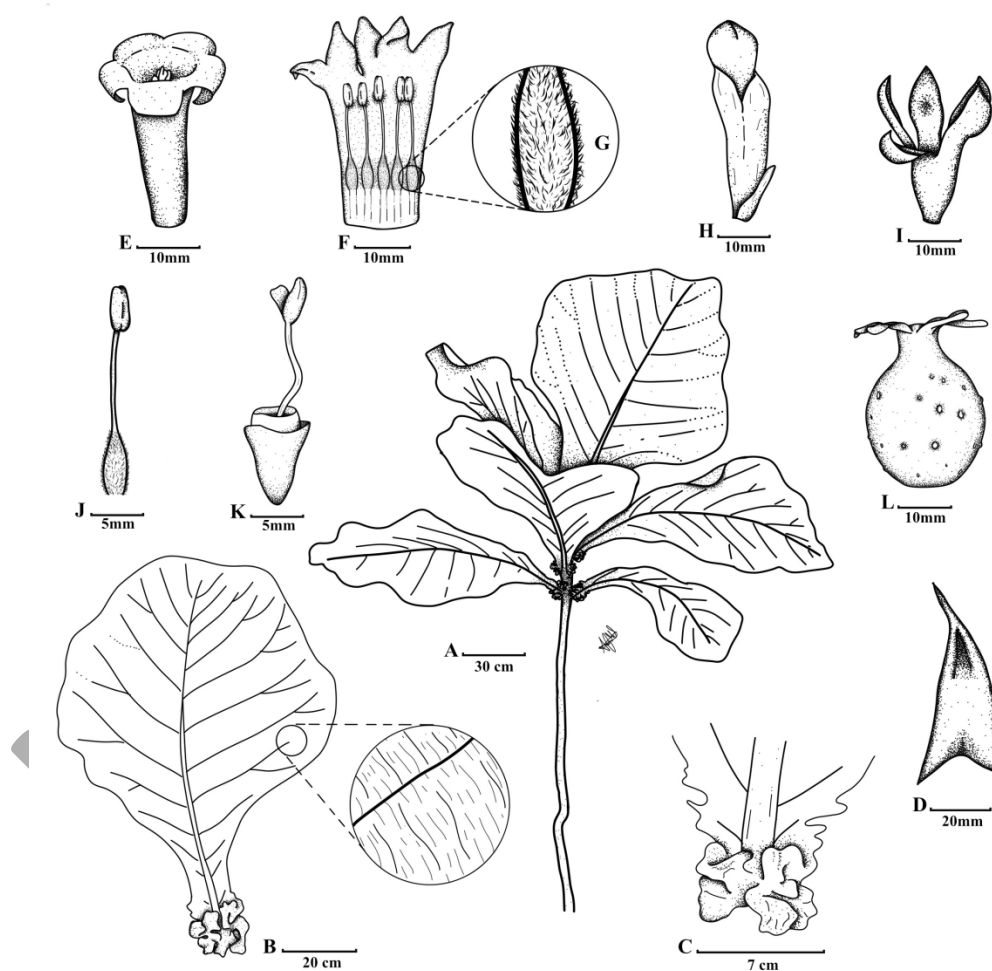


Fig. 3. *Pentagonia santanderensis* A. F. Majín-L., Paz-López & M.A.Jaram. **A.** Habit. **B.** Leaf. **C.** Details leaf base deeply plicate. **D.** Stipule. **E.** Corolla in anthesis, side view. **F.** Corolla longitudinally dissected. **G.** Details of filament at base. **H.** flower bud, side view. **I.** Hypanthium and calyx, side view. **J.** Stamen. **K.** Pistil. Based on Robayo *et al.* 001 & C. Paz *et al.* 2222. Illustration by Andrés F. Majín-Ladino.

Additional specimens examined (Paratypes)

COLOMBIA: Santander. Cimitarra. Vereda El Oponcito, 6° 25' 53.82" N, 73° 53' 24.89" W, 152 m, May 2017 [fl], *L. Carvajal et al.* 3945 (UDBC042837!, UDBC042838!); Landazuri, vereda Miralindo, 6°19'39.77"N, 73° 44'6.76" W, 30 Jul 2025, *Robayo et al.* 22 (UDBC); La Belleza, vereda Cachipayal, 5°51'17.04"N, 74° 1'11.63" W, 11 Oct 2025 [fl,fr.], *C. Paz et al.* 2222 (UDBC, UMNGH).

Etymology

The epithet *santanderensis* is dedicated to the Santander department, where the new species was collected. This department is characterized by a wide variety of ecosystems that, despite significant pressure, maintain high biodiversity.

Habitat and distribution

The new species was collected in the department of Santander, specifically in the municipalities of Cimitarra, Landázuri, and La Belleza (Fig. 4), at elevations ranging from 152 to 1,267 m, where temperatures range from 22 °C to 28 °C and annual precipitation ranges from 2,300 to 2,835 mm (Fick & Hijmans, 2017). It was found in undisturbed forests, forest edges, and fragmented forests associated with water sources, such as small streams. In terms of associated vegetation, genera such as *Aspidosperma* (Apocynaceae), *Bauhinia* (Fabaceae), *Bomarea* (Alstroemeriaceae), *Magnolia* (Magnoliaceae), *Oreopanax* (Araliaceae), *Otoba* (Myristicaceae), *Protium* (Burseraceae), and *Piper* (Piperaceae) were found.

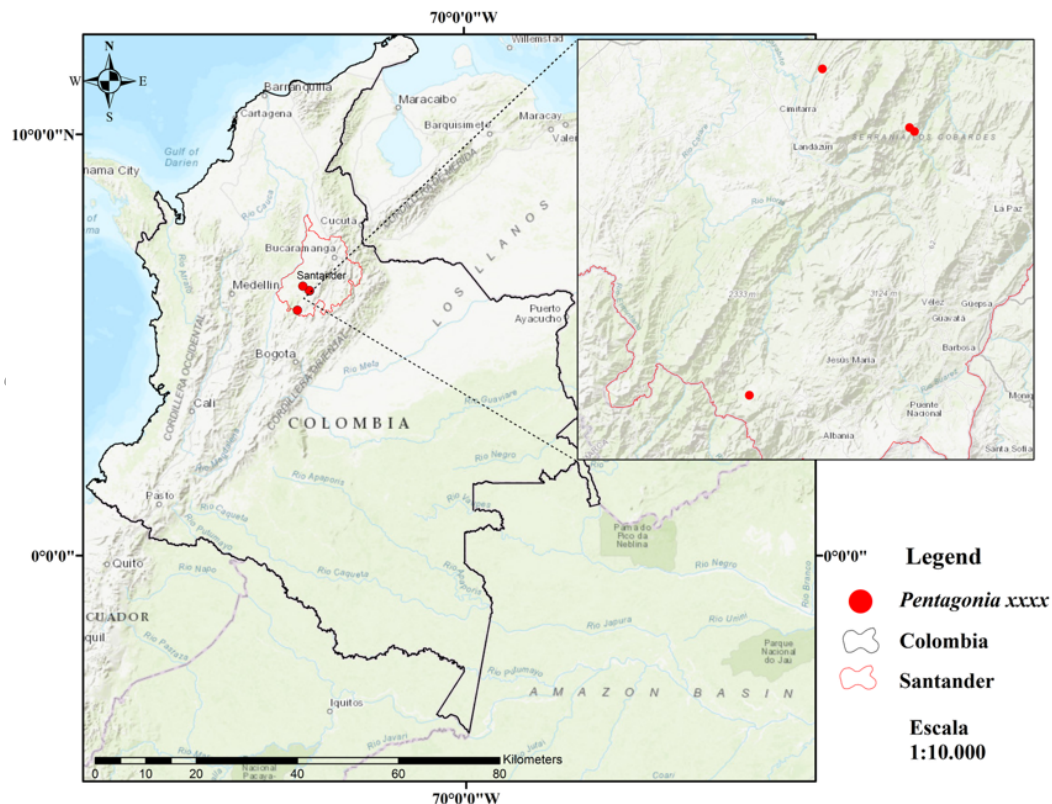


Fig. 4. Collection localities of *Pentagonia santanderensis* A. F. Majín-L., Paz-López & M.A.Jaram.

Phenology

Pentagonia santanderensis was collected with flowers in July and with fruits in October.

Preliminary Conservation Status

Endangered (EN B2, a[ii] b[iii]). This species is known from three locations in the municipalities of Cimitarra, La Belleza, and Landázuri in the Santander department. It has an area of occupancy (AOO) of 16 km² and an extent of occurrence (EOO) of 662,684 km² and should therefore be considered Endangered (EN B2, a[ii] b[iii]), according to IUCN criteria (2024). Although there have been no recent major changes in forest cover in the area, as shown in MapBiomass (2025), the area remains exposed to deforestation due to the expansion of extensive livestock farming and the agricultural frontier (WCS, 2025). This condition places significant ecological pressure on the species described, as its habitat is threatened by fragmentation from the aforementioned activities.

Notes

The described species is morphologically similar to *P. plicatifolia* in being small trees 2–3 m tall, with leaves with plicate base, infundibular corolla, and fruits with a granulous surface; from which it differs by having smaller leaf blades 63–82 × 50–88 cm with 11–13 secondary veins pairs (vs. 90–120 × 50–80 cm with 18–20 pairs), smaller stipules 45–50 × 12–15 mm (vs. 6–8 × 2–3 cm), bracteoles ca. 8.4–9.8 mm, oblong-elliptical and acuminate (vs. ca. 20 mm, obovate-elliptical and rounded at apex), a shorter calyx tube 17–18 mm with acuminate lobes 7.2–10 mm (vs. tube 16–21 mm with rounded lobes 14–16 mm), a creamish-green corolla (vs. cream-yellow). *Pentagonia santanderensis* is also similar to *P. carniflora* in sharing a monocaulous habit with large obovate leaves, congested cymose inflorescences, a similarly sized hypanthium (ca. 5–6 mm vs. ca. 5 × 3–4 mm), which also occurs in the Middle Magdalena Valley. However, the new species differs from similar and co-occurring taxa by the characters presented in the diagnosis, identification key, and comparative table (Table 1) provided in this study.

Key to the species of *Pentagonia* occurring in Colombia (based on Majín-Ladino et al., 2025)

- | | |
|---|-------------------------------------|
| 1 Leaves entire | 2 |
| 1 Leaves deeply pinnatifid or compound | 19 |
| 2 Leaves sessile or subsessile; petioles (when present) to 2 cm long | 3 |
| 2 Leaves petiolate; petioles 2–19 cm long | 9 |
| 3 Branched trees, 10 m or more tall; calyx green | 4 |
| 3 Monocaulous trees; less than 5 m tall; calyx reddish or pink–fuchsia | 5 |
| 4 Internodes sub-tetragonal; calyx five-lobed; corolla greenish to white or cream-white, 20–25 mm (Chocó Region) | <i>P. tapacula</i> Cornejo |
| 4 Internodes terete; calyx spathaceous; corolla tube cream, ca. 35–38 × 15–20 mm (dried), ca. 60 × 35–50mm (fresh), the lobes deep red, (Middle Magdalena Valley, Chocó Region) | <i>P. carniflora</i> Cornejo & Rova |
| 5 Leaf base deeply plicate; corollas 20–24 mm long | 6 |
| 5 Leaf base truncate to slightly plicate; corollas 25–45 mm long | 7 |

- 6 Leaf base pink-fuchsia when young and mature; calyx tube 17–18 mm long; corolla greenish, pubescent externally, glabrous internally, lobes reflexed (Middle Magdalena Valley)... ***P. santanderiensis*** A. F. Majín-L., Paz-López & M.A.Jaram.
- 6 Leaf base pale only when young; calyx tube 16–21 mm long; corolla cream-yellow, glabrous in both surfaces, lobes patent (Middle Magdalena Valley, Chocó Region)... ***P. plicatifolia*** A. F. Majín-L. & M.A.Jaram.
- 7 Abaxial surface of stipules, and pedicels glabrous (Chocó Region) ***P. magnifica*** K.Krause
- 7 Abaxial surface of stipules and pedicels hirtellous or strigose 8
- 8 Leaf blades densely hirtellous along veins on abaxial surface; corolla white–pale reddish, lobes 8–10 mm long (Chocó Region) ***P. subsessilis*** L.Andersson & Rova
- 8 Leaves glabrous; corolla pink–red or yellow–red, lobes 4–9 mm long 9
- 9 Calyx 12–22 mm long; fruit ellipsoid or subglobose, ca. 30 × 25 mm (Costa Rica, Panama, and Chocó Region, W of the Andes) ***P. wendlandii*** Hooker
- 9 Calyx 3 mm long; fruit globose, 11–15 × 10–14 mm (NW Amazon, E of the Andes, E of the Andes) ***P. microcarpa*** L.Andersson & Rova
- 10 Petioles > 10 cm long; leaf blades > 70 cm long 11
- 10 Petioles < 10 cm long; leaf blades < 50 (–70 cm) long 14
- 11 Branched trees to 20 m tall; calyx spathaceous (NW Amazon, E of the Andes) ***P. spathicalyx*** K. Schum.
- 11 Monocaulous trees to 8 m tall; calyx 5-lobed 12
- 12 Leaves > 100 cm long; floral bracts ca. 60 mm long; calyx 60 mm long; corolla 6 mm long (Chocó Region) ***P. grandiflora*** Standl.
- 12 Leaves up to 70 cm long; floral bracts reduced; calyx 8–15mm long; corolla up to 40 mm long 13
- 13 Axillary cymes have 12–15 flowers, calyx green, (NW Amazon, SE of the Colombian Andes) ***P. wurdackii*** Steyererm.
- 13 Axillary cymules have 3–4 flowers, calyx red (Costa Rica, Panama, and Chocó Region, W of the Colombian Andes) ***P. macrophylla*** Benth.
- 14 Leaf length:width ratio ca. 3 15
- 14 Leaves length:width ratio < 2 18
- 15 Leaves strigilose on the abaxial surface along veins, floral bracts reduced or absent, flower 60–70 mm long (Costa Rica, Panama, and Chocó Region) ***P. angustifolia*** C.M.Taylor
- 15 Leaves glabrous; floral bracts 12–40 mm long; flower 30–40 mm long 16
- 16 Inflorescences 1–2 flowers; involucre bracts 13–22 mm long; calyx lobes elliptic to lanceolate, 20–24 mm long, imbricated (Chocó Region) ***P. involucrata*** C.M.Taylor
- 16 Inflorescences ca. 5 flowers; involucre bracts 9–16 mm long; calyx lobes narrowly lanceolate, 30–40 mm long, aestivation unknown (Chocó Region) ***P. chocoensis*** Cornejo
- 17 Sericeous pubescence on internodes, and on veins on the abaxial surface of leaf blades (NW Amazon, E of the Andes) ***P. amazonica*** (Ducke) L.Andersson & Rova
- 17 Glabrous internodes and leaf surfaces, sometimes strigulose on the veins on the abaxial surface 18
- 18 Leaves narrowly elliptic, 5–20 cm wide; secondary veins 8–12 on each side of midrib; corolla glabrous outside (Chocó Region, W of the Andes) ***P. nuciformis*** Dwyer

- 18 Leaves elliptic, ovate or obovate, 14–34 cm wide; secondary veins 12–14 on each side of midrib; corolla densely puberulous outside (Costa Rica, Panama, and northern Colombia) *P. costaricensis* (Standl.) W.Burger & C.M.Taylor
- 19 Leaves compound, with 8 pairs of leaflets (Chocó Region) ... *P. imparipinnata* Cornejo
- 19 Leaves deeply pinnatifid, 1–6 pairs of lobes 20
- 20 Leaves with deeply plicate auricles at the base (Chocó Region) ... *P. pinnatifida* Seem.
- 20 Leaves without auricles at the base 21
- 21 Monocaulous trees to 3 m tall; leaves with 3–4 pairs of lobes (Chocó Region, Costa Rica, Panama) *P. tinajita* Seem.
- 21 Monocaulous trees 6–7 m tall; leaves with 4–6 pairs of lobes 22
- 22 Petioles 4–12 cm long; calyx regularly lobed; corolla cream-colored (Chocó Region, Colombia, Panama) *P. gymnopoda* (Standl.) Standl.
- 22 Petioles 15–19 cm long; calyx spathaceous; corolla green to cream (Costa Rica, Colombia) *P. lobata* C.M. Taylor

Table 1. Comparison of diagnostic morphological characters of *Pentagonia santanderensis* with species with short petioles, sessile or subsessile.

Character	<i>P. magnifica</i>	<i>P. microcarpa</i>	<i>P. plicatifolia</i>	<i>P. santanderensis</i>	<i>P. subsessilis</i>	<i>P. wendlandii</i>
Leaf base	Truncate	Truncate	Strongly plicate	Strongly plicate with magenta coloring on young and mature leaves	Truncate	Truncate, cordate or lightly plicate
Vestiture	Glabrous throughout	Densely strigose the abaxial surface of stipules; pedicels strigose or hirtellous	Leaves glabrous; calix sparsely hispid on both surfaces	Leaves glabrous on both surfaces but densely strigose in abaxial venation; abaxial surface of the corolla, calix sparsely strigose on both surfaces	Densely velutinous adaxial stipules, densely hirtellous: petioles, leaf blades densely hirtellous on abaxial surface along veins, corolla hirtellous outside	Densely strigose on the abaxial surface stipules, pedicels, outside of the calyx.
Calyx tube	15 mm long.	3 mm long	16–21 mm long	17–18 mm long	17–25 mm long	12–22 mm long
Corolla	Red, tube 20–25 mm long, lobes 1.8–3 mm long	Pink–red; tube 26–27 mm, lobes 7–9 mm long	Cream yellow; tube 20–24 mm, lobes 6–9 mm long	Cream green; tube 20–21 mm, lobes 3–5 mm long	White–pale reddish; tube ca. 26 mm, lobes 8–10 mm long	Yellow–red; tube 22–40 mm, lobes 4–5 mm long
Geographic distribution	Chocó Region	NW Amazon	Middle Magdalena Valley, Eastward extension of the Chocó Region	Middle Magdalena Valley	Chocó Region	Chocó Region, extending to Panamá and Costa Rica.

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