

Magnolia carmelita (Magnoliaceae), a new species from the eastern Colombian Andes

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The Department of Santander in the Eastern Cordillera of the Colombian Andes comprises the biogeographical region of the Pacific and the districts of Magdalena (lowland forests) and paramo (mountainous areas above 1000 m; González-Orozco 2021). Harbouring 20% of the Colombian endemic plant species (Torres & Quiñones 2019), these ecosystems face enormous habitat loss mainly due to agriculture and livestock production (Pérez-Rojas *et al.* 2020).

Magnolia Linnaeus (1753: 535) has over 390 species, at least 170 of which occur in the Neotropics (Aldaba-Nuñez *et al.* 2024). Colombia with 42 species (Serna-González *et al.* 2024) is the country with the most species in South America. The latest classification placed the Colombian species in *M.* section *Talauma* Jussieu (1789: 281) Figlar & Nootboom (2004: 90), subsections *Dugandiodendron* (Lozano 1975: 33) Figlar & Nootboom (2004: 90) and *Chocotalauma* A. Vázquez, Á.J. Pérez & F. Arroyo, (2016: 270 ; Want *et al.* 2020, Figlar & Serna 2021, Aldaba-Nuñez *et al.* 2024, Guzmán-Díaz *et al.* 2025). Colombian species are highly threatened, exhibiting a high level of endemism and usually restricted distribution (Linsky *et al.* 2023). Santander is the Department with greatest number of species in the Eastern Cordillera with six species: *Magnolia argyrotricha* (Lozano 1975: 38) Govaerts in Frodin & Govaerts (1996: 70), *M. betuliensis* Aguilar-Cano & Mendoza-Cifuentes (2018: 38), *M. georgii* (Lozano 1983: 76) Govaerts in Frodin & Govaerts (1996: 70), *M. resupinatifolia* Aguilar-Cano & Mendoza-Cifuentes (2018: 31), *M. santanderiana* (Lozano 1983: 95) Govaerts in Frodin & Govaerts (1996: 72), and *M. virolinensis* (Lozano 1983: 95) Govaerts in Frodin & Govaerts (1996: 72). With this contribution, the number of species increases from six to seven for Santander (Fig. 1) and 43 species for Colombia.

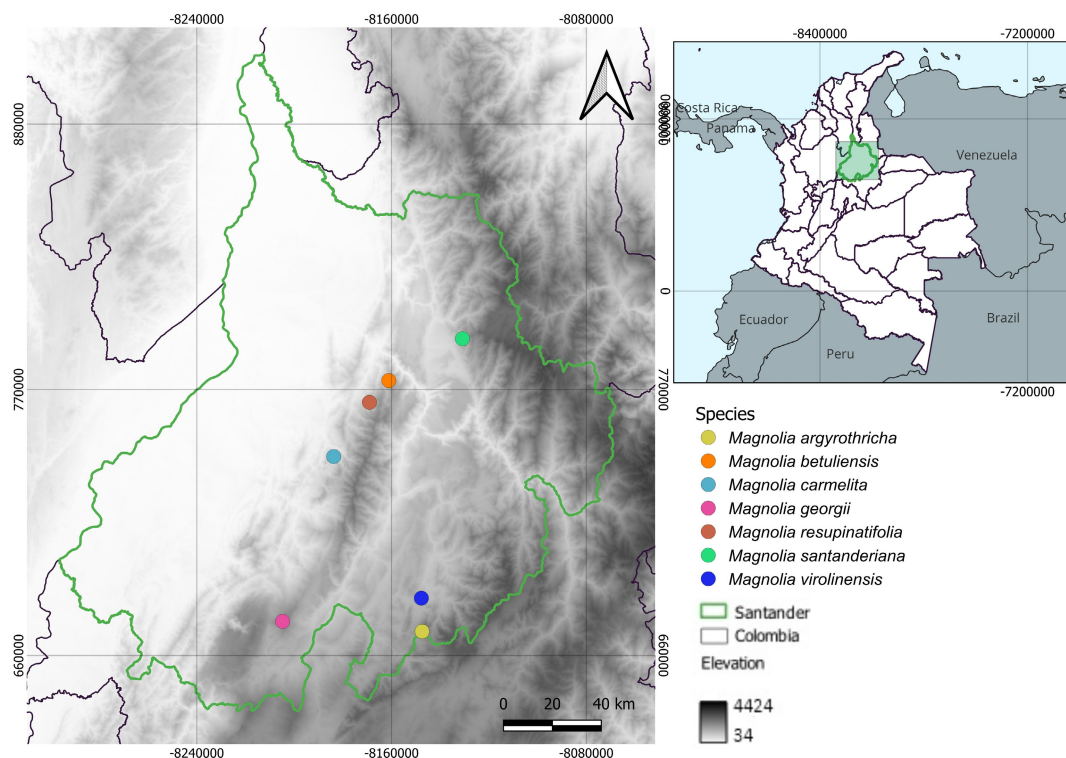


FIGURE 1. Geographic distribution of *Magnolia* species in Santander Department, Colombia.

After the review of collections and images at herbaria COL, JAUM, MO, and UIS, and based on exploratory fieldwork performed in Santander (Serna 2013), a new species was recognized and described here. This new species belongs to *M.* section *Talauma* due to the presence of an adaxial scar on the petiole and the circumscissile dehiscence of the fruits (Lozano 1994). During fieldwork in Carmen de Chucurí and San Vicente de Chucurí, Santander Department, March 2020–December 2024, 45 trees were observed, photographed and collected. Six samples were taken and processed at Herbarium JAUM. Additional herbaria collections were also used for the species description. Shape and indumentum definitions by Beentje (2010) were followed, and measurements of 25 leaves, 10 flowers and 10 fruits were performed. Original descriptions of similar species of *Magnolia* (Lozano 1994, Aguilar-Cano *et al.* 2018, Rodríguez-Duque *et al.* 2022) were used to compare morphological characters.

Taxonomy

Magnolia carmelita Serna & J. Quiroga, *sp. nov.* (Figs 2–5.)

TYPE:—COLOMBIA. Santander: Carmen de Chucurí, Vereda Quinal Alto, a 40 metros pasando de la casa de Isaías Vargas, borde de carretera, zona de bosque húmedo tropical, 6°41'48.19" N, 73°29'39.61" W, 867 m, 14 Sep 2022 (fl, fr), *Quiroga 16* (holotype: JAUM; isotypes: COL, UIS).

Magnolia carmelita is like *M. resupinatifolia* in leaf shape, but differs by its larger leaves size (7.0–47.0 × 4.0–20.0 cm vs. 25.0–29.0 × 9.0–11.0 cm), greater number of petals (8 vs 6), more numerous stamens (304–398 vs. 200–255) and carpels (108–173 vs. 88–112), globose mature fruits (vs. spheroid, lightly asymmetric) and a flat and hairy dorsal wall of the carpels (vs. convex and glabrous).

Trees 18.0–35.0 m tall, 20.0–70.0 cm dbh. Bark brown with lenticels. Branchlets terete, 0.8–1.1 cm in diameter, internodes 0.5–0.8 cm long, scarcely puberulent, with lenticels. Petioles 2.5–6.5 × 0.2–0.4 cm, swollen at base, covered by deciduous hairs, with flat adaxial scar covering 90–100% of its length. Leaf blades elliptic, glabrous on both surfaces, 7.0–47.0 × 4.5–20.0 cm, apex acute to emarginate, margin entire, base acute to attenuate; lateral veins 9–14 on each side of the midrib. Flowers terminal, solitary; peduncle 1.3–1.7 cm in diameter, bracts 3–4, covered by cream-coloured short hairs; sepals 3, 5.8–10.4 × 4.2–7.5 cm, ovate to elliptic, apex obtuse, glabrous; petals (7–)8, outer 7.7–12.1 × 4.6–6.8 cm, inner 3.5–7.0 × 1.9–4.5 cm; gynoecium 3.0–3.4 × 3.5–4.7 cm; carpels 108–173, the basal ribbed, apex acute deciduous when mature, leaving a flat top; stamens 304–398, arranged in 7–8 series, 1.2–1.6 cm long, apex acute. Syncarp subglobose, densely covered by short cream-coloured hairs, 11.8–17.0 × 8.7–15.4 cm; seeds 1–2 per carpel, obovate, 0.9–1.3 × 0.5–0.8 cm, sarcotesta reddish.

Phenology:—Flowering May, August, September and fruiting June, July.

Etymology:—Referring to the type municipality, chosen from among three other options after a citizen interview performed with the help of the municipality officials.

Distribution, ecology and conservation status:—Distributed in the lowland and Andean humid forests in Santander in the Eastern cordillera, 850–1200 m. This species is currently known from remnant forests of Carmen de Chucurí Municipality (villages of Quinal Alto, La Victoria, Honduras and Islanda; most individuals have been found in Honduras among forest remnants and cocoa agroforestry systems). One of the trees was found in the protected area of the Serranía de los Yariguíes National Natural Park. Extinction risk was assessed according to the IUCN (2012, 2022). Species extent of occurrence (EOO) and area of occupancy (AOO) were calculated using GeoCAT with the default setting of 2 km² grid (Bachman *et al.* 2011; <https://geocat.kew.org/>). Based on an EOO <100 km² (=66.2 km²) and AOO <10 km² (=40 km²), the species is preliminarily assessed as EN according to the criterion B1ab (iii). However, considering criterion D and the number of adults observed so far, the species can be considered CR.

Additional specimens examined:—COLOMBIA. Santander: Carmen de Chucurí, Finca Víctor Pérez, 6°36'08.16" N, 73°34'13.44" W, 835 m, 3 Aug 2022 (fr) *Quiroga 15* (JAUM); Carmen de Chucurí, Vereda Quinal Alto, 6°41'48.19" N, 73°29'39.61" W, 867 m, 14 Sep 2022 (fl fr), *Quiroga 16* (JAUM); Carmen de Chucurí, Vereda Quinal Alto, 6°41'48.19" N, 73°29'39.61" W, 938 m, 938 m (fl) 27 Dec 2022 (fl), *Quiroga et al. 17* (JAUM); Carmen de Chucurí, Vereda Quinal Alto, 6°41'48.19" N, 73°29'39.61" W, 938 m, 3 Feb 2023 (fl), *Quiroga 19* (JAUM); Carmen de Chucurí, Vereda Quinal Alto, 6°41'50.91" N, 73° 29' 39.60" W, 910 m, 12 May 2023 (fl, fr), *Díaz-Rueda et al. 2856* (JAUM, JBB, HECASA, HUA, UDBC, UIS, UPTC); Carmen de Chucurí, Vereda Honduras Alto, 6°39'13.0" N, 73°30'51.1" W, 790 m, 15 May 2023 (fl, fr), *Díaz-Rueda et al. 2910* (COL, JAUM, JBB, HUA, UDBC, UIS); Carmen de Chucurí, vereda Honduras Alto, 1073 m, 9 May 2025 (fl, fr), *Quiroga et al. 255* (JBB); Carmen de Chucurí, vereda Delicias Alto, 6°39'46.80" N, 73° 28'57.65" W, 853 m, 2 Aug 2025(fl), *Solano et al. 180* (UDBC).

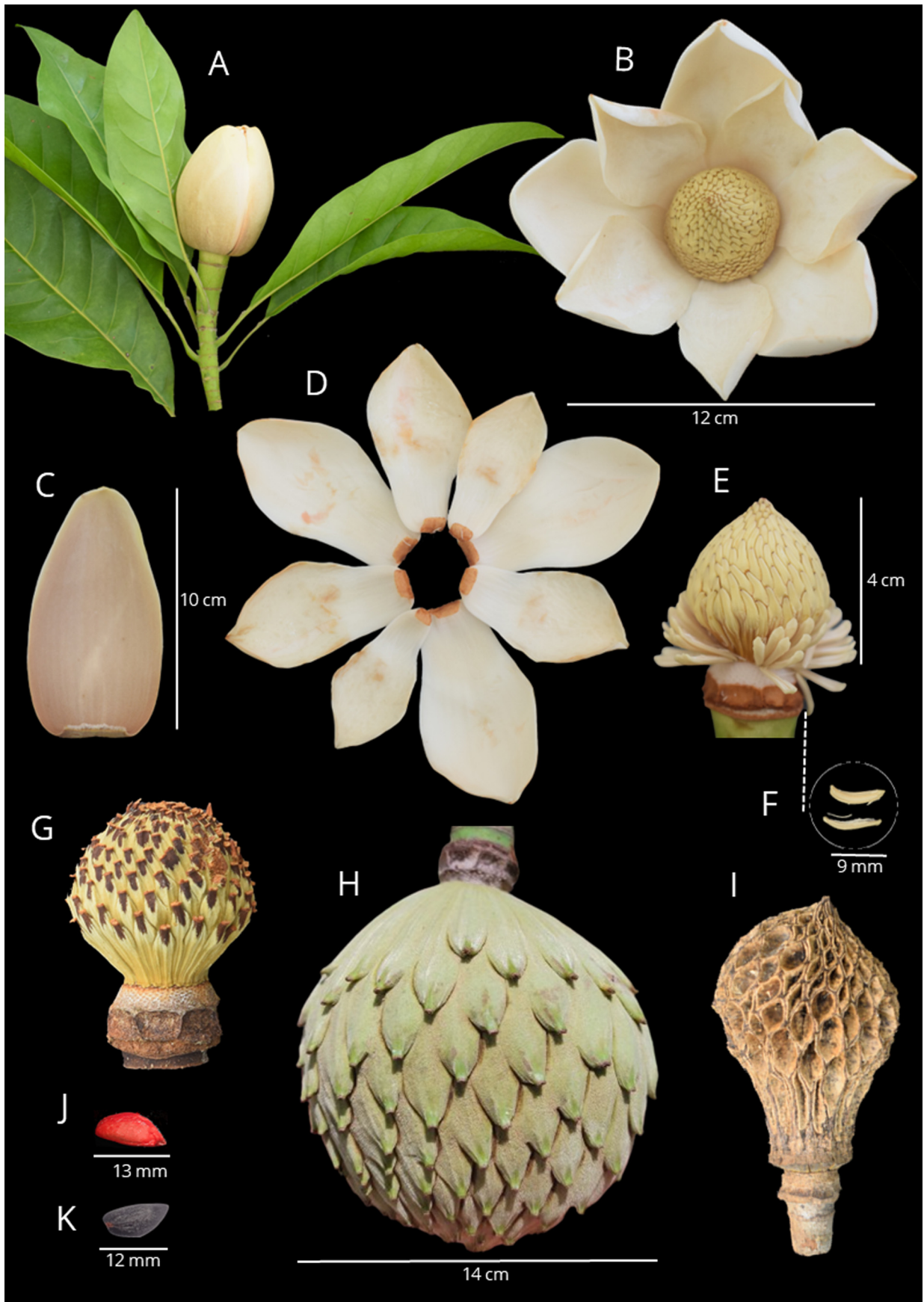


FIGURE 2. *Magnolia carmelita*. A. Branchlet with visible annular stipule scars and floral bud. B. Open flower. C. Sepal. E. Gynoecium. F. Stamens. G. Immature fruit. H. Fruit I. Receptacle. J. Seed with reddish sarcotesta. K. Seed with black sclerotesta. Photographs by J. Quiroga, illustration by J. Quiroga & M. Serna.



FIGURE 3. *Magnolia carmelita*. A. Habit. B. Branch with floral buds and female phase flowers. C. Open flower D. Terminal stipule. E. Scar on the petiole. F. Floral bud. Photographs by J. Quiroga, illustration by M. Serna.

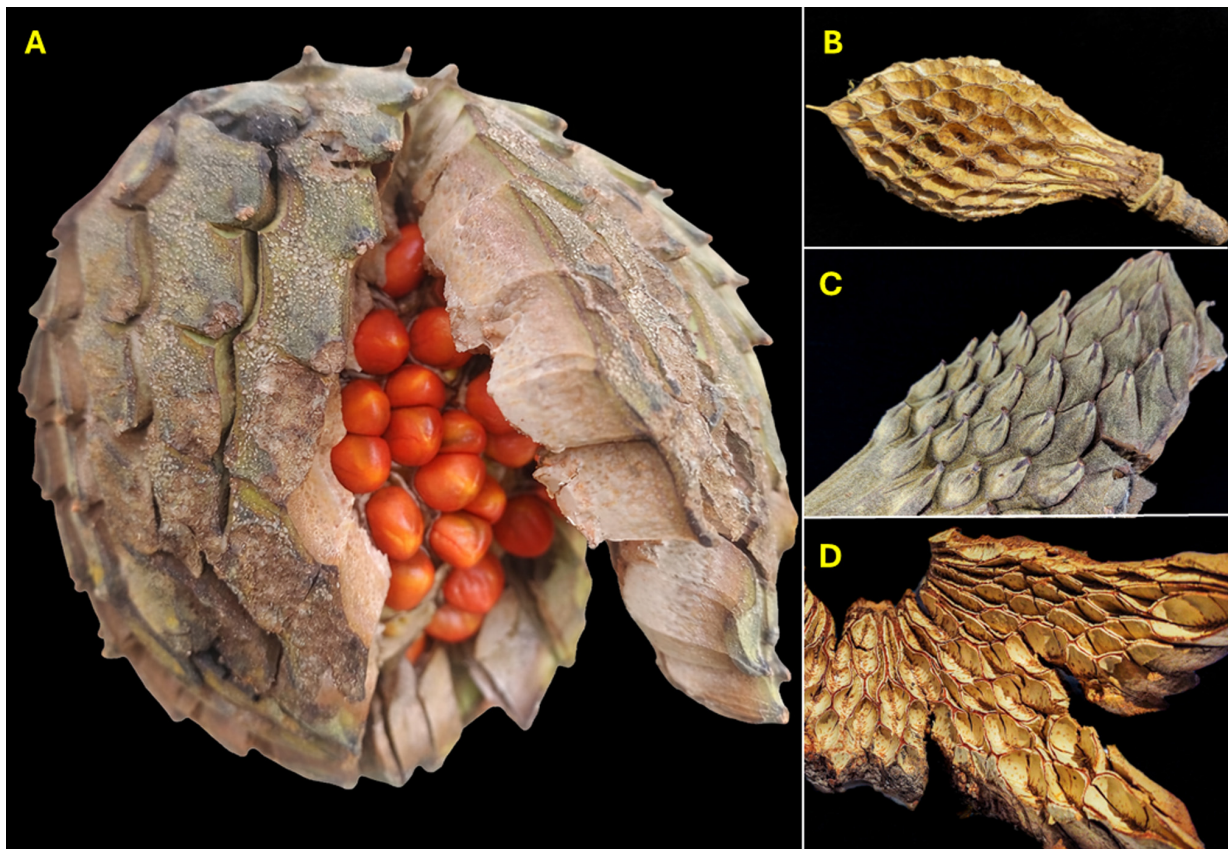


FIGURE 4. *Magnolia carmelita*. A. Fruit dehiscing with reddish seeds. B. Receptacle. C. External carpels wall D. Internal carpels wall. Photographs by J. Quiroga, illustration by M. Serna.

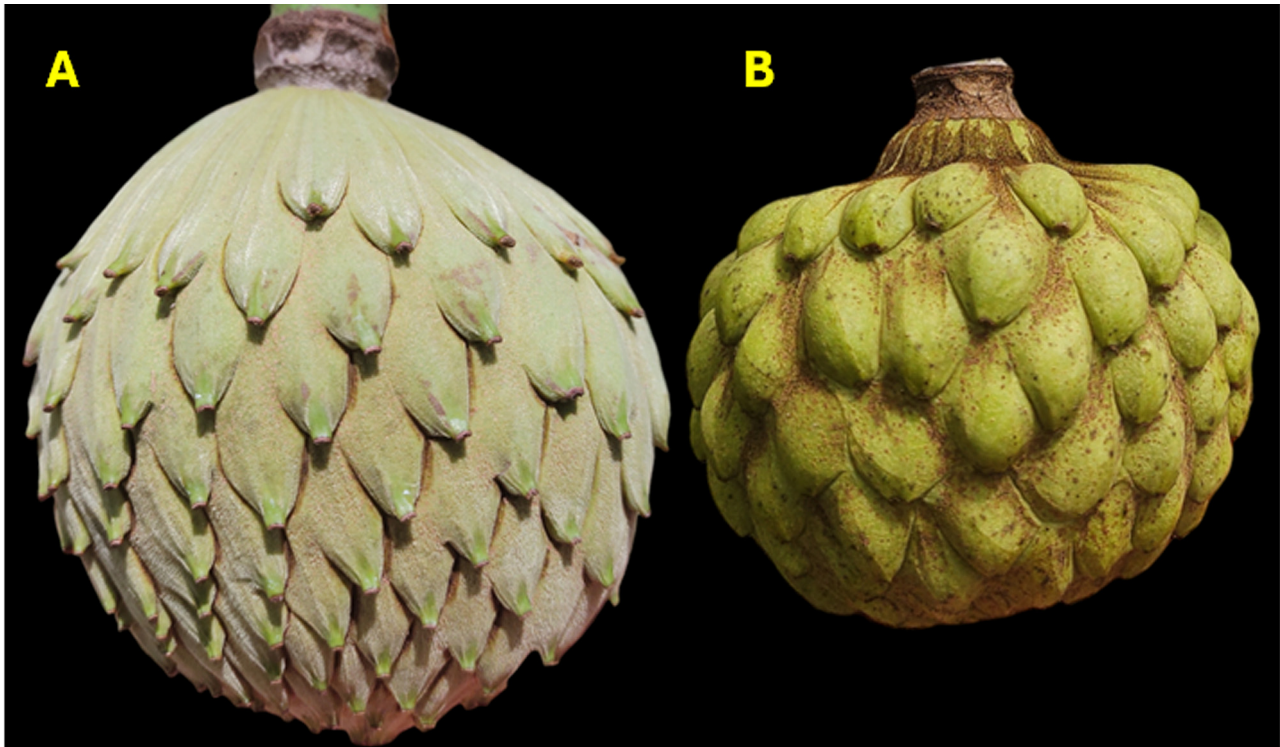


FIGURE 5. Fruit shape. A. *Magnolia carmelita*. B. *M. resupinatifolia*. Photographs by J. Quiroga, illustration by M. Serna.

Notes:—*Magnolia carmelita* is like *M. sambuensis* (Pittier) (1918: 105) Govaerts (1996: 72), but it differs from the latter in its larger leaves (7.0–47.0 × 4.0–20.0 cm vs. 11.0–25.0 × 4.5–11.0 cm), more numerous petals (8 vs 6) stamens (304–398 vs. 100–300) and carpels (108–173 vs. 139–156). *Magnolia sambuensis*, Panama to north-western Colombia, occurs in lowland forests, whereas *M. carmelita* inhabits remnant Andean forests. *Magnolia carmelita* is also like *M. cespedesii* (Triana & Planch. 1862: 23) Govaerts in Frodin & Govaerts 70: 1996, sharing the same elevational distribution, but the latter exhibits a more bracts and fewer petals, stamens and carpels (Table 1). *Magnolia carmelita* has the same distribution as *M. resupinatifolia* but differs in its greater number of bracts, petals, stamens and carpels. Some local people use the vernacular name *molinillo* for *M. carmelita*, probably because of its similarity to *M. resupinatifolia*, in which the fruit receptacles are widely used to stir chocolate beverages in the region (Fig. 4). Fruits of *M. carmelita* are globose, whereas fruits of *M. resupinatifolia* are stipitate and described as spheroid and slightly asymmetrical (Fig. 5).

TABLE 1. Morphological comparison of *M. carmelita* with its morphologically closest species.

Character	<i>M. carmelita</i>	<i>M. resupinatifolia</i>	<i>M. sambuensis</i>	<i>M. cespedesii</i>
Distribution	Eastern cordillera	Eastern cordillera	Western cordillera	Eastern cordillera
Altitude (m)	850–1200	1350–1850	0–600	1000
Height (m)	35	6–30	30–40	30
Indumentum	Abaxially scarcely villous, deciduous	Adaxially glabrous, villous along midrib	Glabrous	long soft hairy along midrib
Petioles (cm)	2.5–9.6	2.6–5.5	1.5–4.0	2.7–6.0
Scar length	90–100%	100%	100%	100%
Leaf blade (cm)	Elliptic to lanceolate, 7.0–47.0 × 4.0–20.0	Elliptic to narrowly elliptic, 25.0–19.0 × 9.0–11.2	Elliptic lanceolate to slightly obovate, 11.0–25.0 × 4.5–11.0	Elliptic 12.0–32.0 × 6.0–15.0
Lateral veins	9–14	10–12	14–17	10–13
Number of bracts	3–4	3	2	6–9

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TABLE 1. (Continued)

Character	<i>M. carmelita</i>	<i>M. resupinatifolia</i>	<i>M. sambuensis</i>	<i>M. cespedesii</i>
Sepals (cm)	3, oblong, 5.8–10.4 × 4.2–7.5	3, widely ovate, 4–7.3 × 2.8–4.8	3, obovate 7.3–7.6 × 4.4–5.1	3, widely elliptic 6.0–7.0 × 4.0–5.0
Petals (cm)	(7–) 8, outer 7.7–12.1 × 4.6–6.8, inner 3.5–7.0 × 1.9–4.5	6, outer 5.8–6.2 × 2.8–4.2, inner 5.1 × 2.4	6, outer 6.8–7.3 × 4.8–7.1, inner 5.6–6.5 × 4–4.2	6 (–7) obovate, 5.3–6.5 × 3.1–4.5
Gynoecium (cm)	Ovoid, 3.0–3.4 × 3.5–4.7	Globose, 1.7–1.9 × 1.6–2	Cupuliform	Ovoid, 3.0 × 2.0
Fruit (cm)	Globose, 11.8–17.0 × 8.7–15.4	Spheric, lightly asymmetric, 9.4–10.0 × 10.2–10.4	Subglobose, 8.0 × 7.5	Ovoid, 10.95 × 7.6–8.84
Stamens	304–398 in 7–8 series	200–255 in 6–7 series	222 in 6 series	232–275 in 7 series
Carpels	102–173	88–112	139–156	120–140
Seeds	0.9–1.3 × 0.5–0.8	1.0–1.2 × 0.8–0.9	1.1–1.3	1.0–1.2 × 1.4–1.6

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References

- Aguilar-Cano, J., Mendoza-Cifuentes, H. & Ayala-Joya, M. (2018) Dos nuevas especies de árboles molinillo (*Magnolia*: Magnoliaceae) de la Serranía de los Yariguíes, departamento de Santander, Colombia. *Biota Colombiana* 19 (supp. 1): 27–42. <https://doi.org/10.21068/c2018.v19s1a04>
- Aldaba Núñez, F.A., Guzmán-Díaz, S., Veltjen, E., Asselman, P., Esteban Jiménez, J., Valdés Sánchez, J., Testé, E., Pino Infante, G., Silva Sierra, D., Callejas Posada, R., Hernández Najarro, F., Vázquez-García, J.A., Larridon, I., Park, S., Kim, S., Martínez Salas, E.M. & Samain, M.S. (2024) Phylogenomic insights into Neotropical *Magnolia* relationships. *Heliyon* 10: e39430. <https://doi.org/10.1016/j.heliyon.2024.e39430>
- Figlar, R. & Nooteboom, H. (2004) Notes on Magnoliaceae IV. *Blumea* 49: 87–100. <https://doi.org/10.3767/000651904X486214>
- Figlar, R.B. & Serna, M. (2021) Magnolias of Colombia. In: International dendrology society yearbook. International Dendrology Society, Exeter, pp. 73–89.
- Frodin, D.G. & Govaerts, R. (1996) *World checklist and bibliography of Magnoliaceae*. Kew Publishing, London, 79 pp.
- González-Orozco, C. (2020) Biogeographical regionalisation of Colombia: a revised area taxonomy. *Phytotaxa* 484: 247–260. <https://doi.org/10.11646/phytotaxa.484.3.1>
- Guzman-Diaz, S., Aldaba Núñez, F.A., Veltjen, E., Asselman, P., Jiménez, J.E., Valdés Sánchez, J., Pino Infante, G., Callejas Posada, R., Vázquez García, J.A., Larridon, I., Park, S., Kim, S., Martínez Salas, E.M. & Samain, M.S. (2025) There and back again: historical biogeography of Neotropical magnolias based on high-throughput sequencing. *BMC Ecology and Evolution* 25: 40. <https://doi.org/10.1186/s12862-025-02379-7>
- IUCN. (2012) *IUCN Red List categories and criteria*, version 3.1, 2nd ed. IUCN, Gland and Cambridge.
- IUCN Standards and Petitions Committee (2022) *Guidelines for using the IUCN Red List categories and criteria*, version 15.1. Prepared by the Standards and Petitions Committee. Available from: <https://www.iucnredlist.org/documents/RedListGuidelines.pdf> (accessed 15 Nov 2024)
- Linnaeus, C. (1753) *Species plantarum*. Salvius, Stockholm, 560 pp.
- Lozano, G. (1975) Contribución al estudio de las Magnoliaceae de Colombia, III. *Caldasia* 11: 27–50. <https://doi.org/10.56178/eh.v11i4.1262>

- Lozano, G. (1983) Magnoliaceae. In: *Flora de Colombia*. Universidad Nacional de Colombia, Instituto de Ciencias Naturales, pp. 119.
- Lozano, G. (1994) *Talauma* y *Dugandiodendron* (Magnoliaceae) en el Neotrópico. Academia Colombiana de Ciencias Exactas, Bogotá, 147 pp.
- Torres, M. & Quiñones, C. (eds.) (2019) *Santander Bio: resultados, retos y oportunidades*. Instituto de Investigación de Recursos Biológicos Alexander von Humboldt, Bogotá.
- Pérez-Rojas, D.A., Escamilla-Quitíán, D., Estupiñán-Tibaduiza, M.F. & Carvajal-Cogollo, J.E. (2020) Annotated checklist of the amphibians and reptiles of the Santander highland, Colombia. *Check List* 16: 611–620.
<https://doi.org/10.15560/16.3.611>
- Rodríguez-Duque, D.L., Escobar-Alba, M., García-González, J.D., Carvajal-Cogollo, J.E. & Aymard-Corredor, G.A. (2022) A new Andean species of *Magnolia* (section *Talauma*, Magnolioideae, Magnoliaceae), and a key to the species found in Colombia. *Harvard Papers in Botany* 27: 131–141.
<https://doi.org/10.3100/hpib.v27iss2.2022.n1>
- Serna, M. (2013) *Magnolias del departamento de Santander*, Informe final proyecto de investigación, Tecnológico de Antioquia, 32 pp.
- Serna-González, M., Cogollo-Pacheco, Á. & Velásquez-Rúa, C. (2024) *Magnolia amalfiensis*, a new species of Magnoliaceae from Antioquia Province, Colombia. *Brittonia* 76: 217–222.
<https://doi.org/10.1007/s12228-024-09796-w>
- Wang, Y.B., Liu, B.B., Nie, Z.L., Chen, H.F., Chen, F.J., Figlar, R.B. & Wen, J. (2020) Major clades and a revised classification of *Magnolia* and Magnoliaceae based on whole plastid genome sequences via genome skimming. *Journal of Systematics and Evolution* 58: 673–695.
<https://doi.org/10.1111/jse.12588>