

A NEW ANDEAN SPECIES OF *MAGNOLIA*
(SECTION *TALAUMA*, MAGNOLIOIDEAE, MAGNOLIACEAE),
AND A KEY TO THE SPECIES FOUND IN COLOMBIA

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Abstract. *Magnolia pajarito*, a new species from the Andean slopes of the Eastern Cordillera of Colombia, is described and illustrated, and its morphological relationships with other similar *Magnolia* species are discussed. This new species is a tree between 9 and 30 m tall from montane forest remnants and pasture lands with dispersal trees (1500–1700 m), and it does not appear to be closely allied to any particular *Magnolia* species. This new species shares several features with four other species (*M. arcabucoana*, *M. caricifragans*, *M. santanderiana*, and *M. virolinensis*) in section *Talauma*. Morphologically it has some similarity to *M. arcabucoana*, but it differs in the length of the adaxial scar of the petiole, the size and shape of the leaf blade, the sepal and inner petal, and in the number of secondary veins, vaginal hypsophyl, and stamens. Additionally, habitat information, a distribution map, and data on *Magnolia* conservation status are included. An identification key of species of *Magnolia* found in Colombia is also provided. This new species elevates to 40 the number of *Magnolia* taxa for the flora of Colombia, of which 31 are endemic. Colombia has the highest diversity of the genus in the neotropics.

Keywords: Andean forests, Eastern Cordillera, Boyacá department, Colombia, *Magnolia*, Magnoliaceae

Resumen. *Magnolia pajarito* una nueva especie de las vertientes de la Cordillera Oriental de los Andes de Colombia, es descrita, ilustrada y se discuten sus relaciones morfológicas con otras especies similares. Esta nueva especie es un árbol entre 9 y 30 m de altura, que se encuentra en remanentes de bosques montañosos y con árboles dispersos (1500–1700 m) y aparentemente no está cercanamente relacionada con ninguna especie en particular de *Magnolia*. *M. pajarito* comparte algunos caracteres con cuatro especies (*M. arcabucoana*, *M. caricifragans*, *M. santanderiana* y *M. virolinensis*) de la sección *Talauma*. Sin embargo, morfológicamente, tiene cierta similitud con *M. arcabucoana*, de la cual difiere en el largo de la cicatriz adaxial del pecíolo, en el tamaño y forma de la hoja, sépalos y pétalos internos y en el número de las venas secundarias, hipsófilos vaginales y estambres. Adicionalmente, se incluye información del hábitat, un mapa de distribución, datos acerca del estado de conservación de *Magnolia* y una clave para la identificación de las especies de *Magnolia* presentes en Colombia. Esta nueva especie eleva actualmente en 40 el número de especies para la flora de Colombia, 31 son endémicas. Colombia es el país con la mayor diversidad del género en el neotrópico.

Palabras clave: Bosques andinos, Cordillera Oriental, departamento de Boyacá, Colombia, *Magnolia*, Magnoliaceae

Magnolia L. (Magnoliaceae) is a pantropical and temperate genus of between 345 and 350 species (World Checklist of Vascular Plants; kew.org; Vázquez-García et al., 2021a). The genus is disjunctly distributed from Southeastern North America, Mexico, Central America, Antilles, the Andes (Venezuela, Colombia, Ecuador, Peru, and Bolivia), along the Pacific Coast of Colombia and Ecuador to Southeastern Brazil (Frodin and Govaerts, 1996), and in Asia, from India, Sri Lanka, Vietnam, the Himalayas, China, Japan, Korea, Taiwan, and southeastward through the Malay Archipelago and New Guinea (Nooteboom, 1993; Azuma et al., 2001; Cicuzza et al., 2007; Sánchez-Velásquez et al., 2016). The genus is absent in Africa, Australia and Europe (World Checklist of Vascular Plants; kew.org). The main center of species diversity for Magnoliaceae is in China (Rivers et al., 2016). However, a second center of diversity is in the Neotropics, where a large number of

new species have been described and published in the last two decades (see Literature Cited). According to Vázquez-García et al. (2015) and Sánchez-Velásquez et al. (2016), *Magnolia* includes nearly 160 species distributed in the Neotropics between sea level and 3200 m (Cicuzza et al., 2007). The neotropical countries with the highest number of species are Colombia (40 species) and Mexico and Ecuador (39 and 24 species, respectively). Neotropical *Magnolia* is most diverse throughout the Mexico, Central America and Andes (Venezuela, Colombia, Ecuador, Perú and Bolivia) bioregions, where species are found from lowland vegetation to montane forests. Additionally, several taxa are found along the Pacific Coast of Colombia and Ecuador (e.g., *M. mahechae* (Lozano) Govaerts; *M. mindoensis* A. Vázquez, D.A. Neill & Dahua) and the Amazon basin (e.g., *M. clementinana* F. Arroyo & M. Serna; *M. manuensis* F. Arrollo). A few species are found on rocky slopes and

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oligotrophic soils derived from the Precambrian crystalline basement of the Guayana Shield (e.g., *M. chimantensis* Steyerl. & Maguire; *M. ptaritepuiana* Steyerl.; *sensu* Berry and Miller, 2001). Others are endemic to particular geographical areas, such as the Caribbean islands (e.g., *M. cristalensis* Bisse; *M. cubensis* Urban, *sensu* Ulloa Ulloa et al., 2018 onwards) or in Central to Southeast Brazil (e.g., *M. brasiliensis* C.O. Azevedo, A.F.P. Machado & A. Vázquez; *M. paranaensis* A. Vázquez, *sensu* Azevedo et al., 2018).

Classification within the Magnoliaceae is largely disputed, and authors are not in agreement about the number of taxa: subfamilies (0–2), genera (1–11), and sections (0–11) (Azuma et al., 2001, Li and Conran, 2003, Figlar and Nooteboom, 2004; Kim and Suh, 2013). A recent molecular study, based on phylogenetic, morphological, and geographic evidence, recognized two subfamilies in Magnoliaceae (Liriodendroideae and Magnolioideae) each with one genus, *Liriodendron* and *Magnolia* (Wang et al., 2020), respectively. In this work *Magnolia* was divided into 15 sections. In the Neotropics, most authors agree with Figlar and Nooteboom (2004) and Kim and Suh (2013), who consider the Neotropical Magnoliaceae to consist of a single genus, *Magnolia*, which is divided into three sections: sect. *Macrophylla* Figlar & Nooteboom, sect. *Magnolia* and sect. *Talauma* (Juss.) Baill. However, Wang et al. (2020) added a fourth section, sect. *Splendentes* Dandy ex J.A. Vázquez, based on whole plastid genome analysis, that strongly supports the *Talauma* clade as sister to the *Splendentes* clade. Their phylogenetic analyses sampled very few taxa of subsects. *Dugandiodendron* and *Splendentes*, and each of them, indeed, forms a subclade. Rather, they included taxa of subsect. *Dugandiodendron* and subsect. *Splendentes* in sect. *Splendentes*, and subsect. *Chocotalauma* A. Vázquez, J.A. Pérez & F. Arroyo in sect. *Talauma*.

In the past decade, 82 new species of Magnoliaceae have been described from the Neotropics (Vázquez-García et al., 2012a,b,c, 2013a,b,c,d, 2015a,b, 2016a,b, 2017a,b,c, 2018, 2019, 2020, 2021a,b, 2022a,b; Marcelo-Peña and Arroyo, 2013, Arroyo and Pérez, 2013, Arroyo et al., 2013, Arroyo, 2014; Molinari-Novoa, 2016; Pérez et al., 2016; Azevedo et al., 2018; Arrollo et al., 2019; Cogollo-Pacheco et al., 2019; Arrollo and Serna-González, 2020; Fernández-Hilario et al., 2020; Archila et al., 2022). This is the result of establishing permanent monitoring plots and from botanical exploration in unexplored tropical regions, and illustrates the need for further fieldwork for certain groups of neotropical plants (Vázquez-García et al., 2016a; 2017a).

The present work describes and illustrates a new species of *Magnolia* sect. *Talauma*, found in an isolated population composed of nine individuals located in disturbed and highly fragmented montane forest and pasture lands with dispersal trees. This discovery was made by a team of botanists from the project entitled: “Investigación de la biodiversidad de Boyacá: complementación y síntesis a través de gradientes altitudinales e implicaciones de su incorporación en proyectos de apropiación social de conocimiento y de efectos de cambio climático.” Currently, the distribution of this new species is restricted to Pajarito Municipality, Boyacá department. However, a more detailed exploration is required in other forest remnants of neighboring municipalities in southeastern Boyacá and northern Santander departments, where additional populations of this species may occur. This contribution increases the number of *Magnolia* species known in Colombia, the country with the highest diversity of the genus in the neotropics, to forty. Of these 40 species, thirty-one are endemic. The department of Antioquia has the highest number of species (13) (Serna-González and Velásquez, 2016; Cogollo-Pacheco et al., 2019).

MATERIALS AND METHODS

We examined, in person, 300 herbarium specimens from South America deposited in the *Magnolia* collection in the “Herbario de la Universidad Nacional de Colombia (COL). In addition, all type specimens, as well as general collections, hosted by virtual herbaria, were consulted, including those maintained by the Field Museum (F; <http://emuweb.fieldmuseum.org/botany/taxonomic.php>), Instituto Nacional de Pesquisas da Amazônia (INPA; <http://inct.florabrasil.net/en/>), JSTOR Global Plants (<http://plants.jstor.org>), Museum of Natural History, Paris (P; <http://www.mnhn.fr>), Reflora Virtual Herbarium (<http://reflora.jbrj.gov.br/reflora/>), speciesLink (<https://specieslink.net/>), Smithsonian Institution (US; <https://collections.si.edu/search/>), Universidad de Antioquia, Colombia (HUA; <http://www2.udea.edu.co/herbario/paginas/consultas/consultarEjemplares.iface>), Universidad Nacional Autónoma de México (MEXU; <https://datosabiertos.unam.mx/bio-diversidad/>), and the National Herbarium of The Netherlands (U; <https://www.nationaalherbarium.nl/>).

This work is based on morphological and herbarium studies. The species description was based on field observations (flower material was preserved in alcohol) and herbarium specimens. The flowers from herbarium specimens were rehydrated for three days before measuring using a 1:1 combination of glycerin and physiological solution.

The World Checklist of Vascular Plants (kew.org) and general taxonomic literature on *Magnolia* were consulted; in particular, Nooteboom (1993), Frodin and Govaerts (1996), Azuma et al. (2001), Li and Conran (2003), Figlar and Nooteboom (2004), Kim and Suh (2013), Sánchez-Velásquez et al. (2016), and Wang et al. (2020). In addition, neotropical bibliographic sources were analyzed; Lozano-Contreras (1983, 1994), Arroyo et al. and Vázquez-García et al. contributions (see Literature Cited). The *Catálogo de plantas y Líquenes de Colombia* (Serna-González and Velásquez, 2016) was also reviewed. Additionally, the International Plant Names Index (<https://www.ipni.org/>), the online botany collections of the Smithsonian National Museum of Natural History (<https://naturalhistory.si.edu/research/botany>), and Tropicos (<http://legacy.tropicos.org/Home.aspx>) were consulted to update the current nomenclature and geographical information.

Terminology for vegetative characters, inflorescences, flowers, and fruit morphology follow Lozano-Contreras (1983, 1994) and Font-Quer (2001). Conservation status (IUCN, 2020), the extent of occurrence (EOO), and area of occupancy (AOO) were calculated using the supporting Red List threat assessments with GeoCAT (Bachman et al., 2011; <https://geocat.kew.org/>).

TAXONOMY

Magnolia pajarito Aymard, Rodríguez-D. & M. Escobar, *sp. nov.* TYPE: COLOMBIA: Boyacá: Municipio Pajarito, Vereda Corinto, Finca el Porvenir, selva subandina muy intervenida del piedemonte llanero, 1669 m, 5°23'47.6"N, 72°43'34.8"W, 11 Noviembre, 2021 (fl), Juan D. García-G., Dayro Rodríguez-D. & Magda Escobar-A. 2328 (Holotype: COL; Isotype: UPTC). Fig. 1–2.

Magnolia pajarito belongs in *M.* sect. *Talauma* and is similar to *M. arcabucoana*. It differs from the latter in having leaf blades 7–17 × 2.5–10 cm, oblanceolate or obovate-elliptic, midvein on the lower surface covered by erect and adpressed yellowish trichomes, more dense at the base, secondary veins 7–9; adaxial canaliculate scar along the entire length of the petiole, vaginal hypsophyl one, sepals widely ovate, 3.0–3.2 × ca. 2.0 cm, inner petals lanceolate, stamens 21–35 in 2 series, and 11–12 carpels (Table 1).

Evergreen trees, 9–30 m high, 38–62 cm DBH, branches and branchlets fragrant, glabrous; apical bud lanceolate, glabrous; twig internodes 0.8–1.8 × 0.5–0.8 cm, glabrous; stipules not seen, soon deciduous, adnate to the petioles, leaving a scar on both edges of the adaxial side of petioles and converging apically. **Leaf** blades obovate, oblanceolate or obovate-elliptic, 7–17 × 2.5–10 cm, discolorous, dull on the upper surface (when dried), shiny on the lower surface, glabrous on both sides, except along the midvein on the lower surface, which is covered by erect and adpressed yellowish trichomes, more dense at the base, glabrescent when mature, coriaceous; the base obtuse or cuneate, the apex rounded or obtuse, sometimes very short mucronate, margin entire, revolute, midvein canaliculate above, prominent beneath, venation brochidodromous, secondary veins, 7–9, prominent on both surfaces, veinlets strongly reticulate forming net venation on both surfaces. **Petioles** 1–4.5 cm long, 1–2 mm wide, 1–4 mm wide at the base, glabrous, with an adaxial canaliculate scar along the entire length of the petiole. **Floral peduncles** 3–6 cm long, glabrous, with 6–8 segments differentiated by annular scars, the major segment length ca. 1 cm, flower buds ellipsoid, 1.5–2 × 1–1.2 cm long, rostrate at the apex; spatheaceous bract (vaginal hypsophyl) 2–2.5 × ca. 3 cm, orbicular, glabrous on both sides, rigid. **Flowers** 4–5 cm in diameter; **Sepals** 3, 3–3.2 × ca. 2 cm, widely ovate, gradually narrower basally (ca. 1.1 cm wide), concave, white, revolute and acute at the apex, truncate at the base; **Petals** 6, white, unequal, concave, glabrous, outer petals 3–3.2 × ca. 1.1 cm, obovate, gradually narrower basally (ca. 5 mm wide), acute at the apex, truncate at the base, inner petals 2.2–2.5 × 0.5–0.6, lanceolate, gradually narrower basally (3–3.5 cm wide), revolute and acute at the apex, truncate at the base; **Stamens** 21–35, 1.5–1.6 × ca. 0.25 cm, arranged in two series, short acute at the apex; **Gynoecium** ellipsoid, 1.5–2 × 0.6–1 cm, formed by 11–12 carpels, glabrous, without persistent styles; **Fruit** narrowly ellipsoid, ca. 2.8 × ca. 1.2 cm, follicles ca. 12, glabrous, costate, slightly gibbous.

Phenology: The type specimen with flowers and young fruits was collected in November, and with flowers in April (Fig. 2).

Etymology: *Magnolia pajarito* is named after Municipio Pajarito, Boyacá department, the type locality (Fig. 2–3). The Municipio Pajarito is located on the Andean slopes of the Eastern Cordillera of Colombia (“Cordillera Oriental”)

in the southeastern portion of Boyacá Department. This region is well-known as a geostrategic territory for access from the Andes to the foothills (“piedemonte llanero”). The epithet also honors the civilian rural societies of Pajarito, who resisted with courage and wisdom more than three decades of armed conflict in their region (for a review see Díaz-Bonilla, 2019).

Distribution and habitat: The species is known to occur in montane forest remnants and pasture lands with dispersal trees between 1500 and 1700 m. In the type locality, *M. pajarito* grows in forest consisting of medium to tall trees. Some dominate species in these forests are *Alchornea glandulosa* Poepp. (Euphorbiaceae), *Vismia mandurr* Hierom. (Hypericaceae), *Cecropia angustifolia* Trécul (Urticaceae), *Beilschmiedia* cf. *B. towarensis* (Klotzsch & H. Karst. ex Meisn.) Sach Nishida (Lauraceae), *Guatteria hirsuta* Ruiz & Pav. (Annonaceae), *Henriettea tuberculosa* (Donn. Sm.) L. O. Williams (Melastomataceae), *Meriania haemantha* (Planch. & Lind.) H. Mend. & Fern. Alonso (Melastomataceae), *Vochysia megalophylla* Stapf (Vochysiaceae), *Billia rosea* (Planch & Lind.) C. Ulloa & P. Jørg. (Sapindaceae), and *Geonoma undata* Klotzsch and *Wettinia praemorsa* (Willd.) Wes. Boer (Arecaceae).

Conservation status. Since this species is currently known only from the type locality, and from four additional collections made around the type locality, consisting of 9 individuals, it is reported here as a very rare species. Under IUCN (2020) guidelines, fewer localities are required in order to assess its conservation status as data deficient (DD). Nevertheless, it should be regarded as Endangered (EN) and Critically Endangered (CR) based on the criterion B1ab(iii)+2ab(iii), due to the low number of known localities (five), its estimated Area of Occupancy, 20,000 km², and its estimated Extent of Occurrence, 1698 km² (IUCN, 2020). Additionally, the Pajarito municipality has been highly deforested over the past six decades, especially in the years during the pre- and post-conflict period. The expansion of deforestation and degradation continues unregulated, with significantly greater agricultural use and pasture lands with dispersal trees, that will accelerate land cover change in the coming years (for a review see Murillo-Sandoval et al., 2021). Although conservation status assessments can be made for species with such small numbers of collections (Rivers et al., 2011), it may be difficult to determine whether the appearance of rarity in a species is due to the lack of, or outdated, data, or to its actual rarity. Furthermore, the area where *Magnolia pajarito* was found is not currently protected by the Colombian National Park service (*Parques Nacionales Naturales de Colombia*).

Notes about *Magnolia* conservation status. Most of the 50% of the species of *Magnolia* included in the Red List of Magnoliaceae are listed as threatened in their geographical distribution range (Cicuzza et al., 2007; Sánchez-Velásquez et al., 2016). It is estimated that 22% of *Magnolia* species are critically endangered (CR), 41% are endangered (EN), 16% are vulnerable (VU), 5% are near threatened (NT), 6% are of least concern (LC), and 6% are considered data deficient (DD). In Colombia, the situation is very similar; all species of this genus are threatened in some risk category (Calderón et al., 2007; Serna-González and Velásquez, 2016).

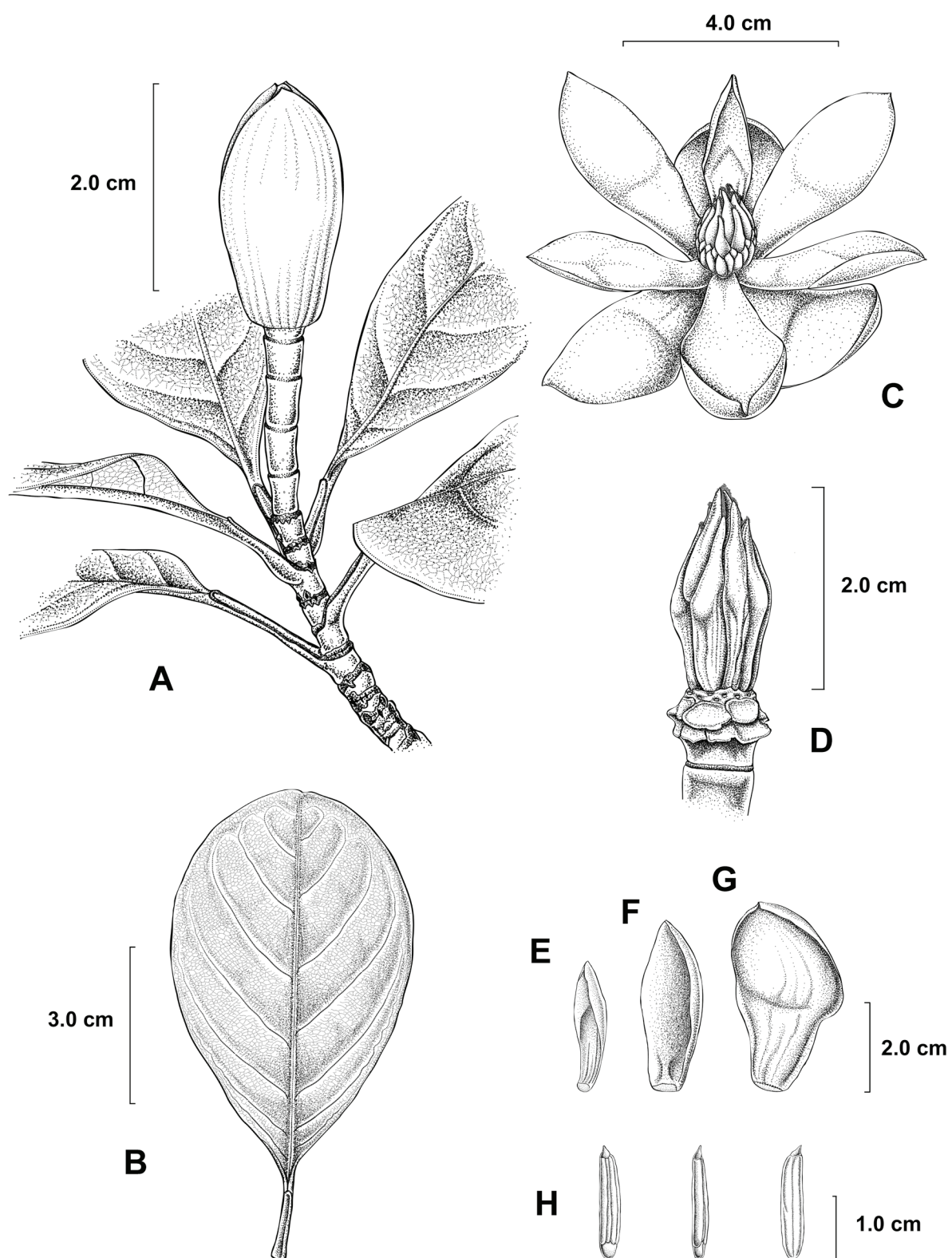


FIGURE 1. *Magnolia pajarito* Aymard, Rodríguez-D. & M. Escobar. **A**, Branch showing the spathaceous bract in bud flower; **B**, Leaf adaxial surface showing the canaliculate scar along the entire length of petiole; **C**, Flower; **D**, Gynoecium; **E**, Inner petal; **F**, Outer petal; **G**, Sepal; **H**, Stamens. Drawn by A. Valenzuela Zúñiga based on the holotype.



FIGURE 2. *Magnolia pajarito* Aymard, Rodríguez-D. & M. Escobar. **A**, Habit; **B**, Leaf adaxial size partially showing the canaliculate scar along the petiole; **C**, Leaf abaxial surface; **D**, Flower bud with spatheous bract; **E**, Flower bud without spatheous bract showing one of the sepals in the foreground; **F**, Flower, lateral view; **G**, Flower, upper view. Photographs by D. Rodríguez-D.

A new Red List of Magnoliaceae was published in 2016 (Rivers et al., 2016). This work contains conservation assessments for 304 Magnoliaceae species. All assessments were submitted for publication in the IUCN Red List of Threatened Species and reveal that a large proportion of Magnoliaceae species are threatened with extinction in the wild (at least 48%). Furthermore, nearly one third of all species are still too poorly known to make a conservation assessment. In an overall context, this analysis concluded that only one in

five species of Magnoliaceae is considered not threatened, and that the neotropics has the highest proportion of threatened *Magnolia* species (75%). A recent study found that the vulnerability of *Magnolia* species to future climate change is negatively related to range size (Wang et al., 2022). Wang et al. (2022) concluded that narrow-ranged *Magnolia* species distributed in Asia are more vulnerable than those distributed in the Americas, and that protected area coverage is lower in Asia than in the Americas. Moreover, the conservation status

TABLE 1. Comparison of diagnostic morphological characters of *Magnolia pajarito* Aymard, Rodríguez-D. & M. Escobar and closely related species.

CHARACTER	<i>M. ARCABUCOANA</i>	<i>M. CARICIFRAGRANS</i>	<i>M. SANTANDERIANA</i>	<i>M. PAJARITO</i>	<i>M. VIROLINENSIS</i>
Internodes of the young branchlets	glabrous	tomentose	tomentose	glabrous	puberulent
Leaf blade	30–33 × 16–18 cm, obovate, glabrous on both surfaces	12–30 × 7–15 cm, obovate, pubescent on the lower surface	12–22 × 7–15 cm, oblong, pubescent on the lower surface, more dense along the midvein	7–17 × 2.5–10 cm, oblanceolate or obovate-elliptic, glabrous on both surfaces, except midvein on the lower surface which is covered by erect and adpressed yellowish trichomes	12–21 × 5–11 cm, obovate or elliptic, with sparse trichomes on the lower surface
Secondary veins	18–21	15–18	9–12	7–9	12–15
Adaxial canaliculate scar of petiole	covers ca. 75% length of petiole	along the entire length of petiole	along the entire length of petiole	along the entire length of petiole	covers ca. 60% length of petiole
Vaginal hypsophyl	2	3	(1)–2	1	2–3(–4)
Sepal	3, obovate, ca. 2.5 × ca. 1.3 cm	3, elliptic, 3.8–5.3 × 1.6–3 cm	3(–4), oblong, ca. 3.8 × ca. 1.4 cm	3, widely ovate, 3–3.2 × ca. 2 cm	3, obovate, ca. 2.9 × ca. 1.3 cm
Petal	6, outer obovate to ovate, ca. 2.5 × ca. 1 cm; inner rhomboid, ca. 2 × ca. 1 cm	6(–7), elliptic, outer 4–5.55 × 3.30–5.5 cm; inner ca. 4.2 × ca. 1.8 cm	7(–8), outer obovate, ca. 5 × ca. 1.8 cm; inner lanceolate, ca. 4.1 × ca. 1.3 cm	6, outer obovate, 3–3.2 × ca. 1.1 cm; inner lanceolate, 2.2–2.5 × 0.5–0.6	6, obovate, outer ca. 3.3 × ca. 1.60; inner ca. 3.1 × 1.1 cm
Stamens	40 in 3 series	35–51 in 3 series	25–28 in 2 series	21–35 in 2 series	29–31 in 2 series
Carpels	12	10–17	10–12	11–12	8–11

ranking of *Magnolia* species classified by the IUCN Red List will likely change as the climate continues to change. Some species classified as Near Threatened and of Least Concern were estimated to be more vulnerable to climate change than species currently classified as Endangered.

Magnolia has evolved through allopatric speciation; i.e., new species evolve as a result of geographic isolation and new selection pressures. As a result, their presence in forests tends to be scanty (Sánchez-Velásquez et al., 2016). In tropical mountain landscapes of the Andes, changes in habitat suitability are expected to be of a mixed character, favorable for some tree species but not for others (Vázquez-García et al., 2021a). In the case of *Magnolia*, the narrow distribution ranges of most species may constitute a risk factor that could lead to the disappearance of suitable habitats due to climate change projected to the end of the 21st century (Vázquez-García et al., 2018).

Additional specimens examined: COLOMBIA. Boyacá: Municipio of Pajarito, aledaño a la quebrada Combita, bosque ripario intervenido, 5°23'45.8"N, 72°43'27.5"W, 1534 m, 04 Abril 2021 (fl), *M. Escobar-A.*, *D. Rodríguez-D.*, *M. L. Verdugo* & *P. Hernández-A.* 382 (COL); Municipio Pajarito, Vereda Corinto, Finca El Porvenir, en potreros,

5°24'01.9"N, 72°43'39.5"W, 1551 m, 11 Septiembre 2021 (bud), *M. Escobar-A.*, *Dayro Rodríguez-D.*, *J. D. García-G.* & *J. Rodríguez-F.* 713 (COL); Municipio Pajarito, Vereda Corinto, Finca El Porvenir, selva subandina muy intervenida del piedemonte llanero, 1710 m, 5°23'45.4"N, 72°43'44.4"W, 11 Noviembre 2021 (young fruit), *J. D. García-G.*, *D. Rodríguez-D.* & *M. Escobar-A.* 2332 (COL); Municipio Pajarito, Vereda Corinto, Finca El Porvenir, selva subandina muy intervenida del piedemonte llanero, 1605 m, 5°23'50.4"N, 72°43'28.3"W, 11 Noviembre 2021 (sterile), *J. D. García-G.*, *D. Rodríguez-D.* & *M. Escobar-A.* 2343 (COL).

The species described here is placed in sect. *Talauma* because it is an evergreen tree, the stipules are adnate to 40%–100% of the length of the petiole, caducous, and leave an adaxial canaliculate scar, and there is an absence of long filaments at the stamen connective (Figlar and Nooteboom, 2004; Wang et al., 2020). It is morphologically related to four other taxa in sect. *Talauma* (*M. arcabucoana* (Lozano) Govaerts, *M. caricifragans* (Lozano) Govaerts, *M. sandanderiana* (Lozano) Govaerts, and *M. virolinensis* (Lozano) Govaerts). However, it is roughly related to *M. arcabucoana* from the Andean forests of the Eastern Cordillera of Colombia (Lozano-Contreras, 1994). Both

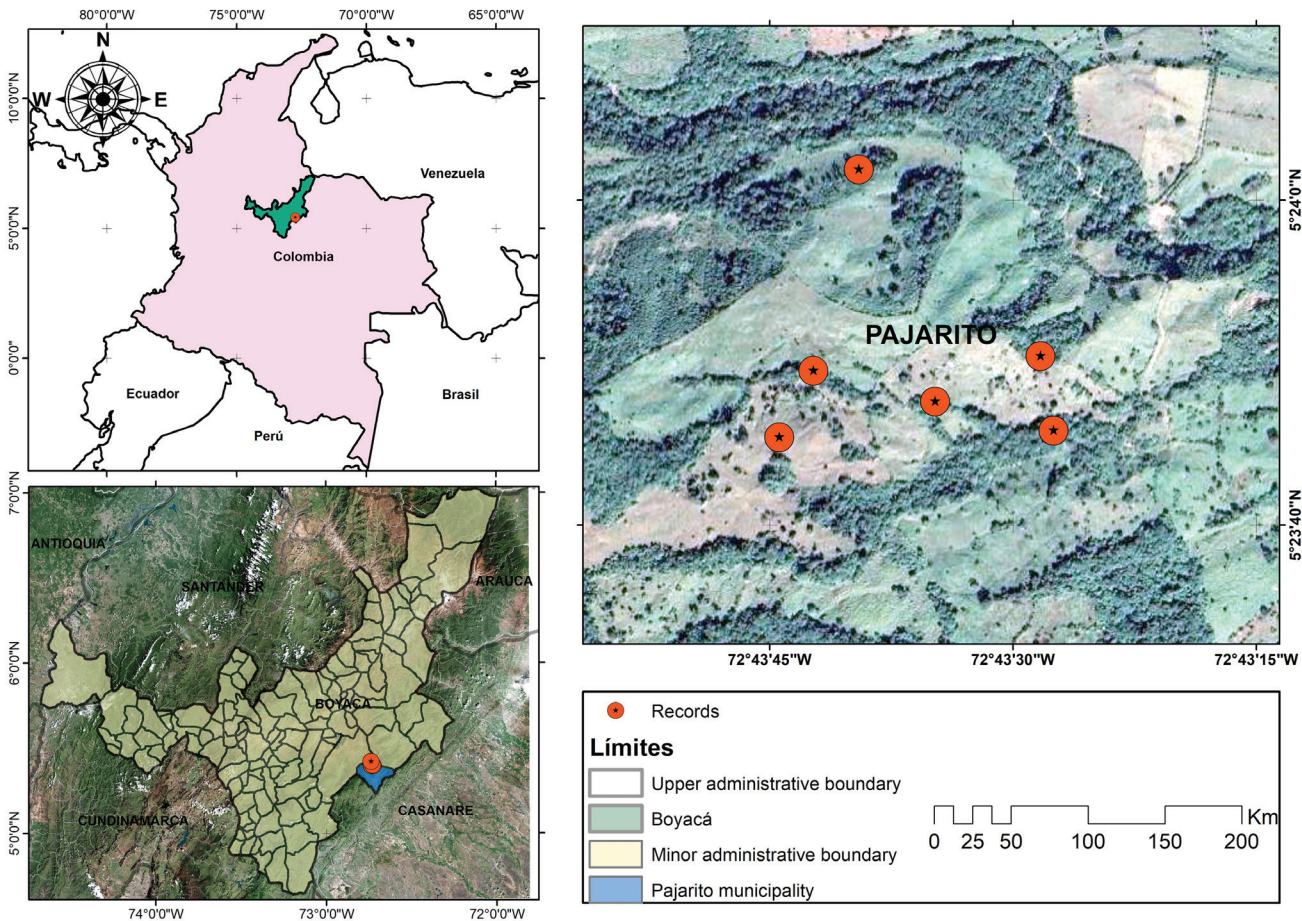


FIGURE 3. Geographical distribution of *Magnolia pajarito* Aymard, Rodríguez-D. & M. Escobar.

species have leaves that are dull on the upper surface, (when dried) shiny on the lower surface, have veinlets strongly reticulate forming net venation on both surfaces, the same shape in the outer petals, and have almost the

same number of carpels. However, *M. pajarito* differs from *M. arcabucoana* and the other three species in the characters presented in diagnosis, Table 1, and in the key to the species presented below.

KEY TO THE SPECIES OF MAGNOLIA OF COLOMBIA

Modified from Lozano-Contreras, 1994; Species indicated with an asterisk (*) are endemic to Colombia

- 1a. Petioles without an adaxial canaliculate scar 2
- 1b. Petioles with an adaxial canaliculate scar 17
- 2a. Leaf blade elliptic. 3
- 2b. Leaf blade obovate, widely obovate, ovate, suborbicular or orbicular 9
- 3a. Fruits globose, spheroid or ovoid 4
- 3b. Fruits ellipsoid. 5
- 4a. Internodes of the young branchlets covered by dense yellow indument; leaf blade chartaceous *M. calophylla** (Colombia: Nariño)
- 4b. Internodes of the young branchlets glabrescent or with sparse cream trichomes; leaf blade membranaceous or papyraceous *M. striatifolia* (Colombia: Nariño; Ecuador)
- 5a. Leaf blade with base decurrent and revolute, fruits small, 1.17–2.9 cm long. *M. frontinoensis** (Colombia: Antioquia)
- 5b. Leaf blade with base acute, attenuate, obtuse, truncate or cuneate, fruits larger than 3 cm 6
- 6a. Leaf blade on the lower surface glabrous or with few trichomes on the veins *M. urraoensis** (Colombia: Antioquia)
- 6b. Leaf blade on the lower surface pubescent 7
- 7a. Youngest internodes of the branches with a ring of woolly, golden pubescence *M. coronata** (Colombia: Antioquia)
- 7b. Youngest internodes of the branches without a ring of woolly, golden pubescence, but brown lanate or covered by a hispid indument 8
- 8a. Leaf blade on the lower surface with a short hispid indument; stamens 58–79 in 4 series *M. mahechae** (Colombia: Valle)
- 8b. Leaf blade on the lower surface with a large lanate indument; stamens ca. 144 in 6 series *M. calimaensis** (Colombia: Valle)
- 9a. Fruits globose, spheroid or ovoid *M. neomagnifolia* * (Colombia: Chocó, Valle)
- 9b. Fruits ellipsoid. 10

KEY TO THE SPECIES OF MAGNOLIA OF COLOMBIA CONT.

Modified from Lozano-Contreras, 1994; Species indicated with an asterisk (*) are endemic to Colombia

- 10a. Leaf blades orbicular, suborbicular or widely obovate 11
- 10b. Leaf blades obovate or widely elliptic 12
- 11a. Internodes of the young branchlets tomentose, leaf blade suborbicular or widely obovate, 8–10 cm wide; petals 8; stamens 83–89 in 6 series *M. yarumalensis** (Colombia: Antioquia, Risaralda)
- 11b. Internodes of the young branchlets glabrous, leaf blade orbicular to suborbicular, 13–15 cm wide; petals 8–10; stamens ca. 155 in 5 series *M. argyrotricha** (Colombia: Boyacá, Santander)
- 12a. Leaf blade on the lower surface glabrous or with sparse trichomes *M. cararensis** (Colombia: Norte de Santander)
- 12b. Leaf blade on the lower surface densely pubescent 13
- 13a. Internodes of the young branchlets with a ring of woolly, golden pubescence *M. coronata** (Colombia: Antioquia)
- 13b. Internodes of the young branchlets without a ring of woolly, golden pubescence, but glabrous, creamy lanate, densely gray villose or covered with adpressed yellow indument 14
- 14a. Internodes of the young branchlets glabrous; leaf blade 7–10 cm long, apex emarginate, lower surface covered by a short pilose indument *M. guatapensis** (Colombia: Antioquia)
- 14b. Internodes of the young branchlets pubescent; leaf blade 10–22 cm long, apex abruptly acuminate, lower surface covered with a lanate-lanuginous indument 15
- 15a. Bark, branches and branchlets strongly lenticellate; secondary nerves 27–25; petioles 2.8–4.5 cm long *M. lenticellata** (Colombia: Antioquia)
- 15b. Bark, branches and branchlets without lenticels or few; secondary nerves 8–24; petioles 1.2–2.6 cm long 16
- 16a. Leaf blade ca. 19–21 × 10–12, obovate to widely elliptic; stamens 106–120, fruit glabrous *M. colombiana** (Colombia: Huila)
- 16b. Leaf blade 10–17 × 5–11 cm, obovate; stamens 42–49; fruit lanate *M. betuliensis** (Santander)
- 17a. Fruits globose, spheroid or ovoid with more than 35 carpels 18
- 17b. Fruits ellipsoid, with fewer than 30 carpels, rarely more 26
- 18a. Adaxial canaliculate scar covering 40% to 75% length of petiole 19
- 18b. Adaxial canaliculate scar along the entire length of petiole 20
- 19a. Internodes of the young branchlets and petioles glabrous; leaf blade obovate, base decurrent; petiole ca. 2 cm long; vaginal hypsophyl one *M. narinensis** (Colombia: Nariño)
- 19b. Internodes of the young branchlets; petioles densely pubescent; leaf blade elliptic, base attenuate; petiole 3–7 cm long; vaginal hypsophyl 4 *M. katiolum** (Colombia: Nariño)
- 20a. Internodes of the young branchlets; petioles densely pubescent; carpels 38 *M. neillii* (Colombia: Amazonas; Ecuador)
- 20b. Internodes of the young branchlets and petioles glabrous or petioles with scattered trichomes; carpels more than 50 21
- 21a. Petioles stout, ca. 5 mm diameter; leaf blade ovate; petals 8 *M. hernandezii** (Colombia: Antioquia, Quindío, Risaralda, Valle)
- 21b. Petioles thin, 2–4 mm diameter; leaf blade elliptic, narrowly elliptic, widely elliptic, obovate or trullate; petals 6, rarely 7 22
- 22a. Vaginal hypsophyl 6–9; stamens 252–375 *M. cespedesii** (Colombia: Cundinamarca)
- 22b. Vaginal hypsophyl 1–3; stamens 74–255 23
- 23a. Leaf blade elliptic, narrowly elliptic to widely elliptic, 6–11 cm wide; petiole 2–5.5 cm long 24
- 23b. Leaf blade obovate or trullate, 11–15 cm wide; petiole 4.5–8.5 cm 25
- 24a. Foliar bud glabrous; leaf blade on fruit branches not resupinate; vaginal hypsophyl two; outer petals 6.8–7.3 × 4.8–7.1 cm, inner petals 5.6–6.5 × 4–4.2 cm *M. sambuensis* (Colombia: Antioquia, Chocó, Córdoba; Panamá)
- 24b. Foliar bud sericeous; leaf blade on fruit branches resupinate (upside down due to twisting of the petiole); vaginal hypsophyl three; outer petals 5.8–6.2 × 2.8–4.2 cm, inner petals ca. 5.1 × 2.3 cm *M. resupinatifolia** (Colombia: Santander)
- 25a. Petiole glabrous; petals ca. 7.6 cm long; stamens 222–247; carpels more than 120 *M. silvioi** (Colombia: Antioquia)
- 25b. Petiole with large trichomes; petals 4–5.5 cm long; stamens 74; carpels less than 90 *M. wolfii** (Colombia: Risaralda)
- 26a. Adaxial canaliculate scar covering 40% to 80% length of petiole 27
- 26b. Adaxial canaliculate scar along the entire length of petiole 31
- 27a. Leaf blades elliptic, widely elliptic or (sub)elliptic, apex acute or acuminate 28
- 27b. Leaf blade obovate, apex obtuse 29
- 28a. Leaf blades elliptic or (sub)elliptic, 8–12 secondary nerves; petals 8, outer petals punctate *M. jardinensis** (Colombia: Antioquia)
- 28b. Leaf blade widely elliptic, 13–21 secondary nerves; petals 6, outer petals not punctate 30
- 29a. Internodes of the young branchlets 1.6–3.6 × 0.8–1.1 cm; leaf blades ca. 1.2 × 6.8 cm, secondary nerves 17–21; adaxial canaliculate scar covering 75% to 80% length of petiole; petals ca. 3.1 × ca. 1.1 cm; stamens 32–34, all entire *M. gilbertoi** (Colombia: Quindío, Risaralda, Valle)
- 29b. Internodes of the young branchlets ca. 1 × ca. 0.5 cm; leaf blades (13–)15–32 × (7.5–)9–18, secondary nerves 13–17; adaxial canaliculate scar covering 40% to 60% length of petiole; petals 6.4–7.1 × 3.3–3.6 cm; stamens 84–86, several bifide and trifide *M. mindoensis* (Colombia: Nariño; Ecuador)
- 30a. Leaf blade 14–16 cm long, coriaceous, secondary nerves 12–15; petiole 2–2.5 cm long; stamens 32–34 *M. virolinensis** (Boyacá, Santander)
- 30b. Leaf blade 28–32 cm long, papyraceous, secondary nerves 18–21; petiole 3–4 cm long; stamens 40 *M. arcabucoana** (Colombia: Boyacá, Cundinamarca, Santander)
- 31a. Internodes of the young branchlets glabrous 32
- 31b. Internodes of the young branchlets pubescent 36

KEY TO THE SPECIES OF *MAGNOLIA* OF COLOMBIA CONT.

Modified from Lozano-Contreras, 1994; Species indicated with an asterisk (*) are endemic to Colombia

- 32a. Leaf blade papyraceous, base attenuate; sepals panduriform (having rounded ends and a contracted center) *M. henaioi** (Colombia: Huila) 33
- 32b. Leaf blade chartaceous or coriaceous, base obtuse, cuneate, rounded or acute; sepals obovate, ovate or widely ovate 33
- 33a. Leaf blade ovate; petals 8 *M. venezuelensis* (Colombia: Cesar, likely in Norte de Santander and Santander; Venezuela) 34
33. Leaf blade elliptic, obovate, oblanceolate or obovate-elliptic; petals 6 34
- 34a. Leaf blade 7–17 cm long, obovate, oblanceolate or obovate-elliptic, midvein on the lower surface covered with erect and adpressed yellowish trichomes, secondary veins 7–9; vaginal hypsophyl one; inner petals lanceolate *M. pajarito** (Colombia: Boyacá) 35
- 34b. Leaf blade 10–27 cm long, elliptic; midvein on the lower surface glabrous, secondary veins 11–16; vaginal hypsophyl 2–11; inner petals obovate 35
- 35a. Vaginal hypsophyl 8–11; stamens 30–43; carpels 9–14; fruit 6–7 cm long *M. polyhypsophylla** (Colombia: Antioquia) 35b. Vaginal hypsophyl 2; stamens 110–120; carpels 24–28; fruit ca. 4.5 cm long *M. gloriensis* (Colombia: Chocó; Nicaragua, Costa Rica, and Panamá) 37
- 36a. Leaf blade with apex obtuse or emarginate 37
- 36b. Leaf blade with apex acute or acuminate 38
- 37a. Leaf blade oblong, base obtuse; petiole 5–6 cm long; petals spatulate; stamens 25–28; fruits 4–5 cm long *M. santanderiana** (Colombia: Boyacá, Santander) 37b. Leaf blade elliptic or slightly obovate, base attenuate; petiole 2–3 cm long; petals obovate; stamens 29–41; fruits 8–9 cm long *M. georgii** (Colombia: Boyacá, Santander) 39
- 38a. Leaf blade elliptic 39
- 38b. Leaf blade obovate, oblong or ovate 40
- 39a. Leaf blade 11–13 cm wide; petiole pubescent; stamens 31–38. *M. chocoensis** (Colombia: Chocó; Risaralda) 39b. Leaf blade 5–10 cm wide; petiole glabrous or with sparse trichomes; stamens 81–87 *M. rimachii* (Colombia: Amazonas; Ecuador and Perú) 40a. Leaf blade 12–30 × 7–22 cm, obovate or oblong, base cuneate, pubescent on the lower surface; petiole 1.7–4.7 cm long; 35–51 stamens *M. caricifragrans** (Colombia: Arauca, Boyacá, Cundinamarca, Norte de Santander) 40b. Leaf blade 14–17 × 7–9 cm, ovate, base obtuse; glabrous or with sparse trichomes on the lower surface; petiole ca. 2 cm long; 50–52 stamens *M. espinalii** (Colombia: Antioquia)

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