




# An updated infrageneric classification of Neotropical *Magnolia* (Magnoliaceae)

## Una clasificación infragenérica actualizada de *Magnolia* (Magnoliaceae) del Neotrópico

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### Abstract:

**Background and Aims:** The infrageneric classification of *Magnolia* has undergone constant revision leading to the development of two main approaches: 1) a unigeneric system, treating *Magnolia* in a broad sense (*sensu lato*) and subdividing it into subgenera, sections and subsections; and 2) a multigeneric system, elevating many of the aforementioned categories to genera, thereby modifying the family-level classification. Molecular evidence, particularly from plastome data, supports the monophyly of *Magnolia* s.l., although it does not support the monophyly of its three traditional subgenera. This evidence suggests a unigeneric framework with 15 sections. However, the multigeneric approach continues to be widely used, especially in Asia. Despite the significant species richness, Neotropical clades are underrepresented in current classifications. The objective of this study is to update the classification of Neotropical clades.

**Methods:** The classification of Neotropical *Magnolia* was reassessed using previously published nuclear and plastid phylogenomic data, combined with morphological evidence. The analysis included a representative sample covering about one-third of the described species, including Asian and Nearctic taxa to encompass the entire genus.

**Key results:** Two subgenera are recognised in the Neotropics: *Magnolia* subg. *Magnolia* and *Magnolia* subg. *Talauma*. Within the latter, *Magnolia* sect. *Cubenses* (renamed from *Magnolia* sect. *Splendentes*) and *Magnolia* sect. *Talauma* are revised, with each section now comprising two subsections. In *Magnolia* sect. *Talauma*, one subsection is newly described, and the other is reinstated based on phylogenetic evidence. Subgenus *Magnolia* sections *Macrophylla* and *Magnolia* maintain their current circumscriptions.

**Conclusions:** Phylogenomic and morphological data support a stable unigeneric framework for Neotropical *Magnolia*, recognising two subgenera and four sections. The redefinition of *M. sect. Cubenses* and *M. sect. Talauma* refines previous infrageneric limits and provides an updated, phylogenetically supported basis for future taxonomic, biogeographic and conservation studies.

**Key words:** *Cubenses*, *Macrophylla*, phylogenomics, section, subsection, *Talauma*.

### Resumen:

**Antecedentes y Objetivos:** La clasificación infragenérica de *Magnolia* ha estado en constante revisión, con dos enfoques principales: 1) enfoque unigénérico, que considera a *Magnolia* en sentido amplio (*sensu lato*) y la subdivide en subgéneros, secciones y subsecciones; y 2) enfoque multigénérico, que eleva muchas de estas categorías al rango genérico, modificando así la clasificación a nivel familiar. La evidencia molecular, especialmente la derivada de plastomas respalda la monofilia de *Magnolia* s.l., pero no apoya la monofilia de sus tres subgéneros tradicionales. Esta evidencia sugiere un enfoque unigénérico con 15 secciones. Sin embargo, el enfoque multigénérico continúa utilizándose ampliamente, especialmente en Asia. A pesar de la notable riqueza específica, los clados neotropicales siguen estando subrepresentados en las clasificaciones actuales. El objetivo de este estudio fue actualizar la clasificación de los clados neotropicales de *Magnolia*.

**Métodos:** Se revaluó la clasificación de las magnolias neotropicales mediante datos filogenómicos nucleares y plastídicos, complementados con evidencia morfológica. El análisis incluyó una muestra representativa de aproximadamente un tercio de las especies descritas, incluyendo también taxones asiáticos y neárticos, para cubrir la totalidad del género.

**Resultados clave:** Se reconocieron dos subgéneros: *Magnolia* subg. *Magnolia* y *Magnolia* subg. *Talauma*. Dentro de este último se redefinieron *Magnolia* sect. *Cubenses* (renombrada a partir de *Magnolia* sect. *Splendentes*) y *Magnolia* sect. *Talauma*, cada una con dos subsecciones. En *Magnolia* sect. *Talauma*, una subsección se describe como nueva y la otra se reivindica con base en evidencia filogenética. Las secciones *Macrophylla* y *Magnolia* del subgénero *Magnolia* mantienen sus circunscripciones actuales.

**Conclusiones:** Los datos filogenómicos y morfológicos respaldan una clasificación unigénérica, con dos subgéneros y cuatro secciones. La redefinición de *M. sect. Cubenses* y *M. sect. Talauma* afina los límites infragenéricos y proporciona una base actualizada y filogenéticamente sustentada para futuras investigaciones taxonómicas, biogeográficas y de conservación.

**Palabras clave:** *Cubenses*, filogenómica, *Macrophylla*, sección, subsección, *Talauma*.

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## Introduction

The genus *Magnolia* L. is named in honour of Pierre Magnol, a notable French botanist (1638-1715), who introduced the taxonomic rank of family (Woodland, 2003). The type species is *Magnolia virginiana* L., described from the Appalachian Mountains of the United States of America. The genus contains about 390 species, representing most of the diversity within the family Magnoliaceae (APG IV, 2016; Rivers et al., 2016; Wang et al., 2020).

*Magnolia* species are typically trees or shrubs with large, showy, fragrant solitary flowers that are usually over 10 cm in diameter (Hernández-Cerda, 1988; Meyer, 1993; Figlar and Nootboom, 2004; Xia et al., 2008; Figlar, 2012; Cruz-Durán et al., 2014). These plants primarily inhabit temperate forests, cloud forests and rainforests across the Americas and Asia (Meyer, 1993; Xia et al., 2008; Figlar, 2012). They are key components of these ecosystems (Rivers et al., 2016; Domínguez-Yescas and Vázquez-García, 2019; Chávez-Cortázar et al., 2021), although they are generally rare (pers. obs.).

The economic significance of *Magnolia* mainly lies in its ornamental use. Additionally, the flowers, along with the bark and fruits to a lesser extent, have medicinal applications for treating various heart conditions (Moerman, 1991; Domínguez et al., 2016; Domínguez-Yescas and Vázquez-García, 2019; Chen et al., 2021). The wood is regarded as hard, likely due to its slow growth, and is therefore locally used as a building material (Vázquez-García et al., 2015; pers. obs.).

The classification of *Magnolia* and Magnoliaceae has changed over time, alternating between two main approaches. Here, we will refer to them as 1) the multigeneric proposal, in which *Magnolia* is divided into up to 16 genera organised into tribes, without any infrageneric categories; and 2) the unigeneric proposal, where these genera are incorporated within *Magnolia* and organised into various infrageneric categories (such as subgenera, sections or subsections). A detailed description of all classification systems mentioned below can be found in Appendix 1.

The classifications based on the multigeneric proposal were among the first to be published, as the initial species of Magnoliaceae discovered were assigned to different genera. This classification system was established in the works of Lin-

naeus (1753; 1766), de Candolle (1818) and Bentham and Hooker (1862). Later, Baillon (1866; 1868) published the first work proposing a unigeneric classification, grouping 10 previously segregate genera within *Magnolia*. However, he did not complete the study and no formal unified infrageneric classification was provided. He merely suggested that these genera might form sections or subgenera. In later studies, these were treated as five sections (Dandy, 1927; Law, 1996).

Later, broader classifications applicable to all plants emerged, adopting a multigeneric perspective (Engler and Prantl, 1915; Hutchinson, 1959). Dandy (1927) developed a multigeneric classification that included nine genera within the tribe Magnolieae (de Candolle, 1824). This classification view remained in place for a long time with minimal modifications (Law, 1984; 1996). A notable semi-multigeneric classification was proposed by Nootboom (1985; 1987), who began to group some genera within others at the levels of subgenera and sections, primarily within *Magnolia*. He also considered subfamilies and tribes, resulting in a proposal comprising only five genera, three subgenera and many sections and subsections.

It is important to remark that all these studies relied solely on morphological evidence, which was common when they were published, as molecular tools had not yet been developed, and ecological evidence was not taken into account. Early research using molecular evidence to address phylogenetic questions in Magnoliaceae revealed the need to revise the classification, as many clades did not align with traditional taxonomic arrangements (Azuma et al., 1999; Kim et al., 2001; Nie et al., 2008; Kim and Suh, 2013).

The issue of whether to classify *Magnolia* as a single genus composed of several infrageneric divisions or as multiple genera has been partially solved. However, recent molecular studies revealed that the three subgenera proposed by Figlar and Nootboom (2004) – *Magnolia* subg. *Gynopodium* (Dandy) Figlar & Noot., *Magnolia* subg. *Magnolia* and *Magnolia* subg. *Yulania* (Spach) Rchb. – are polyphyletic and require further changes at the infrageneric level (Kim and Suh, 2013; Wang et al., 2020; Guzmán-Díaz et al., 2022; Aldaba Núñez et al., 2024).

To address this, authors started using high-throughput sequencing techniques and increased taxon sampling. Wang et al. (2020), based on morphological and genom-



ic evidence from plastids, suggested a unigeneric proposal that eliminates the ranks of subgenus and subsection. They proposed a classification that consists of 15 sections, four of which are located in the Neotropical region: *Magnolia* sect. *Macrophylla*, *Magnolia* sect. *Magnolia*, *Magnolia* sect. *Splendentes*, and *Magnolia* sect. *Talauma*, and which represents the most recent infrageneric classification supported by morphological and genomic (plastome) evidence.

As most phylogenetic studies of *Magnolia* have been led by researchers from Asia or North America, sampling has been largely biased towards taxa from these regions. In contrast, Neotropical species have received comparatively little attention. Meanwhile, species richness in the Neotropics has continued to increase, with many new species to science described in recent years (particularly in Central America, Ecuador, Mexico and Peru) without being included in systematic phylogenetic analyses (e.g., [Marcelo-Peña and Arroyo, 2013](#); [Vázquez-García et al., 2013, 2019, 2022](#); [Fernandez-Hilario et al., 2020](#)). Many of these newly described taxa also present taxonomic challenges, as they are often based on limited specimens that lack fertile structures. In addition, the distribution of many species in remote, mountainous regions makes access and comprehensive study difficult ([Aldaba Núñez, 2020](#)). Recent research has also identified species complexes, such as *M. pacifica* A.Vázquez ([Muñiz-Castro et al., 2020](#)), and *M. dealbata* Zucc. in western and eastern Mexico, respectively ([Chávez-Cortázar et al., 2021](#); [Aldaba Núñez et al., 2025](#)), that, although at the species level, exemplify the broader challenges in understanding the true extent of diversity within Neotropical *Magnolia*.

Based on these challenges, the objective of the present study is to update the infrageneric classification of *Magnolia* specifically focusing on Neotropical clades and species. Although Asian groups are not discussed in detail here, they are considered where necessary for comparative purposes and to ensure consistency with broader phylogenetic frameworks.

## Materials and Methods

### Taxonomic and sampling framework

The present study builds upon the Neotropical *Magnolia* field sampling and taxonomic coverage previously analysed by [Aldaba Núñez et al. \(2024\)](#), which provided a phyloge-

onomic framework for the genus. Briefly, sampling was carried out between 2016 and 2019 across the Neotropical region, including Colombia, Costa Rica, Dominica, the Dominican Republic, Ecuador, France (Guadeloupe and Martinique), Mexico, Panama, Peru, Puerto Rico, Saint Lucia, and Saint Vincent. Additional surveys were conducted in suitable vegetation types to locate previously undocumented *Magnolia* populations.

Although no molecular data were obtained for Cuban and Haitian taxa, numerous herbarium specimens from both countries were examined and included in the taxonomic treatment. In total, around 800 specimens representing 90 taxa were collected or obtained for morphological and phylogenetic analyses. The sampling was designed to include representatives of all major Neotropical clades of *Magnolia* (*M. sect. Macrophylla*, *M. sect. Magnolia*, *M. sect. Splendentes*, and *M. sect. Talauma*), ensuring broad geographical and morphological coverage.

### Molecular and phylogenetic analyses

The procedures for DNA extraction, sequencing, and bioinformatic processing were performed following the protocols described in [Aldaba Núñez et al. \(2024\)](#), specifically optimised for *Magnolia*. To ensure transparency and reproducibility, we briefly summarise the approach: DNA extraction was performed using a modified CTAB method ([Larridon et al., 2015](#)), and sequencing was conducted by RAPiD Genomics (Gainesville, Florida, USA) using Illumina HiSeq 3000 technology. Two strategies were applied: target capture (TC) for nuclear loci using a Magnoliaceae-specific bait kit, and genome skimming (GS) for plastid genome assembly. Sequence reads were deposited in the NCBI Sequence Read Archive (BioProject PRJNA1035522).

Bioinformatic analyses, including demultiplexing, quality control, trimming, and assembly, were also performed using the pipelines described in [Aldaba Núñez et al. \(2024\)](#). We re-analysed the same molecular dataset under a taxonomic framework focused on infrageneric delimitation, to test the monophyly and morphological coherence of the groups proposed herein. Plastid genomes were assembled with GetOrganelle ([Jin et al., 2018](#)), and nuclear sequences were recovered using HybPiper ([Johnson et al., 2016](#)) with the BWA approach for read mapping.

The phylogenetic framework employed in this study was derived from the analyses published in Aldaba Núñez et al. (2024). For the present classification, we reinterpreted and reorganised the clades under a revised infrageneric scheme, consistent with both molecular and morphological evidence. *Liriodendron* L. was used as outgroup, and ten additional Asian sequences from GenBank were incorporated. Maximum Likelihood (IQ-TREE v. 2.0.3; Minh et al., 2020) and Bayesian Inference (MrBayes v. 3.2.7; Ronquist et al., 2012) analyses were conducted on plastid and nuclear datasets. The latter were further analysed using a multispecies coalescent model in ASTRAL-III (Zhang et al., 2018). A total of 178 samples (104 plastid and 74 nuclear) were analysed, covering all major Neotropical *Magnolia* clades.

### Taxonomic treatment and morphological studies

Different online databases were consulted to identify accepted names, basionyms and synonyms of Neotropical *Magnolia* species (IPNI, 2025; JSTOR, 2025; POWO, 2025; TROPICOS, 2025). Information corresponding to the taxa's protologues was also consulted in these databases, either physically in libraries or digitally through the Biodiversity Heritage Library (BHL, 2025).

Type specimens of the taxa, as well as regular specimens, were obtained from physical herbaria belonging to different research centres and universities located in the Neotropical region (HUA, HUAP, IEB, MEDEL, MEXU, PMA, USM, XAL; Thiers, 2025 continuously updated), as well as from other digital herbaria with global collections (BR, C, F, K, MA, MO, NY, P; Thiers, 2025 continuously updated) and through the JSTOR Global Plants portal (JSTOR, 2025). Approximately 800 vouchers of the Neotropical *Magnolia* species were reviewed in detail, including around 250 type specimens examined on JSTOR Global Plants (JSTOR, 2025) or in digital herbaria [F (FIELD, 2018), MEXU (DGRU, 2026), MO (TROPICOS, 2025), P (MNHN, 2025; Thiers, 2025, continuously updated)].

Furthermore, field photographs and morphological descriptions of Neotropical *Magnolia* from a range of literature sources (Hernández-Cerda, 1988; Meyer, 1993; Gutiérrez-Carvajal and Dorantes-López, 2004; Pennington and Sarukhán, 2005; Cruz-Durán et al., 2014) were analysed to complement the morphological study. The 25-character matrix of Aldaba Núñez et al. (2024) was used to delimit

the Neotropical clades and assess diagnostic traits distinguishing the main lineages. In the present work, we build upon that dataset to reassess the infrageneric classification of the Neotropical *Magnolia*, in which all sections and subsections are redefined by integrating the combined phylogenomic evidence from Aldaba Núñez et al. (2024) with new taxonomic evaluations, and a formal infrageneric treatment. Distribution maps were generated using QGIS v. 3.38 (QGIS.org, 2024), utilizing physical layers from ESRI (ESRI, 2009) and administrative boundaries from the World Food Programme (WFP, 2019).

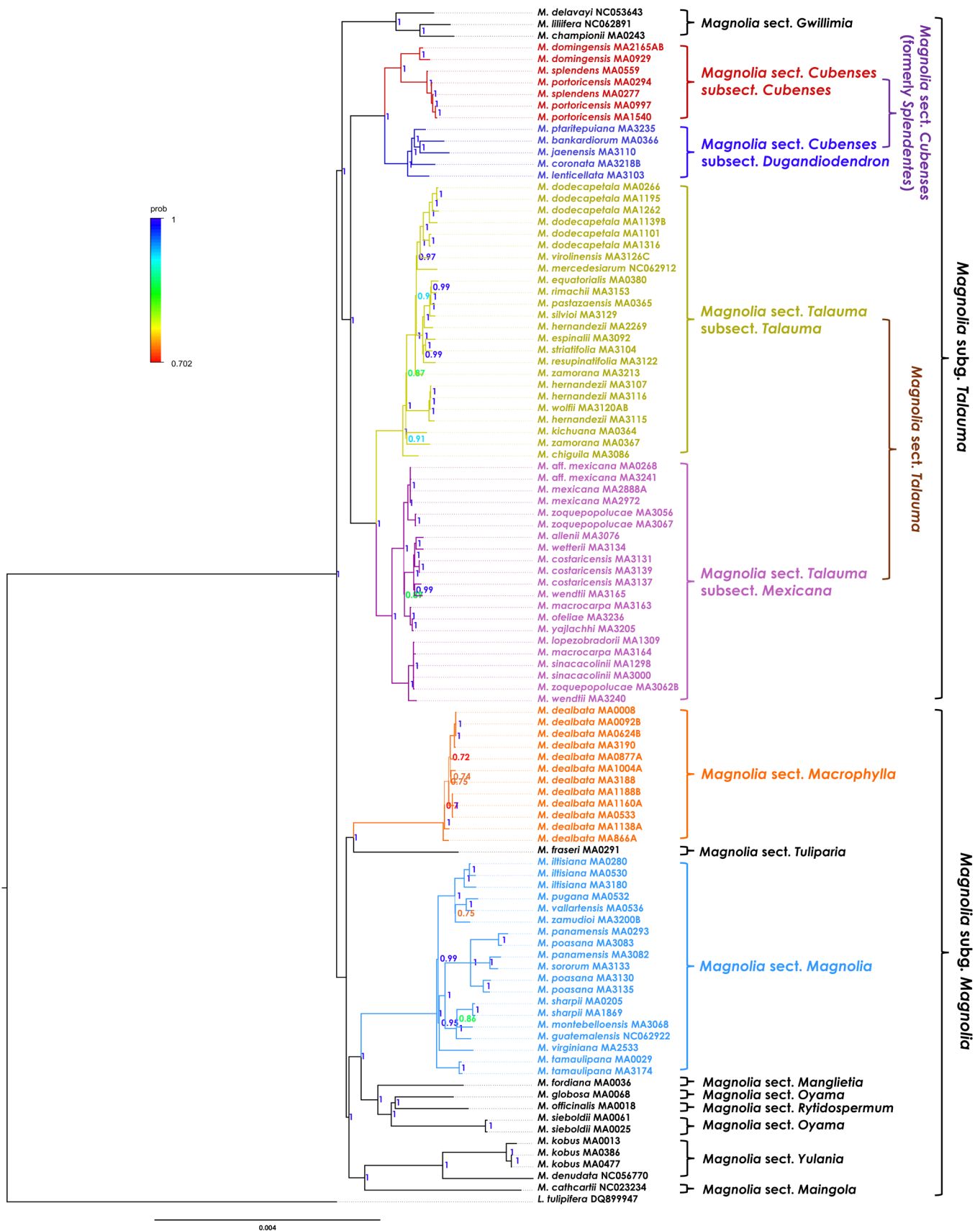
## Results

### Phylogenetic analyses

We analysed a total of 104 complete plastid sequences, representing 70 taxa, including 49 accepted Neotropical species, seven Neotropical morphospecies, and 13 non-Neotropical taxa. The phylogenetic hypotheses discussed in this study are based on previously published plastid and nuclear data (Aldaba Núñez et al., 2024) and are presented here to support our proposed taxonomic classification. The nuclear dataset (target capture) and the plastid dataset (genome skimming) used for these analyses are deposited in the Sequence Read Archive (NCBI, 2024a) and GenBank (NCBI, 2024b), respectively. Furthermore, the 4597 baits designed for the capture of nuclear genes (Aldaba Núñez et al., 2023a), as well as the sequence assembly lengths reported by HybPiper (Aldaba Núñez et al., 2023b), are available through the Zenodo repository (CERN, 2013).

Figure 1 shows the phylogenetic hypothesis of *Magnolia* based on single-locus (SL) plastid data obtained by Bayesian Inference (BI), with posterior probabilities (PP) indicated at the nodes. Figure 2 presents the BI phylogenetic hypothesis derived from SL nuclear data. As in the plastid tree, posterior probabilities are shown at the nodes. Neotropical clades are highlighted in both figures. Although not shown here, the topologies recovered by Maximum Likelihood (ML) analyses and the species tree obtained under the multispecies coalescent (MSC) model using ASTRAL were congruent with the BI topologies and are available as supplementary figures in Aldaba Núñez et al. (2024).

The SL plastid analysis (Fig. 1) revealed two major clades: Clade I, comprising *Magnolia* sect. *Splendentes* and



**Figure 1:** Phylogenetic hypothesis of *Magnolia* L. based on plastid data obtained by Bayesian Inference. Posterior Probabilities (PP) are shown at nodes. Coloured clades correspond to the Neotropical lineages.



*Magnolia* sect. *Talauma* from the Neotropics, along with *Magnolia* sect. *Gwillimia* from Asia; and Clade II, comprising Neotropical *Magnolia* sect. *Macrophylla* and *Magnolia* sect. *Magnolia*, together with the Asian and Nearctic lineages. In contrast, the SL nuclear phylogeny (Fig. 2) placed *Magnolia* sect. *Gwillimia* as sister to Clades I and II, resulting in three well-supported lineages: *Magnolia* subg. *Gwillimia*, *Magnolia* subg. *Magnolia* and *Magnolia* subg. *Talauma*.

Both *Magnolia* sect. *Splendentes* and *Magnolia* sect. *Talauma* were consistently recovered as dichotomous in all phylogenies (Figs. 1, 2). In *Magnolia* sect. *Splendentes*, one subclade included species previously classified in *Magnolia* sect. *Talauma* subsect. *Dugandiodendron*, while the other corresponded to *Magnolia* sect. *Talauma* subsect. *Cubenses*. In *Magnolia* sect. *Talauma*, one subclade grouped species from Central and North America, and the other from South America and the Caribbean. *Magnolia* sect. *Macrophylla* and *Magnolia* sect. *Magnolia* did not show a consistent biogeographic pattern. All major clades showed strong support across analyses (PP>0.8; Figs. 1, 2), and most Neotropical sections and subsections corresponded to geographically structured lineages in both plastid and nuclear phylogenies (Figs. 1, 2).

### Taxonomic treatment and morphological studies

The infrageneric classification of *Magnolia* was updated by formally naming the two major clades obtained in the phylogenetic hypotheses and assigning them subgenus status: *Magnolia* subg. *Magnolia* for Clade II and *Magnolia* subg. *Talauma* for Clade I. Within *Magnolia* sect. *Splendentes* and *Magnolia* sect. *Talauma*, the classification was also updated by renaming the *Magnolia* sect. *Splendentes* according to the principle of priority in nomenclature (Turland et al., 2025) as *Magnolia* sect. *Cubenses*, comb. et stat. nov., and naming the two clades obtained in both at the subsection level (*Magnolia* sect. *Cubenses* subsect. *Cubenses*, comb. nov., *Magnolia* sect. *Cubenses* subsect. *Dugandiodendron*, comb. nov., *Magnolia* sect. *Talauma* subsect. *Mexicana*, subsect. nov., and *Magnolia* sect. *Talauma* subsect. *Talauma*). As a result, we recognise two subgenera: *Magnolia* subg. *Magnolia* and *Magnolia* subg. *Talauma*; four Neotropical sections: *Magnolia* sect. *Cubenses*, *Magnolia* sect.

*Macrophylla*, *Magnolia* sect. *Magnolia* and *Magnolia* sect. *Talauma*; and four Neotropical subsections: *Magnolia* sect. *Cubenses* subsect. *Cubenses*, *Magnolia* sect. *Cubenses* subsect. *Dugandiodendron*, *Magnolia* sect. *Talauma* subsect. *Mexicana* and *Magnolia* sect. *Talauma* subsect. *Talauma*. Morphological descriptions, number of taxa (Appendix 2) and their distribution are presented for each Neotropical clade.

Approximately 800 specimens of Neotropical *Magnolia* were examined, including around 250 type specimens. The morphological dataset comprised 25 characters (Aldaba Núñez et al., 2024). This analysis allowed the identification of coherent morphological groups corresponding to well-supported clades recovered in the phylogenomic trees. Morphological differentiation was especially congruent at the sectional and subsectional levels.

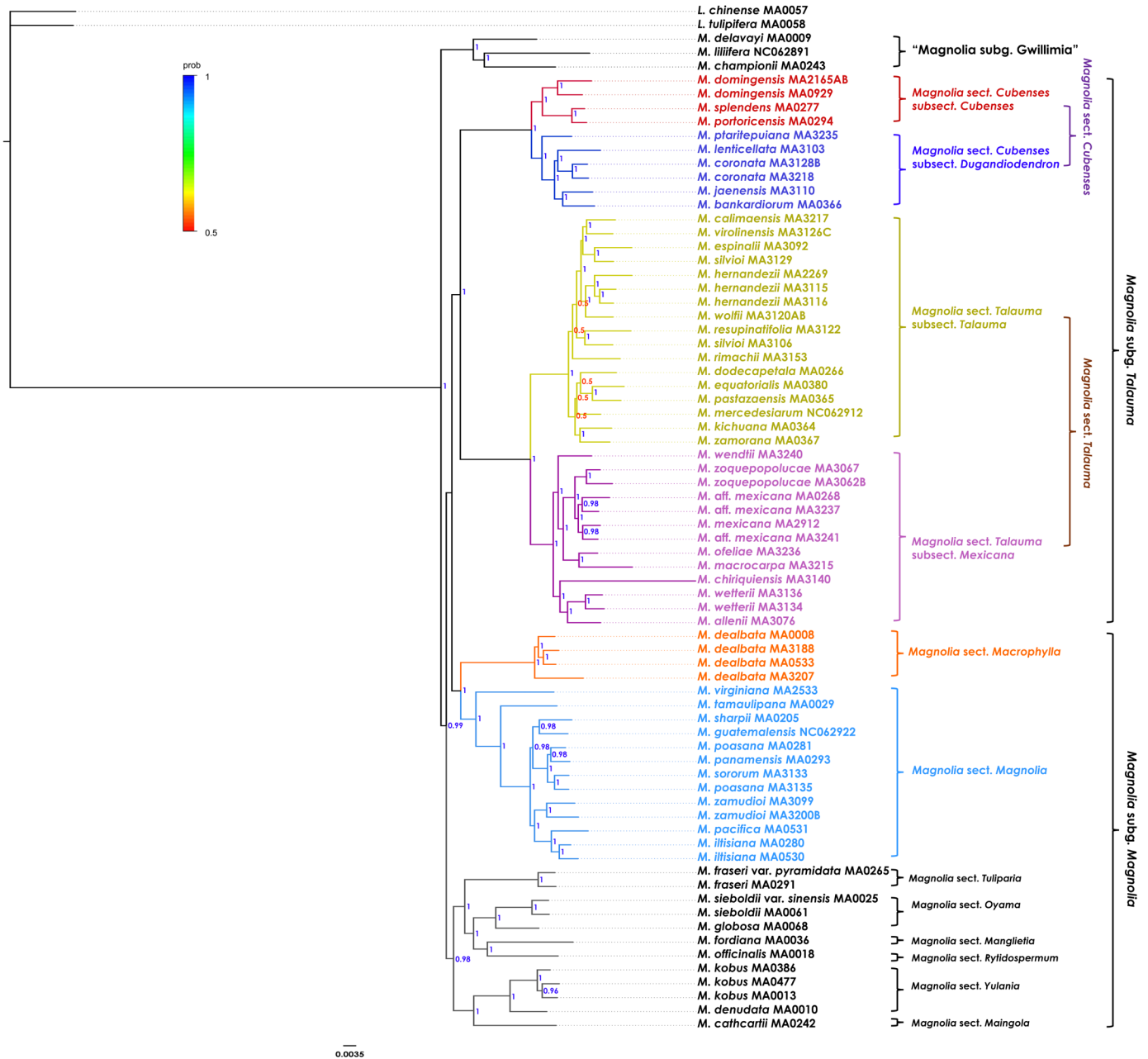
### Taxonomy

This section presents a revised infrageneric classification of Neotropical *Magnolia* based on the phylogenetic hypothesis obtained from plastome and nuclear phylogenomic data. The diagnostic characters chosen to construct the taxonomic key and to differentiate between subgenera were based on Neotropical clades only. The most relevant morphological differences among sections and subsections are shown in Table 1. The Appendix 2 provides a comprehensive list of all currently accepted Neotropical *Magnolia* species names, with their respective subgenus, section and subsection. The habitats described follow the IUCN habitats classification scheme (Version 3.1; IUCN, 1973, 2025).

### Taxonomic key to the infrageneric clades of *Magnolia* present in the Neotropics

- 1a. Follicles with longitudinal dehiscence, petioles with a cymbiform scar <15% of petiole length in most taxa from North America or up to 50% of petiole length in taxa from Eastern or Southern Mexico (Sect. *Macrophylla* Figlar & Noot.), stylar branches recurved..... 2 (I Subg. *Magnolia*)
- 1b. Follicles with circumscissile dehiscence (except longitudinal in taxa from the Greater Antilles), petioles with a cymbiform scar <15% of petiole length in some taxa from South America and all taxa from the Greater An-





**Figure 2:** Phylogenetic hypothesis of *Magnolia* L. based on nuclear data obtained by Bayesian Inference. Posterior probabilities (PP) are shown at nodes. Coloured clades correspond to the Neotropical lineages.

tilles or up to 50% of petiole length in most taxa from South America and all taxa from North America, stylar branches straight in most taxa from South America and all taxa from North America or recurved in some taxa from South America and all taxa from the Greater Antilles (Sect. *Cubenses* F.A.Aldaba, E.Martínez & Saimain, **comb. et stat. nov.**) .....

..... 3 (II Subg. **Talauma** (Juss.) Pierre)  
 2a. Leaves deciduous, auriculiform, >20 cm long, base cordate or auriculate .... 1 Sect. **Macrophylla** Figlar & Noot.  
 2b. Evergreen leaves, elliptic or lanceolate, <20 cm long, base generally cuneate ..... 2 Sect. **Magnolia**  
 3a. Follicles with longitudinal dehiscence, endemic to the Greater Antilles .....



- ..... 3a Sect. **Cubenses** subsect. **Cubenses** (Imkhan.) F.A.Aldaba, E.Martínez & Samain, **comb. nov.**
- 3b. Follicles with circumscissile dehiscence, endemic to continental America (northern region of South America) ..... 4
- 4a. Petioles with a cymbiform scar only at the base of the petiole (<15% of petiole length), stipules adnate only at the base of the petiole (<15% of petiole length) ..... 3b Sect. **Cubenses** subsect. **Dugandiodendron** (Lozano) F.A.Aldaba, E.Martínez & Samain, **comb. nov.**
- 4b. Petioles with cymbiform scar (>25% of the length of the petiole), stipules adnate to the along 75 - 100% of petiole length ..... 5 (4 Sect. **Talauma** (Juss.) Baill.)
- 5a. Leaves generally glabrous abaxially, endemic to North America and the Greater Antilles ..... 4a Sect. **Talauma** subsect. **Mexicana** F.A.Aldaba, E.Martínez & Samain, **subsect. nov.**
- 5b. Leaves generally pubescent abaxially, endemic to South America and the Lesser Antilles..... 4b Sect. **Talauma** subsect. **Talauma** (Juss.) Figlar & Noot.
- Updated infrageneric classification of Neotropical *Magnolia*
- Magnolia* L., Sp. Pl.: 535. 1753.**
- TYPE: *Magnolia virginiana* L.
- =*Champaca* Adans., Fam. Pl. (Adanson) 2: 365. 1763.  
 =*Lassonia* Buc'hoz, Pl. Nouv. Decouv. t. 19. 1779.  
 =*Kobus* Kaempf. ex Salisb., Parad. Lond. 2: t. 87. 1808.  
 =*Gwillimia* Rottler ex DC., Syst. Nat. 1: 455. 1817.  
 =*Blumia* Nees ex Blume in Verh. Batav. Genootsch. Kunsten 9: 147. 1823.  
 =*Manglietia* Blume in Verh. Batav. Genootsch. Kunst. 9: 149. 1823.  
 =*Aromadendron* Blume in Bijdr. Fl. Ned. Ind. 1: 10. 1825.  
 =*Guillimia* Rchb., Consp. Regn. Veg.: 193. 1828.  
 =*Liriopsis* Spach, Hist. Nat. Vég. (Spach) 7: 460. 1839, nom. illeg., non Rchb. 1828.  
 =*Yulania* Spach, Hist. Nat. Vég. (Spach) 7: 462. 1838.  
 =*Tulipastrum* Spach, Hist. Nat. Vég. (Spach) 7: 481. 1838.  
 =*Lirianthe* Spach, Hist. Nat. Vég. (Spach) 7: 485. 1838.  
 =*Buergeria* Siebold & Zucc., Abh. Math.-Phys. Cl. Königl. Bayer. Akad. Wiss. 4(2): 186, t. 2. 1845.  
 =*Santanderia* Cespedes ex Triana & Planch., Ann. Sci. Nat., Bot., sér. 4, 17: 23. 1862.  
 =*Alcimandra* Dandy, Bull. Misc. Inform. Kew 1927(7): 260. 1927.  
 =*Pachylarnax* Dandy, Bull. Misc. Inform. Kew 1927(7): 260. 1927.  
 =*Elmerrillia* Dandy, Bull. Misc. Inform. Kew 1927(7): 261. 1927.  
 =*Kmeria* (Pierre) Dandy, Bull. Misc. Inform. Kew 1927(7): 262. 1927.  
 =*Svenhedinia* Urb., Repert. Spec. Nov. Regni Veg. 24: 3. 1927.  
 =*Paramichelia* Hu, Sunyatsenia 4: 142. 1940.  
 =*Parakmeria* Hu & W.C.Cheng, Acta Phytotax. Sin. 1(1): 1. 1951.  
 =*Paramanglietia* Hu & W.C.Cheng, Acta Phytotax. Sin. 1(3): 255. 1951.  
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 =*Tsoongiodendron* Chun, Acta Phytotax. Sin. 8(4): 281. 1963.  
 =*Dugandiodendron* Lozano, Caldasia 11(53): 33. 1975.  
 =*Manglietiastrum* Y.W.Law, Acta Phytotax. Sin. 17(4): 72. 1979.  
 =*Sinomanglietia* Z.X.Yu, Acta Agric. Univ. Jiangxiensis 16(2): 202. 1994.  
 =*Woonyoungia* Y.W.Law, Bull. Bot. Res., Harbin 17(4): 354. 1997.  
 =*Houpoea* N.H.Xia & C.Y.Wu, Fl. China 7: 64. 2008.  
 =*Oyama* (Naki) N.H.Xia & C.Y.Wu, Fl. China 7: 66. 2008.  
 =*Paramagnolia* Sima & S.G.Lu, Proc. Second Internat. Symp. Fam. Magnoliac.: 65. 2012.  
 =*Metamagnolia* Sima & S.G.Lu, Proc. Second Internat. Symp. Fam. Magnoliac.: 66. 2012.  
 ='*Sphenocarpus* Wall.', Numer. List: n.º 236. 1829, nom. inval.  
 ='*Buergeria* Miq.' in Ann. Mus. Bot. Lugduno-Batavi 3: 53. 1867, nom. inval.
- Distribution: America; East, South and Southeast Asia, the Philippine, Indonesian and Taiwanese archipelagos and Melanesia.

**Table 1:** Main morphological differences among the Neotropical clades of *Magnolia* L.

Character	<i>Magnolia</i> sect. <i>Macrophylla</i> Figlar & Noot.	<i>Magnolia</i> sect. <i>Magnolia</i>	<i>Magnolia</i> sect. <i>Cubenses</i> subsect. <i>Cubenses</i> (Imkhan.) F.A.Aldaba, E. Martínez & Samain	<i>Magnolia</i> sect. <i>Cubenses</i> subsect. <i>Dugandiodendron</i> (Lozano) F.A.Aldaba, E.Martínez & Samain	<i>Magnolia</i> sect. <i>Talauma</i> subsect. <i>Mexicana</i> F.A.Aldaba, E.Martínez & Samain	<i>Magnolia</i> sect. <i>Talauma</i> subsect. <i>Talauma</i> (Juss.) Figlar & Noot.
Leaf persistence	Deciduous	Evergreen	Evergreen	Evergreen	Evergreen	Evergreen
False leaf whorls on young branches	Present	Absent	Absent	Absent	Absent	Absent
Presence of pulvinus	Present	Absent	Absent	Absent	Present	Present
Length of stipular scar	Partial (<50%)	Barely perceptible	Barely perceptible	Barely perceptible	Partial (<50%) to full (>75%)	Partial (<50%) to full (>75%)
Pubescence of stipules	Pubescent, rarely glabrous	Glabrous to pubescent	Glabrous to pubescent	Pubescent rarely glabrous	Glabrous to puberulent	Glabrous, rarely pubescent
Leaf shape	Auriculiform	Elliptic or lanceolate	Elliptic to orbicular	Elliptic	Elliptic to ovate	Elliptic to ovate
Leaf base shape	Auriculate or cordate	Cuneate	Cuneate or obtuse	Cuneate or obtuse	Cuneate or rounded	Cuneate or rounded
Indumentum of abaxial surface	Pulverulent or sericeous	Glabrous to pubescent	Glabrous to pubescent	Glabrous to pubescent	Glabrous	Pubescent
Pubescence of bracts	Pulverulent	Glabrous to pubescent	Glabrous to pubescent	Glabrous to pubescent	Glabrous to puberulent rarely pubescent	Glabrous rarely pubescent
Shape of style branches	Curved	Curved	Curved	Curved	Straight	Straight
Type of follicle dehiscence	Longitudinal	Longitudinal	Longitudinal	Circumscissile	Circumscissile	Circumscissile

Number of taxa: 365-397 accepted species (180 Neotropical taxa; Appendix 2).

### I. *Magnolia* subg. *Magnolia*.

TYPE: *Magnolia virginiana* L.

=*Magnolia* subg. *Yulania* (Spach) Rchb, Deut. Bot. Herb.-Buch: 192. 1841, **syn. nov.**

=*Magnolia* subg. *Manglietia* (Blume) Baill., Adansonia 7: 66, 3. 1866, **syn. nov.**

=*Magnolia* subg. *Michelia* (L.) Baill., Adansonia 7: 66, 3. 1866, **syn. nov.**

=*Magnolia* subgen. *Kmeria* Pierre, Fl. Forest. Cochinch. 1: sub t. 1. 1880, **syn. nov.**

=*Magnolia* subg. *Pleurochasma* Dandy, J. Roy. Hort. Soc. 75: 161. 1950, **syn. nov.**

=*Magnolia* subg. *Gynopodium* (Dandy) Figlar & Noot., Blumea 49(1): 94. 2004, **syn. nov.**

=*Manglietia* subg. *Sinomanglietia* (Z.X.Yu) N.H.Xia, Proc. Second Internat. Symp. Fam. Magnoliac.: 30. 2012, **syn. nov.**



Distribution: North America (including the Greater Antilles), East, South and Southeast Asia, the Philippine, Indonesian and Taiwanese archipelagos and Melanesia.

Number of taxa: 232 taxa (48 Neotropical taxa; Appendix 2).

Note: the well-supported subgenus *Magnolia* includes most North American and Asian taxa, and encompasses the formerly recognized subgenera '*Gynopodium*', '*Magnolia*' and '*Yulania*' (Figlar, 2006; 2012). It is consistently recovered as a monophyletic group in both nuclear and plastid phylogenies (Figs. 1, 2). This lineage corresponds to Subgenus A in System IV of Kim and Suh (2013), based on chloroplast DNA regions, and to Clade II in Wang et al. (2020), based on whole plastid genome data.

**1. *Magnolia* sect. *Macrophylla* Figlar & Noot. in *Blumea* 49(1): 92. 2004. Figs. 3, 4.**

TYPE: *Magnolia macrophylla* Michx.

=*Metamagnolia* Sima & S.G. Lu, Proc. Second Internat. Symp. Fam. Magnoliac.: 66. 2012.

Deciduous trees, young branches pulverulent, rarely sericeous; leaves disposed in false whorls on young branches, leaves large (>25 cm long), auriculiform, abaxially pulverulent, rarely sericeous, base auriculate or cordate; petioles with cymbiform stipular scar (<50% length), young petioles glabrous or pulverulent, rarely sericeous; stipules pubescent, rarely glabrous; peduncles pulverulent, rarely glabrous; bracts pulverulent; flowers large (>20 cm wide), gynoecium glabrous, rarely tomentose, style branches recurved; follicles glabrous, rarely sericeous, acute apexes, dehiscence longitudinal.

Distribution and habitat: United States of America (eastern, southeastern, southern), Mexico (western, eastern, southern). Inhabiting mainly temperate forests and (sub)tropical moist montane forests at elevations of 1000-2300 m.

Number of taxa: four species: two Neotropical species; two Nearctic species (Appendix 2).

**2. *Magnolia* sect. *Magnolia*. Figs. 5, 6.**

TYPE: *Magnolia virginiana* L.

=*Magnolia* sect. *Magnoliastrum* DC., Candolle, Prodr. 1: 80. 1824.

=*Magnolia* sect. *Theorhodon* Spach, Hist. Nat. Vég. 7: 470. 1839.

Evergreen trees, young branches glabrous, rarely pubescent; leaves disposed alternately, medium size (<25 cm long), elliptic to (ob)lanceolate, rarely (ob)ovate, abaxially glabrous, rarely pubescent, base cuneate, rarely attenuate or rounded; petioles without or with barely perceptible cymbiform stipular scar (>25% length), young petioles glabrous, rarely pubescent; stipules glabrous to pubescent; peduncles glabrous, rarely pubescent; bracts glabrous to pubescent; flowers medium size (<20 cm wide), gynoecium glabrous to pubescent, style branches curved; follicles glabrous rarely pubescent, acute apexes, rarely acuminate, dehiscence longitudinal.

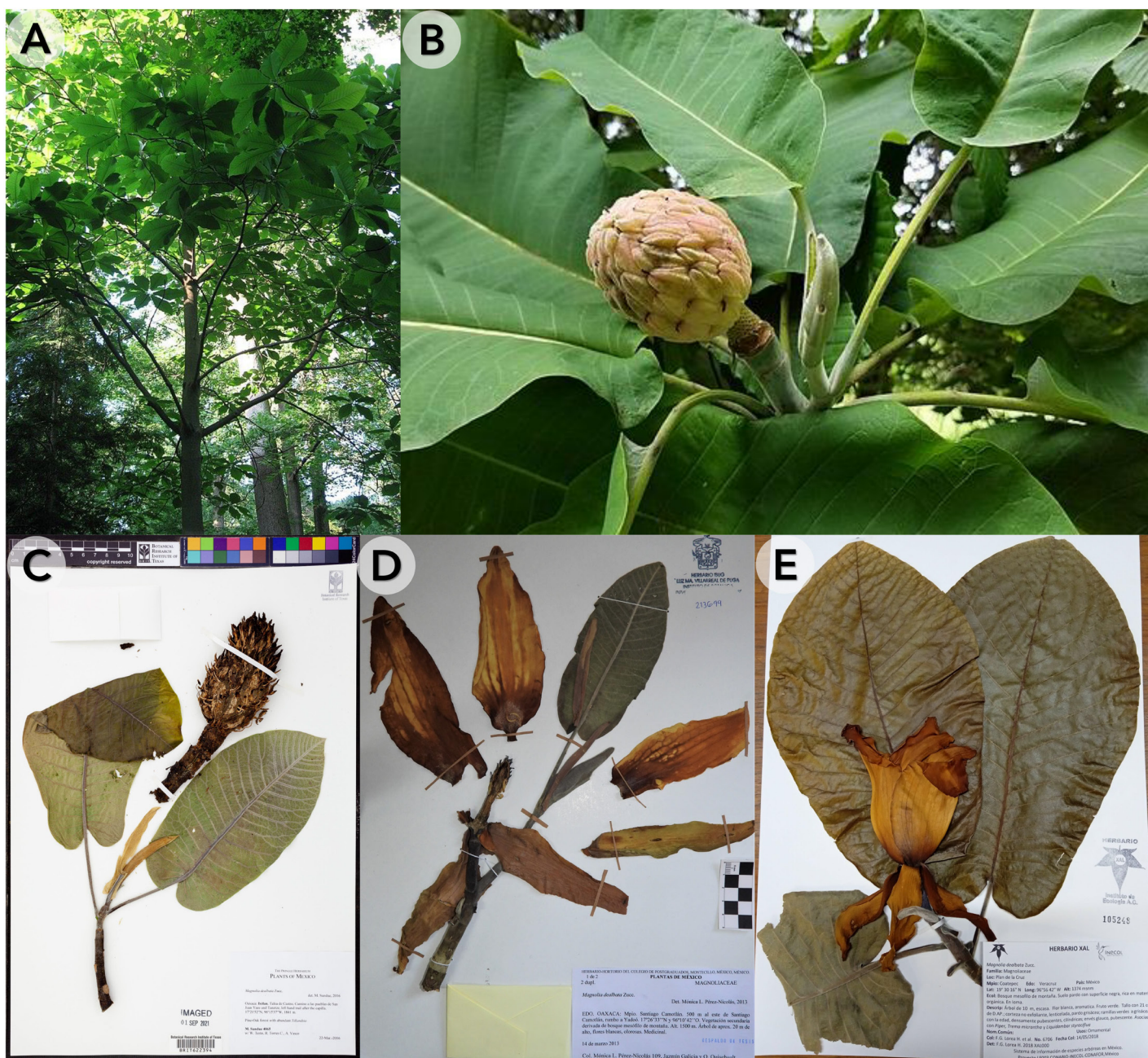
Distribution and habitat: United States of America (eastern, southeastern, southern), Mexico (northwestern, western, eastern, southern), Guatemala (central), Honduras (western, southern), Nicaragua (northern), Costa Rica (northern, central), Panama (western), Cuba (northern). Inhabiting mainly temperate forests, (sub)tropical moist montane forest, (sub)tropical dry forest and rarely swamps (*M. virginiana* in Cuba) at elevations of (5)100-3200 m.

Number of taxa: 49 taxa: 46 Neotropical taxa (43 species, three subspecies); three Nearctic taxa (one Nearctic species, two Nearctic subspecies; Appendix 2).

**II. *Magnolia* subg. *Talauma* (Juss.) Pierre, Fl. Forest. Cochinch. 1: sub. T. 1. 1881.**

TYPE: *Magnolia dodecapetala* (Lam.) Govaerts.





**Figure 3:** Species representing *Magnolia* sect. *Macrophylla* Figlar & Noot.: A, B. *Magnolia macrophylla* Michx. (United States of America); C, D. *Magnolia dealbata* Zucc. (Mexico); E. *Magnolia vovidesii* A.Vázquez, Domínguez-Yescas & L.Carvajal (Mexico). Note: The identifications of the vouchers were reviewed, some specimens may have incorrect labels. Photo by: Fabián Augusto Aldaba Núñez.

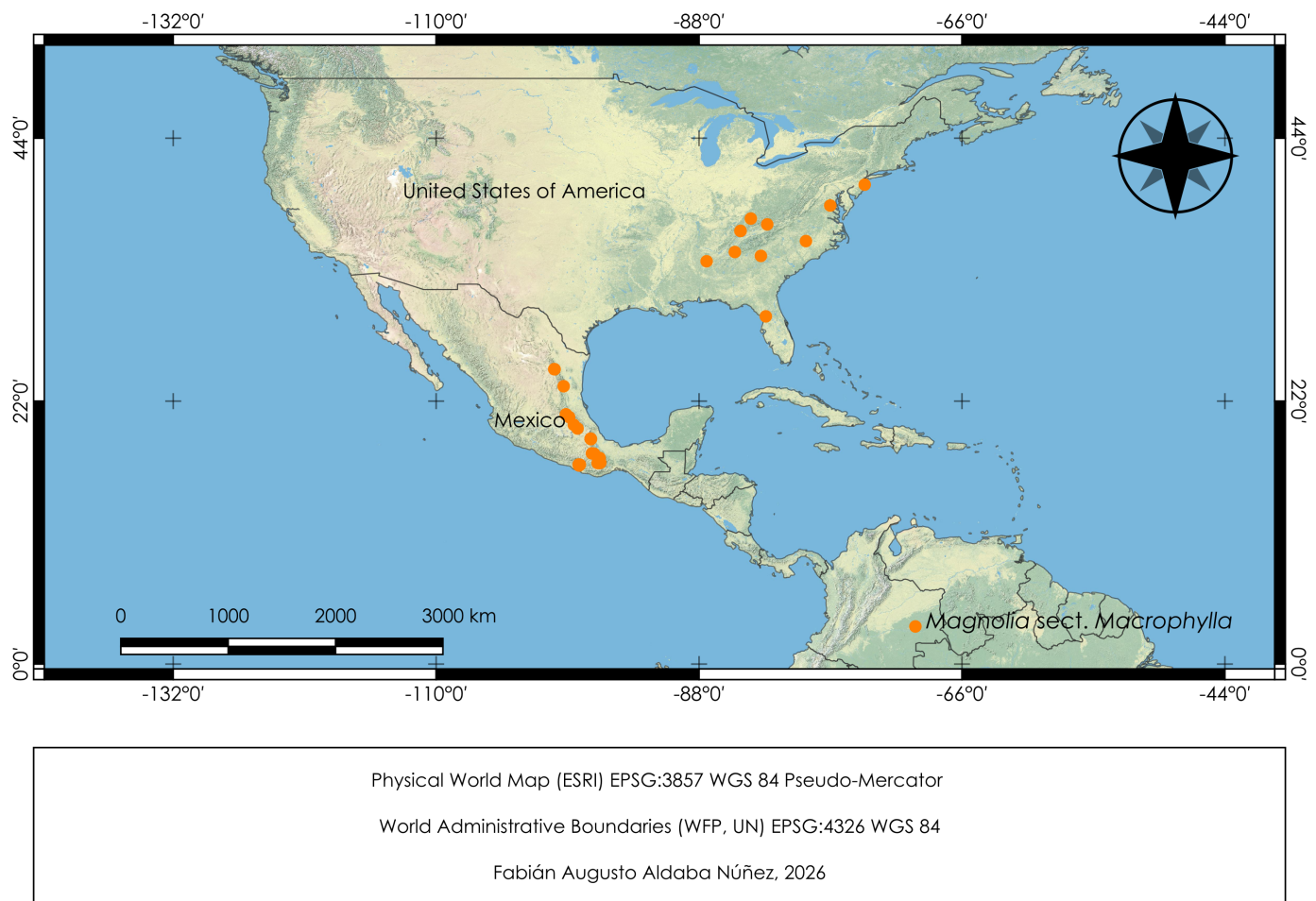
≡ *Talauma* Juss., Gen. Pl. (Jussieu): 281. 1789.

Distribution: North and South America (including the Greater and Lesser Antilles), Southeast Asia, the Philippine and Indonesian archipelagos, and Melanesia.

Number of taxa: 165 taxa (132 Neotropical species; Appendix 2).

Note: the well-supported subgenus *Talauma* is primarily Neotropical, although it also includes Asian taxa, and encompasses part of the formerly recognized subgenus '*Magnolia*' (Figlar, 2006; 2012). It is consistently recovered as a monophyletic group in both nuclear and plastid phylogenies (Figs. 1, 2). This lineage corresponds to Subgenus B in System IV of Kim and Suh (2013), based on chloroplast DNA regions, and to Clade I in Wang et al. (2020), based





**Figure 4:** Geographic distribution map of *Magnolia* sect. *Macrophylla* Figlar & Noot. The basemap represents the physical world map (ESRI, 2009) and international administrative boundaries (WFP, 2019). Occurrence data were retrieved from GBIF.org (2024).

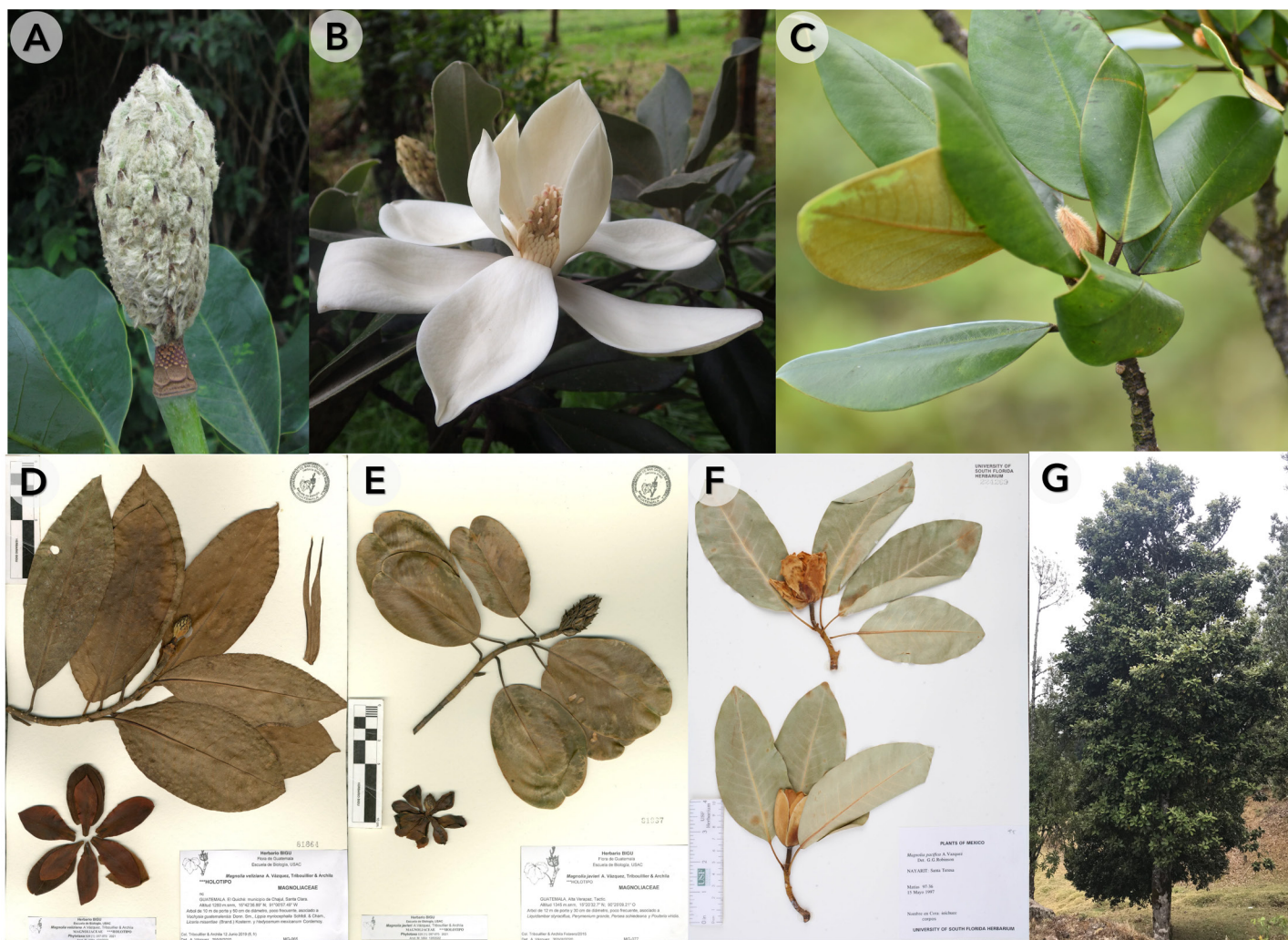
on whole plastid genome data. It is likely that the Asian species currently placed in *Magnolia* sect. *Gwillimia* represent a distinct subgenus. In plastid-based phylogenies, *Magnolia* sect. *Gwillimia* is embedded within *Magnolia* subg. *Talauma*, but nuclear-based phylogenies consistently recover it as an early-diverging clade: ‘*Magnolia* subg. *Gwillimia*’, distinct from both *Magnolia* subg. *Magnolia* and *Magnolia* subg. *Talauma*. Due to the limitations of plastid data in resolving complex reticulate evolutionary histories, greater weight should be given to nuclear evidence (Dong et al., 2022). However, since our study focuses on Neotropical groups, our sampling of *Magnolia* sect. *Gwillimia* is limited (3 out of ~35 total taxa). We recommend broader taxon sampling in future studies to clarify the phylogenetic position and potential subgeneric status of this lineage.

**3. *Magnolia* sect. *Cubenses* (Imkhan.) F.A.Aldaba, E.Martínez & Samain, comb. et stat. nov. Figs. 7, 8, 9.**

TYPE: *Magnolia cubensis* Urb.

≡ *Magnolia* subsect. *Cubenses* Imkhan., Novosti Sist. Vyssh. Rast. 28: 60. 1991.

Evergreen trees, young branches glabrous to puberulent, rarely pubescent; leaves disposed alternately, medium size (<25 cm long), elliptic or (ob)ovate, rarely orbicular, abaxially glabrous to puberulent, rarely lanuginous, base cuneate or rounded, rarely obtuse or truncate; petioles without or with barely perceptible cymbiform stipular scar (<25%), young petioles glabrous, rarely lanuginous; stipules pubescent, rarely glabrous; peduncles glabrous or lanuginous;



**Figure 5:** Taxa representing *Magnolia* sect. *Magnolia*: A. *Magnolia mayae* A.Vázquez & Pérez-Farr. (Mexico); B, G. *Magnolia sororum* subsp. *lutea* A.Vázquez (Costa Rica); C. *Magnolia sororum* subsp. *sororum* Seibert (Panama); D. *Magnolia veliziana* A.Vázquez, Tribouill. & Archila (Guatemala); E. *Magnolia javieri* A.Vázquez, Tribouill. & Archila (Guatemala); F. *Magnolia pacifica* A.Vázquez (Mexico). Photo by: Esteban Manuel Martínez Salas, Marie-Stéphanie Samain and Fabián Augusto Aldaba Núñez.

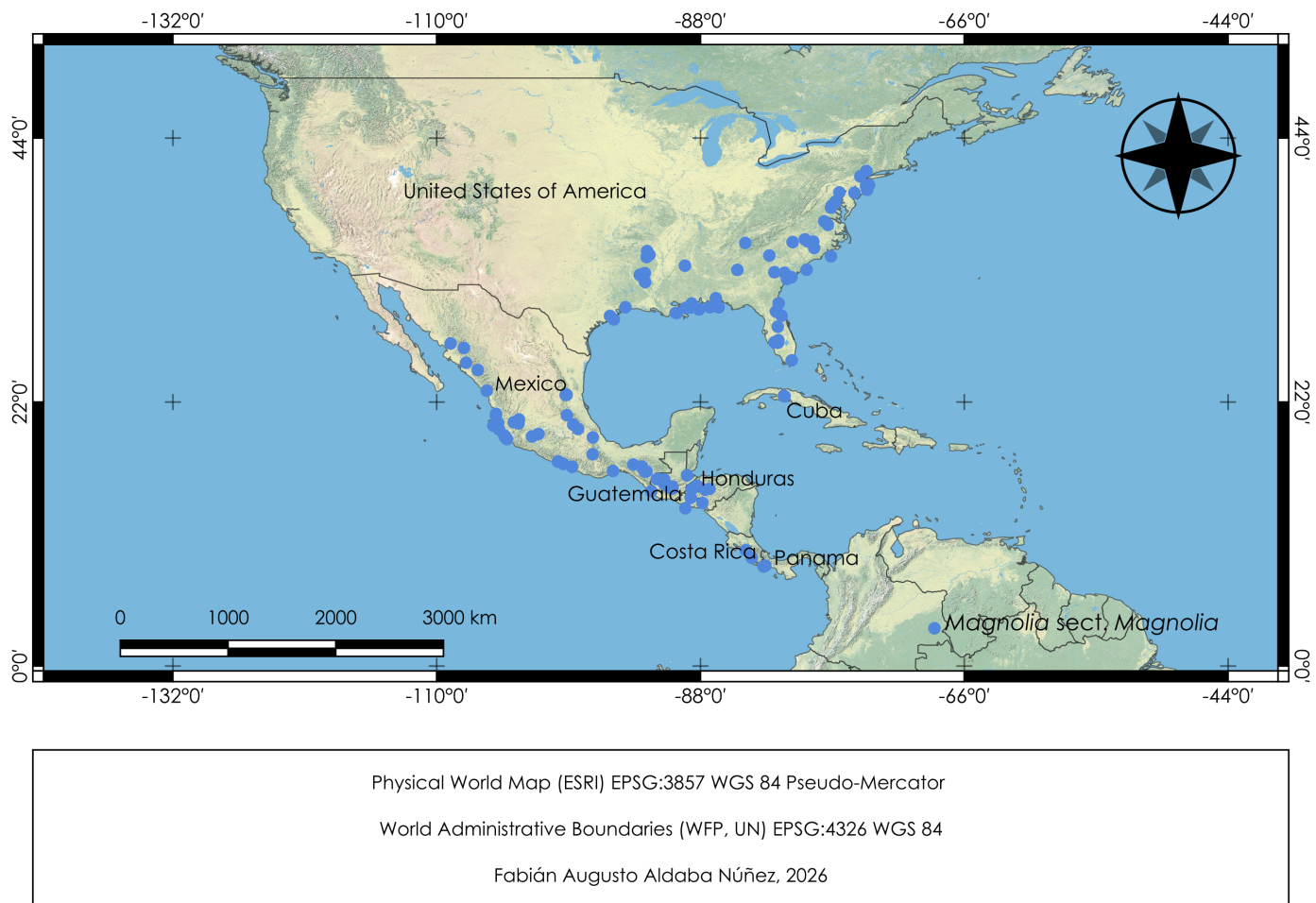
bracts glabrous or pubescent; flowers medium size (<20 cm wide), gynoecium glabrous to pulverulent, rarely pubescent, style branches curved, follicles glabrous, rarely lanate, acuminate apexes, dehiscence circumscissile or longitudinal.

Distribution and habitat: Venezuela (southeastern), Colombia (northern, western), Ecuador (southeastern), Peru (northern, central), and the Greater Antilles. Inhabiting mainly temperate forest, (sub)tropical moist montane forest, (sub)tropical moist lowland forest and (sub)tropical dry forest at elevations of 500-2550 m.

Number of taxa: 30 species, all Neotropical (Appendix 2).

Note: Phylogenomic evidence from plastome and nuclear data (Aldaba Núñez et al., 2024) supports the division of *Magnolia* sect. *Cubenses* into two well-differentiated clades, herein recognized as two subsections. A similar phylogenetic structure was previously recovered in plastid-based analyses (Veltjen et al., 2019; Wang et al., 2020). These clades are geographically structured: *Magnolia* sect. *Cubenses* subsection. *Cubenses* is restricted to the Greater Antilles, while *Magnolia* sect. *Cubenses* subsection. *Dugandiodendron* occurs in northern South America. In addition to their distribution, they differ morphologically, particularly in type of follicle dehiscence (circumscissile in *Magnolia* sect. *Cubenses* subsection. *Dugandiodendron* vs. longitudinal in *Magnolia* sect. *Cubenses* subsection. *Cubenses*).





**Figure 6:** Geographic distribution map of *Magnolia* sect. *Magnolia*. The basemap represents the physical world map (ESRI, 2009) and international administrative boundaries (WFP, 2019). Occurrence data were retrieved from GBIF.org (2024).

**3a. *Magnolia* sect. *Cubenses* subsect. *Cubenses* (Imkhan.)  
F.A.Aldaba, E.Martínez & Samain, comb. nov. Figs. 7, 9.**

TYPE: *Magnolia cubensis* Urb.

≡ *Magnolia* sect. *Talauma* subsect. *Cubenses* Imkhan., Novosti Sist. Vyssh. Rast. 28: 60. 1991.

= *Magnolia* sect. *Splendentes* Dandy ex A.Vázquez, Brittonia 46(1): 4. 1994, **syn. nov.**

≡ *Magnolia* subsect. *Splendentes* (Dandy ex A.Vázquez) Figlar & Noot., Blumea 49(1): 91. 2004.

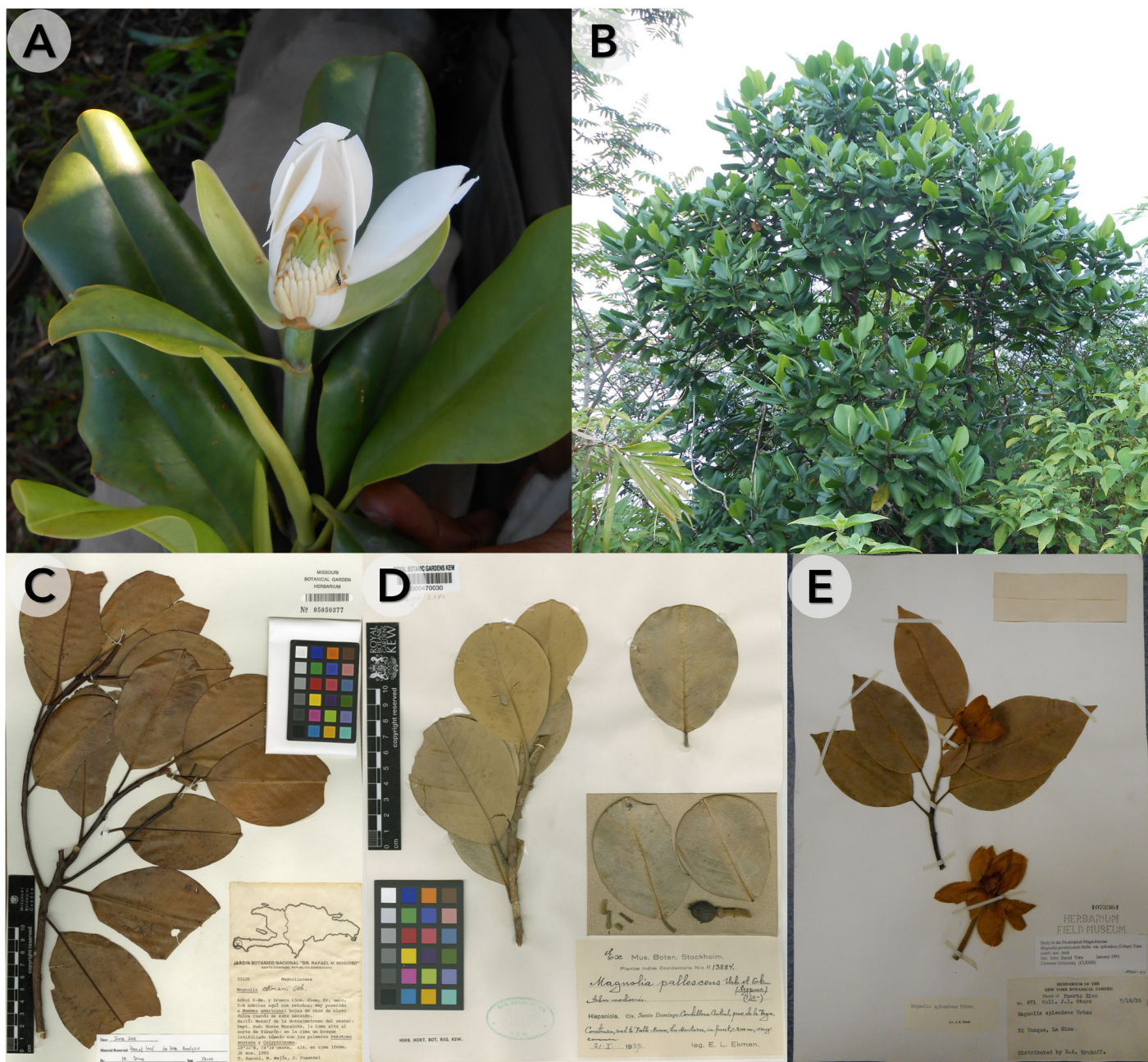
Young branches puberulent to pubescent, young petioles glabrous or pubescent, stipules glabrous to pubescent, leaves abaxially glabrous to puberulent, gynoecium

glabrous or puberulent, follicles glabrous to puberulent, dehiscence longitudinal.

Distribution and habitat: the Greater Antilles: Cuba, Haiti, Dominican Republic, and Puerto Rico. Inhabiting mainly temperate forest, (sub)tropical moist montane forest and (sub)tropical moist lowland forest at elevations of 500-2100 m.

Number of taxa: 10 species, all Neotropical (Appendix 2).

**3b. *Magnolia* sect. *Cubenses* subsect. *Dugandiodendron* (Lozano) F.A.Aldaba, E.Martínez & Samain, comb. nov. Figs. 8, 9.**



**Figure 7:** Species representing *Magnolia* sect. *Cubenses* subsect. *Cubenses* (Imkhan.) F.A.Aldaba, E.Martínez & Samain: A, B, C. *Magnolia ekmanii* Urb. (Haiti). D. *Magnolia pallescens* Urb. & Ekman (Dominican Republic). E. *Magnolia splendens* Urb. (Puerto Rico). Note: The identifications of the vouchers were reviewed, some specimens may have incorrect labels. Photo by: Esteban Manuel Martínez Salas, Marie-Stéphanie Samain and Fabián Augusto Aldaba Núñez.

TYPE: *Magnolia mahechae* (Lozano) Govaerts.

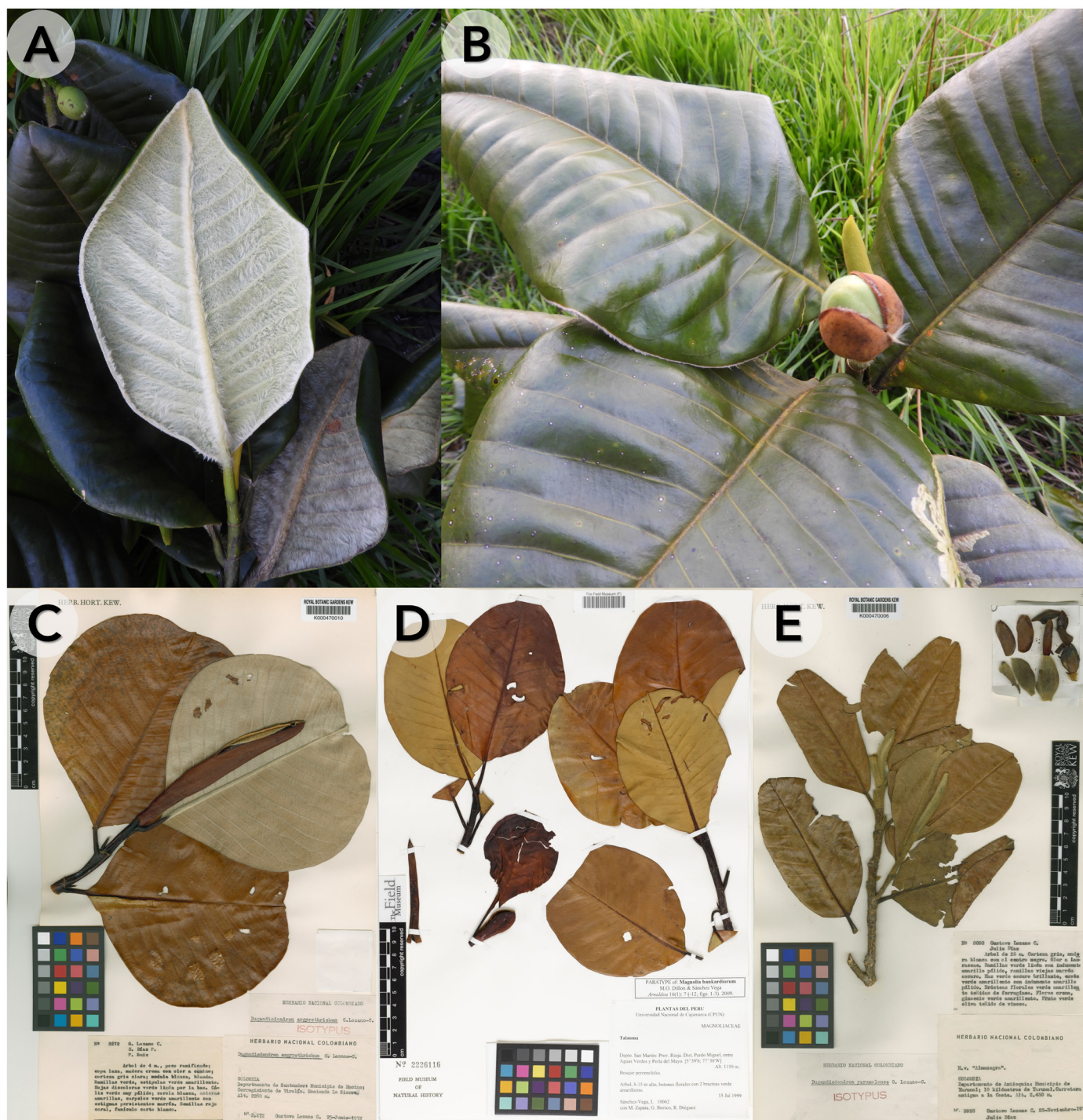
≡ *Dugandiodendron* Lozano, *Caldasia* 11(53): 33. 1975.

Young branches glabrous or puberulent, young petioles pubescent, rarely glabrous, stipules pubescent, rarely glabrous, leaves abaxially pubescent, rarely glabrous,

gynoecium glabrous or pulverulent, rarely pubescent, follicles glabrous, rarely pubescent, dehiscence circumscissile.

Distribution and habitat: Venezuela (southeastern), Colombia (northern, western), Ecuador (southeastern), and Peru (northern, central). Inhabiting mainly temperate forest





**Figure 8:** Species representing *Magnolia* sect. *Cubenses* subsect. *Dugandiodendron* (Lozano) F.A.Aldaba, E.Martínez & Samain: A, B. *Magnolia jansenensis* Marcelo-Peña (Peru). C. *Magnolia argyrothricha* (Lozano) Govaerts (Colombia). D. *Magnolia bankardiorum* M.O.Dillon & Sánchez Vega (Peru). E. *Magnolia yarumalensis* (Lozano) Govaerts (Colombia). Note: The identifications of the vouchers were reviewed, some specimens may have incorrect labels. Photo by: Esteban Manuel Martínez Salas, Marie-Stéphanie Samain and Fabián Augusto Aldaba Núñez.

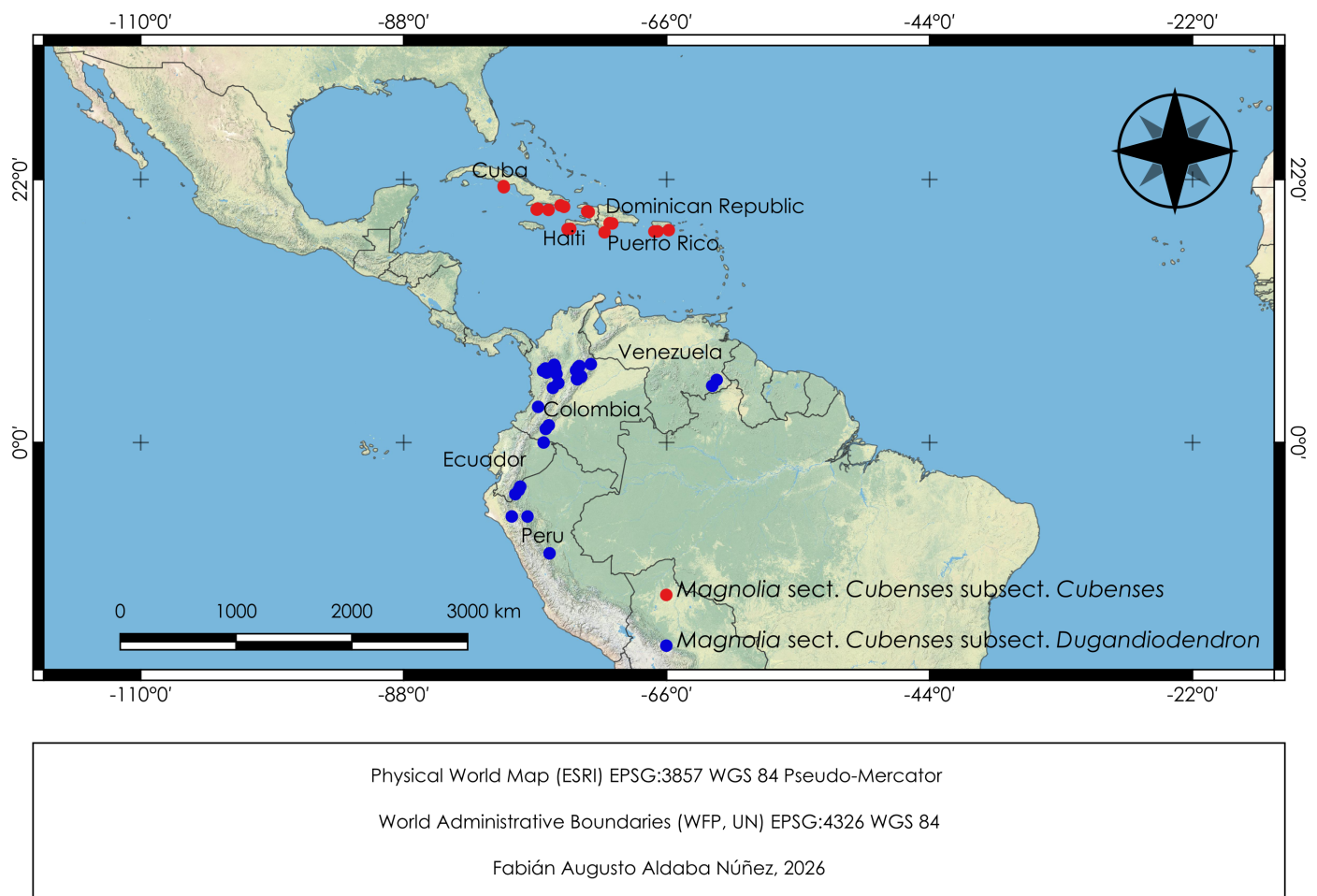
and (sub)tropical moist montane forest at elevations of 900-2550 m (Fig. 9).

**4. *Magnolia* sect. *Talauma* (Juss.) Baill., *Adansonia* 7: 3, 66. 1866. Figs. 10, 11, 12.**

Number of taxa: 20 species, all Neotropical (Appendix 2).

TYPE: *Magnolia dodecapetala* (Lam.) Govaerts.





**Figure 9:** Geographic distribution map of *Magnolia* sect. *Cubenses* (Imkhan.) F.A.Aldaba, E.Martínez & Samain. The basemap represents the physical world map (ESRI, 2009) and international administrative boundaries (WFP, 2019). Occurrence data were retrieved from GBIF.org (2024).

≡ *Magnolia* sect. *Talauma* (Juss.) Baill., Hist. Pl. 1: 142. 1868, nom. illeg.

≡ *Talauma* Juss., Gen. Pl. (Jussieu) 281. 1789.

= *Talauma* sect. *Richardsianae* Blume, Flora Javae 19-20: 32. 1829.

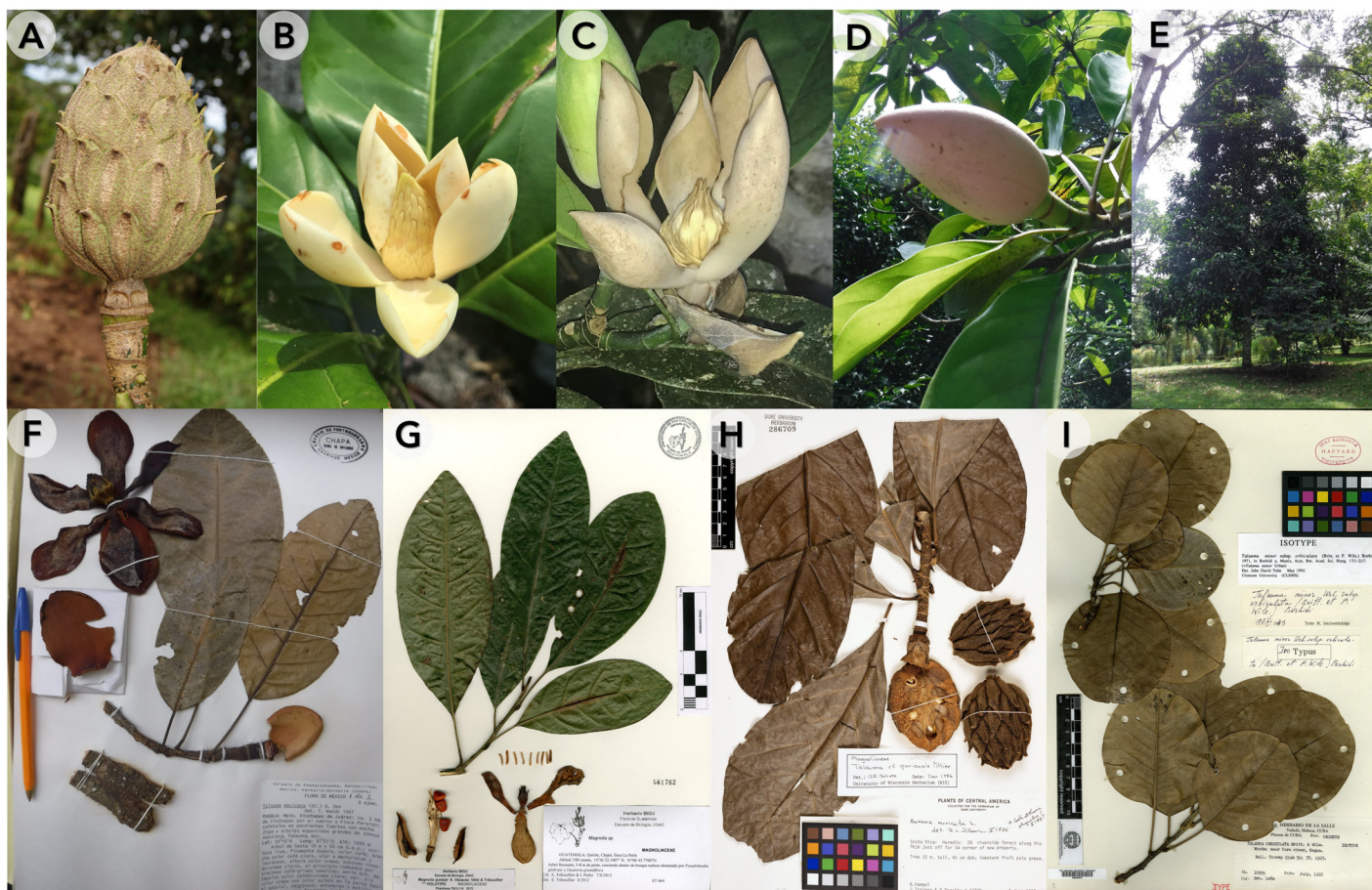
= *Talauma* subsect. *Caricifragantes* Imkhan., Novosti Sist. Vyssh. Rast. 29: 74. 1993.

= *Magnolia* subsect. *Chocotalauma* A.Vázquez, Á.J.Pérez & F.Arroyo, Phytotaxa 286(4): 270. 2016.

Evergreen trees, young branches glabrous to pulverulent, rarely pubescent; leaves disposed alternately, medium size (<25 cm), elliptic to ovate or (ob)ovate, abaxially glabrous to pubescent, base cuneate or rounded, rarely decurrent, obtuse or truncate; petioles with pulvinus and

cymbiform stipular scar (>50% length), young petioles glabrous to pulverulent, rarely pubescent; stipules glabrous to puberulent, rarely pubescent; peduncle glabrous to pulverulent, rarely pubescent; bracts glabrous to puberulent, rarely pubescent; flowers large (>20 cm wide), gynoeceum glabrous to pulverulent, rarely pubescent, style branches straight, follicles glabrous to pulverulent, generally with acuminate apices, rarely acute, falling clustered in groups or individually, dehiscence circumscissile.

Distribution and habitat: Mexico (western, central, southern), Guatemala (western, central), Honduras (northern), Nicaragua (southern), Costa Rica, Panama, Venezuela (northwestern), Colombia (central, western, southwestern), Ecuador (northern, central, eastern, southern), Peru



**Figure 10:** Species representing *Magnolia* sect. *Talauma* subsect. *Mexicana* F.A.Aldaba, E.Martínez & Samain: A. *Magnolia gloriensis* (Pittier) Govaerts (Costa Rica). B. *Magnolia wetteri* A.Vázquez (Costa Rica). C. *Magnolia costaricensis* A.Vázquez (Costa Rica). D, E, F. *Magnolia mexicana* DC. (Mexico). G. *Magnolia quetzal* A.Vázquez, Véliz & Tribouill. (Guatemala). H. *Magnolia inbioana* A.Vázquez (Costa Rica). I. *Magnolia orbiculata* (Britton & P.Wilson) Palmarola (Cuba). Note: The identifications of the vouchers were reviewed, some specimens may have incorrect labels. Photos by: Esteban Manuel Martínez Salas, Marie-Stéphanie Samain and Fabián Augusto Aldaba Núñez.

(northern, central, southeastern), Bolivia (northwestern, central), Brazil (northcentral, western, southwestern), Cuba, and the Lesser Antilles (Guadeloupe, Dominica, Martinique, Saint Lucia, and Saint Vincent). Inhabiting mainly temperate forest, (sub)tropical dry forest, (sub)tropical moist lowland forest, (sub)tropical moist montane forest, and dry savanna at elevations of 50-2700 m.

Number of taxa: 102 species, all Neotropical.

Note: phylogenomic evidence from both plastome and nuclear data (Aldaba Núñez et al., 2024) supports the division of *Magnolia* sect. *Talauma* into two well-differentiated clades, which are herein recognised as two subsections, one of which is newly described. These clades are

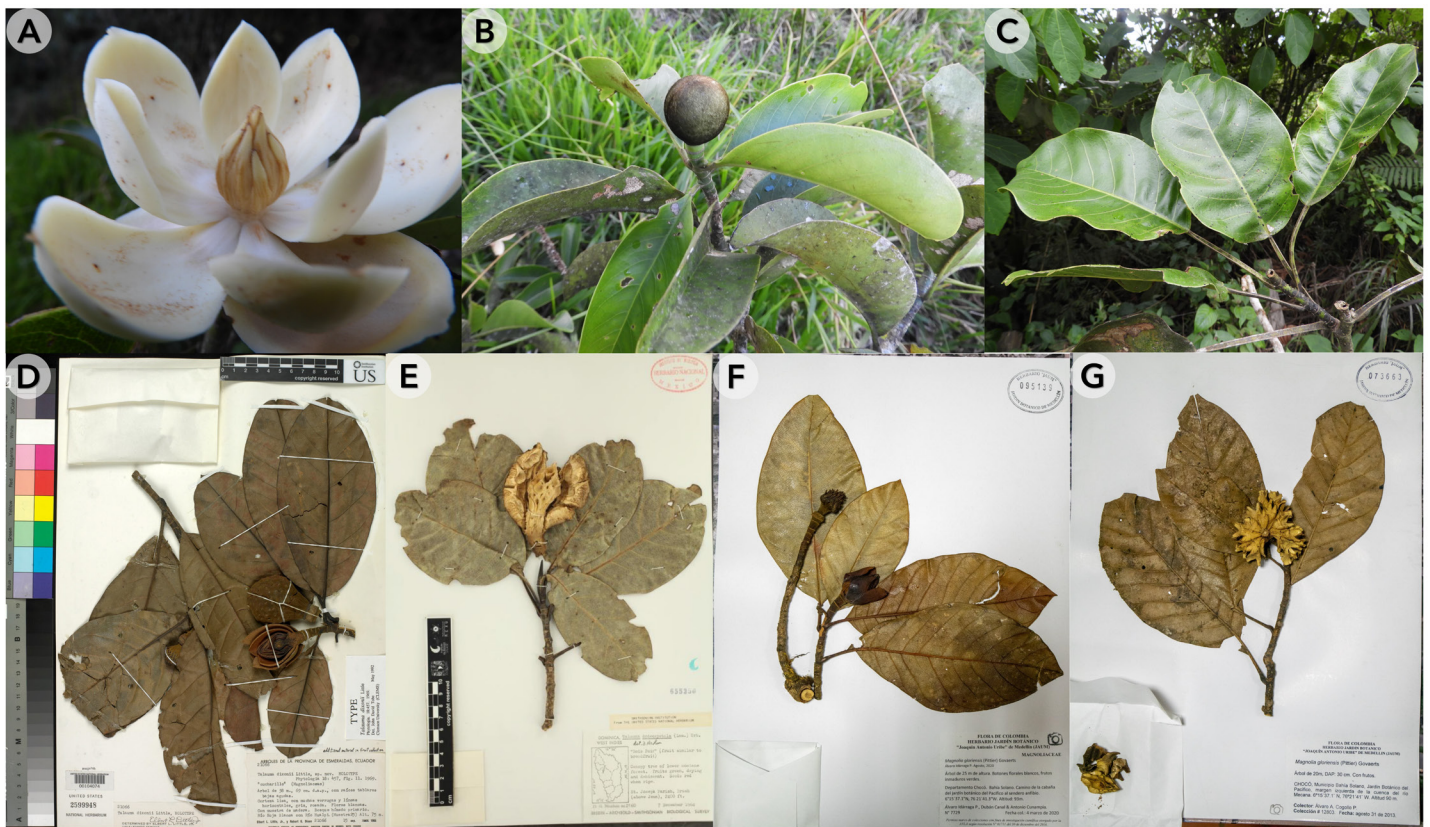
geographically structured: the northern clade is restricted to Mexico and Central America, while the southern clade includes species from the Antilles and South America. In addition to their distribution, the two groups are morphologically distinct (particularly in the indumentum of the abaxial leaf surface, which is glabrous in the northern taxa and pubescent in the southern species).

**4a. *Magnolia* sect. *Talauma* subsect. *Mexicana* F.A.Aldaba, E.Martínez & Samain, subsect. nov. Figs. 10, 12.**

TYPE: *Magnolia mexicana* DC.

*Magnolia* sect. *Talauma* subsect. *Mexicana* can be distinguished from the subsect. *Talauma* by stipules gla-





**Figure 11:** Species representing *Magnolia* sect. *Talauma* subsect. *Talauma* (Juss.) Figlar & Noot.: A, B. *Magnolia enepeceana* Rob.Fern. & Marcelo-Peña (Peru). C. *Magnolia sanchez-vegae* Marcelo-Peña (Peru). D. *Magnolia dixonii* (Little) Govaerts (Ecuador). E. *Magnolia dodecapetala* (Lam.) Govaerts (Dominica). F, G. *Magnolia striatifolia* Little (Colombia). Note: The identifications of the vouchers were reviewed, some specimens may have incorrect labels. Photos by: Esteban Manuel Martínez Salas, Marie-Stéphanie Samain and Fabián Augusto Aldaba Núñez.

brous to puberulent vs. glabrous, rarely pubescent; indumentum of abaxial leaves surface glabrous vs. pubescent; bracts glabrous to puberulent, rarely pubescent vs. glabrous, rarely pubescent and by distribution: endemic to North America and the Greater Antilles vs. endemic to South America and the Lesser Antilles.

Young branches glabrous or pulverulent, young petioles glabrous or pulverulent, stipules glabrous to puberulent, leaves elliptic to ovate, abaxially glabrous, peduncle glabrous or pulverulent, bracts glabrous to puberulent, rarely pubescent, gynoecium glabrous, follicles glabrous to puberulent, rarely pubescent, acute apex, generally falling individually.

**Etymology:** the epithet was chosen in recognition of *M. mexicana* DC., the first species to be described within this subsection. Additionally, it refers to the largest country

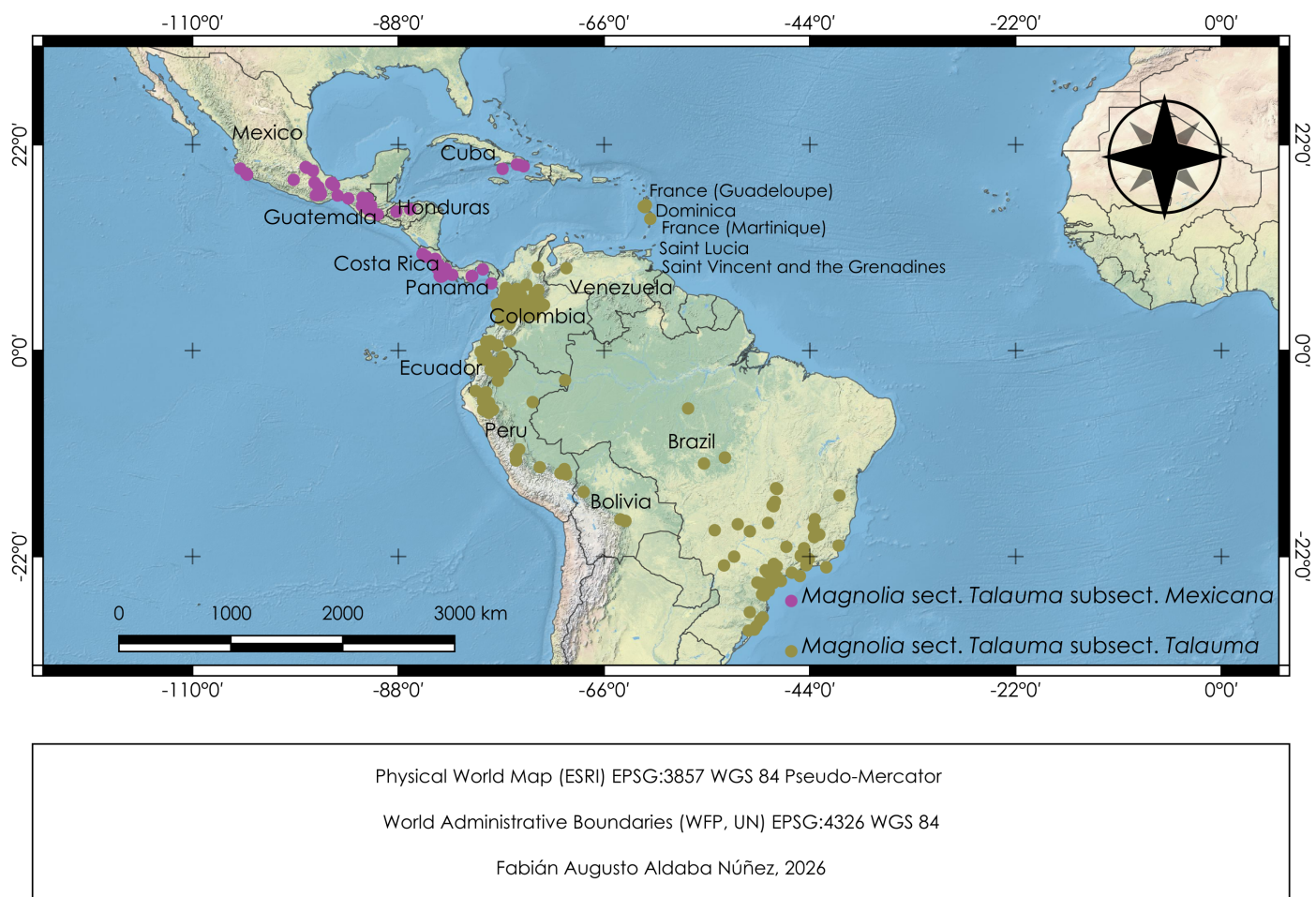
encompassing this lineage, where the greatest species diversity of this subsection occurs.

**Distribution and habitat:** Mexico (western, central, southern), Guatemala (western, central), Honduras (northern), Nicaragua (southern), Costa Rica, Panama, and Cuba. Inhabiting mainly temperate forest, (sub)tropical moist lowland forest, (sub)tropical moist montane forest and (sub)tropical dry forest at elevations of 50-2000 m.

**Number of taxa:** 40 species, all Neotropical (Appendix 2).

**4b. *Magnolia* sect. *Talauma* subsect. *Talauma* (Juss.) Figlar & Noot., *Blumea* 49(1): 90. 2004. Figs. 11, 12.**

**TYPE:** *Magnolia dodecapetala* (Lam.) Govaerts.



**Figure 12:** Geographic distribution map of *Magnolia* sect. *Talauma* (Juss.) Baill. The basemap represents the physical world map (ESRI, 2009) and international administrative boundaries (WFP, 2019). Occurrence data were retrieved from GBIF.org (2024).

=*Magnolia* subsection. *Chocotalauma* A.Vázquez, Á.J.Pérez & F.Arroyo, Phytotaxa 286(4): 270. 2016.

Young branches glabrous, rarely pubescent, young petioles glabrous, rarely pubescent, stipules glabrous, rarely pubescent, leaves elliptic to (ob)ovate, abaxially glabrous to pubescent, peduncle glabrous to pubescent, bracts glabrous, rarely pubescent, gynoeceum glabrous or pulverulent, rarely pubescent, follicles glabrous or pulverulent, usually with acuminate apices, generally falling clustered in groups.

Distribution and habitat: Venezuela (northwestern), Colombia (central, western, southwestern), Ecuador (northern, central, eastern, southern), Peru (northern, central, southeastern), Bolivia (northwestern, central), Brazil

(northcentral, western, southwestern), and the Lesser Antilles (Guadeloupe, Dominica, Martinique, Saint Lucia, and Saint Vincent). Inhabiting mainly temperate forest, (sub) tropical moist lowland forest, (sub)tropical moist montane forest, (sub)tropical dry forest and dry or moist savanna (*M. brasiliensis* C.O.Azevedo, A.F.P.Machado & A.Vázquez) at elevations of 100-2700 m (Fig. 12).

Number of taxa: 62 species, all Neotropical (Appendix 2).

## Discussion

### General relationships in Neotropical *Magnolia*

The present work proposes a new infrageneric classification for *Magnolia* clades of Neotropical distribution based on the

results of Aldaba Núñez et al. (2024), in which nuclear and plastid phylogenomic data were integrated and complemented with morphological evidence. Recent studies have shown that *Magnolia* is divided into two major clades that do not correspond to the three subgenera recognised in the most recent and widely accepted classification systems (Wang et al., 2020; Guzmán-Díaz et al., 2022; Aldaba Núñez et al., 2024).

The interpretation of our topologies (Figs. 1, 2) is based on the two major clades identified by Wang et al. (2020). Clade I comprises *Magnolia* sect. *Gwillimia*, *Magnolia* sect. *Talauma*, and *Magnolia* sect. *Cubenses* whereas Clade II includes the remaining sections. It is important to note that Wang et al. (2020) did not assign formal names to these clades. In contrast, Kim and Suh (2013) were the first to propose a system that recognised two subgenera within *Magnolia* (System IV). In this scheme, subgenus A corresponds to Clade II, while subgenus B corresponds to Clade I, as identified by both Wang et al. (2020) and our results. Since Kim's proposal predates that of Wang and aligns with the topology we observed in our analyses, we have adopted Kim and Suh's subgeneric names to refer to the major clades.

All Neotropical clades were recovered as monophyletic and fall within either of the major clades: *Magnolia* sect. *Cubenses* (= *Magnolia* sect. *Splendentes*, according to Wang et al., 2020) and *Magnolia* sect. *Talauma* in subgenus B (Kim and Suh, 2013), Clade I (Wang et al., 2020), and *Magnolia* sect. *Macrophylla* and *Magnolia* sect. *Magnolia* in subgenus A (Kim and Suh, 2013), Clade II (Wang et al., 2020; Figs. 1, 2).

According to the plastome phylogeny (Fig. 1), within Clade I, *Magnolia* sect. *Cubenses* and *Magnolia* sect. *Talauma* were recovered as sister clades, while the Asian *Magnolia* sect. *Gwillimia* was placed as an early divergent lineage. In contrast, the lineages forming Clade II, *Magnolia* sect. *Macrophylla* and *Magnolia* sect. *Magnolia*, remained unchanged in their circumscription.

Incongruences between nuclear and plastid data have been revealed in previous studies addressing the phylogenetic relationships in *Magnolia* (Azuma et al., 1999; Kim et al., 2001; Nie et al., 2008; Kim and Suh, 2013; Aldaba Núñez et al., 2024). Dong et al. (2022) suggest that nuclear

evidence should be considered over plastid data because of its shortcomings in detecting complex reticulated evolutionary histories. In light of this evidence, it seems plausible to propose that *Magnolia* comprises three distinct subgenera, with *Magnolia* sect. *Gwillimia* as a separate subgenus differentiated from *Magnolia* subg. *Talauma*. However, this approach is not adopted in the present proposal due to limited sampling of that section. Additionally, *Magnolia* sect. *Gwillimia* is not a Neotropical group, and therefore falls outside the scope of this study.

In addition to the topological incongruences discussed above, species-level challenges in Neotropical *Magnolia* further illustrate the complexity of the group. Several taxa have been described based on limited or sterile material, and some form part of species complexes that remain poorly resolved, such as those involving *M. pacifica* and *M. dealbata* (Muñiz-Castro et al., 2020; Chávez-Cortázar et al., 2021; Aldaba Núñez et al., 2025). While these issues do not affect infrageneric placement directly, they reflect the ongoing difficulties in delineating natural groups at all taxonomic levels. Although our sampling included all Neotropical clades, we could not include some Cuban or Haitian species in the phylogenetic analyses due to the poor quality or incompleteness of the nuclear DNA sequences obtained for those taxa. For example, some samples yielded sufficient DNA quantity but extremely short sequences (e.g., only 119 bp) or failed to recover any target genes with adequate coverage. To avoid introducing error or noise into the molecular trees, these species were excluded from the final phylogenetic reconstruction. Nevertheless, *M. virginiana*, which occurs in Cuba, and at least one species occurring in Haiti (*M. domingensis* Urb.), were successfully included. Moreover, all Cuban and Haitian species were thoroughly examined in the morphological dataset to ensure their proper consideration in the taxonomic framework.

### Morphological traits and their relevance for infrageneric delimitation

Based on the character matrix used (Aldaba Núñez et al., 2024), the most useful diagnostic traits to delimit the Neotropical lineages were leaf persistence, presence of false leaf whorls on young branches, presence of pulvinus,



length of stipular scar, leaf shape, leaf base shape, indumentum of abaxial surface, shape of style branches and type of follicle dehiscence (Table 1). These traits proved useful for identifying sections and subsections within the Neotropics, but did not provide sufficient resolution to support broader subgeneric boundaries.

In particular, a clear morphological character to consistently distinguish *Magnolia* subg. *Magnolia* from *Magnolia* subg. *Talauma* was not found. The only potential indicator may be the dehiscence of the carpels, which is longitudinal in the *Magnolia* subg. *Magnolia* and predominantly circumscissile in *Magnolia* subg. *Talauma*. However, this trait is not consistent: for instance, taxa in *Magnolia* sect. *Cubenses* (previously referred to as *Magnolia* sect. *Talauma* subsect. *Cubenses*) and in some species of *Magnolia* sect. *Gwillimia* also exhibit longitudinal dehiscence, undermining its reliability as a synapomorphy (Figlar and Nootboom, 2004; Figlar, 2006, 2012; Wang et al., 2020; Aldaba Núñez et al., 2024). Studies of secondary metabolites in *Magnolia* have shown that species of *Magnolia* sect. *Talauma* and *Magnolia* sect. *Gwillimia* share the presence of methyl 2-methyl-butanoate (Azuma et al., 1999, 2004), which may serve as an additional line of evidence in the future for subgeneric delimitation.

Pollen morphology was once thought to provide strong taxonomic signals; however, recent studies have failed to detect consistent differences between subgenera (Xu and Kirchoff, 2008). For example, no significant variation has been observed between the pollen of species from *Magnolia* sect. *Dugandiodendron* and *Magnolia* sect. *Talauma* (Serna González and Velásquez-Ruiz, 2017), suggesting that pollen morphology is insufficient for infrageneric classification.

Finally, anatomical features may still hold promise for distinguishing subgenera, but further detailed investigation is needed. Subtle but consistent differences could emerge from such analyses and provide a complementary perspective to the molecular and morphological data currently available.

### *Magnolia* subgenus *Magnolia*

While the relationships between clades or sections within this large clade (subgenus A, Clade II) varied depending on the molecular evidence employed (Aldaba Núñez et al., 2024), the Neotropical *Magnolia* sect. *Macrophylla* and

*Magnolia* sect. *Magnolia*, along with the Asiatic and Nearctic groups, could be clearly distinguished (Figs. 1, 2). This finding corroborates previous results based on Sanger sequencing (Azuma et al., 1999, 2001; Kim et al., 2001; Nie et al., 2008; Kim and Suh, 2013) and morphological data (Nootboom, 2000; Figlar and Nootboom, 2004).

### *Magnolia* sect. *Macrophylla*

*Magnolia* sect. *Macrophylla* includes a small number of species (4 accepted species; Appendix 2), mainly distributed in the southeastern United States of America and northeastern Mexico. These taxa show a high degree of morphological similarity, and no clear phylogenetic structure was recovered within the section to support further subdivision (Figs. 1, 2). Moreover, previous evidence (Aldaba Núñez et al., 2025) suggests that species occurring in the U.S.A. and Mexico may represent a single, morphologically variable species, further complicating any attempt at defining subsections.

Our results are consistent with previous research and confirm that the species belonging to the *Magnolia* sect. *Macrophylla* are distinct from those of the *Magnolia* sect. *Rytidospermum* (Azuma et al., 2001, 2004; Kim et al., 2001). Historically, the former group was included with the latter based on the whorl-like arrangement of the leaves, leading to a classification that spanned both American and Asian distributions (Dandy, 1927; Nootboom, 1985). However, the DNA sequence analysis by Kim et al. (2001) showed that some American species of *Magnolia* sect. *Rytidospermum* formed a separate clade from their Asian counterparts, leading Figlar and Nootboom (2004) to describe the *Magnolia* sect. *Macrophylla* as a separate section.

Both morphological and molecular evidence (using both Sanger and next-generation sequencing data) further confirm that *Magnolia* sect. *Macrophylla* is indeed separate from the Asian American *Magnolia* sect. *Rytidospermum* (Kim and Suh, 2013; Wang et al., 2020; Aldaba Núñez et al., 2024). The whorl-like arrangement of leaves, once considered a unifying character, is now recognised as a case of evolutionary convergence rather than a true synapomorphy.

### *Magnolia* sect. *Magnolia*

*Magnolia* sect. *Magnolia* includes around 50 species (Appendix 2) and exhibits greater morphological diversity. However,



the relationships among these taxa remain unclear due to differences in topology depending on the molecular dataset used (Figs. 1, 2). These incongruences might be explained by evolutionary processes, such as incomplete lineage sorting, introgression, or hybridization, which have been documented in other groups of *Magnolia* (e.g., Sang and Zhong, 2000; Azuma et al., 2001; Kim et al., 2001; Nie et al., 2008; Wang et al., 2020; Dong et al., 2022) and flowering plants.

Our findings validate the recognition of the *Magnolia* sect. *Magnolia* as a monophyletic group. Some of the species currently placed in this section were initially classified within the *Magnolia* sect. *Magnoliastrum*, the first recognised section within the genus (de Candolle, 1824). However, they were later removed from consideration (Bentham and Hooker, 1862; Baillon, 1866). Subsequently, *Magnolia* sect. *Magnolia* was recognised in early classification systems, with *M. virginiana* as the type species and sole representative (Dandy, 1927; Nootboom, 1985). However, all the Neotropical taxa and the remaining Nearctic species now included in this clade were originally placed in the *Magnolia* sect. *Theorhodon*, with *M. grandiflora* L. as the type species (Vázquez-García, 1994). This distinction was based on the facultative deciduous foliage in *M. virginiana* vs. the evergreen condition of the taxa in *Magnolia* sect. *Theorhodon* and the stipules adnate to most of the petiole in *M. virginiana* vs. adnate to the base of the petiole in *Magnolia* sect. *Theorhodon* (Figlar and Nootboom, 2004; Figlar, 2012). Subsequent phylogenetic analyses based on sequence data indicated that *M. virginiana* should be grouped with the species of *Magnolia* sect. *Theorhodon*, making it effectively synonymous with the *Magnolia* sect. *Magnolia* (Azuma et al., 1999, 2001, 2004; Kim et al., 2001; Kim and Suh, 2013). This reclassification has been validated by subsequent studies using morphologic and plastome data (Wang et al., 2020; Aldaba Núñez et al., 2024).

Some of its morphological traits are shared with *Magnolia* sect. *Cubenses* (stipular scar on petioles barely perceptible, follicles with longitudinal dehiscence), and so it was thought that *Magnolia* sect. *Cubenses* should be treated as a subsection of the ancient *Magnolia* sect. *Theorhodon* (Nootboom, 2000). However, these shared traits would represent another possible example of evolutionary convergence, as molecular evidence shows that they represent two distinct clades.

### *Magnolia* subgenus *Talauma*

Within the subgenus B, Clade I (*Magnolia* subgenus *Talauma*), there were no inconsistencies between nuclear and plastome data for the Neotropical clades (Figs. 1, 2). In both, *Magnolia* sect. *Cubenses* and *Magnolia* sect. *Talauma* were dichotomously split (Aldaba Núñez et al., 2024). However, in the plastome phylogeny (Fig. 1), *Magnolia* sect. *Gwillimia* clustered together with the Neotropical clades, whereas in the nuclear trees (Fig. 2), this Asian clade was shown as a sister group to Clades I and II, behaving as early divergent. Therefore, it is necessary to delimit the position of the *Magnolia* sect. *Gwillimia* within the genus by increasing the sampling of this section, in addition to emphasising the use of nuclear data, which has proven to be a more effective approach (Dong et al., 2022).

### *Magnolia* sect. *Cubenses*

The placement of *Magnolia* sect. *Cubenses* within *Magnolia* sect. *Talauma* as *Magnolia* sect. *Talauma* subsect. *Cubenses* has long been accepted in the taxonomic literature (Figlar and Nootboom, 2004; Figlar, 2006, 2012). However, recent phylogenomic studies based on nuclear and plastome data challenge this classification, providing compelling evidence that *Magnolia* sect. *Cubenses* represents a distinct evolutionary lineage, diverging from the *Magnolia* sect. *Talauma* subsect. *Talauma* (Wang et al., 2020; Guzmán-Díaz et al., 2022; Veltjen et al., 2022; Aldaba Núñez et al., 2024). This evidence highlights the need for a reassessment of its taxonomic rank and nomenclatural treatment.

The first phylogenomic study of *Magnolia* by Wang et al. (2020), based on plastomes and including only four species of this lineage, revealed a dichotomous division between taxa previously assigned to *Magnolia* sect. *Talauma* subsect. *Dugandiodendron* and *Magnolia* sect. *Talauma* subsect. *Cubenses*. However, these subgroups were not formally named as subsections. Instead, they were merged into the *Magnolia* sect. *Splendentes*. Subsequent research focusing on Neotropical groups with broader sampling confirmed this division, and here we formally describe both subsections within the *Magnolia* sect. *Cubenses* (Aldaba Núñez et al., 2024).

We adopt the name *Magnolia* sect. *Cubenses* over *Magnolia* sect. *Splendentes* in accordance with the principle

of nomenclatural priority, as outlined in the International Code of Nomenclature for algae, fungi, and plants (Turland et al., 2025). *Magnolia* sect. *Talauma* subsect. *Cubenses* was described by Imkhanitzkaja (1991) with *M. cubensis* Urb. as type species, whereas *Magnolia* sect. *Splendentes* was later described by Vázquez-García (1994) with *M. splendens* Urb. (from Puerto Rico) as the type species. As both names refer to the same taxonomic group, *Magnolia* sect. *Cubenses* is the correct name and takes precedence. This treatment has also been historically acknowledged by Cuban authors, who have predominantly followed the nomenclature of the *Magnolia* sect. *Talauma* subsect. *Cubenses* (Palmarola et al., 2016; Testé et al., 2022, 2023b).

### *Magnolia* sect. *Talauma*

*Magnolia* sect. *Talauma* neither was adequately represented in phylogenetic studies, with a maximum of six taxa included (Azuma et al., 2001, 2004; Kim et al., 2001; Nie et al., 2008; Kim and Suh, 2013; Wang et al., 2020). There are currently 102 accepted taxa in this section (Appendix 2), which is the most species-rich in the Neotropics. The present study included 34 taxa, representing one third of the total species number of the *Magnolia* sect. *Talauma*, and on this basis, two distinct subclades were identified (Figs. 1, 2). The first includes species from North America and the second comprises species from South America and the Caribbean, here formally considered at subsection level.

Few morphological differences were observed between the two subclades based on the character matrix used. A notable difference is pubescence: few South American-Caribbean *Magnolia* sect. *Talauma* species exhibit pubescence on vegetative parts (young branches, petioles, peduncles, and stipules) and fertile parts (especially the gynoecium). In contrast, the northern *Magnolia* sect. *Talauma* species tend to be glabrous or pulverulent. However, the abaxial side of the leaves in the northern *Magnolia* sect. *Talauma* species show a greater tendency to pubescence, a feature absent in the South American-Caribbean *Magnolia* sect. *Talauma* (Aldaba Núñez et al., 2024).

The most obvious morphological difference lies in the type of follicle dehiscence. In most northern species of *Magnolia* sect. *Talauma*, follicles fall individually (with some exceptions in southern Mexico), whereas in the

South American-Caribbean *Magnolia* sect. *Talauma*, the follicles fall in clusters. This difference has been discussed previously, with groups assigned based on this characteristic: Apocarpae (Mexican and Central American species with individually dehiscent follicles) and Syncarpae (South American species with clustered dehiscence; Vázquez-García et al., 2015). This distinction was later confirmed by phylogenomic data (Aldaba Núñez et al., 2024).

In the present study, unsampled species were classified mainly based on geographical criteria: *Magnolia* sect. *Talauma* subsect. *Mexicana*, for taxa from North America and Cuba, and *Magnolia* sect. *Talauma* subsect. *Talauma* for species from South America and the Lesser Antilles. However, considering morphological criteria, the classification of some species may require revision in future studies. This is particularly true for the *Magnolia* sect. *Talauma* subsect. *Talauma*, where species with fruits exhibiting uneven follicle dehiscence could not be included in the phylogenetic analyses (Vázquez-García et al., 2012, 2013, 2015; Pérez-Castañeda, 2015).

Various informal groups have been proposed based on fruit morphology, but these have shown limited phylogenetic consistency. This is especially the case for Ecuadorian species (e.g., Costaticarpae, Ecinaticarpae, Minuticarpae; Vázquez-García et al., 2015, p. 4), but these groups lack formal taxonomic status (series, Rea et al., 2022). Furthermore, their utility is questionable. For instance, *M. zamorana* F. Arroyo (from Ecuador) and *M. costaricensis* A. Vázquez would belong to Costaticarpae (characterised by ellipsoid fruits, ribbed or gibbed carpel walls, and apiculate or truncate apices; Vázquez-García et al., 2015), yet, phylogenetic analyses place the former in *Magnolia* sect. *Talauma* subsect. *Talauma* and the latter in *Magnolia* sect. *Talauma* subsect. *Mexicana*.

Additionally, these groups suffer from inconsistent definitions. For example, *M. kichuana* A. Vázquez, F. Arroyo and Á. J. Pérez was initially placed in Costaticarpae (Vázquez-García et al., 2015), but later reassigned to Stenopetalae (Rea et al., 2022). Both groups, however, share similar characteristics (Pérez-Castañeda, 2015; Vázquez-García et al., 2015; Rea et al., 2022). Costaticarpae also includes species from unrelated clades, such as the *Magnolia* sect. *Talauma* subsect. *Dugandiodendron* (now part of *Mag-*



*nolia* sect. *Cubenses*) and *Magnolia* sect. *Talauma* subsect. *Chocotalauma* (now part of *Magnolia* sect. *Talauma* (Lozano-Contreras, 1994; Vázquez-García et al., 2015; Pérez-Castañeda et al., 2016; Aldaba Núñez et al., 2024).

Cuban species traditionally assigned to *Magnolia* sect. *Talauma* were not included in the molecular analyses due to limitations in sequence quality and completeness. However, all of them were thoroughly reviewed and incorporated into the morphological dataset. Their vegetative and reproductive traits were analysed alongside those of mainland species, revealing patterns that are largely consistent with those of *Magnolia* sect. *Talauma* subsect. *Mexicana*. For instance, the glabrous vegetative parts in Cuban species, a trait also shared with Mexican and Central American taxa, reinforces their placement within this section. While we acknowledge that molecular data from these taxa could help clarify their phylogenetic position, the morphological evidence supports their current sectional assignment and suggests that they do not represent a distinct evolutionary lineage separate from the other Neotropical groups. In addition, it is known that *Magnolia* sect. *Talauma* colonised Cuba during a first dispersal event from North America. Phylogenetic analyses have shown that the Cuban species, such as *Magnolia orbiculata* (Britton & P. Wilson) Palmarola, *M. oblongifolia* (León) Palmarola, and *M. minor* (Urb.) Govaerts form a well-supported clade with the rest of the North American species of the *Magnolia* sect. *Talauma* subsect. *Mexicana* (Veltjen et al., 2019; 2022).

Furthermore, regarding sectional classification consistency, it is confirmed that *Magnolia* sect. *Talauma* subsect. *Chocotalauma* does not represent a clade, since three of the six recognised species (Pérez-Castañeda et al., 2016) were included here, and these were nested inside the *Magnolia* sect. *Talauma* subsect. *Talauma* (Figs. 1, 2). It is therefore synonymised with the latter, as first proposed by Wang et al. (2020). It should be noted that *Magnolia* sect. *Talauma* subsect. *Chocotalauma* was not included in the proposed classification of the Magnolia Society International (Figlar, 2012), which has not been updated since 2012.

In addition, the type species of *Magnolia* sect. *Talauma* has been updated in this taxonomic treatment. Usually, *M. plumieri* Sw. is given (Palmarola et al., 2016; Wang et al., 2020; Testé et al., 2023a), but according to the principle of

taxonomic priority (Turland et al., 2025), the correct type species is *M. dodecapetala* (Lam.) Govaerts (from the Lesser Antilles), since the former is a synonym. In the case of *Magnolia* sect. *Talauma* subsect. *Mexicana*, the species *M. mexicana* DC. was designated as the type species as it was the first of this clade that was described. The rest of the clades maintain the type species, as mentioned in previous treatments (Figlar, 2012; Wang et al., 2020).

## Conclusions

The infrageneric classification of Neotropical *Magnolia* was reassessed using previously published phylogenomic and morphological data, covering nearly one third of all described Neotropical taxa. Although minor incongruences were found between nuclear and phylogenies, the overall topology supported the recognition and reinstatement of two subgenera and the confirmation of four sections: *Magnolia* sect. *Macrophylla* and *Magnolia* sect. *Magnolia* within *Magnolia* subg. *Magnolia*, and *Magnolia* sect. *Cubenses* and *Magnolia* sect. *Talauma* within *Magnolia* subg. *Talauma*. *Magnolia* sect. *Cubenses* is here renamed from *Magnolia* sect. *Splendentes*, and two new combinations are proposed: *Magnolia* sect. *Cubenses* subsect. *Cubenses* and *Magnolia* sect. *Cubenses* subsect. *Dugandiodendron*. Within *Magnolia* sect. *Talauma*, two subsections are recognised: *Magnolia* sect. *Talauma* subsect. *Mexicana*, newly proposed here and diagnosed morphologically, and *Magnolia* sect. *Talauma* subsect. *Talauma*, which is reinstated. These results provide a robust and updated framework for classifying Neotropical magnolias, offering a valuable basis for future research and conservation strategies.

## Author contributions

Conceptualization: FA, MS; Data curation: FA, SG; Formal analysis: FA, SG; Funding acquisition: MS; Investigation: EM, FA, MS; Methodology: FA, MS, SG; Project administration: MS; Resources: EM, MS; Software: FA, SG; Supervision: EM, MS; Validation: EM, MS; Visualization: FA, MS; Writing – original draft: FA; Writing – review & editing: EM, MS, SG.

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Appendix 1: History of infrageneric classification schemes for *Magnolia* L.

References	Linnaeus, 1753, 1764, 1766	Jussieu, 1789	De Candolle, 1818, 1824	Bentham and Hooker, 1862, 1867	Baillon, 1866	Engler and Prantl, 1915	Engler and Gilg, 1924	Hutchinson, 1926, 1959	Dandy, 1927, 1950, 1974, 1978	Law, 1984, 1996	Nooteboom, 1985, 1987	Figlar and Nooteboom, 2004; Figlar, 2006, 2012	Sima and Lu, 2012	Xia, 2012	Wang et al., 2020
Type of proposal	Multigeneric	Multigeneric	Multigeneric	Multigeneric	Unigeneric	Multigeneric	Multigeneric	Multigeneric	Multigeneric	Multigeneric	Multigeneric	Unigeneric	Multigeneric	Multigeneric	Unigeneric
Evidence used	Morphology	Morphology	Morphology	Morphology	Morphology	Morphology	Morphology	Morphology	Morphology	Morphology	Morphology	Morphology, plastid and nuclear DNA	Morphology, plastid and nuclear DNA	Morphology, plastid and nuclear DNA	Morphology and plastome
Classification	Magnoliaceae	Magnoliaceae	Magnoliaceae	IV Magnoliaceae	Magnoliaceae	Magnoliaceae	Magnoliaceae	Magnoliaceae	Magnoliaceae	Magnoliaceae	Magnoliaceae	Magnoliaceae	Magnoliaceae	Magnoliaceae	Magnoliaceae
	<i>Liriodendron</i> L.	Magnolieae	Tribe Magnolieae	Tribe II Magnolieae	Magnolia L.	Tribe Magnolieae	Tribe Magnolieae	Alcimandra Dandy	Tribe Magnolieae	Subfam. Magnolioideae	Subfam. Magnolioideae	Subfam. Magnolioideae	Subfam. Magnolioideae	Subfam. Magnolioideae	Subfam. Magnolioideae
	<i>Magnolia</i> L.	<i>Drymis</i> Juss.	<i>Magnolia</i> L.	<i>Magnolia</i> L.	Sect. <i>Aromadendron</i>	<i>Magnolia</i> L.	<i>Magnolia</i> L.	<i>Aromadendron</i> Blume	<i>Alcimandra</i> Dandy	Tribe Magnolieae	Tribe Magnolieae	<i>Magnolia</i> L.	Tribe Magnolieae	Tribe Magnolieae	<i>Magnolia</i> L.
	<i>Michelia</i> L.	<i>Euryandra</i> J.R.Forst. & G.Forst.	Sect. I <i>Magnoliastrum</i>	<i>Manglietia</i> Blume	Sect. <i>Blumia</i>	<i>Michelia</i> L.	<i>Michelia</i> L.	<i>Elmerrillia</i> Dandy	<i>Aromadendron</i> Blume	Subtribe Alcimandriinae	<i>Magnolia</i> L.	Subg. <i>Gynopodium</i>	<i>Dugandiodendron</i> Lozano	<i>Dugandiodendron</i> Lozano	Sect. <i>Gwillimia</i>
	<i>Illicium</i> L.	Sect. II <i>Gwillimia</i>	<i>Michelia</i> L.	Sect. <i>Buergeria</i>	<i>Talauma</i> Juss.	<i>Liriodendron</i> L.	<i>Liriodendron</i> L.	<i>Kmeria</i> Dandy	<i>Elmerrillia</i> Dandy	<i>Alcimandra</i> Dandy	Subg. <i>Magnolia</i>	Sect. <i>Gynopodium</i>	<i>Houpoea</i> N.H.Xia & C.Y.Wu	<i>Houpoea</i> N.H.Xia & C.Y.Wu	Sect. <i>Gynopodium</i>
	<i>Liriodendron</i> L.	<i>Liriodendron</i> L.	<i>Talauma</i> Juss.	Sect. <i>Lirianthe</i>	<i>Liriodendron</i> L.	<i>Liriodendron</i> L.	<i>Liriodendron</i> L.	<i>Kmeria</i> Dandy	Subtribe Magnoliinae	<i>Alcimandra</i>	Sect. <i>Manglietiastrum</i>	Sect. <i>Manglietiastrum</i>	<i>Kmeria</i> Dandy	<i>Kmeria</i> Dandy	Sect. <i>Kmeria</i>
	<i>Magnolia</i> L.	<i>Mayna</i> Aubl.	<i>Liriodendron</i> L.	Sect. <i>Liriopsis</i>	<i>Magnolia</i> L.	<i>Magnolia</i> L.	<i>Magnolia</i> L.	<i>Aromadendron</i> Blume	Sect. <i>Gwillimia</i>	Subg. <i>Magnolia</i>	Sect. <i>Magnolia</i>	Subg. <i>Magnolia</i>	<i>Lirianthe</i> Spach	<i>Lirianthe</i> Spach	Sect. <i>Macrophylla</i>
	<i>Mayna</i> Aubl.	<i>Michelia</i> L.		Sect. <i>Manglietia</i>	<i>Manglietia</i> Blume	Subg. <i>Magnolia</i>	<i>Magnolia</i>	<i>Dugandiodendron</i> Lozano	Sect. <i>Gynopodium</i>	Sect. <i>Auriculata</i>	Sect. <i>Magnolia</i>	<i>Magnolia</i> L.	<i>Magnolia</i> L.	Sect. <i>Magnolia</i>	
	<i>Michelia</i> L.	<i>Talauma</i> Juss.		Sect. <i>Michelia</i>	<i>Michelia</i> L.	Sect. <i>Gwillimia</i>	<i>Kmeria</i> Dandy	Sect. <i>Lirianthe</i>	Sect. <i>Gwillimia</i>	Sect. <i>Manglietia</i> Blume	Sect. <i>Manglietia</i> Blume	<i>Manglietia</i> Blume	<i>Manglietia</i> Blume	Sect. <i>Maingola</i>	
	<i>Talauma</i> Juss.			Sect. <i>Talauma</i>	<i>Talauma</i>		<i>Pachylarnax</i> Dandy	Sect. <i>Magnolia</i> L.	Sect. <i>Magnolia</i>	Subsect. <i>Blumiana</i>	Subsect. <i>Blumiana</i>	<i>Metamagnolia</i> Sima & S.G.Lu	<i>Oyama</i> (Nakai) N.H.Xia & C.Y.Wu	<i>Oyama</i> (Nakai) N.H.Xia & C.Y.Wu	Sect. <i>Manglietia</i>
				Sect. <i>Tulipastrum</i>	<i>Talauma</i> Juss.	Sect. <i>Lirianthe</i>		<i>Parakmeria</i> Hu & W.C.Cheng	Sect. <i>Maingola</i>	Subsect. <i>Gwillimia</i>	Subsect. <i>Gwillimia</i>	<i>Oyama</i> (Nakai) N.H.Xia & C.Y.Wu	<i>Pachylarnax</i> Dandy	<i>Parakmeria</i> Hu & W.C.Cheng	Sect. <i>Michelia</i>
				Sect. <i>Yulania</i>				<i>Talauma</i> Juss.	Sect. <i>Magnolia</i>	Sect. <i>Oyama</i>	Sect. <i>Kmeria</i>	<i>Pachylarnax</i> Dandy	<i>Parakmeria</i> Hu & W.C.Cheng	Sect. <i>Oyama</i>	
								Sect. <i>Woonyoungia</i> Y.W.Law	Sect. <i>Rytidospermum</i>	Sect. <i>Macrophylla</i>	Sect. <i>Macrophylla</i>	<i>Paramagnolia</i> Sima & S.G.Lu	<i>Talauma</i> Juss.	Sect. <i>Talauma</i>	Sect. <i>Rytidospermum</i>
								Sect. <i>Oyama</i>	Subtribe Manglietiinae	Sect. <i>Theorhodon</i>	Sect. <i>Magnolia</i>	<i>Talauma</i> Juss.	<i>Woonyoungia</i> Y.W.Law	Sect. <i>Splendentes</i>	
								Sect. <i>Rytidospermum</i>	Sect. <i>Manglietia</i> Blume	Subg. <i>Talauma</i>	Sect. <i>Manglietia</i>	Tribe Michelieae	Tribe Michelieae	Sect. <i>Talauma</i>	
								Sect. <i>Theorhodon</i>	<i>Manglietiastrum</i> Y.W.Law	Sect. <i>Aromadendron</i>	Sect. <i>Rytidospermum</i>	<i>Aromadendron</i> Blume	<i>Alcimandra</i> Dandy	Sect. <i>Tuliparia</i>	
								Subg. <i>Yulania</i>	<i>Pachylarnax</i> Dandy	Sect. <i>Blumiana</i>	Subsect. <i>Oyama</i>	<i>Michelia</i> L.	<i>Aromadendron</i> Blume	Sect. <i>Tulipastrum</i>	
								Sect. <i>Buergeria</i>	Tribe Michelieae	Sect. <i>Manglietiastrum</i>	Subsect. <i>Rytidospermum</i>	<i>Yulania</i> Spach	<i>Elmerrillia</i> Dandy	Sect. <i>Yulania</i>	
								Sect. <i>Tulipastrum</i>	<i>Elmerrillia</i> Dandy	Sect. <i>Talauma</i>	Sect. <i>Talauma</i>	<i>Michelia</i> L.			

## Appendix 1: Continuation.

References	Linnaeus, 1753, 1764, 1766	Jussieu, 1789	De Candolle, 1818, 1824	Bentham and Hooker, 1862, 1867	Baillon, 1866	Engler and Prantl, 1915	Engler and Gilg, 1924	Hutchinson, 1926, 1959	Dandy, 1927, 1950, 1974, 1978	Law, 1984, 1996	Nooteboom, 1985, 1987	Figlar and Nootebomm, 2004; Figlar, 2006, 2012	Sima and Lu, 2012	Xia, 2012	Wang et al., 2020
									Sect. <i>Yulania</i>	<i>Michelia</i> L.	Subg. <i>Yulania</i>	Subsect. <i>Cubenses</i>		<i>Yulania</i> Spach	
									<i>Manglietia</i> Blume	<i>Paramichelia</i> Hu	Sect. <i>Buergeria</i>	Subsect. <i>Dugandiodendron</i>			
									<i>Michelia</i> L.	<i>Tsoangiodendron</i> Chun	Sect. <i>Tulipastrum</i>	Subsect. <i>Talauma</i>			
									<i>Pachylarnax</i> Dandy		Sect. <i>Yulania</i>	Subg. <i>Yulania</i>			
									<i>Paramichelia</i> Hu		<i>Kmeria</i> Dandy	Sect. <i>Michelia</i>			
									<i>Talauma</i> Juss.		<i>Manglietia</i> Blume	Subsect. <i>Aromadendron</i>			
									<i>Tsoangiodendron</i> Chun		<i>Pachylarnax</i> Dandy	Subsect. <i>Elmerrillia</i>			
											Tribe <i>Michelieae</i>	Subsect. <i>Maingala</i>			
											<i>Elmerrillia</i> Dandy	Subsect. <i>Michelia</i>			
											<i>Michelia</i> L.	Sect. <i>Yulania</i>			
												Subsect. <i>Tulipastrum</i>			
												Subsect. <i>Yulania</i>			



**Appendix 2:** Checklist of the subgenera, sections and subsections of Neotropical *Magnolia* L. and their corresponding species and subspecies. Notes: The countries listed correspond to the location where each taxon was originally described. \*: Nearctic taxa. 1: The Cuban population of *M. virginiana* L. corresponds genetically to *M. virginiana* var. *australis* Sarg. (Azuma et al., 2011), although it is referred to simply as *M. virginiana* by Testé and Palmarola (2024).

Clade and taxa	Country
<i>Magnolia</i> subg. <i>Magnolia</i> (around 230 taxa: 53 Neotropical taxa)	
<i>Magnolia</i> sect. <i>Macrophylla</i> Figlar & Noot. (4 species: 2 Neotropical species, 2 Nearctic species)	
1 * <i>M. ashei</i> Weath.	United States of America
2 <i>M. dealbata</i> Zucc.	Mexico
3 * <i>M. macrophylla</i> Michx.	United States of America
4 <i>M. mixteca</i> A.Vázquez & Domínguez-Yescas	Mexico
<i>Magnolia</i> sect. <i>Magnolia</i> (49 taxa: 46 Neotropical taxa (43 species, 3 subspecies), 3 Nearctic taxa (one species and two subspecies))	
5 <i>M. archilana</i> A.Vázquez, Tribouill. & Véliz	Guatemala
6 <i>M. celaquensis</i> A.Vázquez & H.Vega	Honduras
7 <i>M. claudiae</i> Archila, Tribouill. & A.Vázquez	Guatemala
8 <i>M. corquinensis</i> A.Vázquez, S.Morales & H.Vega	Honduras
9 <i>M. cusucoensis</i> A.Vázquez & D.L.Kelly	Honduras
10 <i>M. darioi</i> A.Vázquez & D.L.Kelly	Honduras
11 <i>M. domei</i> Archila, Tribouill. & R.E. Aguilar	Guatemala
12 <i>M. emilceana</i> Archila, Tribouill. & A.Vázquez	Guatemala
13 <i>M. faustinomirandae</i> A.Vázquez	Mexico
14 <i>M. granbarrancae</i> A. Vázquez, Muñiz-Castro & A. Nuño	Mexico
15 * <i>M. grandiflora</i> L.	United States of America
16 <i>M. guatemalensis</i> Donn.Sm.	Guatemala
17 <i>M. guerrensis</i> J.Jiménez Ram., K.Vega & Cruz Durán	Mexico
18 <i>M. harnpariphaniana</i> Archila, Tribouill. & A.Vázquez	Guatemala
19 <i>M. hondurensis</i> A.M.Molina	Honduras
20 <i>M. iltisiana</i> A.Vázquez	Mexico
21 <i>M. javieri</i> A.Vázquez, Tribouill. & Archila	Guatemala
22 <i>M. juliana</i> Archila, Tribouill. & O.E.Alvarado	Guatemala
23 <i>M. krusei</i> J.Jiménez Ram. & Cruz Durán	Mexico
24 <i>M. mayae</i> A.Vázquez & Pérez-Farr.	Mexico
25 <i>M. montebelloensis</i> A.Vázquez & Pérez-Farr.	Mexico
26 <i>M. necae</i> Archila, Tribouill. & Á.J. Pérez	Guatemala
27 <i>M. oaxacensis</i> A.Vázquez	Mexico
28 <i>M. oscarrodrigo</i> A.Vázquez, Tribouill. & Archila	Guatemala
29 <i>M. pacifica</i> A.Vázquez	Mexico
30 <i>M. panamensis</i> Iltis & A.Vázquez	Panama
31 <i>M. pastorcortezii</i> A.Vázquez & D.L.Kelly	Honduras
32 <i>M. pedrazae</i> A.Vázquez	Mexico
33 <i>M. picopijolensis</i> A.Vázquez	Honduras
34 <i>M. poasana</i> (Pittier) Dandy	Costa Rica
35 <i>M. poqomchi</i> M.J.Serrano & A.Vázquez	Guatemala
36 <i>M. pugana</i> (Iltis & A.Vázquez) A.Vázquez & Carvajal	Mexico
37 <i>M. schiedeana</i> Schltldl.	Mexico



## Appendix 2: Continuation.

Clade and taxa	Country
38 <i>M. sharpii</i> V.V.Miranda	Mexico
39 <i>M. sororum</i> subsp. <i>lutea</i> A.Vázquez	Costa Rica
40 <i>M. sororum</i> subsp. <i>oligocarpa</i> A.Vázquez	Honduras
41 <i>M. sororum</i> subsp. <i>sororum</i> Seibert	Panama
42 <i>M. talpana</i> A. Vázquez, Muñiz-Castro & S. Ortega	Mexico
43 <i>M. tamaulipana</i> A.Vázquez	Mexico
44 <i>M. tarahumara</i> (A.Vázquez) A.Vázquez	Mexico
45 <i>M. tribouillierana</i> A.Vázquez, Archila & Véliz	Guatemala
46 <i>M. vallartensis</i> A. Vázquez & M.A. Muñiz C	Mexico
47 <i>M. vazquezii</i> Cruz Durán & K.Vega	Mexico
48 <i>M. veliziana</i> A.Vázquez, Tribouill. & Archila	Guatemala
49 * <i>M. virginiana</i> subsp. <i>virginiana</i> L.	United States of America
50 * <i>M. virginiana</i> var. <i>australis</i> Sarg.	United States of America
51 <i>M. weerakitiana</i> Archila, A.Vázquez & Tribouill.	Guatemala
52 <i>M. yoroconte</i> Dandy	Honduras
53 <i>M. zamudioi</i> A.Vázquez	Mexico
<i>Magnolia</i> subg. <i>Talauma</i> (Juss.) Pierre (165 taxa: 132 Neotropical species)	
<i>Magnolia</i> sect. <i>Cubenses</i> (Imkhan.) F.A. Aldaba, E. Martínez & Samain (30 species, all Neotropical)	
<i>Magnolia</i> sect. <i>Cubenses</i> subsect. <i>Cubenses</i> (Imkhan.) F.A. Aldaba, E. Martínez & Samain (10 species, all Neotropical)	
54 <i>M. cristalensis</i> Bisse	Cuba
55 <i>M. acunae</i> (Imkhan.) Palmarola & Testé	Cuba
56 <i>M. cubensis</i> Urb.	Cuba
57 <i>M. domingensis</i> Urb.	Haiti
58 <i>M. ekmanii</i> Urb.	Haiti
59 <i>M. emarginata</i> Urb. & Ekman	Haiti
60 <i>M. hamorii</i> Howard	Dominican Republic
61 <i>M. pallescens</i> Urb. & Ekman	Dominican Republic
62 <i>M. portoricensis</i> Bello	Puerto Rico
63 <i>M. splendens</i> Urb.	Puerto Rico
<i>Magnolia</i> sect. <i>Cubenses</i> subsect. <i>Dugandiodendron</i> (Lozano) F.A. Aldaba, E. Martínez & Samain (20 species, all Neotropical)	
64 <i>M. argyrothricha</i> (Lozano) Govaerts	Colombia
65 <i>M. azulensis</i> F.Arroyo	Peru
66 <i>M. bankardiorum</i> M.O.Dillon & Sánchez Vega	Peru
67 <i>M. betuliensis</i> Aguilar-Cano & Humberto Mend.	Colombia
68 <i>M. cararensis</i> (Lozano) Govaerts	Colombia
69 <i>M. chimantensis</i> Steyerm. & Maguire	Venezuela
70 <i>M. colombiana</i> (Little) Govaerts	Colombia
71 <i>M. frontinoensis</i> Cogollo, Hoyos-Gómez & M.Serna	Colombia
72 <i>M. guatapensis</i> (Lozano) Govaerts	Colombia
73 <i>M. jaenensis</i> Marcelo-Peña	Peru
74 <i>M. lenticellata</i> (Lozano) Govaerts	Colombia
75 <i>M. lozanoi</i> A.Vázquez & Castro-Arce	Ecuador
76 <i>M. mahechae</i> (Lozano) Govaerts	Colombia
77 <i>M. ptaritepuiana</i> Steyerm.	Venezuela



## Appendix 2: Continuation.

Clade and taxa	Country
78 <i>M. shuariorum</i> F.Arroyo & A.Vázquez	Ecuador
79 <i>M. tapichalacaensis</i> Á.J.Pérez & E.Rea	Ecuador
80 <i>M. unicarmensis</i> Montoya-López & Bota-Sierra	Colombia
81 <i>M. urraoensis</i> (Lozano) Govaerts	Colombia
82 <i>M. yantzazana</i> F.Arroyo	Ecuador
83 <i>M. yarumalensis</i> (Lozano) Govaerts	Colombia
<i>Magnolia</i> sect. <i>Talauma</i> (Juss.) Baill. (102 species, all Neotropical)	
<i>Magnolia</i> sect. <i>Talauma</i> subsect. <i>Mexicana</i> F.A. Aldaba, E.Martínez & Samain (40 species, all Neotropical)	
84 <i>M. alfredo-mironii</i> Archila, Tribouillier & A.Vázquez	Guatemala
85 <i>M. allenii</i> Standl.	Panama
86 <i>M. antonii</i> Kottaim.	Costa Rica
87 <i>M. atlantida</i> A.Vázquez	Honduras
88 <i>M. chimalapana</i> A.Vázquez, Padilla-Lepe & Rodr.-Pérez	Mexico
89 <i>M. chiriquiensis</i> A.Vázquez	Panama
90 <i>M. ciroorum</i> A.Vázquez, S.Estrada & D.Aguirre	Honduras
91 <i>M. cochranii</i> A.Vázquez	Honduras
92 <i>M. costaricensis</i> A.Vázquez	Costa Rica
93 <i>M. decastroi</i> A.Vázquez & Muñiz-Castro	Mexico
94 <i>M. gloriensis</i> (Pittier) Govaerts	Costa Rica
95 <i>M. guanacastensis</i> A.Vázquez	Costa Rica
96 <i>M. heriberto</i> A.Vázquez, Rodr.-Pérez & Muñiz-Castro	Mexico
97 <i>M. inbioana</i> A.Vázquez	Costa Rica
98 <i>M. izabalensis</i> Archila, Tribouillier & A. Vázquez	Guatemala
99 <i>M. jaliscana</i> A.Vázquez & R.Guzmán	Mexico
100 <i>M. lacandonica</i> A.Vázquez, Pérez-Farr. & Mart.-Camilo	Mexico
101 <i>M. lopezobradorii</i> A.Vázquez	Mexico
102 <i>M. macrocarpa</i> (Zucc.) A.Vázquez & Castro-Arce	Mexico
103 <i>M. mexicana</i> DC.	Mexico
104 <i>M. minor</i> (Urb.) Govaerts	Cuba
105 <i>M. morii</i> (Lozano) Govaerts	Panama
106 <i>M. oblongifolia</i> (León) Palmarola	Cuba
107 <i>M. ofeliae</i> A.Vázquez & Cuevas	Mexico
108 <i>M. orbiculata</i> (Britton & P.Wilson) Palmarola	Cuba
109 <i>M. otto</i> A.Vázquez, Tribouill. & Archila	Guatemala
110 <i>M. perezfarrerae</i> A.Vázquez & Gómez-Domínguez	Mexico
111 <i>M. quetzal</i> A.Vázquez, Véliz & Tribouill.	Guatemala
112 <i>M. quichensis</i> Tribouillier, A.Vázquez & Archila	Guatemala
113 <i>M. sambuensis</i> (Pittier) Govaerts	Panama
114 <i>M. savegreensis</i> A.Vázquez	Costa Rica
115 <i>M. sinacacolinii</i> A.Vázquez	Mexico
116 <i>M. stefaniana</i> Archila, Á.J. Pérez & A.Vázquez	Guatemala
117 <i>M. steyermarkii</i> A.Vázquez	Guatemala
118 <i>M. talamancana</i> A.Vázquez	Costa Rica
119 <i>M. uxpanapana</i> A.Vázquez, Padilla-Lepe & Gallardo-Yobal	Mexico



## Appendix 2: Continuation.

Clade and taxa		Country
120	<i>M. wendtii</i> A.Vázquez	Mexico
121	<i>M. wetteri</i> A.Vázquez	Costa Rica
122	<i>M. yajlachhi</i> A.Vázquez & Domínguez-Yescas	Mexico
123	<i>M. zoquepopolucae</i> A.Vázquez	Mexico
<i>Magnolia</i> sect. <i>Talauma</i> subsect. <i>Talauma</i> (Juss.) Figlar & Noot. (62 species)		
124	<i>M. amalfiensis</i> M.Serna, Cogollo & C.Velásquez	Colombia
125	<i>M. amazonica</i> (Ducke) Govaerts	Brasil
126	<i>M. arcabucoana</i> (Lozano) Govaerts	Colombia
127	<i>M. arroyoana</i> Molinari	Ecuador
128	<i>M. boliviana</i> (M.Nee) Govaerts	Bolivia
129	<i>M. brasiliensis</i> C.O.Azevedo, A.F.P.Machado & A.Vázquez	Brasil
130	<i>M. buenaventurensis</i> Á.J.Pérez & E.Rea	Ecuador
131	<i>M. calimaensis</i> (Lozano) Govaerts	Colombia
132	<i>M. calophylla</i> (Lozano) Govaerts	Colombia
133	<i>M. canandeana</i> F.Arroyo	Ecuador
134	<i>M. caricifragrans</i> (Lozano) Govaerts	Colombia
135	<i>M. cespedesii</i> (Triana & Planch.) Govaerts	Colombia
136	<i>M. chiguila</i> F.Arroyo, Á.J.Pérez & A.Vázquez	Ecuador
137	<i>M. chocoensis</i> (Lozano) Govaerts	Colombia
138	<i>M. clementinana</i> F.Arroyo & M.Serna	Peru
139	<i>M. coronata</i> M.Serna, C.Velásquez & Cogollo	Colombia
140	<i>M. dixonii</i> (Little) Govaerts	Ecuador
141	<i>M. dodecapetala</i> (Lam.) Govaerts	France (Guadeloupe)
142	<i>M. elfina</i> A.Vázquez	Peru
143	<i>M. enepeceana</i> Rob.Fern. & Marcelo-Peña	Peru
144	<i>M. equatorialis</i> A.Vázquez	Ecuador
145	<i>M. espinalii</i> (Lozano) Govaerts	Colombia
146	<i>M. gentryi</i> A.Vázquez	Peru
147	<i>M. georgii</i> (Lozano) Govaerts	Colombia
148	<i>M. gilbertoi</i> (Lozano) Govaerts	Colombia
149	<i>M. henaoui</i> (Lozano) Govaerts	Colombia
150	<i>M. hernandezii</i> (Lozano) Govaerts	Colombia
151	<i>M. irwiniana</i> (Lozano) Govaerts	Brasil
152	<i>M. jardinensis</i> M.Serna, C.Velásquez & Cogollo	Colombia
153	<i>M. juninensis</i> F.Arroyo	Peru
154	<i>M. katorum</i> (Lozano) Govaerts	Colombia
155	<i>M. kichuana</i> A.Vázquez, F.Arroyo & Á.J.Pérez	Ecuador
156	<i>M. llanganatensis</i> A. Vázquez & D.A. Neill	Ecuador
157	<i>M. madiensis</i> A.Vázquez	Bolivia
158	<i>M. manguillo</i> Marcelo-Peña & F.Arroyo	Peru
159	<i>M. manuensis</i> F.Arroyo	Peru
160	<i>M. mashpi</i> Á.J.Pérez, F.Arroyo & A.Vázquez	Ecuador
161	<i>M. mercedesiarum</i> D.A.Neill, A.Vázquez & F.Arroyo	Ecuador
162	<i>M. mindoensis</i> A.Vázquez, D.A.Neill & A.Dahua	Ecuador



## Appendix 2: Continuation.

Clade and taxa	Country
163 <i>M. napoensis</i> F.Arroyo, Á.J.Pérez & A.Vázquez	Ecuador
164 <i>M. narinensis</i> (Lozano) Govaerts	Colombia
165 <i>M. neillii</i> (Lozano) Govaerts	Ecuador
166 <i>M. neomagnifolia</i> I.M.Turner	Colombia
167 <i>M. ovata</i> (A.St.-Hil.) Spreng.	Brasil
168 <i>M. pajarito</i> Aymard, D.L.Rodr. & M.Escobar	Colombia
169 <i>M. palandana</i> F.Arroyo	Ecuador
170 <i>M. pastazaensis</i> F.Arroyo & Á.J.Pérez	Ecuador
171 <i>M. peruviana</i> A.Vázquez	Peru
172 <i>M. polyhypsophylla</i> (Lozano) Govaerts	Colombia
173 <i>M. resupinatifolia</i> Aguilar-Cano & Humberto Mend.	Colombia
174 <i>M. reynelii</i> Rob.Fern. & Marcelo-Peña	Peru
175 <i>M. rimachii</i> (Lozano) Govaerts	Peru
176 <i>M. sanchez-vegae</i> Marcelo-Peña	Peru
177 <i>M. santanderiana</i> (Lozano) Govaerts	Colombia
178 <i>M. sellowiana</i> (A.St.-Hil.) Govaerts	Brasil
179 <i>M. silvioi</i> (Lozano) Govaerts	Colombia
180 <i>M. striatifolia</i> Little	Ecuador
181 <i>M. vargasiana</i> A.Vázquez & D.A.Neill	Ecuador
182 <i>M. venezuelensis</i> (Lozano) Govaerts	Venezuela
183 <i>M. virolinensis</i> (Lozano) Govaerts	Colombia
184 <i>M. wolfii</i> (Lozano) Govaerts	Colombia
185 <i>M. zamorana</i> F.Arroyo	Ecuador

