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THREE NEW SPECIES OF *MAGNOLIA* (MAGNOLIACEAE) FROM ECUADOR

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ABSTRACT

Three species of the genus *Magnolia* from premontane and low montane humid forests of Ecuador are newly described and illustrated: **Magnolia palandana** F. Arroyo, **sp. nov.**, **M. pastazaensis** F. Arroyo & A.J. Pérez, **sp. nov.**, and **M. yantzazana** F. Arroyo, **sp. nov.**

KEY WORDS: *Magnolia*, Magnoliaceae, Ecuador, South America

Prior to the present work, only six species of *Magnolia* were known to occur in Ecuadorian territory (*Magnolia dixonii* (Little) Govaerts, *M. equatorialis* A. Vázquez, *M. lozanoi* A. Vázquez & De Castro, *M. neillii* (Lozano) Govaerts, *M. rimachii* (Lozano) Govaerts and *M. striatifolia* Little) (Lozano 1994; Liesner 1999; Valencia et al. 2000; Vázquez et al. 2012). The majority of those species were reported for lowland rainforests of Amazonian and Coastal Ecuador, with only one (*M. lozanoi*) described from a mountainous habitat. A fifth species listed for Ecuador (Liesner 1999), *Magnolia hernandezii* (Lozano) Govaerts, is not included above because it was doubtfully determined.

Study of collections at herbaria LOJA, QCA, and QCNE resulted in the recognition and description of these new species of *Magnolia* from premontane and low montane forests of Ecuador. The terminology used in the descriptions follows the work of Lozano (1983, 1994).

According to the classification by Figlar and Nooteboom (2004), two of the species described here (*Magnolia palandana* and *M. pastazaensis*) are placed in subsect. *Talauma* because of the adaxial petiole scar, the circumscissile dehiscence of the fruit, and the absence of a filament at the stamen connective. This subsection, which extends from South America into North America in eastern Mexico (represented by *Magnolia mexicana* DC.), is the sister clade to the rest of the genus *Magnolia*, with a divergence at approximately 42 mya (Azuma et al. 2001). *Liriodendron* is sister to *Magnolia* and completes the Magnoliaceae. *Magnolia yantzazana* belongs to subsect. *Dugandiodendron*, which is noted for the lack of a petiole scar and the presence of a filament at the apex of stamen connective. This latter feature also occurs in the Caribbean subsect. *Splendentes* but the phylogenetic data make uncertain its relationships with the other subsections (Azuma et al. 2001) being treated also in subsection Talauma (Kim et al. 2001).

MAGNOLIA PALANDANA F. Arroyo, **sp. nov**. **TYPE: ECUADOR. Zamora Chinchipe:** Palanda, Parroquia San Francisco de Vergel, Playones, cuenca alta del Río Vergel, 04°43’01’’ S, 78°57’47’’ W, 1880–2200 m, 17 Mar 2005 (fl, bud), *Quizhpe et al. 1138* (holotype: LOJA!; isotypes: QCNE!, MO).

Species similar to *Magnolia chimantensis* Steyerm. & Maguire in the shape and size of leaves but different from it because of the (a) hirsute ferrugineous pubescence (vs. dense, villous whitish pubescence in *M. chimantensis*) on branchlets, petioles, underside of leaves, hypsophylls, and sepals, (b) number of hypsophylls, and (c) petioles with an adaxial scar.

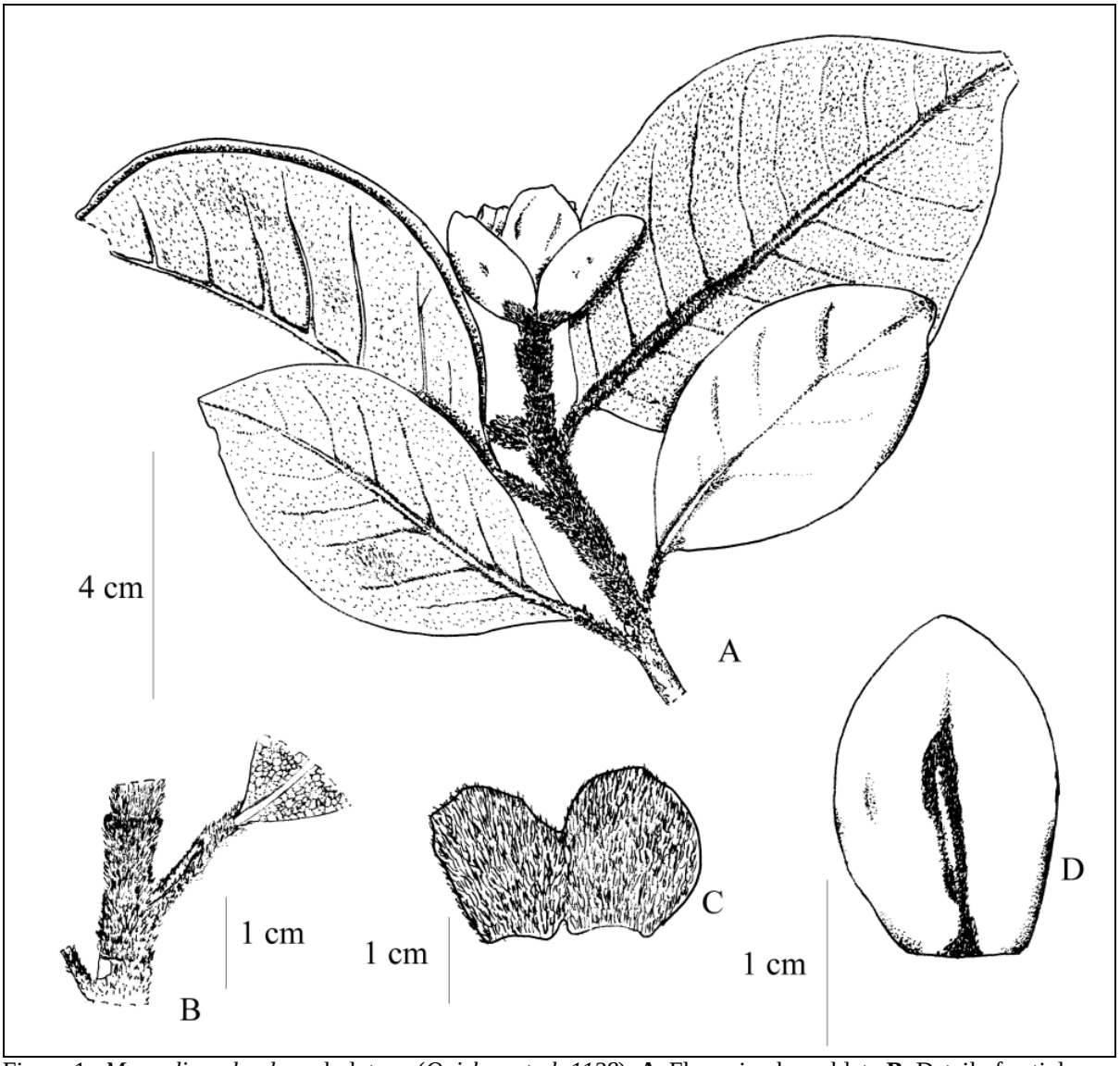

Figure 1. *Magnolia palandana*, holotype (*Quizhpe et al. 1138*). **A.** Flowering branchlet. **B.** Detail of petiole. **C.** Hypsophyll (external view). **D.** Sepal (external view).

Trees to 35 m high. **Branchlets** terete, 0.4–0.6 cm in diameter, rugose, covered with dense ferrugineous hirsute pubescence distally. **Petioles**, 1–1.5 x 0.2–0.3 cm, semiterete, densely villous-hirsute, with flat adaxial scar covering half their length. **Stipules** hirsute, 1.8 cm long. **Leaves** elliptic, 6–13.5 x 3.1–7.4 cm, glabrous above, densely hirsute beneath, especially along the midrib; apex obtuse, acute or acuminate, margin entire, base acute to decurrent; midrib plane to impressed above, prominent beneath; lateral nerves 8–12 on each side of midrib, prominulous above, prominent beneath; reticulate venation prominulous on both surfaces. **Flowers** terminal, solitary; hypsophylls 3, externally covered with dense villous ferrugineous pubescence; sepals 3, 2.1–2.3 x 1.4–1.6, concave,

indumentum of appressed ferrugineous hairs in patches; outermost petals 3, obovate, glabrous, up to 1.5 cm long (beginning of anthesis), apex obtuse to apiculate. Inner petals, stamens and gynoecium not seen.

Magnolia palandana is present in primary humid low montane forests in the province of Zamora Chinchipe, between 1800–2200 m elevation. Flowering November to March. The epithet alludes the region of the type locality, Palanda.

Additional collections examined. ECUADOR. Zamora Chinchipe: Area of the Estación Científica San Francisco, road Loja–Zamora, ca. 30 km from Loja, 03°58' S, 79°04' W, 1950 m, 13 Nov 2000 (bud), *Homeier 606* (LOJA!, QCNE!); New road Loja – Zamora, 12.5 km E of the pass, 03°58' S, 79°06' W, 2000 m, 14 Feb 1991 (bud), *Øllgaard et al. 98797* (QCA!, QCNE!, AAU).

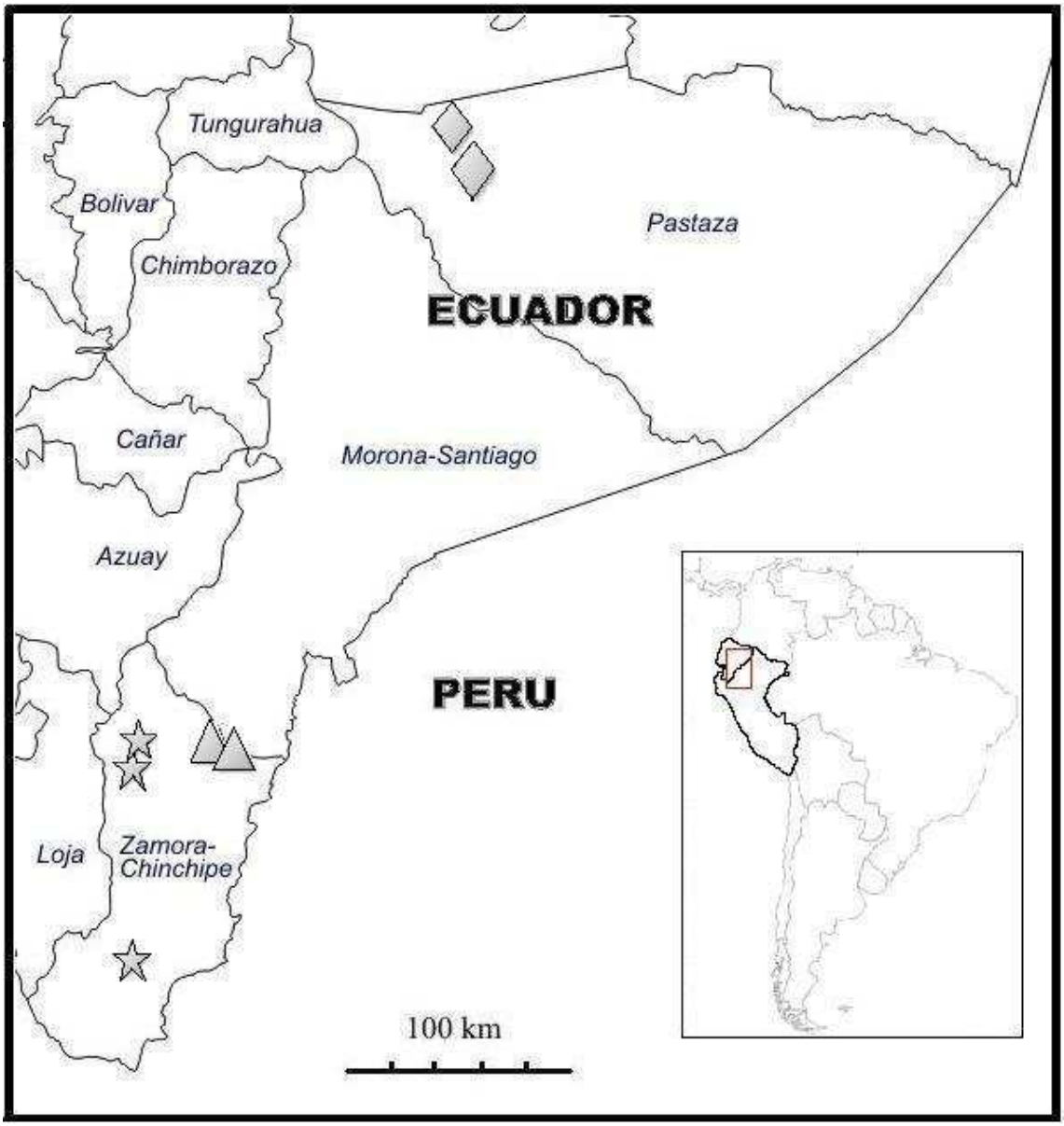

Figure 2. Distribution of *Magnolia* species described in this study (based on herbarium collections). *Magnolia palandana* (stars), *Magnolia pastazaensis* (diamonds), *Magnolia yantzazana* (triangles).

MAGNOLIA PASTAZAENSIS F. Arroyo & Á.J. Pérez, **sp. nov. TYPE: ECUADOR. Pastaza:** Márgenes del lote del k-32, 01°25'54'' S, 77°40'32.8'' W, 684 m, 26 Oct 2008 (bud), *Jaramillo & Buenaño 27761* (holotype: QCA)

Species similar to *Magnolia amazonica* (Ducke) Govaerts in leaf shape and measurements but different in its completely glabrous and coriaceous leaves, thicker branchlets, fewer number of lateral veins (15–19 in *M. amazonica* vs. 10–14 in *M. pastazaensis*), and bigger floral buds (up to 3.5 cm long in *M. amazonica*, up to 8 cm long in *M. pastazaensis*).

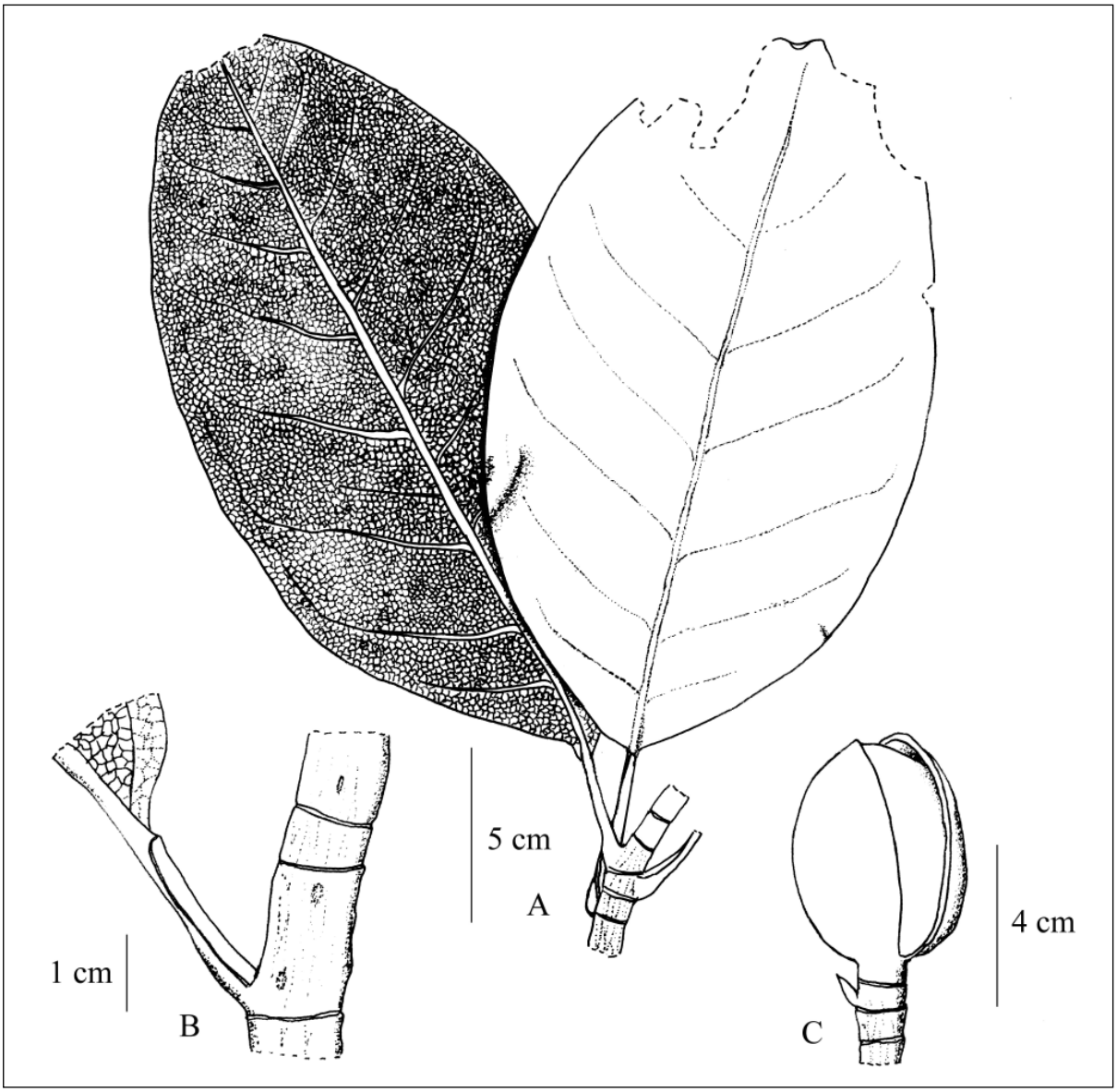

Figure 3. *Magnolia pastazaensis*, holotype (*Jaramillo & Buenaño. 1138*). **A.** Sterile branchlet. **B.** Detail of petiole. **C.** Floral bud.

Trees to 20 m tall. **Branchlets** terete, glabrous, striate, 0.8–1.3 cm in diameter. **Petioles** 2.4–4.9 x 0.3–0.4 cm, glabrous, semiterete, with flat adaxial scar covering all of their length. **Leaves** elliptic, coriaceous, glabrous, 16–26 x 6–17 cm, apex obtuse, margin entire, base obtuse or acute; lateral veins 6–9 on each side of midrib, brochidodromous, midrib and lateral veins plane to slightly

raised above, raised beneath; reticulate venation prominulous on both surfaces. **Buds** 6.5–8 x 5–5.5 cm, terminal, solitary; hypsophylls 3, glabrous, smooth. Flowers at anthesis and fruit not seen.

Magnolia pastazaensis occurs in primary humid premontane forests on hilly terrain in the province of Pastaza, between 684–1000 m elevation. Flowering October to December. The epithet alludes the province of the type locality, Pastaza.

Additional collections examined. **ECUADOR. Pastaza.** 31 km N of Puyo on road to Tena, side road E to Cajabamba, 1°15' S, 77°50' W, 1000 m, 23 Dec 1987 (bud), *Boom et al. 7778* (NY, QCA!).

MAGNOLIA YANTZAZANA F. Arroyo, **sp. nov. TYPE: ECUADOR. Zamora Chinchipe.** Yantzaza. Parroquia Los Encuentros, Concesión Sachavaca, 1540 m, 30 Jul 2011 (fr), *Miranda 3017* (holotype: QCNE).

Species similar to *Magnolia ovata* (A. St.-Hil.) Spreng. in leaf shape but different from it in the lack of an adaxial scar on the petiole, abaxially pubescent leaves (vs. entirely glabrous leaves in *M. ovata*), and ellipsoid fruits (vs. globose in *M. ovata*).

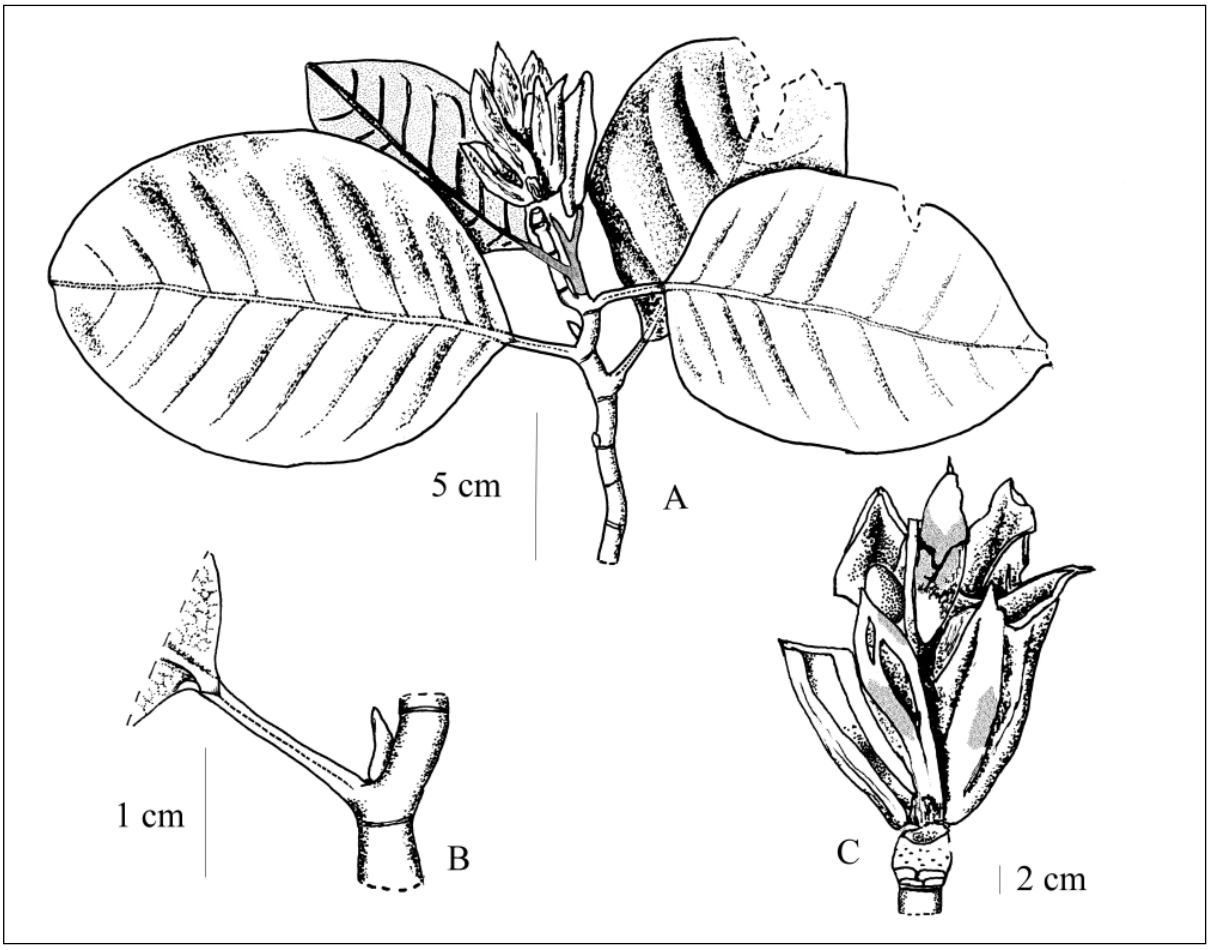

Figure 4. *Magnolia yantzazana*, holotype (*Miranda 3017*). **A.** Fruiting branchlet. **B.** Detail of petiole. **C.** Mature fruit at dehiscence.

Trees to 15 m high. **Branchlets** 0.5–0.9 cm in diameter, distally puberulent, glabrous with age. **Petioles** terete, 2.1–2.5 x 0.3–0.4 cm, covered with densely appressed pubescence, glabrous with age. **Stipules** 8–9 cm long, glabrescent. **Leaves** ovate, 19.5–23 x 12.5–14 cm, coriaceous, glabrous above, sparse villous pubescence beneath becoming denser and appressed along the midrib and lateral veins, apex obtuse, acute or acuminate, margin entire, base obtuse; midrib plane to impressed above, prominent beneath; lateral veins 13–21 on each side of midrib; reticulate venation obscure to prominulous above, prominulous beneath. **Fruit** ellipsoid, up to 5 cm long, longitudinally ribbed along the carpels, covered with short tan pubescence in patches, seeds angular-obovate, 0.7–0.8 x 1 cm.

Magnolia yantzazana grows in premontane humid forest on sandstone plateaus in the province of Zamora Chinchipe. It is currently reported between 1540–1620 m elevation but more collections are needed to establish the actual extent of the elevational range as well as more detailed information about flowering and phenology. Flowering reported in June, fruiting in July. The name derives from the region of the type locality, Yantzaza.

Additional collections examined. **ECUADOR. Zamora Chinchipe.** Río Machinaza watershed, east of Los Encuentros, 03°46’36’’ S, 78°29’43’’ W, 1620 m, 28 Jun 2009 (bud), *Neill & Kajekai 16612* (LOJA!, MO, QCNE!).

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