Nine new species and a new country record for Meriania (Melastomataceae) from Peru

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Abstract: Nine new species of Meriania are described and illustrated and M. zunacensis, originally described from Ecuador, is recorded for the first time for Peru from Andean forests in the Amazonas Department. The new species are M. bicentenaria and M. vasquezii from Pasco, M. bongarana, M. callosa and M. juanjil from Amazonas, M. hirsuta from Piura, M. megaphylla from La Libertad, M. sumatika from Cusco and M. escalerensis from the Loreto-San Martin border. Following IUCN criteria, M. megaphylla is categorized as Data Deficient (DD) as it is only known from one collection made in 1914, M. bicentenaria and M. sumatika are categorized as Endangered (EN) and the remaining new species are categorized as Critically Endangered (CR). With these discoveries, N Peru (Departments of Amazonas, Cajamarca and Piura) harbours the highest number of Meriania species in the country. Also, Peru now has a total of 34 species of Meriania and is the country with the second highest diversity for the genus.

Keywords: Amazons, Andean forests, Andean tepuis, Cusco, La Libertad, Melastomataceae, Meriania, Merianieae, neotropics, new species, Pasco, Peru, Piura, taxonomy

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Introduction

Meriania (Melastomataceae) was established by Swartz in 1798 based on collections from Jamaica. It currently comprises 121 species of shrubs, trees and occasionally climbers, distributed from SE Mexico and the Greater Antilles to E Brazil and Bolivia (Michelangeli & al. 2015; Michelangeli & al. 2020). Along with Adelobotrys DC., Axinacea Ruiz & Pav., Centronia D. Don, Graffenrieda DC., Macrocentrum Hook. f., Maguireanthus Wurdack and Salpinga Mart. ex DC., it forms the neotropical tribe Merianieae (Michelangeli & al. 2020), which can be recognized by the diplostemonous flowers, anthers with dorsal appendages, capsular fruits and predominantly pyramidal seeds (Renner 1993; Mendoza-Cifuentes & Fernández-Alonso 2010).

The genus is characterized by being trees and shrubs, occasionally climbers, lacking malpighiaceous trichomes, with an entire calyx, which can be lobed, subcalyptate or calyptate and with regular, irregular or circumscissile dehiscence, spreading to campanulate corollas and anthers usually with a dorsally inclined pore (Wurdack 1973, 1980, 1993; Michelangeli & al. 2015; Mendoza-Cifuentes 2021). In recent years, the exploration of the
Andean forests (Michelangeli & Goldenberg 2018; Fernández-Fernández & al. 2020; Fernandez-Hilario & al. 2020a, 2021; Mendoza-Cifuentes 2021) and the Atlantic forest of Brazil (Goldenberg & al. 2016, 2020) has led to the discovery of many new species. Despite these breakthroughs, there are still many undescribed species, mainly due to the poor exploration and collection in some highly diverse regions (see Michelangeli & Goldenberg 2018).

The highest diversity of Meriania is recorded in Colombia (37 species, Mendoza-Cifuentes 2021) and Ecuador (31 species, Fernández-Fernández 2010). In Peru, the last revision of the genus was made by Macbride (1941), where he recognized 12 species. Since then, several publications have increased the number of recognized species to 24 through new descriptions and new records: 15 of these species have been recorded in the N Peruvian Andes (Departments of Amazonas, Cajamarca and Piura) (Brako & Zarucchi 1993; Cotton & al. 2014; Michelangeli & Goldenberg 2018; Paredes-Burneo & al. 2018; Fernandez-Hilario & al. 2020a, 2021).

As part of an ongoing taxonomic revision of Meriania for Peru, we present nine new species and a new country record. All of them were discovered during botanical expeditions in the Peruvian Andes and the study of herbarium material. We provide morphological descriptions along with comments on related species and diagnostic characteristics, conservation status and geographic distribution for each of the newly described species.

Material and methods

The descriptions were made through examination of herbarium specimens deposited in AMAZ, CPUN, CUZ, HOXA, HSP, HUT, KUELAP, MOL, NY, UPCB and USM (herbarium codes follow Thiers 2020+). Additionally, specimens from digital collections at F (https://collections-botany.fieldmuseum.org/), P (https://science.mnhn.fr/) and US (https://collections.nmnh.si.edu/search/botany/) were consulted. Indumentum terminology, trichome classification and fruit type follow Beentje (2010), Wurdack (1986) and Baumgratz (1983–1985), respectively. For the description of inflorescences, we considered “few-flowered”, “submultiflorous” and “multiflorous” as inflorescences with fewer than 25 flowers, with 25–60 flowers and with more than 60 flowers, respectively. The description and measurement of flowers is based on rehydrated material (Meriania bicentenaria, M. escalerensis, M. hirsuta, M. megaphylla, M. juanjil and M. sumatika) or material fixed in 50–70 % ethanol (M. bongarana, M. callosa, M. vasquezii and M. zunacensis). Information on colours of floral parts is derived from our own field observations supplemented by label information and photographs provided by collaborators. Thecae surfaces are described as smooth or corrugated; the latter condition refers to polysporangiate anthers (see Caetano & al. 2020). A complete description is provided for the new record of M. zunacensis for Peru as these additional specimens provide not only a range extension, but also some additional character variability.

A morphological species concept has been used in this study, which establishes that consistent differences in morphology, resulting in discrete entities, are considered evidence of the existence of separate species (see Judd 2007). The combination of several discontinuous morphological characters was used to recognize the new species. Comments on the distribution and morphological differences among Andean species of Meriania were made based on checklists and taxonomic treatments for Bolivia (Jörgensen & al. 2014), Colombia (Almeda & al. 2020; Mendoza-Cifuentes 2021), Ecuador (Wurdack 1980; Jörgensen & León-Yáñez 1999), Peru (Macbride 1941; Brako & Zarucchi 1993) and Venezuela (Wurdack 1973; Hokeche & al. 2008) and examination of the protologues of recently described Meriania species and type specimens available through JSTOR Global Plants Initiative portal (https://plants.jstor.org/). The distribution maps were made in software QGIS version 3.18.1 (QGIS Development Team 2021). Conservation status for the new species was assigned using IUCN criteria (2012, 2019), based on estimates of Extent of Occurrence (EOO) and Area of Occupancy (AOO), both calculated through GeoCat Geospatial Conservation Assessment Tool (http://geocat.kew.org/) (Bachman & al. 2011).

Taxonomic treatment

New species

1. *Meriania bicentenaria* Rob. Fern., R. Rojas & Michelang., sp. nov. – Fig. 1–3.

Holotype: Peru, Pasco, Prov. Oxapampa, Dist. Oxapampa, Abra Oxapampa-Villa Rica, 10°40’36”S, 75°18’55”W, 2300–2500 m, 6 Aug 2004 (fl., fr.), R. Vásquez, A. Monteaudo, L. Valenzuela, J. Perea & A. Peña 30366 (HOXA accession no. 10648!!: isotypes: NY barcode D3785787!!; USM accession no. 215491!!).

*Diagnosis* — A species differing from other congensers by the combination of roughened to dendritic trichomes evenly covering the abaxial surface of leaves, calyces with rounded lobes and without dorsal projections, campanulate, deep pink corollas, strongly dimorphic stamens, stamen connectives with acuminate to falcate, descending dorsobasal appendages and antipetalous stamens with inflated connectives.

*Morphological description* — Tree up to 35 m tall and 50 cm d.b.h.; young branches and petioles puberulent with roughened to dendritic trichomes up to 0.13 mm long, sparsely to moderately on young branches, moderately to densely on petioles. *Young branches* terete, 4–6 mm in diam., lacking wings, nodes without interpetiolar flaps.
Fig. 1. Meriania bicentenaria – A: terminal fertile branch with inflorescence; B: detail of leaf base, adaxial surface; C: detail of abaxial leaf surface; D: petal; E: antisepalous stamen, lateral view; F: antipetalous stamen, lateral view; G: flower with petals removed. – A–C from A. Monteagudo & al. 6960; D–G from R. Villanueva-Espinoza 675.
Fig. 2. *Meriania bicentenaria* – A: terminal fertile branch; B: leaf blade, abaxial view; C: flower at anthesis, lateral view; D: flower at anthesis, apical view. – From *R. Villanueva-Espinoza* 675. – Photographs by Rosa Villanueva-Espinoza.
Leaves opposite, isophyllous, sometimes slightly anisophyllous. Petioles terete, 2.4–6 cm, with an adaxial projection (scutum) at insertion of petiole with leaf blade, up to 0.5 mm high, sometimes inconspicuous or obscured by trichomes. Leaf blades coriaceous, 10–18.9 × (2.9–)5–8.4 cm, elliptic to slightly lanceolate, sometimes broadly elliptic, apex acute, rarely obtuse, base obtuse to rounded, margin entire, discolorous; venation acrodromous and basal, with one pair of secondaries (lateral nerves) and an additional pair of faint submarginal veins running up to leaf apex, tertiary (transversal nerves) 33–48 on each side of primary, midvein, secondary and tertiary veins impressed, reticulation barely visible on adaxial surface, midvein and secondary veins salient, tertiary veins prominent and reticulation barely visible on abaxial surface; adaxial surface flat, brown, glabrous or sparsely puberulent with roughened to dendritic trichomes, denser near base, up to 0.13 mm long; abaxial surface light brown, midvein, secondary veins, reticulation and surface densely pubescent with roughened to dendritic trichomes up to 0.13 mm long, evenly covering entire surface. Inflorescences terminal panicles, erect, 15.6–30 × 6.7–17 cm, multiflorous; axis and peduncle moderately puberulent with trichomes similar to ones on twigs and petioles. Peduncle 4.8–8.2 cm long, terete. Main axis 7.5–16.5 cm, terete. Paracalades in 5–7 pairs, proximal 5.9–11 cm long, distal 1.8–2.8 cm long; flowers in 4-flowered umbels at ends of branchlets. Bracts foliaceous, persistent. 10.6–16 × 4.3–6.5 cm, petioles 3.2–7.3 cm long, shape and indument similar to principal leaves. Bracteoles not seen (probably early caducous). Flowers (4 or)5-merous, with campanulate corollas. Pedicels 3.5–6 mm long, greenish to light purple, moderately puberulent with trichomes similar to ones on inflorescence axis. Hypanthium 3–4 × 5.5–7.5 mm, campanulate, greenish to light purple, outer surface sparsely to moderately puberulent with trichomes up to 0.13 mm long, similar to those on pedicels, inner surface glabrous to sparsely puberulent with trichomes similar to those on pedicels; torus glabrous. Calyx opening regularly, greenish to light purple, outer surface glabrous to sparsely puberulent with trichomes up to 0.13 mm long, similar to ones on pedicels, inner surface glabrous; tube 1–1.5 mm long; lobes 1–1.5 mm long, 3–5 mm wide at base, rounded, without dorsal projections. Petals 11.5–13.5 × 7–9 mm, 3.5–4 mm wide at base, oblong, apex asymmetric, margin entire, deep pink, apex sometimes slightly ciliate. Stamens (8–)10, strongly dimorphic, all bent to one side of flower at anthesis giving flower a zygomorphic appearance; antisepalous stamens with filaments 5–6 mm long, deep pink, flat, glabrous, connectives not prolonged below thecae, dark purple,
glabrous, with two appendages, one descending dorsal basal, 3–4 mm long, acuminate, dark purple, other dorsal appendage a mere hump or inconspicuous, c. 0.25 mm long, broadly rounded, dark purple, 4 mm from tip of descending dorsal basal appendage, anthers 4–5 mm long, lanceolate, purple, glabrous, slightly curved, opening by one dorsally inclined pore, thecae with a smooth surface; antepetalous stamens with filaments 5–6 mm long, deep pink, flat, glabrous, connectives elongated beneath thecae c. 0.25 mm long (not including descending dorsal basal appendage), abruptly inflated from 1–1.5 mm of tip of thecae, purple at apex, cream in first half of inflated portion and light purple in second half of inflated portion, glabrous, with one descending dorsal basal appendage, 3–4.5 mm long, falcate, dark purple, anthers 4.5–5 mm long, lanceolate, purple, glabrous, slightly curved, opening by one dorsally inclined pore, thecae surface smooth. **Ovary** (4 or)5-locular, superior, 3–3.5 × 3–4 mm, spheroid and slightly 5-costate, pink, not exceeding hypanthium length, glabrous; style 11.5–16 mm long, pink, glabrous, incurved at apex and opposite to anthers at anthesis; stigma punctiform and minutely papillate, c. 0.5 mm wide, deep pink. **Fruits** capsular (velatidiana), with persistent hypanthium and calyx; mature ovary 5 × 5.5 mm, spheroid, slightly costate, 1.5 mm exceeding hypanthium length; fruiting pedicels 5–8 cm long. **Seeds** triangular-linear, c. 0.5 mm long, numerous.

**Phenology** — Flowering occurs from June to September and fruiting from March to November.

**Distribution and ecology** — *Meriania bicentenaria* is endemic to high-elevation montane forests in the Department of Pasco, between 2200 and 2550 m. Populations of this species usually occur in pristine forests and seldom in disturbed forests.

**Conservation status** — *Meriania bicentenaria* is known from five localities, growing in surroundings of the Yanachaga-Chemillén National Park. Following IUCN (2012, 2019) guidelines and based on an estimated extent of occurrence of 304 km², we recommend the category Endangered EN B1ab(iii) for this species.

**Etymology** — The specific epithet commemorates the 200th anniversary of the Independence of Peru (1821–2021).

**Discussion** — *Meriania bicentenaria* belongs to the *M. macrophylla* complex (Wurdack 1978; Ulloa Ulloa & Homeier 2008), which is characterized by campanulate corollas, strongly dimorphic stamens and antepetalous stamens with inflated connectives. The *M. macrophylla* complex comprises six species distributed from S Mexico (state of Chiapas) to NW South America (Columbia, Ecuador, Peru and Venezuela) (Wurdack 1978; Almeda 1993; Ulloa Ulloa & Homeier 2008; Bussmann & Paniagua 2012; Almeda & al. 2020; Fernandez-Hilario & al. 2021).

*Meriania bicentenaria*, *M. franciscana* C. Ulloa & Homeier and *M. ninakurorum* (Bussmann & Paniagua) E. Cotton & Balslev are the only species of *M. macrophylla* complex occurring in Peru. *Meriania bicentenaria* occurs in central Peru (Department of Pasco), while the other two species occur in the N part of the country in the Departments of Cajamarca (*M. franciscana*) and San Martín (*M. ninakurorum*). These species are also the only ones within the complex that lack stamen connectives with descending bifid dorsal basal appendages. *Meriania bicentenaria* shares with *M. ninakurorum* the antepetalous stamen connectives without ascending appendages. Nevertheless, *M. bicentenaria* is distinguished from *M. ninakurorum* by the petals with projections (scutum) (vs without projections in *M. ninakurorum*) and leaf blades 10–18.9 × (2.9–)5–8.4 cm (vs 23–32 × 9–15 cm). In addition, *M. bicentenaria* shares with *M. franciscana* the presence of an adaxial projection (scutum) at the insertion of the petiole with the leaf blade and roughened to dendritic trichomes on abaxial leaf surfaces. However, *M. bicentenaria* differs from *M. franciscana* by its leaf blades with entire flat margins (vs often slightly revolute at the base), abaxial leaf surface densely pubescent evenly covering the entire surface (vs sparsely to densely puberulent but without covering the entire surface), deep pink petals (vs reddish purple) and antepetalous stamen connectives without ascending appendages (vs with blunt ascending appendages).

**Additional specimens examined (paratypes) — Peru:** Pasco, Prov. Oxapampa, Dist. Palcazú, without locality, 10°32’S, 75°23’W, 2200 m, 4 Oct 1984 (fr.), D. Smith & al. 8685 (F!); Dist. Oxapampa, camino a la Cordillera Yanachaga, 10°23’S, 75°27’W, 2400 m, 19 Jul 1984 (fr.), D. Smith & al. 7913 (F!, US!, USM!); camino Oxapampa-Abra Villa Rica, 10°39’23’’S, 75°20’27’’W, 2270 m, 10 Aug 2004 (fl.), A. Monteagudo & al. 6960 (HOXA!, NY!); camino Oxapampa-Villa Rica, km 37 en zona de amortiguamiento, 10°38’12’’S, 75°24’55’’W, 2462 m, 15 Mar 2006 (sterile), S. Vilca & al. 643 (HOXA!, USM!); Cuenca del río San Alberto, 10°32’39.90’’S, 75°22’13.63’’W, 2286 m, 1 Oct 2019 (sterile), C. Llerena 23 (MOL!); same locality and data (fr.), C. Llerena 32 (MOL!); CDS, Sector San Alberto – Entrada al Parque Nacional Yanachaga Chemillén, 10°32’25.89’’S, 75°22’14.92’’W, 2290 m, 10 Jun 2021 (fl.), R. Villanueva-Expinoza 675 (MOL!); Parque Nacional Yanachaga Chemillén, 10°32’5’’S, 75°21’32’’W, 2420 m, 26 Aug 2002 (fl., fr.), A. Monteagudo & al. 3807 (AMAZ!, MOL!, NY!); Parque Nacional Yanachaga-Chemillén, cercanías del Refugio el Cedro, 10°32’51’’S, 75°21’32’’W, 2457 m, 24 Mar 2014 (sterile), R. Tupayachi & al. 13589
2. Merenia bongarana Rob. Fern., R. Goldenb. & Michelang., sp. nov. – Fig. 4–6.

Holotype: Peru, Amazonas, Prov. Bongará, Dist. Yambasbamba. Inmediaciones de la Estación Biológica Abra Patrícia, 05°41’32.91”S, 77°48’41.1”W, 2320 m, 19–20 Feb 2020 (fl., fr.), R. Fernandez-Hilario, R. Villanueva & L. Pillaca 1930 (MOL barcode 000006!; isotypes: CUZ!, HOXA!, NY!, USM!); PN Yanachaga-Chemillén, parcela permanente 1.0 ha Oso Playa, 10°17’58”S, 75°35’06”W, 2200 m, 20 May 2004 (fr.), R. Rojas & al. 2403 (HOXA!).

Diagnosis — A species differing from other congeners by the combination of ferruginous indumentum evenly covering the abaxial surface of leaves, calyx lobes with claw-shaped dorsal projections (1.5–2.5 mm long), campanulate, pink-orange corollas, isomorphic stamens, stamen connectives prolonged below the thecae and with a slightly crown-shaped descending dorsobasal appendage.

Morphological description — Tree up to 5 m tall; young branches and petioles pubescent with sessile stellate trichomes, these up to 0.10 mm long, moderately to densely on young branches, densely on petioles. Young branches terete-quadrangular, 5–6 mm in diam., lacking wings, nodes without interpetiolar flaps. Leaves opposite, isophyllous. Petioles terete, 1.2–1.5 cm long, without projections. Leaf blades coriaceous, 7.5–9.5 × 3.2–4.3 cm, elliptic, apex acuminate, base acute, margin finely serrulate on distal half to two-thirds, discolorous; venation acrodromous and suprabasal, with one pair of secondaries (lateral nerves), diverging 3–4 mm from base of blade and an additional pair of faint submarginal veins running up to leaf apex, tertiary (transversal nerves) 31–33 on each side of primary, percurrent, 1.5–3.5 mm distant from each other, midvein, secondary and tertiary veins impressed, reticulation barely visible on adaxial surface, midvein and secondary veins salient, tertiary veins prominent and reticulation visible on abaxial surface; adaxial surface flat, light olive to olive-green when dry, glabrous; abaxial surface ferruginous when dry, densely pubescent with sessile stellate trichomes intermixed with elongated trichomes with greatly roughened base, up to 0.5 mm, evenly covering entire surface, with pocket domatia at convergence of midvein and secondary veins. Inflorescences terminal panicles, erect, 7.5–8.2 × 6.8–7 cm, submultiflorous; axis and peduncle densely pubescent with trichomes similar to ones on abaxial surface of leaves, longer (up to 1 mm long) on nodes. Peduncle 2–2.2 cm long, terete-quadrangular. Main axis 3.5–4.8 cm long, terete-quadrangular, with 2–3 pairs of proximal paraphclades and two nodes, subdistal node with 4 flowers, distal node with an umbel. Paraclesodes in one proximal pair, 3.7–4.2 cm long; flowers in 4- or 5-flowered umbels at ends of branchlets. Bracts foliaceous, persistent, 8.9–9.7 × 3.5–4.2 cm, petioles 1.5–1.8 cm long, shape and indumentum similar to principal leaves; sometimes with one pair of additional bracts on paraphclades of main axis, 5.5 × 6.8 cm, petioles 1.2–1.7 cm long. Bracteoles not seen (probably early caducous). Flowers 5-merous, pendant, with campanulate corollas. Pedicels 7–9 mm long, ferruginous, densely pubescent with trichomes similar to ones on inflorescence axis, up to 0.75 mm. Hypanthium 6.5–7 × 4.5 mm, campanulate, ferruginous, outer surface pubescent with trichomes similar to ones on pedicels, inner surface glabrous; torus glabrous. Calyx opening regularly, ferruginous, outer surface densely pubescent with trichomes similar to ones on pedicels, inner surface glabrous; tube 2–2.5 mm long; lobes 2.5–5 × 7 mm, acute, each with a claw-shaped dorsoapical projection, 2–3 mm long. Petals 14–15.5 × 13–16 mm, 3–3.5 mm wide at base, obovate and slightly asymmetric, apex rounded, margin entire, pink-orange, glabrous. Stamens 10, isomorphic, all bent to one side of flower at anthesis giving flower a zygomorphic appearance; filaments 8–8.5 mm, pink to magenta, semiterete, glabrous; connectives prolonged below thecae 1 mm (not including descending dorsobasal appendage), magenta, glabrous, with one descending dorsobasal appendage, c. 1 mm long, slightly crown-shaped, with rounded to irregular lobes up to 0.13 mm; anthers 8.5–9 mm long, lanceolate, magenta, glabrous, with its apical third slightly inflked, opening by one dorsally inclined pore, theca surface slightly corrugated. Ovary 5- or 6-locular, superior, basally fused with hypanthium, free portion c. 5 × 3.5 mm, ovate and slightly 5- or 6-costate, magenta, not exceeding hypanthium length,
Fig. 4. *Meriania bongarana* – A: terminal fertile branch with inflorescence with detail of leaf margin; B: inflorescence branch; C: flower at anthesis, lateral view; D: petal; E: stamen, lateral view; F: ovary and style; G: hypanthium and calyx, longitudinal section. – A–D from *R. Fernandez-Hilario & al. 1930*. – Drawing by Leticia Lajo.
Fig. 5. *Meriania bongarana* – A: leaf blade, abaxial view; B: inflorescence with flower buds; C: terminal fertile branch with inflorescence; D: fruits. – A–D from *R. Fernandez-Hilario & al. 1930*. – Photographs by Robin Fernandez.
Therefore, following IUCN (2012, 2019) guidelines and based on an estimated area of occupancy of 4 km², we recommend the category Critically Endangered CR B2ab(iii) for this species.

**Etymology** — The specific epithet refers to Bongará province (Department of Amazonas) in N Peru.

**Discussion** — *Meriania bongarana* belongs to a group of species characterized by campanulate, reddish orange corollas, and calyx lobes usually with claw-shaped to falcate dorsal projections. The species of this group occur in the Andes from Venezuela to N Peru. *Meriania dazae* Rob. Fern. & al. and *M. bongarana* are the only species in this group recorded for Peru. Within this group the most similar species to *M. bongarana* are *M. cuneifolia* Gleason, *M. furvanthera* Wurdack and *M. stellata* (Gleason) Wurdack, all endemic to Ecuador. However, *M. bongarana* differs from the first by its hypanthium terete (vs obscurely ribbed in *M. furvanthera*), calyx lobes with dorsal projections 2–3 mm long (vs c. 0.5 mm) and petals 14–15.5 mm long (vs 21–22.5 mm).

**Phenology** — Flowering and fruiting occur in February.

**Distribution and ecology** — *Meriania bongarana* is a Peruvian endemic known from a single locality in the Abra Patricia Conservation Area in the Department of Amazonas, on moderate slopes at 2320 m. At this locality, *M. bongarana* occurs in undisturbed forests.

**Conservation status** — The only locality recorded for *Meriania bongarana* is located between two protected areas, Alto Mayo Protection Forest and Nieva River Reserved Zone. However, the pristine forests in Bongará province are decreasing due to the expansion of agriculture and livestock. Despite being a little-explored region in Amazonas, several endemic species have been discovered in Bongará province in recent years (e.g. Fernandez-Hilario & al. 2020b; Fernandez-Hilario & al. 2021; Tejedor & Calatayud 2017). Therefore, following IUCN (2012, 2019) guidelines and based on an estimated area of occupancy of 4 km², we recommend the category Critically Endangered CR B2ab(iii) for this species.
It differs from the third by its inflorescences and hypanthia densely pubescent (vs densely villose in *M. stellata*), hypanthia terete (vs obscurely ribbed), isomorphic stamens (vs dimorphic in size) and stamen connectives with descending dorsobasal appendages c. 1 mm long (vs 0.25–0.4 mm).

The only Peruvian species with features similar to *Meriania bongarana* is *M. dazae*. Both species can be distinguished by the colour of the leaf blades on the abaxial surface (ferruginous in *M. bongarana* vs whitish to cream in *M. dazae*), petal length (14–15.5 mm vs 19.5–24 mm) and the dorsal appendages of stamen connectives (absent vs a mere hump, 0.25 mm long). Other Peruvian species such as *M. acida* (Markgr.) Wurdack and *M. tomentosa* (Cogn.) Wurdack can be confused with *M. bongarana* because they share the campanulate, pink-orange to reddish orange corollas. However, these two species have calyptrate calyces without dorsal projections (vs lobed calyces with falcate dorsal projections), spreading, deep pink (0.5–3 mm long), glabrous hypanthia and calyces, calyx densely pubescent (vs densely villose in *M. bongarana* vs whitish to cream in *M. dazae*), petal length (14–15.5 mm vs 19.5–24 mm) and the dorsal appendages of stamen connectives (absent vs a mere hump, 0.25 mm long). Other Peruvian species such as *M. acida* (Markgr.) Wurdack and *M. tomentosa* (Cogn.) Wurdack can be confused with *M. bongarana* because they share the campanulate, pink-orange to reddish orange corollas. However, these two species have calyptrate calyces without dorsal projections (vs lobed calyces with falcate dorsal projections in *M. bongarana*) and with irregular dehiscence (vs regular dehiscence). Furthermore, *M. bongarana* differs from *M. acida* by the size of the leaf blades (7.5–9.5 × 3.2–4.3 cm vs 12–18 × 5–9 cm), inflorescence position (terminal vs pseudolateral) and petal size (14–15.5 mm vs 19.5–24 mm). *Meriania bongarana* differs from *M. tomentosa* by its inflorescences 7.5–8.2 cm long (vs 19.5–24 mm) and the dorsal appendages of stamen connectives (absent vs a mere hump, 0.25 mm long). Other Peruvian species such as *M. acida* (Markgr.) Wurdack and *M. tomentosa* (Cogn.) Wurdack can be confused with *M. bongarana* because they share the campanulate, pink-orange to reddish orange corollas. However, these two species have calyptrate calyces without dorsal projections (vs lobed calyces with falcate dorsal projections in *M. bongarana*) and with irregular dehiscence (vs regular dehiscence). Furthermore, *M. bongarana* differs from *M. acida* by the size of the leaf blades (7.5–9.5 × 3.2–4.3 cm vs 12–18 × 5–9 cm), inflorescence position (terminal vs pseudolateral) and petal size (14–15.5 mm vs 19.5–24 mm). *Meriania bongarana* differs from *M. tomentosa* by its inflorescences 7.5–8.2 cm long (vs 19.9–32.3 cm), stamen connectives with crown-shaped descending dorsobasal appendages (vs blunt) and magenta thecae (vs cream).

3. **Meriania callosa** Rob. Fern., R. Goldenb. & Michelang., sp. nov. — Fig. 7–9.

Holotype: Peru, Amazonas, Prov. Bongará, Dist. Yambashamba, ruta desde CP Santa Rosa hacia bosque El Toro, 05°40'07.98"S, 77°55'30.04"W, 1950 m, 11 Nov 2020 (fl.), R. Fernandez-Hilario, W. Chuquitucto & A. Wong 2055 (MOL barcode 000007!; isotypes: HOXA accession no. 077833!, KUELAP accession no. 971!, MOL barcode 000008!, NY barcode [a239393]), UPCB accession no. 99412!).

**Diagnosis** — A species differing from other congeners by the combination of nodes with interpetiolar flaps (0.5–3 mm long), glabrous hypanthia and calyces, calyces with callose dorsal projections, spreading, deep pink corollas, isomorphic stamens, stamen connectives with two appendages, one triangular descending dorsobasal appendage and the other dorsal appendage a mere hump, and spheroid mature ovaries.

**Morphological description** — Tree up to 18 m tall; young branches and petioles glabrous. Young branches obscurely quadrangular, lacking wings, nodes with interpetiolar flaps, 0.5–3 mm long. Leaves opposite, isophyllous to slightly anisophyllous. Petioles semiterete and adaxially slightly ribbed, 10–22 mm long, without projections. Leaf blades coriaceous, 11–16 × 6.8–10.4 cm, elliptic to oblong, rarely ovate, apex acute to acuminate, base obtuse to rounded, sometimes slightly revolute at base, margin entire, concolorous; venations acrodromous and basal, with one or two pairs of secondaries (lateral nerves) and an additional pair of faint submarginal veins running up to leaf apex, tertiary (transversal nerves) 30–42 on each side of primary, percurrent, 1–11.5 mm distant from each other, midvein, secondary and tertiary veins impressed, reticulation visible on adaxial surface, midvein and secondary veins salient, tertiary veins prominent and reticulation impressed on abaxial surface; adaxial surface flat, yellowish brown, glabrous; abaxial surface yellowish brown, glabrous to sparsely puberulent with short trichomes up to 0.10 mm long. Inflorescences terminal panicles, erect, 14–27.5 × 10–20 cm, few-flowered or submultiflorous; axis and peduncles glabrous. Peduncle 2.4–12.3 cm, quadrangular. Main axis 6–12.5 cm, quadrangular. *Paraclades* in 3–4 pairs, proximal 6–16.5 cm long, distal 2–3.5 cm long; flowers in regular dichasia at ends of branchlets. *Bracts* foliaceous, persistent, sometimes caducous, 12–18.2 × 9.2–11.2 cm, petioles 12–25 mm long, shape and indumentum similar to principal leaves; sometimes with one pair of additional bracts on subproximal nodes of main axis, 12.5–16 × 2.5–8.8 cm, petioles of these 1.5–2 cm long. *Bracteoles* foliaceous, caducous, 35–36 × 2.5–4 mm, elliptic, petioles 5–6 mm long, indumentum similar to ones on bracts. *Flowers* 5-merous, with spreading corollas. *Pedicels* 5–7 mm long, green, glabrous. *Hypanthium* c. 8.5 × 19 mm, campanulate, green, outer and inner surfaces glabrous; torus glabrous. *Calyx* opening regularly, green, outer and inner surfaces glabrous; tube 6–7 mm long; lobes repand; with 5 callose dorsal projections, forming irregularly square light green spots, much darker than rest of calyx and hypanthium when dry. *Petals* 44 × 38–40 mm, 8 mm wide at base, strongly asymmetric obovate, apex rounded, margin entire, deep pink, glabrous. *Stamens* 10, isomorphic, all bent to one side of flower at anthesis giving flower a zygomorphic appearance; filaments 18–19 mm, purple, flat, glabrous; connectives not prolonged below thecae, dark purple in thecae, glabrous, with two appendages, one descending dorsobasal, 5.5–6 mm long, triangular, yellow, other dorsal appendage a mere hump, c. 0.25 mm long, rarely inconspicuous, acute, dark purple, 5.5–5.8 mm from tip of descending dorsobasal appendage; anthers 13–14 mm long, lanceolate, dark purple, glabrous, straight, opening by one dorsally inclined pore, thecae surface smooth. *Ovary* 5-locular, superior, basally fused with hypanthium, free portion c. 7.5 × 7 mm, ovoid and slightly 5-lobed, light purple, 2.5 mm exceeding hypanthium length, glabrous; style c. 19.5 mm long, light purple, glabrous, incurved at apex and opposite anthers at anthesis; stigma punctiform and minutely papillate, 1 mm wide, cream. *Fruits* capsular (velatidia), with persistent hypanthium and calyx; mature ovary c. 11 × 11–12 mm, spheroid, 4–8 mm exceeding hypanthium.
Fig. 7. *Meriania callosa* – A: terminal fertile branch with inflorescence with detail of interpetiolar flap; B: flower at anthesis, apical view; C: flower bud; D: petal; E: stamen, lateral view; F: fruit, lateral view; G: longitudinal section of flower with petals and stamens removed. – A–G from R. Fernandez-Hilario & al. 2055. – Drawing by Leticia Lajo.
Fig. 8. *Meriania callosa* – A: leaf blade, abaxial view; B: inflorescence with flower buds; C: flower at anthesis, lateral view; D: flower at anthesis, apical view. – A–D from *R. Fernandez-Hilario & al. 2055*. – Photographs by Robin Fernandez.
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length; fruiting pedicels 11.5 mm long. Seeds triangular-linear, c. 1.25 mm long, numerous.

**Phenology** — Flowering occurs in April and November and fruiting in August and November.

**Distribution and ecology** — *Meriania callosa* is endemic to high-elevation montane forests in the Districts of Mariscal Benavides and Yambrasbamba (Amazonas, Peru), between 1880 and 1970 m, on moderately to strongly sloping terrain. Common tree species at this locality “CP Santa Rosa” (Fernandez-Hilario & al. 2055, 2056) include *Alzatea verticillata* Ruiz & Pav. (*Alzateaceae*), *Cecropia angustifolia* Trécul (*Urticaceae*), *Ficus mutisii* Dugand (*Moraceae*), *Graffenrieda emarginata* Triana (*Melastomataceae*), *M. penningtonii* Rob. Fern. & al. (*Melastomataceae*) and *Ladenbergia riveroana* Standl. (*Rubiaceae*).

**Conservation status** — *Meriania callosa* is known from two localities, the CP Santa Rosa and the CP Izuchaca, both located outside protected areas or conservation areas. In both localities, the forests are fragmented due to the recent increase of deforestation for agriculture and livestock. Therefore, following IUCN (2012, 2019) guidelines and based on an estimated area of occupancy of 8 km², we recommend the category Critically Endangered CR B2ab(iii) for this species.

**Etymology** — The specific epithet refers to the presence of callose dorsal projections on the calyx of this species.

**Discussion** — *Meriania callosa* is distinguished from other congeners by the combination of nodes with interpetiolar flaps (0.5–3 mm long), glabrous flowers, spreading, deep pink corollas, calyces with callose dorsal projections and isomorphic stamens. The callose dorsal projections on the calyx are an unusual feature within *Meriania*, although some species such as *M. hernandi* L. Uribe, *M. tetragona* (Cogn.) Wurdack, *M. sanguinea* Wurdack may have them. In these species, the projections are less conspicuous and often difficult to see in herbarium material. In addition, *M. hernandi* (Ecuador and Colombia) has spreading, orange corollas and *M. sanguinea* (from Colombia to Peru) and *M. tetragona* (Ecuador and Peru) have campanulate, deep red corollas. *Meriania penningtonii* also has callose dorsal projections and grows sympatrically with *M. callosa*. However, the projections in both species are different, these being small and whitish in *M. penningtonii* (see fig. 3C, D in Fernandez & al. 2021) while in *M. callosa* they are light green and cover a large part of the calyx. Additionally, *M.*
penningtonii has winged internodes (vs internodes without projections in M. callosa) and bullate leaves (vs flat). Another species with similar dorsal projections on the calyx is M. fantastica Alvear & al. (Colombia), although in this species the callose projections are much more evident than in M. callosa (see fig. 4B in Mendoza-Cifuentes & al. 2014). Meriaria callosa is distinguished from M. fantastica by leaf blade size (11–16 × 6.8–10.4 cm vs 15.5–31 × 10.4–20 cm), petal colour (deep pink vs orange) and relative stamen size (isomorphic vs dimorphic in size).

Among Peruvian species, Meriaria callosa resembles M. megaphylla (also described here) and M. zunacensis D. Fernández & Dellinger (also in Ecuador). All of them differ from the others at the insertion of the petioles with the leaf blade. Meriaria callosa also differs from Meriaria megaphylla by its obscurely quadrangular internodes (vs quadrangular and 4-winged in M. megaphylla), leaf blades 11–16 × 6.8–10.4 cm with obtuse to rounded bases (vs 21–29.4 × 14.8–22 cm with cordate base), hypanthia c. 8.5 × 19 mm (vs 4.5–5 × 4–4.5 mm) and stamen connectives with dorsal appendages as mere humps (vs blunt, ascending); it differs from M. zunacensis by its leaf blades with entire flat margins (vs revolute at the base in M. zunacensis), flowers at the ends of branchlets arranged in regular dichasia (vs 4- or 5-flowered umbels), ovary c. 7.5 × 7 mm (vs 13–14.5 × 7–7.5 mm), spheroid when mature (vs pyriform).

**Additional specimens examined (paratypes) — PERU: Amazonas, Prov. Bongará, Dist. Yambratsbamba, ruta desde CP Santa Rosa hacia bosque El Toro, 05°40′09.22″S, 77°55′30.05″W, 1970 m, 11 Nov 2020 (fl. bud, fr.), R. Fernandez-Hilario & al. 2056 (HOXA!, MOL!, NY!, UPCB!); Prov. Rodríguez de Mendoza, Dist. Mariscal Benavides, CP Izcuchaca, 06°19′40″S, 77°31′05″W, 1880 m, 30 Aug 1998 (fr.), R. Vásquez & J. Campos 25339 (NY!); same locality, 11 Apr 2001 (fl.), H. van der Werff & al. 106941 (NY!, USM!).**

4. **Meriaria esculentis** Rob. Fern., R. Goldenb. & Michael., sp. nov. – Fig. 9–11.

Holotype: Peru, Loreto, Prov. Alto Amazonas, Dist. Balzacuario, Cordillera Escalera, Campamento Cumbre – Alto Cachiacaya, 05°52′02.1″S, 76°46′29.3″W, 1930 m, 22 Sep 2013 (fl.), M. Ríos, T. Mori, D. Neill, L. Torres & C. Vriesendorp 3316 (AMAZ!, isotypes: F accession no. 2323926!, USM accession no. 287375!).

**Diagnosis** — A species differing from other congeners by the combination of ferruginous indumentum, calyptrate calyces with circumsessile dehiscence, spreading, deep pink corollas, isomorphic stamens, and stamen connectives with two appendages, one triangular descending dorosbasal appendage and the other blunt ascending dorsal appendage.

**Morphological description** — Small tree up to 4 m tall; young branches and petioles densely setulose with conic densely roughened trichomes up to 0.3 mm long. Young branches quadrangular, 5–5.5 mm in diam., lacking wings, nodes without interpetiolar flaps. Leaves opposite, isophyllous to slightly anisophyllous. Petioles semi-terete, 1.2–2.2 cm long, without projections. Leaf blades coriaceous, 13.3–15.5 × 7.6–8.8 cm, ovate to lanceolate, apex acute to obute, base cordate, margin moderately denticulate on distal two-thirds, slightly discolorous; venation acrodromous and basal, with two pairs of secondary (lateral nerves) and an additional pair of faint submarginal veins running up to leaf apex, tertiary (transversal nerves) 30–41 on each side of primary, percurrent, 1.5–7 mm distant from each other, midvein, secondary and tertiary veins impressed, reticulation barely visible on adaxial surface, midvein and secondary veins salient, tertiary veins prominent and reticulation visible on abaxial surface; adaxial surface flat, golden brown when dry, glabrous to sparsely setulose on veins with similar trichomes to ones on petioles; abaxial surface light golden brown when dry, midvein and secondary veins densely setulose, tertiary veins, reticulations and surface sparsely to moderately setulose, with trichomes similar to ones on petioles, denser on veins. Inflorescences terminal panicles, erect, c. 22 × 14 cm, submultiflorous or multiflorous; axis and peduncle densely setulose with trichomes similar to ones on terminal twigs, longer (up to 0.75 mm long) on nodes. Peduncle 4.5–7 cm long, quadrangular. Main axis 15.7–16.5 cm, quadrangular. Paraclades in 6 pairs, proximal 9–10 cm long, distal 2.2–2.5 cm long; flowers in regular dichasia at ends of branchlets. Bracts foliaceous, persistent or caducous, 2.9 × 0.9 cm, elliptic, petioles 7.5–8 mm long, indumentum denser than ones on leaves. Bracteoles not seen (probably early caducous). Flowers 5-merous, erect, with spreading corollas. Pedicels 2.5–3 mm long, ferruginous, densely setulose with trichomes similar to ones on peduncle and axis up to 0.3 mm long. Hypanthium c. 4.5 × 7 mm, campanulate, ferruginous, outer surface densely setulose with trichomes similar to ones on pedicels, inner surface glabrous; torus glabrous. Calyx with circumsessile dehiscence, ferruginous, outer surface densely setulose with trichomes similar to ones on pedicels, inner surface glabrous; calyx lobes fused, forming a calyptra, 8–9.5 mm long, conic and acuminate, without dorsal projections. Petals c. 21 × 14 mm, c. 2.5 mm wide at base, obovate, apex rounded, margin entire, pink, glabrous. Stamens 10, isomorphic, all bent to one side of flower giving flower a zygomorphic appearance; filaments c. 8.5 mm long, pink, flat, glabrous; connectives not prolonged below thecae, light purple in distal half of thecae, cream in proximal half of thecae, with two appendages, one descending dorosbasal, c. 3.75 mm long, triangular, cream, other ascending dorsal appendage, c. 0.75 mm long, blunt, cream, 3–3.5 mm from tip of descending dorosbasal appendage; anthers c. 7.5 mm long, lanceolate, magenta on apex and cream to base,
Fig. 10. *Merania escalerensis* – A: terminal fertile branch with inflorescence; B: detail of abaxial leaf surface; C: detail of ovary apex; D: flower bud, lateral view; E: petal; F: stamen, lateral view; G: hypanthium, lateral view; H: longitudinal section of flower with petals and stamens removed. – A–H from *M. Ríos & al. 3316*. – Drawing by Leticia Lajo (E).
glabrous, straight, opening by one dorsally inclined pore, thecae surface corrugated. Ovary 5-locular, superior, c. 5 × 4–4.5 mm, ovate and 10-lobed, with an apical ring of 10 teeth, 1 mm long, pink, c. 1 mm exceeding hypanthium length, glabrous; style c. 10 mm long, pink, glabrous, slightly incurved at apex and opposite anthers at anthesis; stigma punctiform and minutely papillate, c. 0.4 mm wide, whitish. Fruits and seeds not seen.

**Phenology** — Flowering occurs in September.

**Distribution and ecology** — *Meriania escalerensis* is probably endemic to elfin forests on high-elevation summits of the Cordillera Escalera (Loreto-San Martín border), on a sandstone substrate above 1950 m. The Cordillera Escalera is one of the “sub-Andean cordilleras” (Andean Tepuis sensu Neill & al. 2014) to the east of the E Andes. Common tree and shrub genera in the area include *Clusia* L. (*Clusiaceae*), *Weinmannia* L. (*Cunoniaceae*), *Ocotea* Aubl. and *Persea* Mill. (*Lauraceae*), *Cybianthus* Mart. (*Primulaceae*) and *Palicourea* Aubl. and *Psychotria* L. (*Rubiaceae*) (Neill & al. 2014).

**Conservation status** — *Meriania escalerensis* is known from a single collection from the Cordillera Escalera. Currently, the main threats facing the Cordillera Escalera are the lack of a legal designation to protect it, the Moyobamba-Balsapuerto highway project and gas and petroleum exploration and production (for more details see Pitman & al. 2014). Therefore, following IUCN (2012, 2019) guidelines and based on an estimated area of occupancy of 4 km², we recommend the category Critically Endangered CR B2ab(ii) for this species.

**Etymology** — The specific epithet refers to the type locality “Cordillera Escalera”.

**Discussion** — *Meriania escalerensis* may be related to the *Meriania* “brachycera” group (Mendoza-Cifuentes & Fernández-Alonso 2012), based on the presence of ferruginous indumentum, calyptrate calyx with circumscissile dehiscence, spreading corollas, and stamen connectives with ascending dorsal appendages. Within this group the species that are most similar to *M. escalerensis* are *M. haemantha* (Planch. & Linden) Humberto Mend. & Fern. Alonso (Colombia and Venezuela), *M. sararensis* Humberto Mend. & Fern. Alonso (Colombia) and *M. yalconensis* Humberto Mend. & Fern. Alonso (Colombia). However, *M. escalerensis* differs from the first by its leaf blades 13.3–15.5 × 7.6–8.8 cm (vs 11–31 × 6.5–22 cm), 5-merous flowers [vs 6–7(–9)-merous] and calyces 8–9.5 mm long (vs 9–19 mm); it differs from the second by its pediolo 1.2–2.2 cm long (vs 2.7–3.8 cm), erect inflorescences (vs pendulous) and hypanthia and calyces with similar trichomes, up to 0.3 mm (vs clearly longer trichomes on the calyces, up to 1 mm); and it differs from
the third by its 30–41 tertiary veins (vs 50–65), 5-merous flowers (vs 7- or 8-merous) and petals c. 21 mm long (vs 29–42 mm).

The only Peruvian species with calyptraceae calyces are Meriania acida and M. tomentosa, the former endemic to N Peru and the latter distributed from Venezuela to Bolivia. Nevertheless, M. acida and M. tomentosa have calyces with irregular dehiscence and campanulate, red-dish orange corollas, whereas M. escalerensis has calyces with circumscissile dehiscence and spreading, deep pink corollas. In addition, M. acida has leaf blades with acute bases and M. tomentosa with obtuse to rounded bases (vs cordonate in M. escalerensis).

Currently, there are two species that grow in the sub-Andean Cordilleras of N Peru, Meriania escalerensis in the Cordillera Escalera (Loreto-San Martín border) and M. microflora Rob. Fern. & al. on the Cerros Kampankis (Amazonas-Loreto border). The two type localities are approximately 220 km apart and are dominated by oligotrophic sandstone substrates (Pitman & al. 2012; Pitman & al. 2014). Although M. escalerensis and M. microflora grow in similar habitats, they are quite different. The two species are easily distinguished by the petiole projections (absent in M. escalerensis vs present in M. microflora), the length and colour of the petals (c. 21 mm and deep pink vs 4–4.5 mm and white) and the shape of the stamens (isomorphic vs strongly dimorphic).

5. Meriania hirsuta Rob. Fern., Paredes-Burneo & Michelang., sp. nov. – Fig. 6, 12.
Holotype: Peru, Piura, Prov. Huancabamba, Dist. El Carmen de la Frontera, Río Samaniego margen izquierda, Zona de Amortiguamiento del Santuario Nacional Tabacnas-Namballe, 05°06′43.1″S, 79°21′25.7″W, 2150 m, 28 Apr 2003 (fl.), S. Baldeón & J. Campos 5373 (USM accession no. 273379!).

Diagnosis — A species differing from other congeners by the combination of branches and leaves with hirsute indumentum (el         long), campanulate, deep red corollas, slightly dimorphic stamens, stamen connectives with one dorsobasal appendage that is almost perpendicular to the thecae and antisepalous stamen connectives with laterally expanded dorsobasal appendages.

Morphological description — Shrub up to 1.5 m tall; young branches and petioles hirsute with elongate fluted trichomes, theses up to 4 mm long, moderately to densely on young branches, densely on petioles. Young branches terete or quadrangular, 5–7 mm in diam., lacking wings, nodes without interpetiolar flaps. Leaves opposite, isophyllous. Petioles terete, 5–15 mm long, without projections. Leaf blades subcoriaceous, 3.2–7.8 × 3–6.7 cm, ovate, apex acute, base cordate, margin denticulate, slightly discolorous; venation acrodromous and basal, with three pairs of secondary leaves (nerves) and an additional pair of faint submarginal veins running up to leaf apex, tertiary (transversal nerves) 14–16 on each side of primary, percurrent, 2–8 mm distant from each other, midvein, secondary and tertiary veins impressed, reticulation visible on adaxial surface, midvein, secondary and tertiary veins prominent and reticulation impressed on abaxial surface; adaxial surface bullate, black when dry, densely hirsute with trichomes similar to ones on petioles; abaxial surface dark brown when dry, moderately hirsute with trichomes similar to ones on petioles, denser on veins. Inflorescences not clear (see discussion). Flowers 5-merous, apparently pendant, with campanulate corollas; on swollen nodes 3–3.5 mm long, moderately hirsute with trichomes similar to ones on petioles. Pedicels 15–18 mm long, colour unknown, glabrous. Hypanthium 4.4–4.5 × 7–7.5 mm, campanulate, colour unknown, glabrous; torus glabrous. Calyx opening regularly, colour unknown, glabrous; tube 1.5 mm long; lobes repand; with 5 slightly callose dorsal projections, whitish and much lighter than rest of calyx and hypanthium when dry. Petals 12.5–13 × 11.5–12 mm, 4–4.5 mm wide at base, slightly obovate, apex rounded, margin entire, deep red, glabrous. Stamens 10, slightly dimorphic, all bent to one side of flower giving flower a zygomorphic appearance; antepetalous stamens filaments c. 8.5 mm long, colour unknown, flat, glabrous, connectives prolonged below thecae c. 0.3 mm long (not including perpendicular appendage), colour unknown, with one almost perpendicular dorsobasal appendage to thecal, c. 3 mm long, acute and with a rounded projection, c. 0.5 mm long, with an irregular surface, colour unknown, 1 mm from tip of dorsobasal appendage, anthers c. 6.5 mm long, lanceolate, colour unknown, glabrous, straight or with its apex slightly reflexed, opening by one slightly dorsally inclined pore, theca surface smooth; antepetalous stamens with shape and size similar to antepetalous stamens, only difference being connectives with laterally expanded perpendicular dorsobasal appendages. Ovary 5-locular, superior, c. 4 × 4.5 mm, spheroidal and 5-lobed, colour unknown, c. 0.25 mm exceeding hypanthium length, glabrous; style 12–13 mm long, colour unknown, glabrous, slightly incurved at apex and opposite to anthers at anthesis; stigma punctiform and minutely papilate, c. 1 mm wide, colour unknown. Fruits and seeds not seen.

Phenology — Flowering occurs in April.

Distribution and ecology — Meriania hirsuta is known only from two localities, about 5 km away from each other, between 2150 and 3035 m. This plant inhabits the montane forests of the E slopes of the Andes, at the northernmost limit of the Yungas (Comunidad Andina 2009), in the headwaters of the Samaniego river, which is part of the Chinchipe river basin. So far, this is a species endemic to Peru, found only in the Piura department (even though the paratype label records it for the Ayabaca province, it rather belongs to the Huancabamba
Fig. 12. *Meriania hirsuta* – A: terminal fertile branches with inflorescences; B: detail of hirsute internode; C: detail of adaxial leaf surface; D: flower bud, lateral view; E: antisepalous stamen, lateral view, with detail of perpendicular dorsobasal appendage; F: antipetalous stamen, lateral view, with detail of perpendicular dorsobasal appendage; G: longitudinal section of flower with petals and stamens removed. – A–G from *S. Baldeón & J. Campos* 5373. – Drawing by Leticia Lajo (E, F).
province). Also, this species occurs in the core of the Amotape-Huancabamba zone, which is home to many other endemic species of Melastomataceae (Bussmann & Paniagua 2012; Bussmann & Paniagua 2013; Burke et al. 2017; Paredes-Burneo & al. 2018; Michelangeli & Paredes-Burneo 2019; Fernandez-Hilario & al. 2021a).

Conservation status — The short range of occurrence of Meriania hirsuta is under the constant pressure of cattle grazing and logging, which might be prevented due to the recent setup of a Private Conservation Area (M-NAM 2016). Therefore, following IUCN (2012, 2019) guidelines and based on an estimated area of occupancy of 8 km², we recommend the category Critically Endangered CR B2ab(iii) for this species.

Etymology — The specific epithet refers to the indumentum of this species.

Discussion — Meriania hirsuta is clearly distinguished from other species within the genus by its hirsute indumentum (trichomes up to 4 mm long) on the branches and leaves. Other species with similar indumentum are *M. arizae* Humbert Mend. & Fern. Alonso (trichomes up to 4.5 mm long), *M. horrida* C. Ulloa & Achá (up to 12 mm long) and *M. mutissii* (Humb. & Bonpl.) Humberto Mend. & Fern. Alonso (up to 4.5 mm long). However, *M. arizae* and *M. mutissii* belong to the Meriania “brachycera” group (Mendoza-Cifuentes & Fernández-Alonso 2012) characterized by its calyptrate calyces with circumsissile dehiscence and spreading corollas, whereas *M. hirsuta* has calyces with repand lobes and regular dehiscence and campanulate corollas. On the other hand, *M. horrida* has dendritic trichomes intermixed with simple trichomes (vs only simple in *M. hirsuta*), flowers 6(-7)-merous (vs 5-merous) with spreading, reddish purple corollas (vs campanulate, deep red). The specific epithet refers to the indumentum of this species.

Etymology — The specific epithet refers to the indumentum of this species.

Discussion — *Meriania hirsuta* is clearly distinguished from other species within the genus by its hirsute indumentum (trichomes up to 4 mm long) on the branches and leaves. Other species with similar indumentum are *M. arizae* Humbert Mend. & Fern. Alonso (trichomes up to 4.5 mm long), *M. horrida* C. Ulloa & Achá (up to 12 mm long) and *M. mutissii* (Humb. & Bonpl.) Humberto Mend. & Fern. Alonso (up to 4.5 mm long). However, *M. arizae* and *M. mutissii* belong to the *Meriania “brachycera”* group (Mendoza-Cifuentes & Fernández-Alonso 2012) characterized by its calyptrate calyces with circumsissile dehiscence and spreading corollas, whereas *M. hirsuta* has calyces with repand lobes and regular dehiscence and campanulate corollas. On the other hand, *M. horrida* has dendritic trichomes intermixed with simple trichomes (vs only simple in *M. hirsuta*), flowers 6(-7)-merous (vs 5-merous) with spreading, reddish purple corollas (vs campanulate, deep red).

Due to the characteristics of the leaves (bullate, ovate and cordate leaf blades) and flowers (campanulate, deep red corollas and stamen connectives with perpendicular dorsobasal appendages to the thecae), *Meriania hirsuta* seems to be closely related with species of the *M. radula* complex, formed by *M. almedae* Wurdack, *M. radula* (Benth.) Triana, *M. tetragona* and *M. sanguinea*. These species have isomorphic stamens and glabrous, granulose-fur furaceous or setulose abaxial leaf blades with dendritic trichomes up to 1 mm long, whereas *M. hirsuta* has hirsute indumentum with elongate fluted trichomes up to 4 mm long and slightly dimorphic stamens (antisepalous stamen connectives with laterally expanded appendages). Within *M. radula* complex, *M. hirsuta* and *M. radula* do not have interpetiolar flaps, but the former is distinguished from the latter by its abaxial leaf blades with trichomes only on nerves and reticulation (vs trichomes evenly covering the entire surface) and petals 12.5–13 mm long (vs 17–19 mm). The laterally expanded appendage of antisepalous stamen connective is a character observed in other Peruvian species such as *M. amischophylla* Wurdack, *M. sumatika*, *M. vargasii* Wurdack, *M. vilcabambensis* Wurdack and *M. weberbaueri* J. F. Macbr., but all these have stamen connectives with spreading, reddish purple corollas and stamen connectives with descending dorsobasal appendages (vs perpendicular dorsobasal in *M. hirsuta*) and ascending dorsal appendages of the antisepalous stamens (vs absent in *M. hirsuta*), except *M. amischophylla*, which has dorsal appendages as mere humps, and *M. weberbaueri*, which lacks dorsal appendages.

The location of the inflorescences on the branches in *Meriania hirsuta* is unclear as the only fertile specimen (Baldeón & Campos 5373) has three short branches with flowers located at the distal nodes. The inflorescences could be interpreted as axillary fascicles (8–10-flowered) or as one terminal panicles (8–18.5 cm long with 3 nodes). The former is a feature not seen within *Meriania* and the latter is present in all species within the *M. radula* complex, although in these species the inflorescences longer than 18 cm and with more than (4 or) 5 nodes.

Additional specimens examined (paratypes) — Peru: Piura, Prov. Ayabaca [Huancabamba], Dist. El Carmen de la Frontera, Carretera Sapalache-Cerro Chinguelas, 05°08’23.6"S, 79°23’45.4"W, 3035 m, 3 Sep 2016 (sterile), F. A. Michelangeli & al. 2636 (NY!, USM!).

6. *Meriania juanjil* Rob. Fern., R. Goldenb. & Michelang., sp. nov. — Fig. 6, 13. Holotype: Peru, Amazonas, Prov. Bongará, Montane rainforest along Yambrasbamba-Pomacocha trail between Yambrasbamba and Yanayacu, 2200–2300 m, 26 Jun 1962 (fl.), J. Wurdack 1054 (USM accession no. 27403; isotypes: F accession no. [16012]4!, NY barcode [02499960], P barcode [05225706], US barcode [02925052]).

Diagnosis — A species differing from other congeners by the combination of elliptic leaf blades (10.8–12.7 × 2.7–3 cm) with moderately puberulent indumentum on the abaxial surfaces, 3-nerved venation, subcalyptrate calyces with small conic dorsal projections (0.5 mm long) and irregular dehiscence, campanulate, pink-orange corollas and isomorphic stamens.

Morphological description — Shrub up to 5 m tall; young branches and petioles puberulent, glabrescent to sparsely so on young branches with stellulate trichomes up to 0.13 mm long, sparsely to moderately on petioles with stellate trichomes up to 0.13 mm long. Young branches quadrangular, 4–5.5 mm in diam., lacking wings, nodes without interpetiolar flaps and leaf axils moderately covered with elongate, slightly roughened trichomes up to 2 mm long. Leaves opposite, isophyllous. Petioles quadrangular, 1.8–2.3 cm long, without projections. Leaf blades coriaceous, 10.8–12.7 × 2.7–3 cm, elliptic, apex acute, base acute to slightly obtuse, margin entire, dis-
Fig. 13. *Merania juanjil*. Terminal fertile branch with inflorescences; B: detail of convergence of midvein and secondary veins, abaxial view; C: detail of calyx apex; D: inflorescence branch; E: stamen, lateral view; F: petal; G: flower with petals and stamens removed. – A–G from J. Wurdack 1054.
colorous; venation acrodromous and suprabasal, with one pair of secondary (lateral nerves), diverging 3–4.5 mm from base of blade and an additional pair of faint submarginal veins running up to leaf apex, tertiary (transversal nerves) 27–32 on each side of primary, percurrent, 1.5–5 mm distant from each other, midvein and secondary veins impressed, tertiary veins and reticulation barely to not visible on adaxial surface, midvein and secondary veins salient, tertiary veins prominent, reticulation impressed on abaxial surface; adaxial surface flat, dark olive when dry, glabrous; abaxial surface light olive when dry, midvein and secondary veins moderately puberulent with stellate trichomes up to 0.13 mm long intermixed with elongated slightly roughened trichomes up to 0.5 mm long, secondary veins and reticulation sparsely puberulent with only stellate trichomes, with elongated slightly roughened trichomes up to 1 mm long at convergence of midvein and secondary veins. Inflorescences pseudolateral panicles (initially terminal but overtopped by developing axillary bud), erect, 6.8–10 × 4.8–8.3 cm, submultiflorous or multiflorous; axis and peduncle moderately puberulent with stellate trichomes up to 0.13 intermixed with elongated trichomes with a substellate base up to 0.75 mm, longer (up to 1.5 mm long) on nodes. Peduncle 1.8–2.4 cm long, quadrangular. Main axis 5.2–5.9 cm, quadrangular, with 2(or 3) pairs of proximal paraparacles and two nodes, subdistal node with 3 pairs of flowers, distal node with an umbel. Paraparacles in proximal pairs, 3.8–4.5 cm long; flowers in 5–7-flowered umbels at ends of branchlets. Bracts foliaceous, persistent, 7–10.5 × 1.8–2.9 cm, petioles 1.6–3.4 cm long, shape and indumentum similar to principal leaves; sometimes with one pair of additional bracts on subproximal paraparacles of main axis, 4.1–6.5 × 1–1.6 cm, petioles 1.8–2 cm long. Bracteoles not seen (probably early caducous). Flowers 5-merous, pendant, with campanulate corollas. Pedicels 6–8 mm long, colour unknown, moderately puberulent covered with trichomes similar to ones on peduncle and axis. Hypanthium c. 3.5 × 4 mm, campanulate, colour unknown, outer surface moderately puberulent covered by trichomes similar to ones on pedicels, inner surface glabrous; torus glabrous. Calyx opening irregularly, colour unknown, outer surface moderately puberulent with stellate trichomes up to 0.13 mm long, inner surface sparsely puberulent with similar trichomes; calyx lobes closely connate in bud, forming a subcalyptra, 3–3.5 mm long, each with a small conic dorsal projection, 0.5 mm long, at maturity splitting irregularly into 2–3 segments, segments irregularly acute to obtuse. Petals 11–13.5 × 10–12.5 mm, c. 2 mm wide at base, obovate and slightly asymmetric, apex rounded, margin entire, pink-orange, glabrous. Stamens 10, isomorphic, all bent to one side of flower giving flower a zygomorphic appearance; filaments 6.5–7 mm long, colour unknown, flat, glabrous; connectives prolonged below thecae c. 0.5 mm (not including descending dorsobasal appendage), colour unknown, glabrous, with one descending dorsobasal appendage, c. 0.75 mm long, acute; anthers 5.5–6 mm long, lanceolate, colour unknown, glabrous, straight or with apices slightly reflexed, opening by one apical to slightly dorsally inclined pore, thecae surfaces smooth. Ovary 5-locular, superior, free, c. 3 × 2.5 mm, oblong and slightly 5-lobed, colour unknown, not exceeding hypanthium length, glabrous; style c. 22.5 mm long, colour unknown, glabrous, slightly incurved at apex and opposite to anthers at anthesis; stigma punctiform and minutely papillate, c. 0.8 mm wide, colour unknown. Fruits and seeds not seen.

Phenology — Flowering occurs in June.

Distribution and ecology — Merania juanjil is endemic to high-elevation montane forests in Bongará province in the Department of Amazonas, on moderately sloping terrain at 2200–2300 m.

Conservation status — Merania juanjil is known from a single collection from Bongará province. Currently, the pristine forests in the Bongará province are decreasing due to the expansion of agriculture and livestock (see additional comments under M. bongarana). Therefore, following IUCN (2012, 2019) guidelines and based on an estimated area of occupancy of 4 km², we recommend the category Critically Endangered CR B2ab(iii) for this species.

Etymology — The specific epithet “juanjil” refers to the name applied by local people in Bongará to the Melastomataceae. Because the epithet is a noun in apposition, it retains its own termination irrespective of the gender of the generic name (see Turland & al. 2018: Art. 23.5).

Discussion — Merania juanjil is clearly distinguished from other species within the genus by the combination of subcalyptrate calyces with small conic dorsal projections (c. 0.5 mm long) and irregular dehiscence, campanulate, pink-orange corollas and isomorphic stamens. The calyx lobes are closely connate in bud, forming a subcalyptra or calyptra, a feature present in other genera within Merianieae (such as Centronia and Graffenrieda) and outside the tribe (e.g. Alloneuron Pilg., Miconia Ruiz & Pav., Mouriri Aubl., Wurdastom B. Walln.). Merania species with these characteristics can be separated into two artificial groups, the first one with species with spreading corollas (e.g. M. brachycera (Naudin) Humberto Mend. & Fern. Alonso, M. escherensis, M. kirkbridgei Wurdack, M. maguirei Wurdack) and the second one with campanulate corollas (e.g. M. acida, M. grandiflora (Standl.) Almeda, M. phlomoides (Triana) Almeda, M. tomentosa, M. vasquezii). Within the latter group, M. juanjil is similar to M. denticulata (Ecuador) and M. vasquezii, also described here from Peru (see comments under the latter for differences). These three species share the subcalyptrate calyx with small dorsal projections...
and irregular dehiscence. However, *M. juanjil* is distinguished from *M. denticulata* by its leaf blades 10.8–12.7 × 2.7–3 cm (vs 9–21–(24) × 5–12(–17) cm) and 3-nerved (vs 5(–7)-nerved) and petals 11–13.5 × 10–12.5 mm (vs 8–10 × 7–8 mm).

In Peru, there are three other species of *Meriania* with a calyptrate calyx [*M. acida*, *M. escalerensis* (also described here) and *M. tomentosa*], but none of them has dorsal projections on the calyx. *Meriania escalerensis* differs from the other species by its calyces with circumscissile dehiscence (vs irregular dehiscence) and spreading, reddish purple corollas (vs campanulate, pink-orange to reddish orange corollas). Additionally, *M. juanjil* is distinguished from *M. acida* and *M. tomentosa* by its subcalyptrate calyx (vs calyptrate) and also differs from the former by its leaf blades 2.7–3 cm wide (vs 5–8 cm wide) and petals 11–13.5 mm long (vs 9–10 mm long). *Meriania juanjil* differs from the latter by its abaxial leaf surface with trichomes only on the nerves (vs evenly covering the entire surface) and inflorescences 6.8–10 cm long (vs 19.9–32.3 cm long).

7. *Meriania megaphylla* Rob. Fern., R. Goldenb. & Michelang., *sp. nov.* — A species differing from other congeners by its leaf blades 10.8–12.7 × 20.5–22.5 × 19–21 mm, 2.5–3 mm wide at base, strongly asymmetrically obovate, apex asymmetric, margin entire, reddish purple, glabrous. *Stamens* 10, isomorphic, all bent to one side of flower at anthesis giving flower a zygomorphic appearance; filaments 10.5–11 mm long, colour unknown, flat, glabrous; connectives not prolonged below thecae, colour unknown, glabrous, with two appendages, one descending dorsobasal, 4–4.5 mm long, triangular, other ascending dorsal appendage, c. 0.75 mm long, blunt and c. 4.5 mm from tip of descending dorsobasal appendage; anthers 8–8.5 mm long, lanceolate, colour unknown, glabrous, straight, opening by one dorsally inclined pore, thecae surface corrugated. *Ovary* 5-locular, superior, c. 4.5 × 3 mm, oblong, colour unknown, not exceeding hypanthium length, glabrous; style 11.5–13.5 mm long, colour unknown, glabrous, incurved at apex and opposite to anthers at anthesis; stigma punctiform and minutely papillate, c. 0.5 mm wide, colour unknown. *Fruits* and *seeds* not seen.

**Phenology** — Flowering occurs in August.

**Distribution and ecology** — *Meriania megaphylla* is endemic to high-elevation montane forests in the Pataz province (Department of La Libertad), between 2000 and 2100 m. The vegetation of this region is part of the relict montane forests from the W slopes of the Andes in NW Peru (see Weigend & al. 2005).

**Conservation status** — *Meriania megaphylla* is known from a single collection made in 1914. Increased deforestation in recent years and artisanal mining threaten the montane forests of Pataz. However, because these crucial forests are at present virtually unknown, we propose that at this time *M. megaphylla* be considered as Data Deficient DD (IUCN 2012, 2019).

**Etymology** — The specific epithet refers to the unusually large leaves of this species.
Fig. 14. *Meriania megaphylla* – A: terminal fertile branch with inflorescence; B: detail of interpetiolar flap; C: detail of leaf base; D: flower at anthesis, apical view; E: stamen, lateral view; F: petal; G: flower with petals and stamens removed. – A–G from A. Weberbauer 7048.
Discussion — *Meriania megaphylla* is distinguished from other species within the genus by the combination of quadrangular and 4-winged internodes, nodes with interpetiolar flaps, an adaxial projection (scutum) at the insertion of the petiole with the leaf blade and large leaf blades (21–29.4 × 14.8–22 cm). Quadrangular and winged internodes also occur in *M. tetragona* (Ecuador and Peru), *M. penningtonii* (Peru) and *M. nobilis* Triana (Colombia), but only *M. penningtonii* lacks interpetiolar flaps on the nodes (vs present in the other species). Additionally, *M. nobilis* has leaf blades with flat adaxial surfaces (vs bullate in *M. megaphylla*), revolute margins at the base (vs entire) and dimorphic stamens (vs isomorphic). In addition, *M. megaphylla* differs from *M. tetragona* by its petioles with adaxial projections (vs abaxial projections), leaf blades 21–29.4 × 14.8–22 cm (vs 7–12 × 3–9 cm) and spreading, reddish purple corollas, isomorphic stamens, and stamen connectives with bullate leaves, spreading corollas, reddish purple corollas, the type specimen of *M. tetraquetra* (vs campanulate, deep red).

Due to the large bullate leaf blades and spreading, reddish purple corollas, the type specimen of *Meriania megaphylla* (Weberbauer 7048) had been erroneously identified as *M. tetraquetra* Triana, a poorly known species endemic to N Peru (Department of Amazonas). However, *M. tetraquetra* probably belongs in a group of species that includes *M. penningtonii* and *M. rugosa* Markgr., these also endemic to N Peru. These species are trees with bullate leaves, spreading corollas, reddish purple petals, isomorphic stamens, and stamen connectives with two appendages, one a triangular descending dorsobasal appendage and the other dorsal appendage a mere hump or absent. Within this group *M. megaphylla* differs from *M. penningtonii* by its petioles with adaxial projections (vs absent), calyces with blunt dorsal projections (vs callose) and stamens connectives with blunt ascending appendages (vs mere humps). Also, *M. megaphylla* can be distinguished from *M. tetraquetra* and *M. rugosa* by its quadrate and 4-winged internodes (vs quadrate but not winged in *M. tetraquetra* and *M. rugosa*), ovate, 21–29.4 × 14.8–22 cm leaf blades (vs oblong, 27–35 × 13–20 cm in *M. tetraquetra* and elliptic, 15–17 × 7–8 cm in *M. rugosa*), calyx with blunt dorsal projections, c. 0.5 mm long (vs absent in *M. tetraquetra* and blunt, 2–3 mm long in *M. rugosa*) and stamen connectives with ascending blunt dorsal appendages (vs absent in *M. tetraquetra* and *M. rugosa*).

*Meriania* is traditionally characterized by its arboreal or shrubby habit with the exception of *S. selvaflorensis* Humberto Mend. (Colombia) which has a lianescent habit. The lianescent habit is also present in other genera within the *Merianieae* (Adelobotrys and Graffenrieda). However, according to the label information on Weberbauer 7048, *M. megaphylla* has a scendent habit. *Meriania megaphylla* is easily distinguishable from *S. selvaflorensis* by its quadrangular and 4-winged branches (vs terete), developed interpetiolar flaps (vs absent), bullate leaf blades (vs flat) and lobed calyx (vs calyptrate).

**Diagnosis** — A species differing from other congers by the combination of 10-costate hypanthia (ridges up to 4.5 mm high in fruit), spreading, reddish purple corollas, large petals (46–55 mm long), dimorphic stamens, stamen connectives with two appendages, one a descending dorsobasal appendage and the other a blunt ascending dorsal appendage, and antisepalous stamen connectives with laterally expanded dorsobasal appendages.

**Morphological description** — Tree up to 20 m tall; young branches and petioles tomentose with elongated trichomes with greatly roughened base, these up to 1 mm long, sparsely to densely on young branches, densely on petioles. *Young branches* quadrangular, 2.5–4.5 mm in diam., nodes without interpetiolar flaps. Leaves opposite, isophyllous, rarely anisophyllous. *Petioles* quadrangular, 1.1–4.8 cm long, without projections. *Leaf blades* coriaceous, 10–17 × 3.7–8.8 cm, elliptic to ovate, apex acute, base acute to obtuse, margin finely serrulate on distal half to two-thirds, discolorous; venation acrodromous and suprabasal, with one of two secondary (lateral nerves), first pair diverging 2–3 mm from base of blade, second pair diverging 5–10 mm from base of blade and an additional pair of faint submarginal veins running up to leaf apex, tertiary (transversal nerves) 30–40 on each side of primary, percurrent, 2–10 mm distant from each other, midvein, secondary and tertiary veins impressed, reticulation barely visible on adaxial surface, midvein and secondary veins salient, tertiary veins prominent and reticulation visible or barely visible on abaxial surface; adaxial surface flat, olive-green when dry, glabrous or with sparse elongated trichomes with greatly roughened base, denser near base of midvein, up to 1 mm long; abaxial surface greenish ferruginous to ferruginous when dry, densely tomentose to villose with elongated trichomes with greatly roughened base up to 1.5 mm long, similar to ones on petioles, covering almost entire surface. *Inflorescences* terminal panicles, erect, 10–22.5 × 12–23 cm, few-flowered; axis and peduncle densely tomentose with trichomes similar to ones on twigs and petioles, up to 1.5 mm long. *Peduncle* 2–5.5 cm long, quadrangular. *Main axis* 3.1–10.4 cm long, quadrangular, with 1–2 pairs of proximal paraclades and two nodes, subdistal node with 2 flowers, distal node with a dichasium. *Paraclades* in ones proximal pairs, 5.5–11.7 cm long; flowers in regular dichasia at ends of branchlets. *Bracts* foliaceous, persistent, 9.9–11.5 × 2.8–6.6 cm, petioles 1.1–3.7 cm long, shape and indumentum similar to principal leaves; sometimes
Fig. 15. *Meriania sumatika* – A: terminal fertile branch with inflorescence; B: infructescence branch; C: flower at anthesis, apical view; D: petal; E: antisepalous stamen, lateral view; F: antepetalous stamen, lateral view; G: longitudinal section of flower with petals and stamens removed. – A from W. Galiano & al. 6410; B–G from P. Nuñez & J. Arque 8369. – Drawing by Leticia Lajo.
with one pair of additional bracts on proximal nodes of main axis, c. 6 × 1.6 cm, petioles 1 cm long. *Bracteoles* (in *Huamantupa & al. 2060*) caducous, 17–20 mm long, lanceolate, indumentum similar to ones on bracts. *Flowers* 5–merous, with spreading corollas. *Pedicels* c. 6 mm long, ferruginous, densely tomentose, trichomes up to 1 mm long, similar to ones on inflorescence axis. *Hypanthium* c. 9.5 × 10.5–11 mm, campanulate, 10-costate, ridges irregular and obscured by trichomes, up to 2–5 mm high, ferruginous, outer surface densely tomentose to villose with trichomes similar to ones on pedicels, up to 1.5 mm long, inner surface glabrous; torus glabrous. *Calyx* opening regularly, ferruginous, outer surface densely tomentose to villose with trichomes similar to ones on hypanthia, up to 1.5 mm long, inner surface moderately tomentose with same trichomes, up to 1 mm long; tube 2.5–3.5 mm long; lobes 14.5–15 × 8–9 mm, acute, each with a falcate dorsal projection, 14.5–15.5 mm long. *Petals* 46–55 × 38 mm, 4–5 mm wide at base, obovate and slightly asymmetric, apex rounded, margin entire, purple, glabrous. *Stamens* 10, dimorphic, all bent to one side of flower at anthesis giving flower a zygomorphic appearance; antepetalous stamens filaments 24–25 mm long, purple, flat, glabrous, connectives not prolonged below thecae, dark purple in thecae, white in transition to descending dorsobasal appendage, with very short and irregular projections from tip of descending dorsobasal appendage to base of ascending dorsal appendage; with two appendages, one descending dorsobasal, laterally expanded, 7–8 mm long, acute and crowned, yellow, other ascending dorsal appendage c. 1 mm long, blunt, purple, 4.5–5 mm from tip of descending dorsobasal appendage, anthers 14–15 mm long, lanceolate, dark purple, glabrous, with its apical third slightly reflexed, opening by one dorsally inclined pore, thecae surface corrugated; antepetalous stamens filaments 24–25 mm long, purple, flat, glabrous, connectives not prolonged below thecae, dark purple in thecae, white in transition to descending dorsobasal appendage, with very short and irregular projections from tip of descending dorsobasal appendage to base of ascending dorsal appendage, denser on dorsal surface, with two appendages, one descending dorsobasal, 12–13 mm long, acute, yellow, other ascending dorsal appendage, c. 1 mm long, blunt, purple, 7–7.5 mm from tip of descending dorsobasal appendage, anthers 15.5–16 mm long, lanceolate, dark purple, glabrous, straight, opening by one dorsally inclined pore, thecae surface corrugated. *Ovary* 5–locular, superior, free, c. 6.5 × 4 mm, oblong, colour unknown, not exceeding hypanthium length, glabrous; style c. 15 mm long, reddish purple, glabrous, incurved at apex and opposite to anthers at anthesis; stigma punctiform and minutely papillate, c. 0.75 mm wide, colour unknown. *Fruits* capsular (velatidia), with a persistent hypanthium,
clearly 10-costate, ridges up to 4.5 mm high, calyx caducous; mature ovary c. 11 × 10–10.5 mm, spheroid, slightly costate, completely concealed by hypanthium; fruiting pedicels 8–11 mm long. Seeds triangular-linear, 1–1.5 mm long, numerous.

**Phenology** — Flowering occurs in February, May and October and fruiting in May and October.

**Distribution and ecology** — *Meriania sumatika* is endemic to high-elevation montane forests within the Machu Picchu National Sanctuary (Urubamba province) and in the Santa Ana district (La Convención province) in the Department of Cusco, between 1800 and 2900 m. Individuals of this new species have been previously recorded by Alfaro & al. (2018), as *M. tomentosa*, in “Wiñaywayna” and growing with *Aniba coto* (Rusby) Kosterm. (*Lauraceae*), *Gordonia fruticosa* (Schrad.) H. Keng (*Theaceae*), *Hieronyma oblonga* (Tul.) Müll. Arg. (*Phyllanthaceae*), *Melosma peytonii* A. H. Gentry (*Sabiaceae*) and *Myrcia fallax* (Rich.) DC. (*Myrtaceae*).

**Conservation status** — All *Meriania sumatika* specimens were collected in the Machu Picchu National Sanctuary (except Huamantupa & al. 2060). Within this sanctuary, the main threat are forest fires for the establishment of crops (CENEPRED 2020). Therefore, following IUCN (2012, 2019) guidelines and based on an estimated area of occupancy of 24 km², we recommend the category Endangered EN B2ab(iii) for this species.

**Etymology** — The specific epithet comes from the Quechua “*sumaq*” (= beautiful) and “*tika*” (= flower), referring to large showy flowers of this species. Because “*tika*” is a noun in apposition, the epithet retains its own termination irrespective of the gender of the generic name (see Turland & al. 2018: Art. 23.5).

**Discussion** — *Meriania sumatika* is distinguished from other species within the genus by the combination of 10-costate hypanthium, spreading, reddish purple corolla and large petals (46–55 mm long). In the Andean region only two other species have costate hypanthia, *M. campii* Wurdack and *M. costata* Wurdack, both species endemic to Ecuador. *Meriania sumatika* is distinguished from *M. campii* by the leaf blades 10–17 × 3.7–8.8 cm (vs 6–12 × 4–8 cm in *M. campii*), calyx lobes with falcate dorsal projections, 14.5–15.5 mm long (vs blunt carnose, 1.7–4 mm) and dimorphic stamens (vs isomorphic). *Meriania sumatika* also shares falcate dorsal projections on the calyx lobes with *M. costata*. Nevertheless, *M. sumatika* differs from *M. costata* by its spreading, reddish purple corollas (vs campanulate, reddish orange), petals 46–55 mm long (vs c. 22 mm) and stamen connectives not prolonged below the thecae (vs 1.5–1.7 mm prolonged).

Among Peruvian species of *Meriania*, *M. sumatika* probably belongs in a group of species that includes *M. amischophylla*, *M. vargasii* Wurdack and *M. weberbaueri* J. F. Macbr.; the first and third species are endemic to central Peru and the second one is endemic to S Peru. These species are trees with tomentose to villose indumentum, calyx lobes with dorsal projections, spreading corollas, deep pink to reddish purple petals, dimorphic stamens and antisepalous stamen connectives with laterally expanded descending dorsobasal appendages. Within this group *M. sumatika* can be distinguished by its 10-costate hypanthium (vs terete in the other species), calyx lobes with falcate dorsal projections, 14.5–15.5 mm long (vs acute, 1–1.5 mm in *M. amischophylla*; falcate, 5–6 mm in *M. vargasii*; and acute, up to 3 mm in *M. weberbaueri*) and petals 46–55 mm long (vs 19–32 mm in *M. amischophylla*; 20–24 mm in *M. vargasii*; and 20–25 mm in *M. weberbaueri*).

Almost all *Meriania sumatika* specimens were previously determined as *M. tomentosa*. In fact, the two species are almost indistinguishable based on vegetative characters. *Meriania sumatika* differs from *M. tomentosa* by its 10-costate hypanthium (vs terete in *M. tomentosa*), lobed calyx with regular dehiscence (vs calyptrate with irregular dehiscence) and spreading, reddish purple corollas (vs campanulate, reddish orange).

Here we place Huamantupa & al. 2060 (in flower bud) in *Meriania sumatika* with reservation, because it has slightly costate hypanthia and calyx lobes with smaller dorsal projections (4–5 mm vs 14.5–15.5 mm). In addition, this specimen was collected 41 km away from the others.

**Additional specimens examined (paratypes) — Peru:** Cusco, Prov. Urubamba, Dist. Machupichu, Intipata, Santuario Histórico de Machu Picchu, 2950 m, 10 Feb 1990 (fl.), A. Cano & al. 2874 (HUT!); Wiñay-Wayna, Machupichu, 2850–2900 m, 21 May 1991 (fr.), H. Dueñas 27 (CUZ!); Microcuenca Wiñaywayna, Wiñaywayna-Intipunku, 13°10’23.04”S, 72°32’03.44”W, 2700 m, 24 Jun 2001 (fr.), R. Tupayachi & al. 4926 (CUZ!); camino Inca, entre Wiñay Wayna e Intipunku, quebrada Wacrataymo, 13°10’42”S, 72°32’02”W, 2737 m, 24 May 2004 (fl., fr.), W. Galiano & al. 6410 (CUZ!, NY!); Prov. La Convención, Dist. Santa Ana, Potrero, 13°53’56”S, 72°43’50”W, 1800 m, 27 May 2002 (fl. bud), I. Huamantupa & al. 2060 (USM!).

9. **Meriania vasquezii** Rob. Fern., R. Villanueva & Michelang., sp. nov. – Fig. 3, 17, 18. Holotyope: Peru, Pasco, Prov. Oxapampa, Dist. Chontabamba, Ucumano Lodge, 10°38’08”S, 75°25’39”W, 2244 m, 23 Feb 2021 (fl.), R. Vásquez, L. Valenzuela, E. Pinche & C. Rojas 45480 (HOXA accession no. 077441; isotypes: MO!, MOL barcode 00009!, UPCB accession no. 99426!).

**Diagnosis** — A species differing from other congeners by the combination of leaf blades with dense villose in-
Fig. 17. *Meriania vasquezii* – A: terminal fertile branch with inflorescence and detail of inflorescence branch; B: detail of abaxial leaf surface; C: detail of calyx apex; D: antisepalous stamen, lateral view, with detail of descending dorsobasal appendage; E: antipetalous stamen, lateral view, with detail of descending dorsobasal appendage; F: hypanthium and calyx after anthesis. – A–F from R. Vásquez & al. 45480.
Fig. 18. *Meriania vasquezii* – A: terminal fertile branch with inflorescence; B: detail of inflorescence; C: flower at anthesis, apical view; D: immature fruit. – A–D from R. Vásquez & al. 45480. – Photographs by Rodollo Vásquez.
dumentum on the abaxial surfaces, inflorescences with flowers in regular dichasia at the ends of branchlets, subcalyptrae calyx with small dorsal projections (c. 3 mm long) and irregular dehiscence, campanulate, deep pink corollas, dimorphic stamens and antisepalous stamen connectives with laterally expanded descending dorsobasal appendages.

**Morphological description — Shrub** up to 2.5 m tall; young branches and petioles pubescent with stellate trichomes up to 0.25 mm long, sparsely to moderately on young branches, moderately to densely on petioles. **Young branches** quadrangular, 5–5.5 mm in diam., lacking wings, nodes without interpetiolar flaps. **Leaves** opposite, isophyllous. **Petioles** quadrangular, 2.2–5 cm long, without projections. **Leaf blades** coriaceous, 16.5–23.5 × 9.3–10.7 cm, broadly elliptic to ovate, apex acuminate, base rounded to obtuse, margin denticulate on distal half and entire to obscurely denticate on proximal half, discolorous; venation acrodromous and suprabasal, with one or two pairs of secondaries (lateral nerves), diverging 3–7 mm from base of blade and an additional pair of faint submarginal veins running up to leaf apex, tertiary (transversal nerves) 40–44 on each side of primary, percurrent, 2–9 mm distant from each other, midvein, secondary and tertiary veins impressed, reticulation barely visible on adaxial surface, midvein and secondary veins salient, tertiary veins and reticulation prominent on abaxial surface; adaxial surface slightly bullate, dark when dry, glabrous or with sparse elongated trichomes with a subellate base, denser near base, up to 1.5 mm long; abaxial surface golden brown when dry, midvein, secondary veins, tertiary veins, reticulation and surface densely villose with elongated curly trichomes with a subellate base up to 2.5 mm long, evenly covering entire surface. **Inflorescences** terminal panicles, erect, 26.5–29.5 × 12.3–14 cm, submultiflorous; axis and peduncle densely tomentose with elongated trichomes with a subellate base up to 1 mm long, longer (up to 2.5 mm long) on nodes. **Peduncle** c. 7.5 cm long, quadrangular. **Main axis** 18.1–18.3 cm, quadrangular. **Paraclades** in 4 pairs, proximal 10.5–14.7 cm long, distal 3.9–4 cm long; flowers in regular dichasia at ends of branchlets. **Bracts** foliaceous, persistent, 16.5–19.1 × 9.3–10.5 cm, petioles 2.2–3.4 cm long, shape and indumentum similar to principal leaves. **Bracteoles** caducous, c. 20 × 1 mm, linear, indumentum similar to ones on peduncle and axis. **Flowers** 5-merous erect, with campanulate corollas. **Pedicels** 9–12 mm long, golden brown, densely tomentose villose covered with trichomes similar to ones on peduncle and axis. **Hypanthium** c. 11 × 7 mm, campanulate, sometimes slightly costate, ridges obscured by trichomes, up to 0.75 mm high, golden brown, outer surface densely tomentose villose covered by trichomes similar to ones on pedicels, inner surface glabrous; torus glabrous. **Calyx opening** irregularly, golden brown, outer surface densely tomentose villose covered by trichomes similar to ones on pedicels, inner surface glabrous; calyx lobes closely connate in bud, forming a subcalyptra, 7.5–8.5 mm long, each with a small claw-shaped dorsal projection, c. 3 mm long, at maturity splitting irregularly. **Petal** 25–31 × 23–26 mm, c. 4 mm wide at base, obovate and slightly asymmetric, apex rounded, margin entire, deep pink, glabrous. **Stamens** 10, dimorphic, all bent to one side of flower giving flower a zygomorphic appearance; antisepalous stamens with filaments 12–13.5 mm long, light purple, glabrous; connectives prolonged below thecae c. 1 mm (not including descending dorsobasal appendage), purple, glabrous, with two appendages, one descending dorsobasal, laterally expanded, 3–3.5 mm long, acute and slightly crowned, light purple, other appendage dorsal appendage a mere hump, c. 0.5 mm, broadly rounded, light purple, 1.5–2 mm from tip of descending dorsobasal appendage, anthers c. 11.5 mm long, lanceolate, purple, glabrous, straight or with its apical portion slightly reflexed, opening by one dorsally inclined pore, thecae surface corrugated; antipetalous stamens with filaments 12–13 mm long, light pink, glabrous; connectives prolonged below thecae 1–1.5 mm (not including descending dorsobasal appendage), purple, glabrous, with one descending dorsobasal appendage, 2.5–3 mm long, triangular, light purple, anthers c. 12 mm long, lanceolate, purple, glabrous, straight or with its apical portion slightly reflexed, opening by one dorsally inclined pore, thecae surface corrugated. **Ovary** 5-locular, superior, free, c. 6 × 4 mm, oblong and slightly 5-lobed, colour unknown, not exceeding hypanthium length, glabrous; style c. 20 mm long, purple, glabrous, slightly incurved at apex and opposite to anthers at anthesis; stigma punctiform and minutely papillate, c. 1 mm wide, whitish. **Fruits** and **seeds** not seen.

**Phenology** — Flowering occurs in February.

**Distribution and ecology** — Meriania vasquezii is endemic to high-elevation montane forests in the Oxapampa province in the Department of Pasco, on moderate slopes at 2244 m.

**Conservation status** — Meriania vasquezii is known from a single collection from Oxapampa province. Increased fieldwork in montane and premontane forests in this region has led to the discovery of several new species of Melastomataceae in recent years (Cárdenas & al. 2014; Michelangeli & Goldenberg 2018, 2021). Therefore, the effective protection of the diverse habitats in Oxapampa province is a high priority. Following IUCN (2012, 2019) guidelines and based on an estimated area of occupancy of 4 km², we recommend the category Critically Endangered CR B2ab (iii) for this species.

**Etymology** — It is an honour to dedicate this species to Rodolfo Vásquez, researcher at the Estación Biológica
del Jardín Botánico de Missouri, who for over 30 years has made an incredible contribution to the knowledge of the flora of Peru. He wrote *Flórula de las reservas biológicas de Iquitos, Perú* (Vásquez 1997) and led the publication of *Flora del Río Cenepa, Amazonas Perú* (Vásquez & al. 2010a, 2010b).

**Discussion** — *Meriania vasquezii* is distinguished from other congeners by the combination of subcalyptrate calyces with small claw-shaped dorsal projections (c. 3 mm long) and irregular dehiscence, campanulate, deep pink corollas, dimorphic stamens and anisopodal stamen connectives with laterally expanded dorsobasal appendages. The species with calyptrous or subcalyptrate calyces and campanulate corollas usually have pink-orange to reddish orange petals (see additional comments under *M. juanjil*). However, *M. vasquezii* is the exception within this group by its deep pink petals. Also, the only Peruvian species with a subcalyptrate calyx and campanulate corolla is *M. juanjil*.

In Peru, the species of *Meriania* with calyx lobes closely connate in bud can be separated into two artificial groups; species with calyptrous calyces (*M. acida, M. escalerensis* (also described here) and *M. tomentosa*) and species with subcalyptrate calyces (*M. juanjil* and *M. vasquezii*). Nevertheless, *M. vasquezii* is easily distinguished within the former group by its small claw-shaped dorsal projections on the calyx (vs absent in the other species) and dimorphic stamens (vs isomorphic). *Meriania vasquezii* most closely resembles *M. juanjil*. They share subcalyptrate calyces with dorsal projections and campanulate corollas, but both species can be distinguished by the leaf blade size (16.5–23.5 × 9.3–10.7 cm in *M. vasquezii* vs 10.8–12.7 × 2.7–3 cm in *M. juanjil*), arrangement of flowers at branchlet ends (regular dichasia vs 5–7-flowered umbels) and length and colour of the petals (25–31 mm long and light purple vs 11–13.5 mm long and pink-orange).

**New record**

10. *Meriania zunacensis* D. Fernández & Dellinger in Phytotaxa 458: 7. 2020. — Holotype: Ecuador, Prov. Tungurahua, Cantón Baños, Parroquia Río Negro, Sector El Topo, Estación Científica Río Zuñac, Fundación EcoMinga, 01°22.593’S, 78°09.213’W, 1568 m, 26 May 2018 (fl., fr.), L. Jost, F. Recalde & S. Recalde 10600 (QCNE barcode 243978 [1/2], QCNE barcode 243977 [2/2]; isotype: QCNE barcode 243976). – Fig. 9, 19.

**Morphological description** — Tree up to 20 m tall; young branches glabrous, petioles glabrous to moderately puberulent with simple trichomes, up to 0.13 mm long. *Young branches* quadrangular and ribbed, 4.5–5.5 mm in diam., nodes with interpetiolar flaps, 2.5–5 mm long. *Leaves* opposite, slightly anisophyllous. *Petioles* semiterete and adaxially ribbed, 2.5–5 cm long, with an adaxial projection (scutum) at insertion of petiole with leaf blade, up to 2 mm tall. *Leaf blades* subcoriaceous, 11.4–26 × 5.6–19.3 cm, ovate to broadly elliptic, apex acuminate, base broadly obtuse to rounded, margin entire, revolute at base, discolored; venation acrodromous and basal, with two pairs or sometimes three pairs of secondaries (lateral nerves) and an additional pair of faint submarginal veins running up to leaf apex, tertiary (transversal nerves) 29–40 on each side of primary, percurrent, 1.5–14 mm distant from each other, midvein, secondary and tertiary veins impressed, reticulation barely visible on adaxial surface, midvein and secondary veins salient, tertiary veins prominent and reticulation visible or barely visible on abaxial surface; adaxial surface flat, dark green when dry, glabrous; abaxial surface green when dry, glabrous to moderately puberulent with simple trichomes, up to 0.13 mm long. *Inflorescences* terminal panicles, erect, 17.5–33 × 21–33 cm, multiflorous; axis and peduncle glabrous. *Pedicule* 5.5–14.5 cm long, quadranular and slightly ribbed. *Main axis* 13–26 cm long, quadranular and slightly ribbed. *Paraclades* in 4 pairs, proximal 14.5–23.5 cm long, distal 3.5 cm long; flowers in 4- or 5-flowered umbels at ends of branchlets. *BRACTS* foliaceous, persistent, 15.3–20 × 10.3–11 cm, petioles 3–4.5 cm long, shape and indumentum similar to principal leaves. *Bracteoles* not seen (probably early caducous). *Flowers* 5–merous, erect, with spreading corollas. *Pedicels* 6–15 mm long, green, glabrous. *Hypanthium* 11.5–12 × 18–18.5 mm, campanulate, green to light purple, outer and inner surface glabrous; torus glabrous. *Calyx* opening regularly, green to light purple, outer and inner surface glabrous; tube 6–8 mm long, entire; with 5 slightly callose dorsal projections, whitish and much lighter than rest of calyx and hypanthium when dry. *Petals* 40–50 × 33–37 mm, 8.5–9.5 mm wide at base, asymmetrically obovate, apex rounded, margin entire, reddish purple, glabrous. *Stamens* 10, isomorphic, all bent to one side of flower at anthesis giving flower a zygomorphic appearance; filaments 19–19.5 mm, light reddish purple, flat, glabrous; connectives not prolonged below thecae, purple in thecae, light purple in transition to descending dorsobasal appendage, glabrous, with one descending dorsobasal appendage, 6–7 mm long, triangular, cream; anthers 13–14.5 mm long, lanceolate, purple, glabrous, straight, opening by one dorsally inclined pore, thecae surface smooth surface. *Ovary* 5–locular, superior, free, 13–14.5 × 7–7.5 mm, ovate and 5-lobed, with apical ring of 5 tooth, c. 1 mm long, reddish purple, 6 mm exceeding hypanthium length, glabrous; style 15.5–16 mm long, reddish purple, glabrous, incurved at apex and opposite to anthers at anthesis; stigma punctiform and minutely papillate, c. 1 mm wide, whitish. *Fruits* capsular (velatid), with persistent hypanthium and calyx; mature ovary 13–14.5 × 8.5–11 mm, pyriform, slightly costate, 12–13 mm exceeding hypanthium length; fruiting pedicels 15–17 mm long. *Seeds* not seen.

**Phenology** — Flowering occurs in February, June and July and fruiting in February and July.
Fig. 19. *Meriania zunacensis* – A: node with interpetiolar flap and adaxial projection on petiole apex; B: terminal fertile branch with inflorescence; C: flower at anthesis, apical view; D: immature fruits. – A–D from R. Fernandez-Hilario & al. 1920. – Photographs by Robin Fernandez.
Distribution and ecology — Meriania zunacensis grows in high-elevation montane forests and elfin forests in Amazonas, Bagua and Bongará provinces in the Department of Amazonas, between 1500 and 2280 m. Populations of this species occur in pristine forests.

Discussion — During the preparation of this work we found specimens that did not correspond to any Peruvian species and we were in the process of describing them as a new taxon. However, the recent publication of Meriania zunacensis made us realize that these Peruvian specimens belonged to this newly described species, although some minor morphological differences do exist expanding some size ranges (see description). Meriania zunacensis was previously known only from Andean forests in Ecuador (Tungurahua province; Fernández-Fernández & al. 2020). We can now add three new localities in the Department of Amazonas in N Peru. Among Peruvian species of Meriania, nodes with interpetiolar flaps occur in M. callosa (see comments under this species for differences), M. megaphylla, M. sanguinea and M. tetragona. However, M. megaphylla has quadrangular winged internodes (vs quadrangular and ribbed in M. zunacensis), leaf blades with cordate bases and bullate adaxial surfaces (vs broadly obtuse to rounded and flat surfaces) and calyces with blunt dorsal projections (vs without projections). Meriania zunacensis can also be distinguished by its petioles with adaxial projections (scutum) (vs abaxial projections; liguliform projections in M. sanguinea and tuberculate projections in M. tetragona), leaf blades with entire margins and revolute at bases (vs serrulate margins and not revolute in M. sanguinea and M. tetragona) and spreading, reddish purple corollas (vs campanulate, deep red corollas in M. sanguinea and M. tetragona). A detailed comparison of M. zunacensis with other related species can be found in Fernández-Fernández & al. (2020).

Specimens examined — PERU: Amazonas, Prov. Amazonas, Dist. Vista Alegre, entre Vista Alegre y La Ventana a Naciente del Río Negro, 06°08’S, 77°18’W, 1500–1640 m, 2 Jul 1998 (fl., fr.), I. Sánchez & al. 9610 (CPUN!, F!); Prov. Bagua, La Peca, 1850–1900 m, 14 Jun 1978 (fl. bud), A. Gentry & al. 23012 (USM!, US!); Prov. Bongará, Dist. Yambrasbamba, inmediaciones de la Estación Biológica Abra Patricia, trochas cercanas a Naciento del Río Negro, 06°08’S, 77°18’W, 2123 m, 21 Feb 2020 (fl.), R. Fernandez-Hilario & al. 1938 (HOXA!, MOL!, UPCB!).

Author contributions

The authors contributed as follows: RFH: study conceptualization, data collection, specimen examination and draft preparation; RdPRG and RVE: data collection, specimen examination and draft preparation; LL: specimen examination and illustrations; AAWS: data collection and specimen examination; DPB: draft preparation; LPH: data collection and specimen examination; FAM and RG: study conceptualization, specimen examination and draft preparation. All authors reviewed the results and approved the final version of the manuscript.

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