

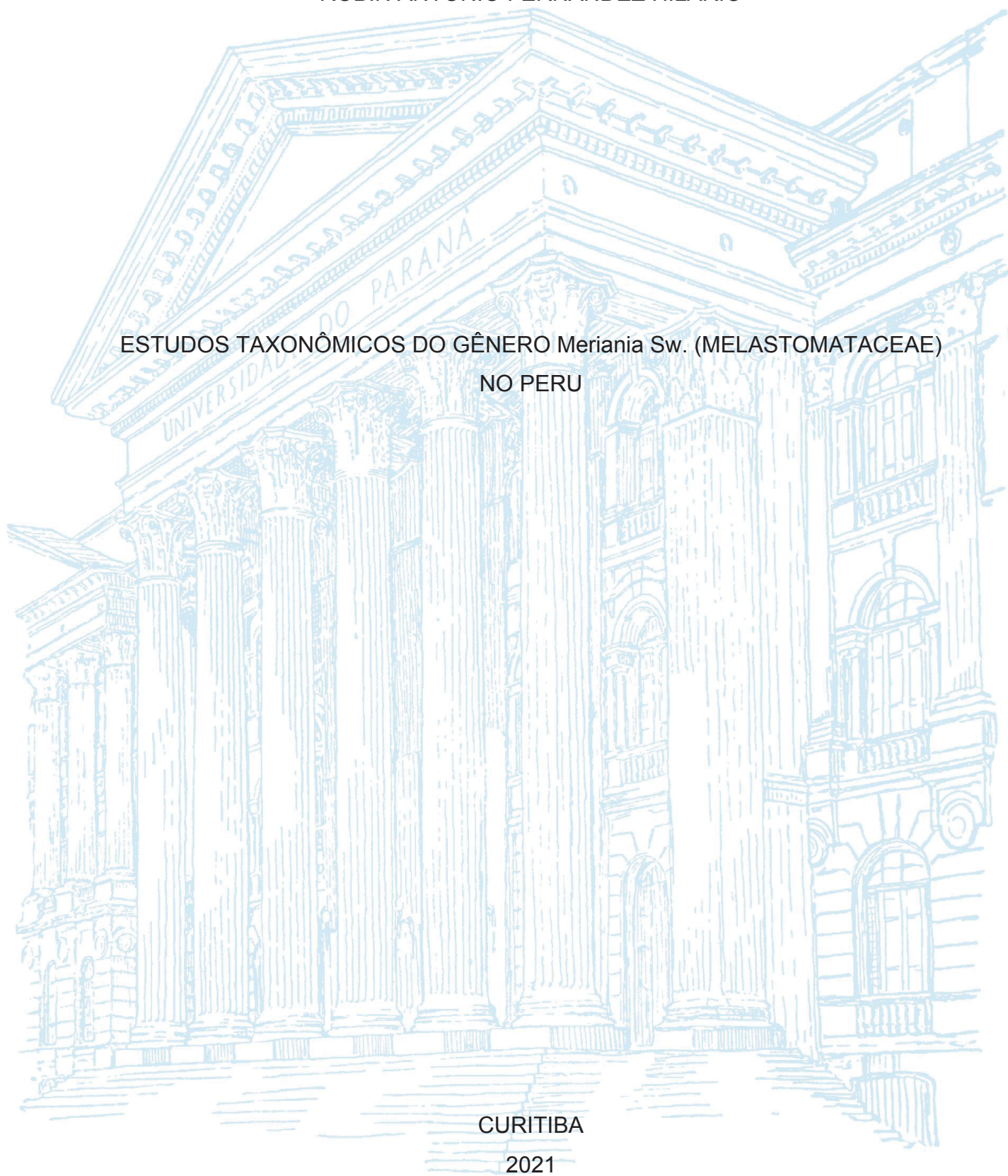
UNIVERSIDADE FEDERAL DO PARANÁ

ROBIN ANTONIO FERNANDEZ HILARIO

ESTUDOS TAXONÔMICOS DO GÊNERO *Meriania* Sw. (MELASTOMATACEAE)
NO PERU

CURITIBA

2021



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NO PERU

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Orientador: Prof. Dr. Renato Goldenberg

Coorientador: Prof. Dr. Fabián A. Michelngeli

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*“Es difícil persistir en la poesía, más aún
cuando ella misma nos desorienta:
en la desesperación
yo escribí los poemas más sosegados.
¡Casi enloquezco pidiendo calma!”*

Extrato do poema “Flores” do José Watanabe

RESUMO

A tribo neotropical Merianieae (Melastomataceae) agrupa taxa com frutos capsulares, anteras com apêndices dorsais e sementes predominantemente piramidais. Dentro de essa tribo, o gênero *Meriania* Sw. compreende 121 espécies de arbustos e árvores (ou ocasionalmente lianas) que ocorrem desde o sul do México e das Grandes Antilhas até o sudeste do Brasil e a Bolívia. *Meriania* é tradicionalmente caracterizado por apresentar cálice com lóbulos conspícuos ou cálice caliptrado com deiscência regular, irregular ou circuncisa e poro da antera geralmente em posição dorsal. No Peru, *Meriania* está representado por espécies que crescem principalmente em florestas de altitude, entre 1500 e 2800 metros. Além disso, ainda não existe nenhum estudo taxonômico completo com ilustrações, chaves e descrição de *Meriania* para o Peru. Neste estudo começamos a revisão taxonômica do gênero *Meriania* para o Peru com objetivo de definir limites morfológicos interespecíficos, esclarecer afinidades entre as diferentes espécies e circunscrição do gênero. Ademais, também foi avaliado o grau de ameaça das novas espécies de *Meriania* de acordo com os critérios da IUCN. O estudo foi realizado em três etapas: 1) visitas e análise de coleções nos herbários AMAZ, CUZ, CPUN, F, HAO, HOXA, HSP, HUT, KUELAP, MOL NY, US e USM; a análise do material tipo em outros herbários foi através da consulta de imagens públicas online por meio da plataforma JSTOR, 2) expedições de coleta de material para as regiões do Amazonas, Cajamarca, Cusco, Huánuco e Junín; as espécies registradas foram coletadas seguindo a metodologia tradicional de herborização, e 3) os dados foram processados para a elaboração das descrições para as espécies, e finalmente foram propostos os graus de ameaça das novas espécies. Doze novas espécies (*M. bicentenaria*, *M. bongarana*, *M. callosa*, *M. dazae*, *M. escalerensis*, *M. hirsuta*, *M. juanjil*, *M. megaphylla*, *M. microflora*, *M. penningtonii*, *M. sumatika* e *M. vasquezii*) foram descritas, uma nova combinação foi feita (*M. sessilifolia*) e quatro novas ocorrências (*M. drakei*, *M. franciscana*, *M. peltata* e *M. zunacensis*) foram registradas para o Peru. Finalmente, foram designados lectótipos para nove espécies (*Axinaea drakei*, *A. purpurea*, *Centronia sessilifolia*, *Graffenrieda acida*, *Meriania prunifolia*, *M. raimondii*, *M. rugosa*, *M. spruceana* e *Pachymeria rigida*).

Palavras-chave: Sistemática, Merianieae, *Centronia*, *Axinaea*, Andes

ABSTRACT

The Neotropical tribe Merianieae (Melastomataceae) groups taxa with capsular fruits, anthers with dorsal appendages and predominantly pyramidal seeds. Within this tribe, the genus *Meriania* Sw. comprises 121 species of shrubs and trees (or occasionally lianas) distributed from southern Mexico and the Greater Antilles to south-eastern Brazil and Bolivia. *Meriania* is traditionally characterized by its calyx with conspicuous lobes or calyprate calyx with regular, irregular or circumcised dehiscence, and anther pore usually in dorsal position. In Peru, *Meriania* is represented by species growing mainly in high montane forests, between 1500 and 2800 metres. Moreover, there is still no complete taxonomic study with illustrations, keys and description of *Meriania* for Peru. In this study we started the taxonomic revision of the genus *Meriania* for Peru in order to define interspecific morphological limits, to clarify affinities among the different species and circumscription of the genus. In addition, the threat category of the new species of *Meriania* according to the IUCN criteria was also evaluated. The study was carried out in three stages: 1) visits and analysis of collections in the herbaria AMAZ, CUZ, CPUN, F, HAO, HOXA, HSP, HUT, KUELAP, MOL NY, US and USM; the analysis of type material in other herbaria was by consulting online public images through the JSTOR platform, 2) expeditions to collect material to the regions of Amazonas, Cajamarca, Cusco, Huánuco and Junín; the recorded species were collected following traditional herborization methodology, and 3) the data were processed for the elaboration of descriptions for the species, and finally the threat categories of the new species were proposed. Twelve new species (*M. bicentenaria*, *M. bongarana*, *M. callosa*, *M. dazae*, *M. escalerensis*, *M. hirsuta*, *M. juanjil*, *M. megaphylla*, *M. microflora*, *M. penningtonii*, *M. sumatika* and *M. vasquezii*) were described, one new combination was made (*M. sessilifolia*) and four new records (*M. drakei*, *M. franciscana*, *M. peltata* and *M. zunacensis*) were recorded for Peru. Finally, lectotypes were assigned to nine species (*Axinaea drakei*, *A. purpurea*, *Centronia sessilifolia*, *Graffenrieda acida*, *Meriania prunifolia*, *M. raimondii*, *M. rugosa*, *M. spruceana* and *Pachymeria rigida*).

Keywords: Systematic, Merianieae, *Centronia*, *Axinaea*, Andes

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1 INTRODUÇÃO GERAL

Melastomataceae, da ordem Myrtales (APG IV, 2016), é uma família principalmente tropical e subtropical com aproximadamente 5750 espécies distribuídas em 177 gêneros (RENNER, 1993; CLAUSING; RENNER, 2001; MICHELANGELI et al. 2020). No Peru é a sexta família mais rica de plantas vasculares, com mais de 637 espécies e 43 gêneros reportados (BRAKO; ZARUCCHI, 1993; ULLOA ULLOA et al., 2004). Nos últimos quinze anos o conhecimento sobre a família Melastomataceae tem aumentado consideravelmente, através de recentes trabalhos florísticos que identificaram 16 novos registros para o território peruano (PAREDES-BURNEO et al., 2018; TORRES et al., 2019) e 31 novas espécies descritas (e.g.: BUSSMANN et al., 2010; CÁRDENAS et al., 2014; BURKE; MICHELANGELI, 2018; MICHELANGELI; GOLDENBERG, 2018). Além da ampla diversidade, as Melastomataceae estão presentes em quase todos os tipos de vegetação neotropical, o que permite que tenham importância de diferentes formas; por exemplo, algumas espécies de Melastomataceae podem ser consumidas pelas populações locais (REYNEL et al., 2016; SMITH et al., 2007), ou podem ser usadas para restauração ecológica de ambientes degradados (ALBURQUERQUE et al., 2013), ou ainda como base para estudos ecológicos com animais (DELLINGER et al., 2018; SANTOS et al., 2017).

A tribo Meranieae, estabelecida por J. J. Triana em 1865, corresponde a uma das maiores tribos neotropicais da família Melastomataceae (BACCI et al., 2019; BOCHORNY et al., 2009; MENDOZA-CIFUENTES; FERNÁNDEZ-ALONSO, 2010). Dentro da tribo, o gênero *Meriania* Sw. apresenta entre 121 espécies principalmente arbóreas e arbustivas que se distribuem do Sudeste do México até o Leste do Brasil e Bolívia (MICHELANGELI et al., 2015, 2020). Atualmente, os limites genéricos de *Meriania* não estão claramente definidos, principalmente pelas similaridades morfológicas que apresenta com algumas espécies de *Adelobotrys* DC., *Axinaea* Ruiz & Pav. e *Centronia* D. Don (MENDOZA-CIFUENTES; FERNÁNDEZ-ALONSO, 2010, 2012).

A última revisão mais completa do gênero *Meriania* foi elaborada por Cogniaux (1891), abrangendo cerca de 50 espécies classificadas em cinco seções. Posteriormente, outros levantamentos florísticos regionais da família Melastomataceae têm incluído registros para o gênero *Meriania* no Brasil

(CHIAVEGATTO, 2009), na Colômbia (MENDOZA-CIFUENTES, 2021), na Costa Rica (ALMEDA, 2007), no Equador (WURDACK, 1980), nas Grandes Antilhas (MICHELANGELI et al., 2015), nas Guianas (WURDACK et al., 1993), na Mesoamérica (ALMEDA, 2009) e na Venezuela (WURDACK, 1973). No caso do Peru, o último trabalho foi realizado por Macbride (1941) durante a elaboração da Flora do Peru, abrangendo 12 espécies no total. Nos anos seguintes, diferentes trabalhos aumentaram para 19 o número de espécies reconhecidas para o Peru (BRAKO; ZARUCCHI, 1993; COTTON et al., 2014; PAREDES-BURNEO et al., 2018; MICHELANGELI; GOLDENBERG, 2018).

Devido à ausência de uma filogenia molecular para a tribo Merianieae, ainda não se reconhecem grupos monofiléticos nem as características morfológicas que definem corretamente as circunscrições dos gêneros. O gênero *Meriania* é tradicionalmente caracterizado por apresentar hábito arbustivo ou arbóreo, cálice com lóbulos conspícuos ou caliptrado (mas sem deiscência circuncisa) e poro da antera em posição dorsal (WURDACK, 1973, 1980). Porém, Mendoza-Cifuentes e Fernández-Alonso (2011, 2012) mostraram inconsistências desses caracteres dentro da tribo Merianieae. Como exemplo, temos o gênero *Centronia*, com aproximadamente 15 espécies (LOZANO; BECERRA, 1999), onde algumas apresentam caracteres mal interpretados ou descritos erroneamente e, portanto, deveriam ser transferidas ou sinonimizadas sob *Meriania* (WURDACK, 1976; MENDOZA-CIFUENTES; FERNÁNDEZ-ALONSO, 2012).

Na atualidade, a diversidade vegetal do Peru está estimada em aproximadamente 19500 espécies registradas e catalogadas (BRAKO; ZARUCCHI, 1993; ULLOA ULLOA et al., 2004; RODRÍGUEZ et al., 2006; HUAMANTUPA et al., 2014; VÁSQUEZ et al., 2018; TORRES et al., 2019). No entanto, ainda existem muitas regiões do território peruano que se encontram inexploradas ou com poucos estudos taxonômicos (HONORIO; REYNEL, 2003) gerando lacunas em nossa compreensão sobre a distribuição das espécies e uma ausência de trabalhos taxonômicos, conhecidas como “Wallacean shortfall” e “Linnean shortfall” respectivamente (WHITTAKER et al., 2005). Junto a essas lacunas deve ser adicionado o crescente desflorestamento que acontece nas florestas andinas e amazônicas (CHIRIF, 2018; BAX; FRANCESCONI, 2018), que acaba reduzindo e fragmentando habitats, e conseqüentemente contribui para o desaparecimento de espécies.

Neste estudo vamos realizar o tratamento taxonômico do gênero *Meriania* para o Peru com o objetivo de definir os limites morfológicos interespecíficos, esclarecer afinidades entre as espécies e suas relações com os gêneros mais próximos (porque provavelmente algumas espécies pouco conhecidas ou mal interpretadas de *Centronia* e *Axinaea* sejam realmente parte de *Meriania*). Igualmente, será avaliado o grau de ameaça das espécies de *Meriania* de acordo com os critérios da IUCN (2019), para promover o estabelecimento de futuras diretrizes para a conservação desse gênero.

O objetivo geral deste estudo é apresentar o tratamento taxonômico para as espécies de *Meriania* Sw. (Melastomataceae) do Peru. Especificamente, procura-se:

- a. Elaborar um tratamento taxonômico embasado em espécimes de *Meriania* coletados no Peru, incluindo chave de identificação, descrições morfológicas, distribuição geográfica, comentários sobre as espécies, fotos, ilustrações e lista de materiais examinados.
- b. Analisar os padrões de distribuição para propor graus de ameaça de acordo com os critérios da IUCN.

A dissertação está dividida em quatro capítulos. Nos três primeiros são descritas doze novas espécies do gênero e três novas ocorrências para o Peru. O último capítulo apresenta a sinopse de *Meriania* para o Peru, com o tratamento para as 36 espécies reconhecidas. O tratamento inclui chave de identificação, comentários das afinidades das espécies, notas nomenclaturais, mapas de distribuição e ilustrações para as espécies.

2 MATERIAIS E MÉTODOS

2.1 ANÁLISE DAS COLEÇÕES DE HERBÁRIO

Atualmente os herbários mais importantes e que têm a maior quantidade de espécimes de *Meriania* e gêneros relacionados no Peru são: ABERG, AMAZ, CPUN, CUZ, HAO, HOXA, HSP, HUT, KUELAP, MOL, PRG e USM (acrônimos de acordo com THIERS 2021). Para este estudo foram feitas visitas aos herbários peruanos para o estudo detalhado dos espécimes de *Meriania* (e os gêneros próximos *Axinaea* e *Centronia*), e também foram pesquisados espécimes nos herbários virtuais do AAU, F, MO, NY, P, U e US, localizados nos EUA e na Europa (TABELA 1). Isto permitiu obter informação sobre a distribuição, fenologia e o estudo morfológico das diferentes espécies. Igualmente, a informação de distribuição serviu para o planejamento das expedições de coleta. Em cada espécime foram estudados os caracteres morfológicos quantitativos (dimensões de folhas, lóbulos do cálice, número de estames e outras informações definidas a posteriori) e qualitativos (tipos de tricomas, forma dos apêndices nos estames e outras informações definidas a posteriori). Adicionalmente, o material tipo das espécies de *Meriania* em outros herbários foram analisados online por meio da plataforma JSTOR ([HTTP://PLANTS.JSTOR.ORG](http://plants.jstor.org)). A consulta nos herbários virtuais também permitiu analisar espécimes de outras regiões andinas como a Bolívia, o Equador, a Colômbia e a Venezuela. Desse jeito, se conseguiu comparar as prováveis espécies novas e novas ocorrências para o Peru com as espécies mais afins.

TABELA 1 – Lista de herbários visitados ou pesquisados.

Instituição	Herbário					Pesquisa virtual
	Acrônimo	País	Departamento / Estado	Visita		
Andes Biodiversity and Ecosystem Research Group	ABERG	Peru	Cusco	X		
Universidad Nacional de la Amazonía Peruana	AMAZ	Peru	Iquitos	X		
Universidad Nacional de Cajamarca	CPUN	Peru	Cajamarca	X		
Universidad Nacional San Antonio Abad del Cusco	CUZ	Peru	Cusco	X		
Universidad Privada Antenor Orrego	HAO	Peru	La Libertad	X		
Estación Biológica del Jardín Botánico de Missouri	HOXA	Peru	Pasco	X		
Instituto Científico Michael Owen Dillon	HSP	Peru	Arequipa	X		
Universidad Nacional de Trujillo	HUT	Peru	La Libertad	X		
Universidad Nacional Toribio Rodríguez de Mendoza	KUELAP	Peru	Amazonas	X		
Universidad Nacional Agraria La Molina	MOL	Peru	Lima	X		
Universidad Nacional Pedro Ruiz Gallo	PRG	Peru	Lambayeque	X		

Universidad Nacional Mayor de San Marcos	USM	Peru	Lima	X
Aarhus University	AAU	Dinamarca	Aarhus	X
Field Museum of Natural History	F	EUA	Illinois	X
Missouri Botanical Garden	MO	EUA	Missouri	X
The New York Botanical Garden	NY	EUA	New York	X
Muséum National d'Histoire Naturelle	P	França	Paris	X
Naturalis	U	Países Baixos	Leiden	X
Smithsonian Institution	US	EUA	Washington	X

2.2 VIAGENS PARA COLETAR MATERIAL

As regiões com maior presença de espécies endêmicas ou pouco estudadas de *Meriania* e *Axinaea* são Amazonas, Cajamarca, Cusco, Huánuco, Junín, Pasco e San Martín. Por isso, foram efetuadas expedições de coleta para cinco de essas regiões (TABELA 2; FIGURA 1). É necessário ressaltar a importância do estudo das espécies de *Meriania* no campo, porque alguns caracteres diagnósticos não podem ser evidentes durante a análise dos espécimes em herbário. Portanto, foi necessário fazer observações no campo que permitiram conhecer em detalhe a morfologia do cálice, tipo de apêndice dorsal dos estames e localização do poro nas anteras, caracteres que tradicionalmente têm sido utilizados para a delimitação de *Meriania* e gêneros relacionados.

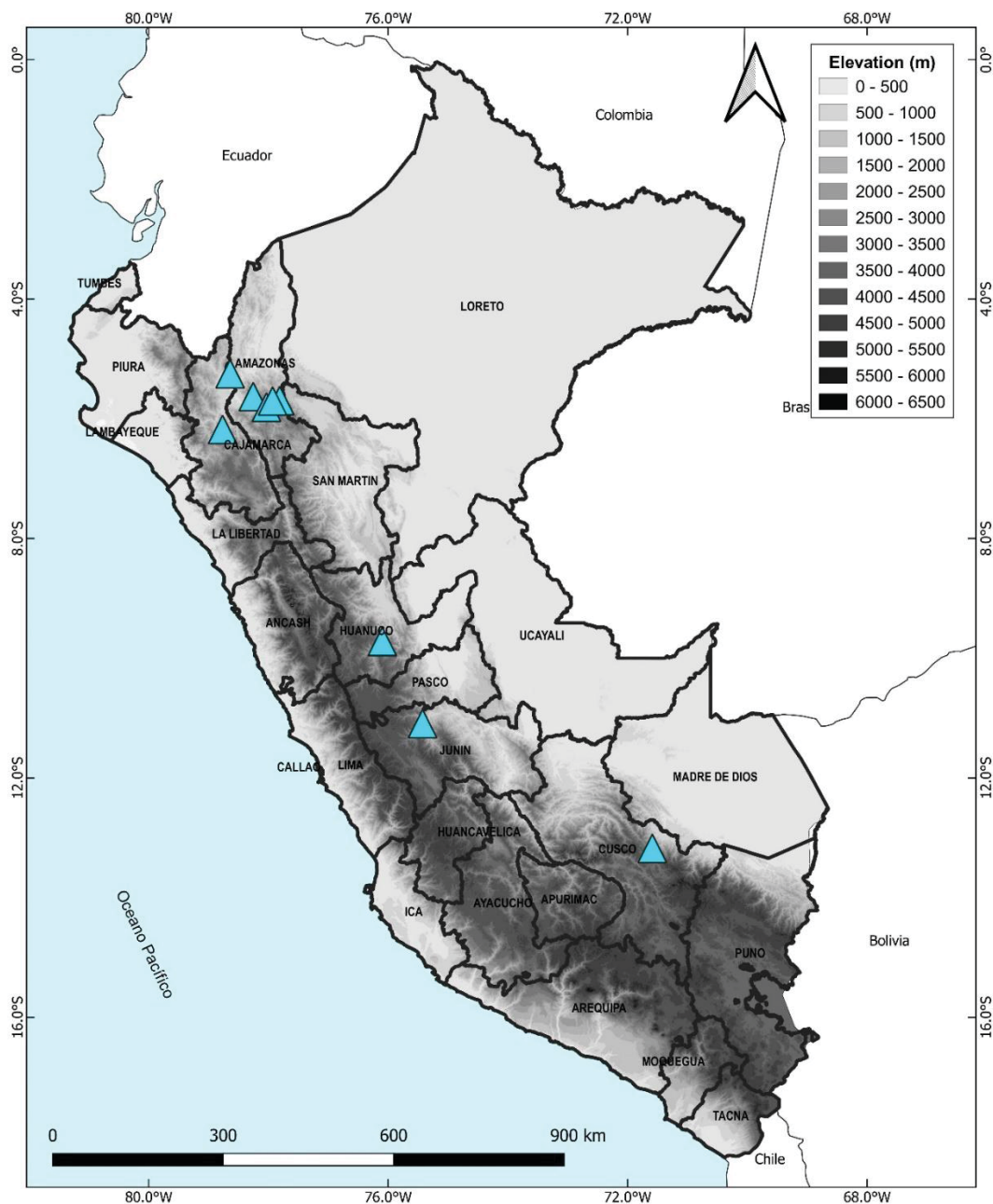
Diferentes autores indicam que os gêneros que compõem a tribo Meranieae apresentam muitos polimorfismos que devem ser estudados em detalhe para uma correta circunscrição (WURDACK, 1980; MENDOZA-CIFUENTES; FERNÁNDEZ-ALONSO, 2010). Todas as espécies registradas no campo foram coletadas seguindo a metodologia tradicional de herborização (LIESNER, 1996), as flores foram conservadas em álcool 70%, foram feitas anotações sobre dados ecológicos (como a presença de polinizadores) e fotografias de todos os caracteres importantes.

TABELA 2 – Lista de regiões onde foram feitas expedições botânicas no Peru.

Região	Localidade	Data	Coordenadas
Amazonas	Zona de Amortiguamiento del Santuario Nacional Cordillera de Colán	Dezembro/2019	05°37'51"S; 78°15'20"O
Amazonas	Comunidad Campesina San Lorenzo	Fevereiro/2020	05°48'21"S; 78°02'00"O
Amazonas	Estación Biológica Abra Patricia	Fevereiro/2020	05°41'45"S; 77°48'41"O
Huánuco	Área de Conservación Regional Bosque Montano de Carpish	Janeiro/2020	09°43'13"S; 76°05'55"O
Junín	Estación Biológica Puyu Sacha	Março/2020	11°05'38"S; 75°25'32"O

Cusco	Estación Biológica Wayquecha	Março/2020	13°10'37"S; 71°35'14"O
Amazonas	Comunidad Campesina Yambrasbamba	Novembro/2020	5°42'16"S; 77°55'54"O
Cajamarca	Parque Nacional Cutervo	Novembro/2020	6°10'46"S; 78°46'02"O
Cajamarca	Centro Poblado Pisaguas – Cordillera Huarango	Novembro/2020	5°14'56"S; 78°38'26"O

FIGURA 1 – Localização das expedições botânicas feitas no Peru (triângulos azuis).



2.3 PROESSAMENTO DE DADOS

O material coletado no campo foi identificado utilizando as chaves dos tratamentos taxonômicos de *Meriania* na região andina para a Colômbia (MENDOZA-CIFUENTES, 2021), as Guianas (WURDACK et al., 1993), o Equador (WURDACK, 1980), o Peru (MACBRIDE, 1941) e a Venezuela (WURDACK, 1973). Para conhecer a distribuição das espécies de *Meriania* nos Andes também foram consultados os catálogos da flora da Bolívia (JØRGENSEN et al., 2014), do Ecuador (JØRGENSEN, LEÓN-YÁNEZ, 1999), da Colômbia (BERNAL et al., 2021), do Peru (BRAKO; ZARUCCHI, 1993) e da Venezuela (HOKCHE et al., 2008). Os espécimes foram analisados para registrar medidas e presenças de caracteres diagnósticos. Junto com a informação obtida dos espécimes estudados nos herbários foi elaborada uma tabela de caracteres para cada espécime. Posteriormente, toda a informação foi resumida através da elaboração das descrições para cada espécie de *Meriania*. Finalmente a informação sobre a distribuição geográfica das espécies, e estado das populações estudadas no campo, permitiu elaborar mapas das espécies e propor os graus de ameaça para as novas espécies de *Meriania* de acordo com os critérios da IUCN (2019).

**3 CAPÍTULO 1 – A NEW SPECIES OF *MERIANIA* (MELASTOMATACEAE)
WITH REMARKABLY SMALL FLOWERS FROM NORTHERN PERU**

**A new species of *Meriania* (Melastomataceae) with remarkably small flowers from
northern Peru***

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Abstract

Meriania microflora (Merianieae, Melastomataceae), a new species endemic to the Amazonas-Loreto border, in the Peruvian Amazon, is described and illustrated here. The new species presents the smallest flowers recorded within the genus, and also differs from other species of *Meriania* by the combination of appendages on the petioles, white petals, strongly dimorphic stamens and connectives with developed ascending appendages and multilobed descending appendages.

Key words: Amazon, Merianieae, Neotropics, Taxonomy

Resumen

Meriania microflora (Merianieae, Melastomataceae), una nueva especie endémica de la frontera de Amazonas y Loreto, en la Amazonia Peruana, es descrita e ilustrada aquí. Esta nueva especie presenta las flores más pequeñas registradas en el género, y además difiere de otras especies de *Meriania* por la combinación de apéndices en el peciolo, pétalos blancos, estambres fuertemente dimórficos y conectivos con apéndices ascendentes desarrollados y apéndices descendentes multilobados.

Palabras clave: Amazonia, Merianieae, Neotrópico, Taxonomía

Introduction

The Neotropical tribe Merianieae was established by J. J. Triana in 1865, and it groups taxa with capsular fruits, anthers with dorsal appendages and predominantly pyramidal seeds (Renner 1993; Mendoza-Cifuentes & Fernández-Alonso 2012). Within the tribe, the genus *Meriania* Swartz (1798: 823) comprises between 95 to 110 shrub and tree species (occasionally climbers) distributed from Southeast Mexico and the Greater Antilles to Eastern Brazil and Bolivia (Michelangeli *et al.* 2015).

The genus *Meriania* was traditionally characterized by presenting trees and shrubs with an entire calyx, which can be lobed or calyptrate (without circumscissile dehiscence), and anthers with a dorsally inclined pore (Wurdack 1973, 1980a, 1993). However, the circumscription of this genus is not completely clear, mainly due to morphological similarities between some of its species and others in the genera *Adelobotrys* de Candolle (1828: 127), *Axinaea* Ruiz & Pavón (1794: 68) and *Centronia* D. Don (1823: 284) (Mendoza-Cifuentes & Fernández-Alonso 2010, 2012). For example, *Centronia* has several species with misinterpreted or wrongly described characters (e.g. dehiscence of calyptra and pore orientation in the stamens), which have been or should be transferred or synonymized under *Meriania* (Wurdack 1976; Mendoza-Cifuentes & Fernández-Alonso 2010, 2012).

The last comprehensive revision of *Meriania* was elaborated by Cogniaux (1891), covering 39 species classified in five sections. Subsequently, other regional floristic works with Melastomataceae have included taxonomic treatments for the genus *Meriania* in Brazil (Chiavegatto & Baumgratz 2008; Goldenberg 2009; Fagundes & Santos 2016), Costa Rica (Almeda 2007), Ecuador (Wurdack 1980a), Greater Antilles (Michelangeli *et al.* 2015), Guyana (Wurdack *et al.* 1993), Mesoamerica (Almeda 2009) and Venezuela (Wurdack 1973). The last revision for Peru was carried out by Macbride (1941) for the “*Flora of Peru*” where 12 species were recognized. Based on range expansions and new species descriptions, this number has now increased to 19 (Brako & Zarucchi 1993; Cotton *et al.* 2014; Paredes-Burneo *et al.* 2018; Michelangeli & Goldenberg 2018).

While reviewing unidentified herbarium material of the genus *Miconia* from Peru we found a specimen with unusual floral characteristics. A detailed analysis showed the stamens with appendages similar to those of Meranieae. After considering other characteristics (see below), we concluded that this material belonged to an undescribed species of *Meriania* with unusually small flowers. In this article, we provide a complete description of this new species, along with ecological information and comments about similar species, diagnostic characteristics and geographic distribution.

Materials and methods

The description was made through examination of herbarium specimens deposited in F, NY and USM (herbarium acronyms follow Thiers 2019). Indument terminology and inflorescence structure follow Wurdack (1986) and Sell & Cremers (1987), respectively. The description of flowers is based on rehydrated material. Conservation status was assigned following the IUCN criteria (2019). Scanning Electron Microscopy images of the trichomes, ovary, and stigma were obtained using a JEOL JSM-6360LV scanning electron microscope at the Electron Microscopy Center of Universidade Federal do Paraná (UFPR). The material was mounted on aluminum stubs coated with asphalt adhesive, and then sputter-coated with gold for two minutes.

Results

Meriania microflora Rob.Fernandez, R.Goldenb. & Michelang. *sp. nov.* (Figure 1–3)

Diagnosis:—Differs from other species of *Meriania* by the combination of appendages on the petioles, white petals, strongly dimorphic stamens and connectives with developed ascending appendages and multilobed descending appendages. Additionally, *Meriania microflora* presents the smallest flowers recorded within the genus.

Type:—PERU. Amazonas: Prov. Condorcanqui, Dist. Santiago, Cerros Kampankis, serranía entre los ríos Santiago y Morona, desde río Marañon hasta frontera con

Ecuador, Campamento 2, Qda. Katerpisa, 710 m, 04°02'17.35''S, 77°33'45.50''W, 09 Aug 2011 (fl.), *I. Huamantupa et al.* 15552 (holotype USM360020!; isotype F2307857!, NY03240851!).

Tree up to 5 m tall; young branches and petioles sparsely covered with short-stalked glands with thin-walled elongate heads, rarely long-stalked up to ca. 0.2 mm long. **Young branches** terete, 2.6–3.1 mm diam., without interpetiolar flaps. **Leaves** opposite, slightly anisophyllous. **Petioles** terete, 8.6–19 mm long, with three liguliform projections, 1–1.5 mm long, two lateral and one adaxial, 1–2 mm below the base of the blade. **Leaf blades** subcoriaceous, 18.3–25 × 7.5–12.7 cm, broadly elliptic to ovate, apex acuminate, base 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 the leaf apex, tertiary (transversal nerves) pairs 26–33, percurrent, 2–10 mm distant from each other, veins only impressed and reticulation not visible on the adaxial surface, veins prominent and reticulation impressed on the abaxial surface; adaxial surface flat, green, glabrous; abaxial surface light green when dry, with sparse trichomes on the midrib similar to the ones on twigs and petioles. **Inflorescence** a terminal panicle, erect, multiflorous, 12.9–15.9 × 11.9–18 cm (including the peduncle). **Peduncle** 4.8–6.2 cm long, peduncle and main axis terete, moderately covered with trichomes similar to the ones on twigs and petioles, denser on the nodes. **Main axis** with 7 pairs of paraclades, the proximal paraclades 5.7–9.6 cm long, the distal paraclades 1.2–1.3 cm long, the flowers in regular or depauperate dichasia. **Bracts** and **bracteoles** not seen (either absent or early caducous). **Flowers** 5-merous, with spreading corollas; pedicels 2.5–3 mm long, green and turning white in the distal third, covered with sparse trichomes similar to the ones on inflorescences. **Hypanthium** 1.5–2 × 1–1.5 mm, campanulate, white, outside surface with sparse trichomes similar to the ones on inflorescences, inside surface glabrous, torus glabrous. **Calyx** opening regularly, tube 0.75–1 mm tall, white, lobes ca. 0.15 mm long, very short and broadly triangular, without dorsal projections, glabrous. **Petals** 4–4.5 × 1.75–2 mm, oblong, apex rounded to slightly emarginate, margin entire, white, glabrous. **Stamens** 10, strongly dimorphic, all bent to one side of the flower at anthesis giving the flower a zygomorphic appearance; antesealous stamens filaments 4–4.5 mm long, white, flat, glabrous, connective prolonged below the thecae 0.6–0.7 mm (not including the basal appendage), white, with very short sparse glandular projections, denser on the descending appendage, with two dorsal appendages, one descending, 0.3–0.5 mm long, multilobed, the lobes very short and irregular, the other appendage ascending, ca. 1 mm long, distant ca. 0.1 mm from the anther base, linear and undivided, subulate, anther 1.75–2.2 mm long, lanceolate, yellow, glabrous, with its apical third slightly reflexed, opening by one ventrally inclined pore; antepetalous stamens filaments 3.75–4 mm long, white, flat, glabrous, connective prolonged below the thecae ca. 1.5 mm (not including the basal appendage), white, with very short sparse glandular projections, denser on the descending appendage, with two dorsal appendages, one descending, ca. 0.5 mm long, multilobed, the lobes very short and more irregular than in the antesealous, the other appendage ascending, ca. 1.5 mm long, distant ca. 0.3 mm from the filament, linear and

apically trilobed, lateral lobes ca. 0.2 mm long, subulate, the central lobe three times shorter, rounded, anthers 2.5–3 mm long, lanceolate, purple, glabrous, straight, opening by one apical to slightly ventrally inclined pore. *Ovary* 3-locular, superior, 1.5 × 0.5–0.7 mm, oblong, not exceeding to the torus, with very short apical papillae; style 10.5–11 mm long, white, glabrous, incurved and opposite the anthers at anthesis; stigma punctiform and minutely papillate, ca. 0.15 mm wide, white. **Fruits** and **seeds** not seen.

Distribution and habitat:—*Meriania microflora* is probably endemic to forests on mid-elevation slopes of the Kampankis Mountains (Amazonas-Loreto border, Peru) above about 700 m (Fig. 4). Common tree species in the area include *Eschweilera andina* (Rusby 1896: 37) Macbride (1941: 246) (Lecythidaceae), *Cassia swartzioides* Ducke (1930: 129) (Fabaceae), *Tachigali inconspicua* van der Werff (2008: 645) (Fabaceae), *Pourouma minor* Benoist (1924: 103) (Urticaceae), *P. guianensis* Aublet (1775: 892) (Urticaceae), *Caryodendron orinocense* Karsten (1859: 91) (Euphorbiaceae), and the palms *Socratea exorrhiza* (Martius 1824: 36) Wendland (1860: 103) and *Wettinia maynensis* Spruce (1859: 194) (Neill *et al.* 2012).

Etymology:—The specific epithet refers to the small flowers, that are the smallest known in the genus.

Phenology:—Flowering takes place in August.

Conservation status:—*Meriania microflora* is known from only a single collection, found in the Kampankis Mountains. Although we would wish for it to be recommended as Critically Endangered, the region of Kampankis Mountains has well-preserved ecosystems that indigenous inhabitants have protected effectively for many years (for more details see Neill *et al.* 2012). Therefore, it should be considered as Data Deficient (DD) (IUCN 2019).

Discussion:—The superior ovary and anthers with a dorsal anther connective place *Meriania microflora* in the tribe Meranieae. Furthermore, the absence of malpighiaceous trichomes (a synapomorphy of *Adelobotrys*), and the anther connectives with ascending and descending appendages clearly place this new species within the genus *Meriania*. The presence of appendages on petioles is a characteristic that has been observed in other species of *Meriania*. Although the pore orientation on the anthers has been traditionally described as dorsally inclined in *Meriania* (Wurdack 1980a, 1993), *Meriania microflora* has antesealous stamens with ventrally inclined pores and the antepetalous stamens with apical to slightly dorsally inclined pores. These inconsistencies in pore orientation in the genus have been previously indicated by other authors (Almeda 1993; Mendoza-Cifuentes & Fernández-Alonso 2010).

Meriania microflora is clearly distinguished from other species within the genus by its unusual floral size and morphology. *Meriania microflora* presents the smallest flowers recorded within the genus (petals 4–4.5 × 1.75–2 mm), which made this specimen to be

previously considered as a *Miconia* (annotation on *Huamantupa et al. 15552*). Before the discovery of this species, the smallest flowers recorded for *Meriania* were those of *M. tetramera* Wurdack (1980b: 324) and *M. squamulosa* Urban & Ekman in Urban (1929: 28) with petals $5-7 \times 4-5.5$ mm and 7×4 mm respectively (Wurdack, 1980b; Michelangeli *et al.* 2015).

Among the Peruvian species of *Meriania*, the only one that also presents strongly dimorphic stamens is *Meriania urceolata* Triana (1871 [1872]: 67), an Amazonian species that can be distinguished from *M. microflora* by its petioles without appendages, purple petals and flowers with larger dimensions. Anther connectives with developed ascending and apically lobed appendages are a common character among Brazilian species of *Meriania* (Chiavegatto & Baumgratz 2008). However, no Brazilian species presents appendages on petioles neither stamens with a multilobed descending appendages, such as in *M. microflora*. This latter characteristic of the stamens is similar to that in *M. steyermarkii* Gleason (1952: 28) (see Figure 2C, Gleason 1947), a species with the connective prolonged below the thecae from the Andes of Venezuela and Colombia. However, in this species the stamens are isomorphic (vs. strongly dimorphic in *M. microflora*) and the ascending appendages are not clearly developed. Additionally, the villose pubescence on the leaves and hypanthium (vs. sparsely covered with short- or long-stalked glands), the presence of dorsal projections on the calyx lobes (vs. without dorsal projections) and the red-orange petals (vs. white petals) distinguish it from *Meriania microflora*.

While white petals are common throughout the Melastomataceae and all other genera of Meranieae, this is not a common character in *Meriania*. In addition to *M. microflora*, white petals in Andean and Western Amazonian *Meriania* are also present in *M. phlomoides* (Triana 1871 [1872]: 72) Almeda (1993: 150) but this species clearly differ in petal size ($11-16 \times 8-13$ mm vs $4-4.5 \times 1.75-2$ mm in *M. microflora*), indumentum (hairs with roughened or substellate base vs. short- or long-stalked glands), calyx (calyptrate vs. lobed) and anther morphology (ascending appendages ca. 0.5 mm vs. ca. 1-1.5 mm). Other species of Andean *Meriania* may eventually present white petals, but the character is variable within the species (sometimes even within the same individual) with color varying from white to red or pink. These species are *M. albertiae* Wurdack (1988: 293), and *M. macrophylla* (Bentham 1841: 75) Triana (1871 [1872]: 66). Both species can be distinguished from *M. microflora* by the absence of appendages on petioles and the leaves with suprabasal venation. Additionally, *M. albertiae* presents the connective with acute descending appendages and *M. macrophylla* presents antepetalous stamens with inflated connectives. In the Greater Antilles, *Meriania albiflora* Carmenate & Michelang. in Michelangeli *et al.* (2015: 121) always has white petals, while *M. involucrata* (Desrousseau 1797: 35) Naudin (1852: 125), *M. leucantha* (Swartz 1788: 61) Swartz (1798: 826) and *M. parvifolia* Judd & Skee (1987: 377) vary from white to bright red. These four species can be distinguished from *M. microflora* by the absence of appendages on petioles and the calyx with dorsal projections. The exception to this trend of rare white petals are the species of *Meriania* in the Atlantic

Forest, where most species have white petals. Among them, interestingly, *M. calophylla* (Chamisso 1834: 372) Triana (1871 [1872]: 67) has purple petals at anthesis that are persistent and turn white in older flowers.

In addition to the unusual small flowers with white petals of *Meriania microflora*, the appendages on the petioles are also very distinctive. In other species within the genus, abaxial-lateral appendages occur in *Meriana radula* (Bentham 1841: 130) Triana (1871 [1872]: 66), *Meriania tetragona* (Cogniaux 1908: 137) Wurdack (1964: 411) and *Meriania sanguinea* Wurdack (1967: 4); in the first two species, the projections are tuberculate, and in the later they are liguliform. These three Andean shrubby species differ from *M. microflora* by the campanulate, deep red corollas. In other species, these appendages may also be adaxial, such as the ones in *Meriania drakei* (Cogniaux 1891: 447) Wurdack (1967: 3), in this case swollen and trapezoidal; this species occurs in Ecuador and Colombia, and differs from the new species by the reddish-purple corollas. Finally, appendages with wedge-like projections, located in the insertion of the petiole to the leaf blade are present in *Meriania franciscana* Ulloa Ulloa & Homeier (2008: 383), from Ecuador, and *Meriania pallida* Gleason (1947: 299), from Colombia; both species differ from *M. microflora* by the campanulate, reddish-purple corollas.

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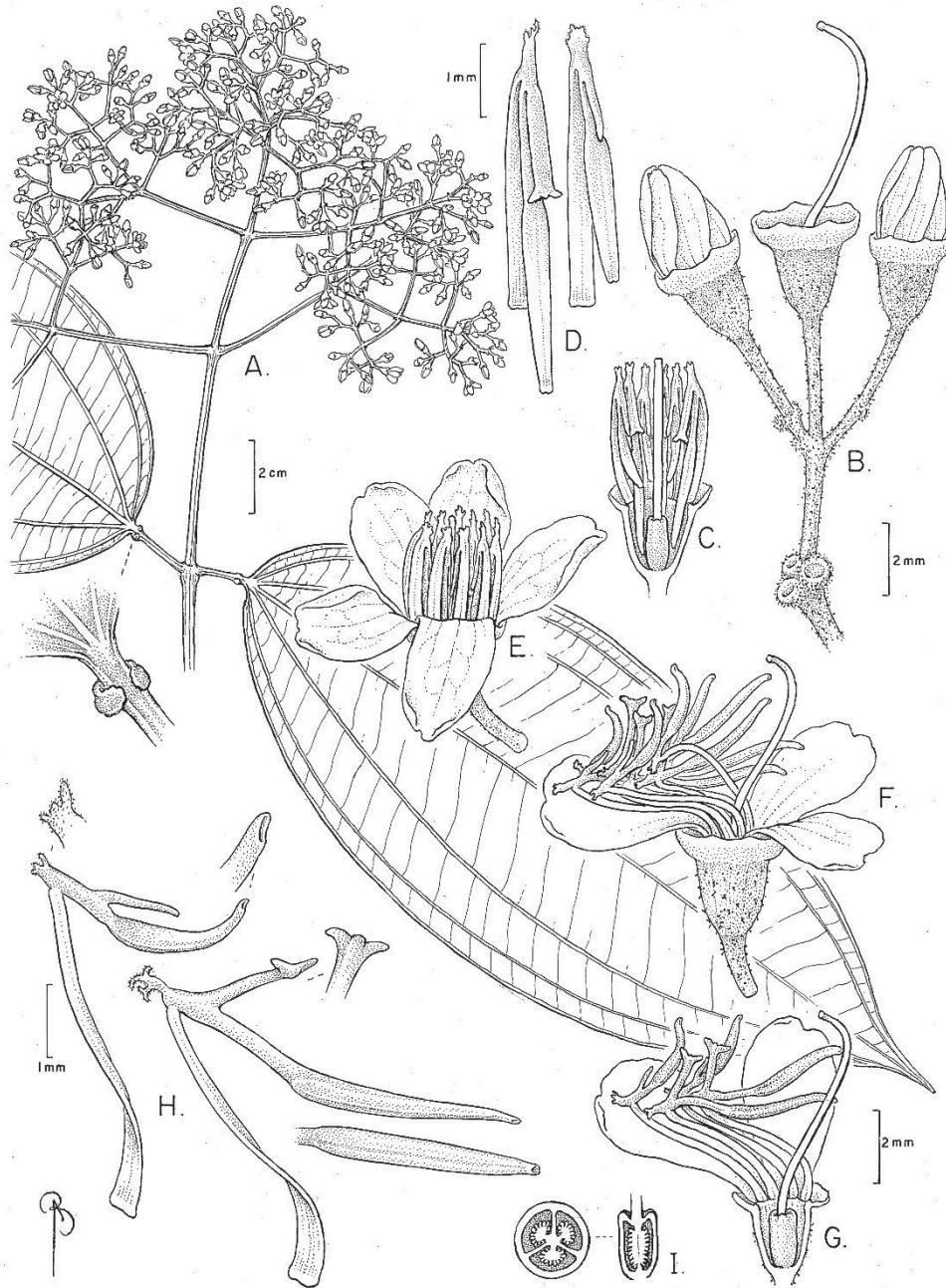


FIGURE 1. *Meriania microflora*. **A.** Terminal fertile branch with inflorescence and a detail of appendages on the petioles. **B.** Inflorescence detail. **C.** Longitudinal section of the flower bud with petals removed. **D.** Antesepalous (right) and antepetalous (left) stamens in flower bud. **E.** Flower before anthesis. **F.** Flower at anthesis. **G.** Longitudinal section of the flower. **H.** Detail of antesepalous (left) and antepetalous (right) stamens in flower at anthesis. **I.** Longitudinal (right) and transversal (left) section of the ovary. From *I. Huamantupa et al. 1552* (NY).

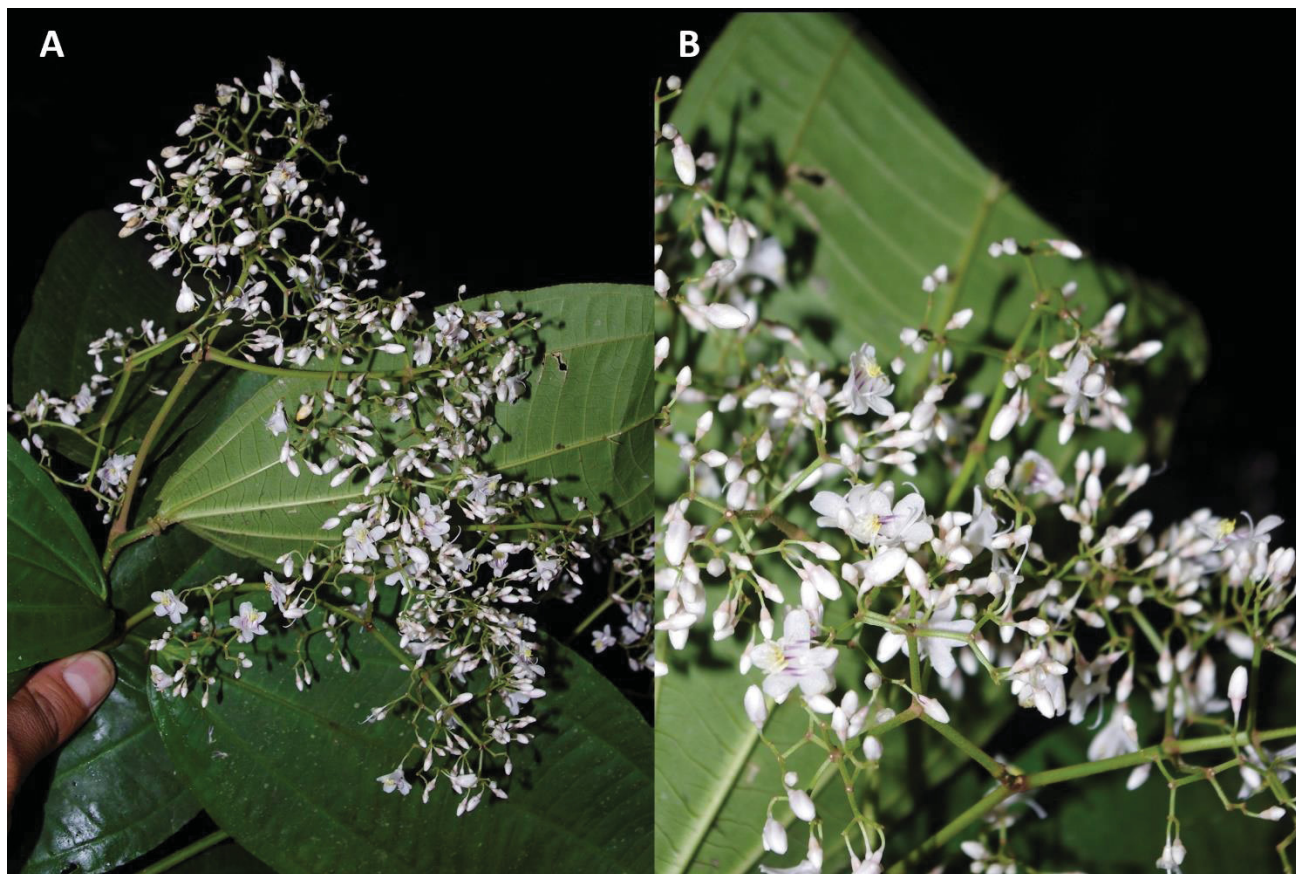


FIGURE 2. *Meriania microflora*. **A.** Terminal fertile branch. **B.** Detail of inflorescence. From I. Huamantupa et al. 15552. Photos by Isau Huamantupa.

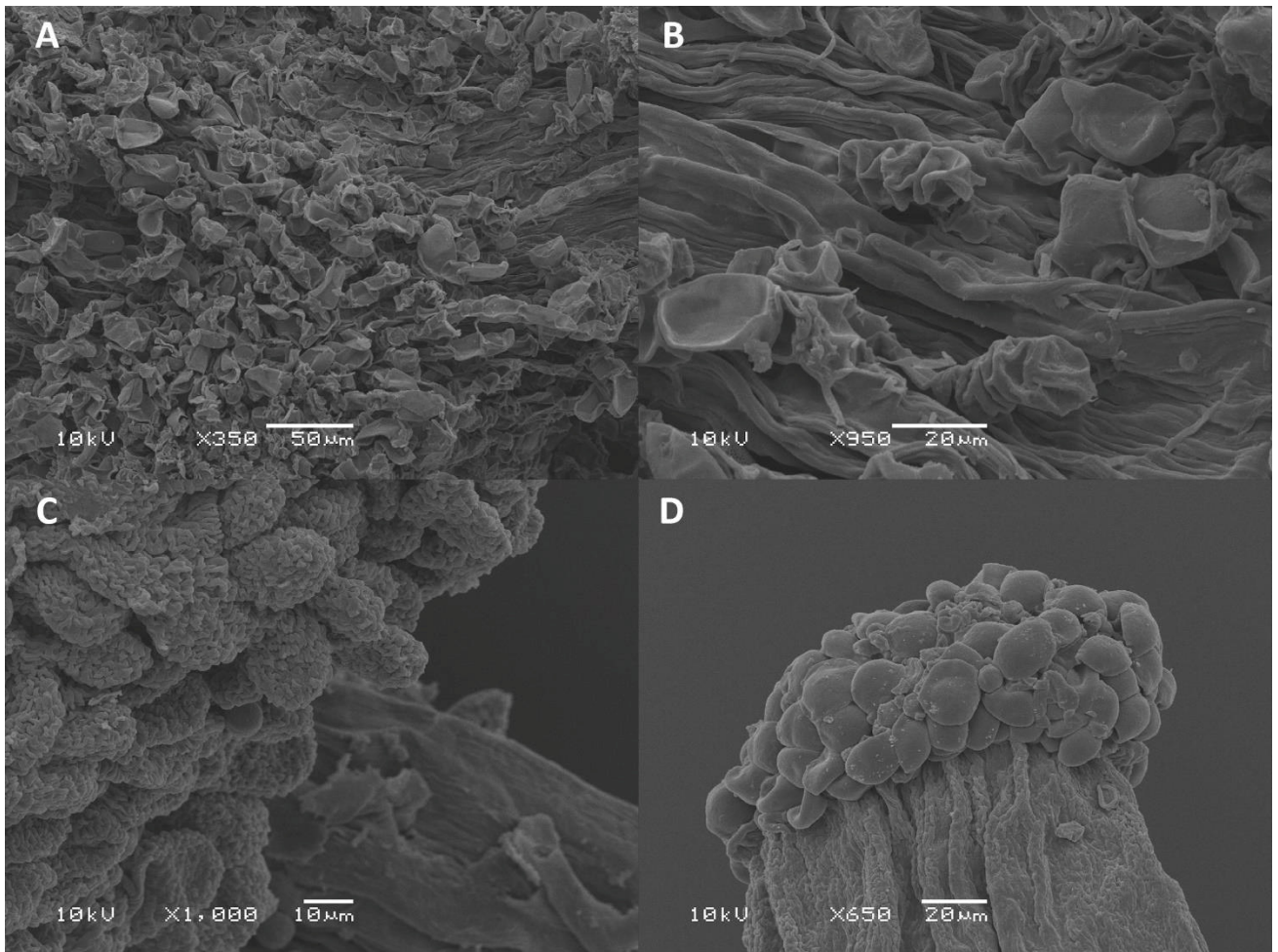


FIGURE 3. SEM images of the indument on the inflorescence and papillae on the ovary and style of *Meriania microflora*. **A.** Trichomes on inflorescence node. **B.** Detail of trichomes on the pedicel. **C.** Papillae on the ovary apex. **D.** Papillae on the stigma. From *I. Huamantupa et al. 15552 (NY)*.

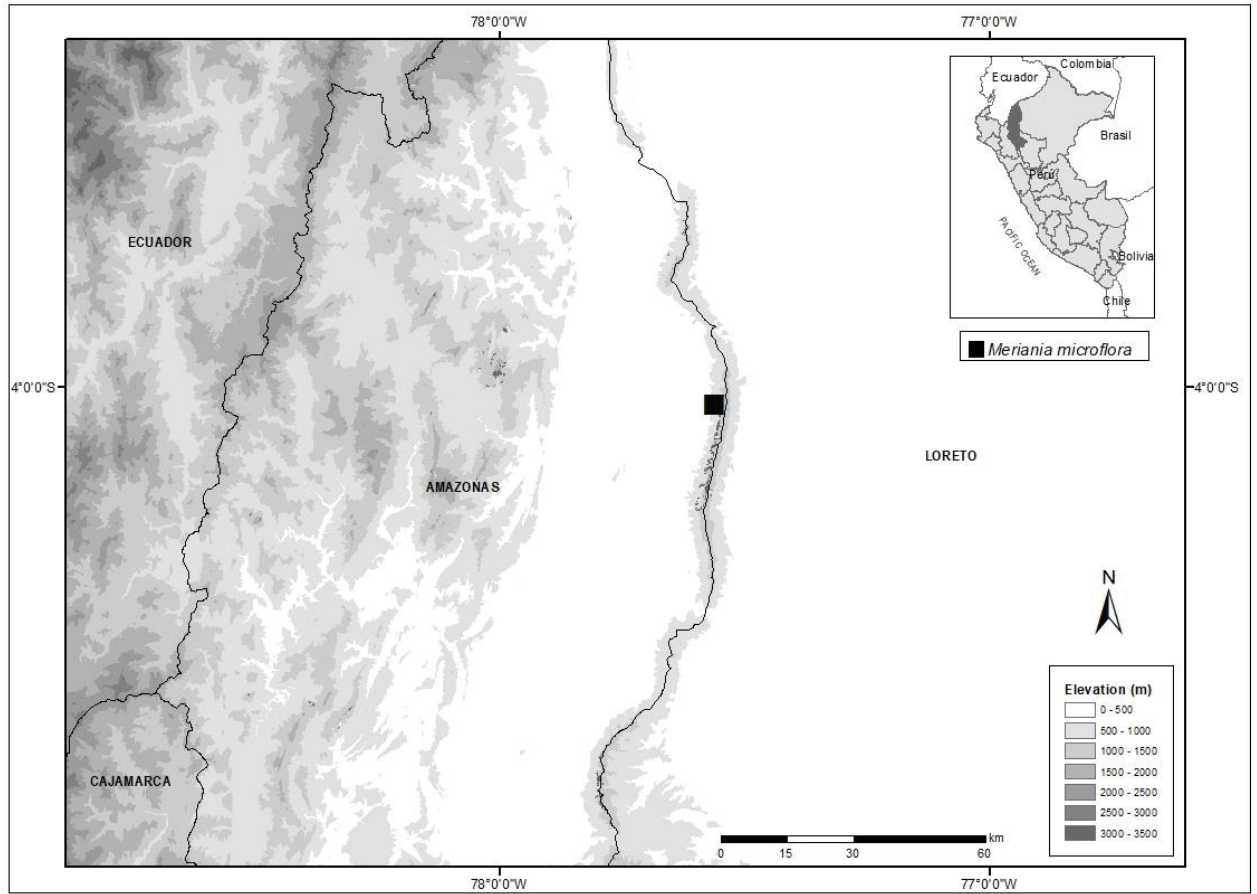


FIGURE 4. Distribution map of *Meriania microflora*.

4 CAPÍTULO 2 – TWO NEW SPECIES AND TWO NEW RECORDS FOR *MERIANIA* (MELASTOMATACEAE) FROM NORTHERN PERU

Two new species and two new country records for *Meriania* (Melastomataceae) from northern Peru*

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1 **Abstract**

2 Two new species of *Meriania* (Melastomataceae, Merianieae) and two new records
3 from northern Peru are described and illustrated here. *Meriania penningtonii* is clearly
4 different from all other species of *Meriania* by its quadrangular and 4-winged
5 internodes, calyx with whitish callose dorsal projections and spreading reddish-purple
6 corollas; *Meriania dazae* differs from the other species by the combination of the calyx
7 with claw-shaped dorsal projections, campanulate reddish-orange corollas and petals
8 19.5–24 mm long. The two new species are endemic to the department of Amazonas.
9 *Meriania drakei*, from Ecuador and Colombia, and *Meriania franciscana*, from
10 Ecuador, are recorded for the first time for the Andean forests of the departments of
11 Amazonas and Cajamarca, respectively. We also propose the second step
12 lectotypification for *Meriania drakei*.

13

14 **Key words:** Amazonas, Andean forests, Cajamarca, Merianieae, Neotropics, Taxonomy

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26 **Introduction**

27 *Meriania* Sw. (Melastomataceae) comprises between 95 to 110 species of shrubs, trees
28 and occasionally climbers, distributed from Southeast Mexico and the Greater Antilles
29 to Eastern Brazil and Bolivia (Michelangeli et al. 2015). *Meriania* was traditionally
30 characterized by being trees and shrubs without malpighiaceae trichomes, flowers with
31 an entire calyx that can be lobed or calyptrate (without circumscissile dehiscence),
32 anthers with a dorsally inclined pore and dorsal appendages, and capsular fruits
33 (Wurdack 1973, 1980, 1993). However, some of these characteristics are inconsistent
34 within *Meriania* and may be present in related genera (Mendoza-Cifuentes and
35 Fernández-Alonso 2010, 2012). For this reason, some species traditionally in
36 *Adelobotrys* DC. and *Centronia* D. Don have been recently transferred to *Meriania*
37 (Mendoza-Cifuentes and Fernández-Alonso 2012, Almeda and Penneys 2013).

38

39 To date, eleven species of *Meriania* have been recorded in the Andean forests of
40 northern Peru (Departments of Amazonas, Cajamarca and Piura) out of the 20 species
41 recorded for the whole country (Brako and Zarucchi 1993, Cotton et al. 2014, Paredes-
42 Burneo et al. 2018, Fernandez-Hilario et al. 2020). These highly diverse forests are
43 located within the Amotape-Huancabamba Zone, an area with levels of diversity that
44 are roughly six to eight times higher than in the adjacent areas to the north and south
45 (Ayers 1999, Weingend 2002, 2004). The climate and topography, along with
46 heterogeneous vegetation types in the Amotape-Huancabamba Zone have promoted
47 high diversification rates in different taxa (Weingend et al. 2005, Smith and Baum
48 2006, Struwe et al. 2009).

49

50 Although in the last ten years botanical expeditions have allowed the description of a
51 large number of new species of Melastomataceae from northern Peru (Bussmann et al.
52 2010; Morales-Puentes and Penneys 2010, Sagástegui et al. 2010, Bussmann and
53 Paniagua 2012, Bussmann 2013, Bussmann and Paniagua 2013, Michelangeli et al.
54 2014; Cotton et al. 2014, Michelangeli and Ulloa Ulloa 2016, Michelangeli and
55 Paredes-Burneo 2019, Fernandez-Hilario et al. 2020), or from the Peru-Ecuador border
56 (Ulloa Ulloa et al. 2012, Penneys et al. 2015, Burke et al. 2017), the eastern flanks of
57 the Cordillera Central in northern Peru facing Amazonia are still under-collected in
58 many areas (Casper et al. 2020). Although these regions have outstanding importance
59 for the conservation of biodiversity, the Andean forests of northern Peru are under high
60 anthropic pressure due to increasing deforestation (MINAM 2009, Weingend et al.
61 2005). Therefore, the effective protection of the diverse habitats in the Amotape-
62 Huancabamba Zone is a high priority.

63

64 Botanical expeditions in the Amazonas region and the revision of herbarium material
65 have been conducted as part of the ongoing taxonomic revision of *Meriania* for Peru.
66 After detailed analysis, we found some specimens that correspond to two new species of
67 *Meriania* and two new records for the country. In this article, we provide a description
68 of these taxonomic novelties in *Meriania* and the new records, along with comments
69 about similar species and diagnostic characteristics, conservation status and geographic
70 distribution.

71

72 **Materials and methods**

73 The type specimens of the new records were examined through JSTOR Global Plants
74 Initiative portal (<https://plants.jstor.org>). The descriptions were made through

75 examination of herbarium specimens deposited in HOXA, HUT, NY, MOL, UPCB and
76 USM (herbarium acronyms follow Thiers 2020). Indument terminology and fruit type
77 follow Wurdack (1986) and Baumgratz (1983–1985), respectively. The description and
78 measurement of flowers is based on rehydrated material and information on colors from
79 our own field observations supplemented by label information and photographs
80 provided by collaborators. Conservation status for the two new species was assigned
81 following the IUCN criteria (2012, 2019), based on estimates of Extent of Occurrence
82 (EEO) and Area of Occupancy (AOO), both calculated through GeoCat Geospatial
83 Conservation Assessment Tool (<http://geocat.kew.org>) (Bachman et al. 2011).
84 Complete descriptions are provided for the two new records for Peru as these additional
85 specimens provide not only range extensions, but also some additional character
86 variability. A morphological species concept has been used in this study, which
87 establishes that consistent differences in morphology, separated by gaps, are considered
88 evidence of the existence of separate species (see Madriñan 2004, Judd 2007). While in
89 practical terms this approach is based solely on comparative morphology, it also
90 correspond to the diagnosable characteristics as per the Phylogenetic Species Concept
91 of Nixon & Wheeler (1990; see Luckow 1995). The combination of several
92 discontinuous morphological characters was used to recognize the species.

93

94 **New species**

95 *Meriania penningtonii* Rob.Fern., R.Goldenb. & Michelang. sp. nov. (Fig. 1–3)

96

97 **Diagnosis**

98 Differs from other species of *Meriania* by the combination of quadrangular and 4-
99 winged internodes, nodes without interpetiolar flaps, sepals with short and callose

100 dorsal projections, whitish when dry, spreading reddish-purple corollas, isomorphic
101 stamens, and connectives with two dorsal appendages, one descending, triangular, and
102 the other a mere hump right above the insertion of the first.

103

104 **Type:** PERU. San Martín [Amazonas]: Rioja to Pedro Ruiz, border with Amazonas

105 [near to CP Buenos Aires], 1800 m, 5°45' S, 77°40' W, 04 Dec 2003 (fl.), *T.D.*

106 *Pennington, R.T. Pennington & A. Daza 17639* (holotype: MOL [barcode 000003];

107 isotypes: E [barcode E00177820], K [barcode K000544378], MOL [barcodes 000004,
108 000005]).

109

110 **Description**

111 ***Shrub or tree*** up to 8 m tall; young branches and petioles puberulent to pubescent with

112 conic and densely roughened trichomes, these up to 0.25 mm long, sparse to moderate

113 on young branches, sparse to dense on petioles. ***Young branches*** quadrangular, 4-

114 winged, 5–13 mm diam., wings along the internodes 1–3.5 mm high, nodes without

115 interpetiolar flaps. ***Leaves*** opposite, isophyllous. ***Petioles*** quadrangular, 2.5–8.1 cm

116 long, with two pairs of abaxial projections (that may be interpreted as glands) on the

117 transition zone from the petiole to the midvein, 0.2–0.75 mm high, conic to rounded,

118 dark when dry and obscured by the trichomes. ***Leaf blades*** coriaceous, 11.3–18.4 × 6.3–

119 12 cm, ovate, rarely elliptic-ovate, apex acute to acuminate, base cordate to rounded,

120 margin denticulate, concolorous or discolorous; venation acrodromous and basal, with

121 two pairs of secondaries (lateral nerves), and an additional pair of faint submarginal

122 veins running up to the leaf apex, tertiary (transversal nerves) pairs 33–40, percurrent,

123 1.5–10 mm distant from each other, midvein, secondary and tertiary veins impressed,

124 and reticulation visible on the adaxial surface, midvein, secondary and tertiary veins

125 salient, and reticulation prominent or impressed on the abaxial surface; adaxial surface
126 bullate, dark green when dry, with sparsely elongated, moderately roughened trichomes
127 on the midvein, denser near the base, up to ca. 1.5 mm long, sometimes glabrous;
128 abaxial surface dark to light green when dry, veins and reticulation moderately to
129 densely puberulent with trichomes up to ca. 0.5 mm long, similar to the ones on petioles
130 and twigs. *Inflorescence* a terminal panicle, erect, 15.5–29.8 × 7–14 cm, multiflorous;
131 the axis and peduncle sparsely to densely puberulent with trichomes up to ca. 0.75 mm
132 long, similar to the ones on twigs and petioles. *Peduncle* 4.8–10 cm long, quadrangular,
133 4-winged, wings similar to the ones on the vegetative internodes. *Main axis* 10.2–16.8
134 cm long, quadrangular, 4-winged, wings 0.5–1 mm high. *Paraclades* in 5–6 pairs, the
135 proximal 4.5–7.5 cm long, the distal 2–2.5 cm long; flowers in regular or depauperate
136 dichasia in the branchlet ends. *Bracts* foliaceous, persistent, 7.5–8.5 × 4–4.5 cm,
137 petioles 1.9–2.7 cm long, shape and indumentum similar to the ones on the leaves.
138 *Bracteoles* not seen (either absent or early caducous). *Flowers* 5–merous, with
139 spreading corollas. *Pedicels* 3–7 mm long, dark reddish-purple, moderately to densely
140 pubescent with trichomes similar to the ones on the inflorescence axis. *Hypanthium* ca.
141 5 × 4.5–5.5 mm, campanulate, dark reddish-purple, outer surface sparsely to moderately
142 puberulent with trichomes up to 0.25 mm long, similar to the ones on the inflorescence
143 axis, inner surface glabrous; torus glabrous. *Calyx* opening regularly, dark reddish-
144 purple, outer surface glabrous to moderately puberulent with trichomes up to 0.25 mm
145 long, similar to the ones on the inflorescence axis, inner surface glabrous; tube 1.5–2
146 mm long; lobes repand, with each with a short and callose dorsal projection, 0.25–0.5
147 mm long, whitish and much lighter than the rest of the calyx and hypanthium when dry.
148 *Petals* 20–22.5 × 10–16 mm, 2.5–3.5 mm wide at base, strongly asymmetrically
149 obovate, apex rounded, margin entire, reddish-purple, glabrous. *Stamens* 10,

150 isomorphic, all bent to one side of the flower at anthesis giving the flower a
 151 zygomorphic appearance; filaments 9–10 mm, reddish-purple, flat, glabrous;
 152 connectives not prolonged below the thecae, purple in the thecae, white in the transition
 153 to the descending appendage, glabrous, with two dorsal appendages, one descending, 2–
 154 2.5 mm long, triangular, yellow, the other a mere hump, ca. 0.25 mm long, broadly
 155 rounded, white, distant 1.25 mm from the tip of the descending appendage; anthers 9.5–
 156 10 mm long, lanceolate, purple, glabrous, with its apical third slightly inflexed, opening
 157 by one dorsally inclined pore, thecae polysporangiate, with a corrugated surface. *Ovary*
 158 5-locular, superior, 3.5×2.25 –2.5 mm, ovate and apically 5-lobed, reddish-purple, not
 159 exceeding the hypanthium length, glabrous; style 12 mm long, reddish-purple, glabrous,
 160 incurved at the apex and opposite to the anthers at anthesis; stigma punctiform and
 161 minutely papillate, ca. 0.5 mm wide, whitish. *Fruits* and *seeds* not seen.

162

163 **Additional specimens examined (paratypes)**

164 PERU. Amazonas: Prov. Bongará, Dist. Yambrasbamba, “El Toro” forest located in the
 165 farming community of Yambrasbamba, 2100 m, 05°39'16.9"S, 77°54'36.9"W, 23 Jul
 166 2015 (fl. bud), *S. Almeyda & C. Castillo 18* (MOL, UPCB), Abra Patricia-Alto Nieva
 167 Private Conservation Area, Abra Patricia, from the highway to the mountain top, 1950-
 168 2200 m, 05°40'03.67"S, 77°46'14.56"W, 20 Jul 2014 (fl.), *Y.F. Deng et al. 1660*
 169 (USM), near to CP Miraflores, 1960 m, 5°42'16.44"S; 77°55'54.18"W, 10 Nov 2020 (fl.
 170 bud), *R. Fernandez-Hilario et al. 2030* (HOXA, MOL, NY), from CP Santa Rosa to El
 171 Toro, 2000 m, 5°40'15.03"S; 77°55'26.60"W, 11 Nov 2020 (fl.), *R. Fernandez-Hilario*
 172 *et al. 2058* (HOXA, MOL, NY, UPCB), from CP La Florida to the Don Ilario's farm,
 173 2100 m, 5°40'21.68"S; 77°57'16.02"W, 12 Nov 2020 (fl.), *R. Fernandez-Hilario et al.*
 174 *2072* (HOXA, MOL, UPCB).

175

176 Distribution and habitat

177 *Meriania penningtonii* is a shrub or small tree endemic to high-elevation montane
178 forests in the District of Yamborasbamba (Amazonas, Peru), between 1800-2200 m (Fig.
179 11), on moderate to strong slopes and creeks. Common tree genera in the locality “El
180 Toro” (Almeyda & Castillo 18) include *Ficus* (Moraceae), *Magnolia* (Magnoliaceae),
181 *Miconia* (Melastomataceae), *Nectandra* (Lauraceae) and *Sapium* (Euphorbiaceae).

182

183 Etymology

184 The species is named in honor of Terence D. “Terry” Pennington, a British botanist who
185 collected *Meriania penningtonii* for the first time. For more than 30 years Terry has
186 carried out research in the flora of Peru, making extensive collections, writing
187 monographies for several Neotropical tree genera and families (*Inga*, *Sloanea*,
188 Meliaceae and Sapotaceae), and led the publication of *Trees of Peru* (Pennington et al.
189 2004).

190

191 Phenology

192 It has been collected in flower in July and December.

193

194 Conservation status

195 *Meriania penningtonii* is known from three localities in the Yamborasbamba district. The
196 original forest cover of this region has been decreasing in recent years mainly due to
197 livestock farming. Following IUCN (2012, 2019) guidelines and based on an estimated
198 extent of occurrence of 94 km², we assign this species to the category Critically Endan-
199 gered [CR (B1a+biiiii)].

200

201 **Discussion**

202 *Meriania penningtonii* is clearly distinguished from other species within the genus by
203 the combination of quadrate 4-winged internodes (the wings projections up to 3.5 mm
204 high, Fig. 2B), the nodes without interpetiolar flaps and calyx with short and callose
205 dorsal projections, these whitish and much lighter than the rest of the calyx and
206 hypanthium when dry. These unusual callose dorsal projections in the calyx of *M.*
207 *penningtonii* (Fig. 3C-D) have not been seen in other species of *Meriania*. Winged to
208 quadrangular internodes also occur in *M. tetragona* (Cogn.) Wurdack, from Ecuador
209 and Peru, and *M. nobilis* Triana, from Colombia, but both species have nodes with
210 interpetiolar flaps, which in turn are absent in *M. penningtonii*. Additionally, *M. nobilis*
211 has glabrous leaves (vs. moderately to densely puberulent in *M. penningtonii*), the calyx
212 with conic dorsal projections (vs. callose), and dimorphic stamens (vs. isomorphic).

213

214 Due to the quadrate and 4-winged internodes, and the ovate leaves, specimens of *M.*
215 *penningtonii* (*S. Almeyda & C. Castillo 18* and *T.D. Pennington et al. 17639*) have been
216 erroneously identified as species in the *Meriania radula* complex, formed by *M.*
217 *almedae* Wurdack, *M. radula* (Benth.) Triana, *M. tetragona* and *M. sanguinea*
218 Wurdack. However, the species in this complex are shrubs with flowers with
219 campanulate, deep red corollas, whereas the shrubs or small trees of *M. penningtonii*
220 have spreading, reddish-purple corollas (Fig. 2D). The projections on the transition zone
221 from the petiole to the midvein of *M. penningtonii* may be interpreted as glands or
222 extra-floral nectaries; they are not covered by trichomes and are dark when dry (Fig.
223 3B). These conic to rounded projections can be confused with the projections on the
224 leaves of species in the *M. radula* complex. In this complex, *Meriania almedae*, *M.*

225 *radula* and *M. tetragona* have tuberculate projections, while *M. sanguinea* has
 226 liguliform projections.

227

228 Among the Peruvian species of *Meriania*, *M. penningtonii* probably belongs in a group
 229 of species that includes *M. tetraquetra* Triana and *M. rugosa* Markgr., both species also
 230 endemic to northern Peru. These species are trees with bullate leaves, spreading
 231 corollas, reddish-purple petals, isomorphic stamens, and connectives with similar dorsal
 232 appendages, one triangular descending and the other a mere hump right above the first
 233 one. Within this group *M. penningtonii* can be distinguished by its quadrate and 4-
 234 winged internodes (vs. quadrate but not winged in the other species), the calyx with
 235 callose dorsal projections 0.75–1 mm long (vs. absent in *M. tetraquetra* and acute, 1.5–
 236 2.25 mm long in *M. rugosa*), and ovate, 11.3–18.4 × 6.3–12 cm leaf blades (vs. oblong,
 237 27–35 × 13–20 cm in *M. tetraquetra* and elliptic, 15–17 × 7–8 cm in *M. rugosa*).

238

239 *Meriania dazae* Rob.Fern., R.Goldenb. & Michelang. sp. nov. (Fig. 4–6)

240

241 **Diagnosis**

242 Differs from other species of *Meriania* by the combination of elongated trichomes
 243 evenly covering the adaxial surface of leaves, calyx with claw-shaped dorsal
 244 projections, campanulate and reddish-orange corollas, large petals (19.5–24 mm long),
 245 isomorphic stamens, and connectives with two dorsal appendages, one descending,
 246 crown-shaped, and the other a mere hump right above the insertion of the first.

247

248 **Type:** PERU. Amazonas: Prov. Rodríguez de Mendoza, Dist. Vista Alegre, along Salas
 249 Creek, 2750 m, 06°06'50.58"S, 77°26'48.21"W, 06 Aug 2012 (fl.), *J.L. Marcelo-Peña*,

250 *R. Fernandez-Hilario & J. Santos 6568* (holotype: MOL [barcode 000001]; isotype:
251 MOL [000002]).

252

253 **Description**

254 **Tree** up to 8 m tall; young branches and petioles tomentose with elongated trichomes,
255 these up to 1 mm long, strongly roughened (substellate) at the base, sparse to moderate
256 on young branches, moderate to dense on petioles. **Young branches** quadrangular, 3–6
257 mm diam., lacking wings, nodes without interpetiolar flaps. **Leaves** opposite,
258 isophyllous. **Petioles** quadrangular, 1.6–4.6 cm long, without projections. **Leaf blades**
259 coriaceous, 8–12.5 × 2.9–5 cm, elliptic, apex acute to attenuate, base obtuse, rarely
260 acute, margin finely serrulate on the distal half to two-thirds, discolorous; venation
261 acrodromous and suprabasal, with one pair of secondaries (lateral nerves), distant 2–5 (–
262 9) mm from the base of the blade, and an additional pair of faint submarginal veins
263 running up to the leaf apex, tertiary (transversal nerves) pairs 20–27, percurrent, 2–5.5
264 mm distant from each other, midvein, secondary and tertiary veins impressed, and
265 reticulation not visible on the adaxial surface, midvein and secondary veins salient,
266 tertiary veins prominent and reticulation visible or barely visible on the abaxial surface;
267 adaxial surface flat, light brown when dry, glabrous; abaxial surface whitish to cream
268 when dry, densely tomentose with curly trichomes up to 2 mm long, similar to the ones
269 on the petioles, evenly covering the entire surface, with pocket domatia at the
270 convergence of the midvein and secondary veins. **Inflorescence** a terminal panicle,
271 erect, 6–10.5 × 4–6.5 cm, few-flowered; the axis and peduncle sparsely to densely
272 tomentose with trichomes similar to the ones on twigs and petioles, longer (up to 2 mm
273 long) on the nodes. **Peduncle** 1.5–4.7 cm long, quadrangular. **Main axis** 2.2–4.2 cm
274 long, quadrangular, with a pair of basal paraclades and two nodes, the proximal node

275 with a pair of flowers, rarely with two pairs, the distal node with an umbel. *Paraclades*
276 in one pair, 2.5–4.1 cm long; flowers in 4–5-flowered umbels in the branchlet ends.
277 *Bracts* foliaceous, persistent, 5.4–9.8 × 2.1–3.5 cm, petioles 1.8–2.6 cm long, shape and
278 indumentum similar to the ones on the leaves; sometimes with one pair of additional
279 bracts on proximal nodes of the main axis, 1.9 × 0.6 cm, petioles 1.6 cm long.
280 *Bracteoles* not seen (either absent or early caducous). **Flowers** 5-merous, pendant, with
281 campanulate corollas. *Pedicels* 10–12 mm long, greenish, densely tomentose, the
282 trichomes up to 1 mm long, similar to the ones on the inflorescence axis. *Hypanthium*
283 6.5–8 × 5.5–6 mm, campanulate, greenish, outer surface densely tomentose with
284 trichomes similar to the ones on pedicels, inner surface glabrous; torus glabrous. *Calyx*
285 opening regularly, greenish, outer surface densely tomentose with trichomes similar to
286 the ones on pedicels, inner surface glabrous; tube 1–2 mm long; lobes 3–6 × 4.5–6 mm,
287 acute to acuminate, with each with a clawed dorsal projections, 1–4.5 mm long. *Petals*
288 19.5–24 × 16.5–19 mm, 3–3.5 mm wide at base, obovate and slightly asymmetric, apex
289 rounded, margin entire, reddish-orange, glabrous. *Stamens* 10, isomorphic, all bent to
290 one side of the flower at anthesis giving the flower a zygomorphic appearance;
291 filaments 8–10.5 mm, magenta, basally flat and apically plano-convex, glabrous;
292 connectives prolonged below the thecae ca. 0.5 mm (not including the descending
293 appendage), magenta, glabrous, with two dorsal appendages, one descending, 1.75–2
294 mm long, crown-shaped, with rounded to irregular lobes up to ca. 0.25 mm, the other a
295 mere hump, 0.25 mm long, broadly rounded, distant 1.25–1.5 mm from the tip of the
296 descending appendage; anthers 8.5–9.5 mm long, lanceolate, magenta, glabrous,
297 straight, opening by one dorsally inclined pore, thecae with a slightly corrugated
298 surface. *Ovary* 5-locular, superior, basally fused with the hypanthium, the free portion
299 4.5–5 × 3.5–4 mm, ovate and slightly 5-costate, color unknown, not exceeding the

300 hypanthium length, glabrous; style 21–25.5 mm long, reddish-orange, glabrous,
301 incurved at the apex and opposite to the anthers at anthesis; stigma punctiform and
302 minutely papillate, ca. 1 mm wide, whitish. **Fruits** capsular (velatidia), with a persistent
303 hypanthium and caducous sepals; mature ovary ca. 6 × 6 mm, spheroid, costate,
304 completely concealed by hypanthium; fruiting pedicels 1.2–1.5 cm long. **Seeds**
305 triangular-linear, ca. 0.75 mm long, numerous.

306

307 **Additional specimens examined (paratypes)**

308 PERU. Amazonas: Prov. Rodríguez de Mendoza, Dist. Vista Alegre, Vista Alegre
309 Regional Conservation Area, near to the camp N°1 and Salas Creek, 2650 m,
310 06°06'42.52"S, 77°26'23.28"W, 04 Aug 2012 (fl.), *R. Fernandez-Hilario et al. 169*
311 (MOL, UPGB), along Salas Creek, 2650 m, 06°06'44.20"S, 77°26'27.51"W, 04 Aug
312 2012 (fl.), *J.L. Marcelo-Peña et al. 6528* (MOL), 2750 m, 06°06'50.58"S,
313 77°26'48.21"W, 06 Aug 2012 (fl.), *J.L. Marcelo-Peña et al. 6559* (MOL).

314

315 **Distribution and habitat**

316 *Meriania dazae* is a tree endemic to high-elevation montane forests in the Vista Alegre
317 Omia Regional Conservation Area (Amazonas, Peru), between 2650-2750 m (Fig. 11),
318 on moderate to strong slopes and creeks. Common tree genera in the area include
319 *Ladenbergia* (Rubiaceae), *Miconia* (Melastomataceae), *Nectandra* (Lauraceae),
320 *Schefflera* (Araliaceae) and *Weinmannia* (Cunoniaceae).

321

322 **Etymology**

323 It is an honor to dedicate name of this species to Aniceto Daza, researcher at the
324 Herbario Forestal (MOL) of Universidad Nacional Agraria La Molina for more than 40

325 years. His collections are an important contribution to the knowledge of the Peruvian
326 tree flora, including the types of several new species. He is a co-author of the *Trees of*
327 *Peru* (Pennington et al. 2004).

328

329 **Phenology**

330 It has been collected in flower and fruit in August.

331

332 **Conservation status**

333 *Meriania dazae* is known from only one locality in the montane forest within the Área
334 de Conservación Regional Vista Alegre Omia. This regional conservation area covers
335 approximately 490 km², and includes premontane, montane forests and paramos. Under
336 the guidelines of IUCN (2012, 2019) and based on an estimated area of occupancy of 4
337 km², we assign this species to the category Endangered [EN (B2a+bi)].

338

339 **Discussion**

340 *Meriania dazae* belongs in a group of species characterized by campanulate, reddish-
341 orange corollas, and lobed calyx, usually with claw-shaped dorsal projections. The
342 species in this group occur in the Andes from Venezuela to Ecuador, with *M. dazae*
343 being the first in this group recorded for Peru. Within this group the species that are
344 most similar to *M. dazae* are *M. cuneifolia* Gleason and *M. loxensis* Gleason, both
345 endemic to Ecuador. However, *Meriania dazae* differs from the former by its
346 hypanthium 6.5–8 mm long (vs. 4–5 mm), petals 19.5–24 mm long (vs. 10–13.5 mm)
347 and isomorphic stamens (vs. dimorphic in size), and differs from the latter by its
348 petioles 1.6–4.6 cm long (vs. 1–2 cm), hypanthium and calyx densely tomentose (vs.

349 moderately puberulous), and flowers on branchlet ends arranged in 4–5-flowered
350 umbels (Fig. 6C; vs. in dichasia).

351

352 The only Peruvian species with some features similar to *M. dazae* are *M. acida*
353 (Markgr.) Wurdack and *M. tomentosa* (Cogn.) Wurdack, the former endemic to
354 northern Peru and the latter distributed from Venezuela to Bolivia. These species share
355 with *M. dazae* the leaf blades with the abaxial surface densely tomentose, and
356 campanulate, reddish-orange corollas. Nevertheless, these two species have calyptrate
357 calyces with irregular dehiscence. In addition, *Meriania dazae* differs from *M. acida* by
358 its leaf blades 8–12.5 × 2.9–5 cm (vs. 12–18 × 5–9 cm), terminal inflorescences (vs.
359 pseudo-terminal) and petals 19.5–24 mm long (vs 10 mm). An additional character that
360 may be shared by *M. dazae* and *M. tomentosa* are the polysporangiate thecae (Caetano
361 et al. 2020), but of a different color (magenta vs. cream). Furthermore, both species can
362 be distinguished by the inflorescence length (6–10.5 cm in *M. dazae* vs. 19.9–32.3 cm
363 in *M. tomentosa*) and the shape of the descending connective appendages (crowned vs.
364 blunt).

365

366 The pocket leaf domatia in *Meriania dazae* are located at the union of the midvein and
367 secondary veins, on the abaxial surface (Fig. 6A). Domatia located in this region have
368 been recorded for species of *Meriania* from the Atlantic Forest in Brazil (Chiavegatto
369 and Baumgratz 2015, Goldenberg et al. 2016) and the Greater Antilles (Michelangeli et
370 al. 2015). However, the species from the Atlantic Forest (with the exception of *M.*
371 *tetramera* Wurdack and *M. inflata* Michelang. & R.Goldenb.) are distinguished by their
372 spreading corollas (vs. campanulate in *M. dazae*) and connectives with developed and
373 apically lobed ascending appendages (vs. a mere rounded hump). *Meriania tetramera*

374 and *M. inflata* differ from *M. dazae* by the combination of leaf blades glabrescent or
375 with sparse trichomes on the adaxial surface (vs. densely tomentose, Fig. 6B), white to
376 pale green petals (vs. reddish-orange) and thecae with an inflated sac at the base (vs. not
377 inflated). As for the species from the Greater Antilles, all of them present solitary and
378 axillary flowers (vs. terminal panicles in *M. dazae*) and dimorphic stamens (vs.
379 isomorphic).

380

381 **New records**

382 *Meriania drakei* (Cogniaux) Wurdack, (1967 p. 3) (Fig. 7–8)

383 **Basionym:** *Axinaea drakei* Cogniaux (1891 p. 447)

384

385 **Type:** ECUADOR. Quebrada near Loja, 09 Nov 1881 (fl.), *Poortman 149* (lectotype
386 designated here: P [barcode P00228665]; isolectotypes: BR-fragment [barcode
387 BR0000005628759], F-fragment [catalog number 935562], P [barcode P0228664]).

388

389 **Description**

390 **Tree** up to 10 m tall; young branches and petioles glabrous to moderately puberulent
391 with dendritic trichomes with a short axis up to ca. 0.05 mm long. **Young branches**
392 terete, 5–8.5 mm diam., lacking wings, nodes without interpetiolar flaps. **Leaves**
393 opposite, isophyllous to slightly anisophyllous. **Petioles** terete, 1–2 cm long, with one
394 adaxial projection, 1–1.5 mm below the base of the blade, 0.5–1.5 mm long, swollen
395 and trapezoidal. **Leaf blades** coriaceous, 11.2–17.3 × 6.5–12.5 cm, elliptic to broadly
396 elliptic, rarely obovate, apex acute to obtuse, base acute to rounded, margin entire,
397 concolorous; venation acrodromous and suprabasal, with one pair of secondaries (lateral
398 nerves), distant 3.5–12 mm from the base of the blade, and an additional pair of faint

399 submarginal veins running up to the leaf apex, tertiary (transversal nerves) pairs 42–55,
400 percurrent, 0.5–4.5 mm distant from each other, midvein, secondary and tertiary veins
401 impressed, and reticulation visible or barely visible on the adaxial surface, midvein and
402 secondary veins salient, tertiary veins prominent and reticulation visible on the abaxial
403 surface; adaxial surface flat, yellowish brown when dry, glabrous; abaxial surface
404 yellowish brown when dry, midvein and secondary veins sparsely to densely puberulent
405 with elongated slightly roughed trichomes up to ca. 0.25 mm long, reticulation and
406 surface sparsely puberulent with smaller dendritic trichomes with a short axis.

407 ***Inflorescence*** a pseudo-lateral panicle (initially terminal but overtopped by the
408 developing an axillary bud), erect, 14–22 × 13.5–17 cm, multiflorous; the axis and
409 peduncle sparsely to moderately puberulent with trichomes similar to the ones on twigs
410 and petioles. *Peduncle* 2.5–5 cm long, slightly flattened. *Main axis* 8–13.5 cm long,
411 flattened. *Paraclades* in 4–5 pairs, the proximal 8–13 cm long, the distal 4–5.3 cm long;
412 flowers in regular or depauperate dichasia in the branchlet ends. *Bracts* foliaceous,
413 caducous, 6.5 × 3.8 cm, petioles ca. 1.2 cm long, shape and indumentum similar to the
414 ones on the leaves. *Bracteoles* not seen (either absent or early caducous). ***Flowers*** 5-
415 merous, with spreading corollas. *Pedicels* 11–18 mm long, greenish to light purple,
416 moderately to densely puberulent with trichomes similar to the ones on the
417 inflorescence axis. *Hypanthium* 9–10 × 17–17.5 mm, campanulate, greenish to light
418 purple, outer surface sparsely to moderately puberulent with trichomes similar to the
419 ones on the inflorescence axis, inner surface glabrous; torus glabrous. *Calyx* opening
420 regularly, greenish to light purple, outer and inner surfaces sparsely to moderately
421 puberulent with trichomes similar to the ones on the inflorescence axis; tube 4.5–6 mm
422 long; lobes 2.5–4.5 × 9–10.5 mm, rectangular, with each with a rudimentary dorsal
423 projections. *Petals* 38–39 × 33–34 mm, 5.5–6 mm wide at base, asymmetrically

424 obovate, apex rounded, margin entire, reddish-purple, abaxial surface moderately to
 425 densely puberulent with dendritic trichomes with a short axis up to ca. 0.10 mm long,
 426 intermixed with elongated smooth trichomes up to ca. 0.5 mm long, adaxial surface
 427 glabrous to very sparsely puberulent with the same trichomes. *Stamens* 10, isomorphic,
 428 all bent to one side of the flower at anthesis giving the flower a zygomorphic
 429 appearance; filaments 13–16 mm long, reddish-purple, flat, glabrous; connectives not
 430 prolonged below the thecae, purple in the thecae, white in the transition to the
 431 descending appendage, glabrous, with two dorsal appendages, one descending, 3–3.5
 432 mm long, triangular, yellow, the other a mere hump, ca. 0.25 mm long, broadly
 433 rounded, white, distant 3.5–4 mm from the tip of the descending appendage; anthers 9–
 434 10 mm long, lanceolate, reddish-purple, glabrous, with its apical third slightly inflexed,
 435 opening by a dorsally inclined pore, thecae polysporangiate with a corrugated surface.
 436 *Ovary* 5-locular, $\frac{1}{2}$ inferior, 4–5 mm basally fused with the hypanthium, the free portion
 437 5–6.5 \times 6.5–7.5 mm, ovate, light pink, 1–2.5 mm exceeding the hypanthium length;
 438 style 15–18.5 mm long, reddish-purple, glabrous, incurved at the apex and opposite to
 439 the anthers at anthesis; stigma punctiform and minutely papillate, ca. 1 mm wide, white.
 440 **Fruits** capsular (velatidia), with persistent hypanthium and sepals; mature ovary 8.5–9.5
 441 \times 9 mm, globose to slightly ovoid, 10-costate, completely concealed by hypanthium;
 442 fruiting pedicels 7–10 mm long. **Seeds** triangular-linear, 0.75–1.25 mm long, numerous.

443

444 **Specimens examined**

445 PERU. Amazonas: Prov. Utcubamba, Dist. Cajaruro, Buffer Zone of the Cordillera del
 446 Colán National Sanctuary, 2280 m, 05°38'32.22"S, 78°15'13.32"W, 19-22 Dec 2019
 447 (fl.), R. Fernandez-Hilario et al. 1775 (HOXA, MOL, NY, UPCB, USM). Prov.
 448 Bongará, Dist. Yambrasbamba, Lechuza pathway of the Abra Patricia Biological

449 Station , 05°41'18.89"S, 77°48'23.68"W, 2120 m, 21 Feb 2020 (fr.), *R. Fernandez-*
450 *Hilario et al. 1937* (HOXA, MOL, UPCB).

451

452 **Comments**

453 *Meriania drakei* was previously known from Andean forests from Ecuador and southern
454 Colombia (Department of Putumayo) (Wurdack 1980, Almeda et al. 2020), and now
455 two new localities are recorded in northern Peru in the Department of Amazonas (Fig.
456 11). Among Peruvian species of *Meriania*, adaxial projections on the petioles are only
457 present in *M. drakei* and *M. franciscana* C. Ulloa & Homeier (see below). However, in
458 *M. drakei* the projections are swollen and trapezoidal (Fig. 8A-B) (vs. wedge-like
459 projections in *M. franciscana*, Fig. 10A-B). *Meriania drakei* can also be distinguished
460 by its suprabasal venation (vs. basal in *M. franciscana*), pseudo-lateral inflorescences
461 (vs. terminal), petals 35.8–39 mm long (vs. 9.5–12 mm) and stamens without an inflated
462 connectives (vs. antepetalous stamens with inflated connectives).

463

464 Although the inflorescences within *Meriania* are usually terminal, in some species the
465 lateral branches grow and overtop the inflorescences, giving a pseudo-lateral
466 appearance. Sometimes this character can be difficult to distinguish, but in some
467 Peruvian species such as *M. acida*, *M. drakei*, *M. hexamera* Sprague and *M. cuzcoana*
468 Wurdack the pseudo-lateral inflorescences are clearly recognizable. Within this group
469 only *M. hexamera*, distributed from Colombia to Peru, may be confused with *M. drakei*,
470 because of the shared elliptic leaf blades and spreading, reddish-purple corollas.
471 However, the former species is distinguishable by its glabrous leaves (vs. puberulent in
472 *M. drakei*, Fig. 8C), 6-merous flowers (vs. 5-merous) and hypanthium 5 mm long (vs.
473 9–10 mm). In addition, *Meriania drakei* is clearly distinguished from the rest of the

474 Peruvian species by its calyx with rectangular lobes, and petals moderately to densely
475 puberulent on the adaxial surface. The puberulent petals are clearly distinguishable in
476 flower buds (Fig. 8D).

477

478 **Nomenclatural notes**

479 According Art. 9.10 of the ICN (Turland et al. 2018), we have to consider that Wurdack
480 (1980) did the first step lectotypification of *M. drakei* when he wrote “*Poortman 149*
481 (*P. holotype*)” in his treatment of Melastomataceae for the Flora of Ecuador. However,
482 there are two sheets of *Poortman 149* housed in P and both with Wurdack’s annotations.
483 Therefore, we designate the sheet P00228665 as the lectotype (second-step
484 lectotypification), conforming with Art. 9.17 (Turland et al. 2018).

485

486 *Meriania franciscana* C. Ulloa & Homeier (2008 p. 383) (Fig. 9–10)

487

488 **Type:** ECUADOR. Zamora-Chinchipec: Reserva San Francisco, road Loja-Zamora, c.
489 35 km from Loja, 1890 m, 03°58’S, 79°04’W, 28 Jul 2007 (fl.), *J. Homeier 2625*
490 (holotype: QCNE [barcode QCNE225593]; isotypes: GOET [barcode GOET011446],
491 LOJA [barcode LOJA213337], M [barcode M-0274973], MO [barcode MO-2161006],
492 NY [barcode NY01287741], QCA [barcode QCA144072]).

493

494 **Description**

495 **Tree** up to 16 m tall; young branches and petioles puberulent with dendritic trichomes
496 with a short axis up to ca. 0.25 mm long, sparse to dense on the young branches,
497 moderate to dense on petioles. **Young branches** terete, 4.5–6 mm diam., lacking wings,
498 nodes without interpetiolar flaps. **Leaves** opposite, isophyllous, sometimes slightly

499 anisophyllous. *Petioles* terete, 2.5–4 cm, with an adaxial projection, on the insertion of
500 the petiole with the leaf blade, up to ca. 0.5 mm high, small wedge-like structure,
501 sometimes inconspicuous or obscured by the trichomes. *Leaf blades* coriaceous, 7.5–
502 14.2 × 4.3–6 cm, elliptic to oblong, apex acute to obtuse, rarely emarginate, base obtuse
503 to rounded, margin entire, often slightly revolute at base, discolorous; venation
504 acrodromous and basal, with one pair of secondaries (lateral nerves), and an additional
505 pair of faint submarginal veins running up to the leaf apex, tertiary (transversal nerves)
506 pairs 29–53, percurrent, 1–7.5 mm distant from each other, midvein, secondary and
507 tertiary veins impressed, and reticulation barely visible on the adaxial surface, midvein
508 and secondary veins salient, tertiary veins prominent and reticulation visible on the
509 abaxial surface; adaxial surface flat, light brown, glabrous or veins sparsely puberulent
510 with dendritic trichomes with a short axis, denser near the base, up to ca. 0.25 mm long;
511 abaxial surface brown, midvein and secondary veins sparsely to densely puberulent with
512 elongated moderately roughed trichomes up to ca. 0.25 mm long, reticulation and
513 surface sparsely to densely puberulent with smaller dendritic trichomes with a short
514 axis, but without covering the entire surface. **Inflorescence** a terminal panicle, erect,
515 15–20 × 5.5–13.8 cm, multiflorous; the axis and peduncle moderately to densely
516 puberulent with trichomes similar to the ones on twigs and petioles. *Peduncle* 3.5–6.2
517 cm long, terete. *Main axis* 7–12.5 cm, terete. *Paraclades* in 5–6 pairs, the proximal 5–
518 8.2 cm long, the distal 1.8–2.5 cm long; flowers in 5–8-flowered umbels in the
519 branchlet ends. *Bracts* foliaceous, persistent, 8.2–11.5 × 3.5–5.5 cm, petioles 3–4 cm
520 long, shape and indumentum similar to the ones on the leaves. *Bracteoles* not seen
521 (either absent or early caducous). **Flowers** 5-merous, with campanulate corollas.
522 *Pedicels* 5–8 mm long, green, sparsely to moderately puberulent with trichomes similar
523 to the ones on the inflorescence axis. *Hypanthium* 3–4 × 5–7.5 mm, campanulate, green

524 to light purple, outer surface sparsely to moderately puberulent with trichomes up to ca.
525 0.13 mm long, similar to the ones on pedicels, inner surface glabrous; torus glabrous.
526 *Calyx* opening regularly, green to light purple, outer surface sparsely puberulent with
527 trichomes up to ca. 0.13 mm long, similar to the ones on pedicels, inner surface
528 glabrous; tube 1.5–2 mm long; lobes 0.5–1 mm long, 3–4 mm wide at base, rounded,
529 without dorsal projections. *Petals* 9.5–12 × 6.5–9 mm, 3.5–5.5 mm wide at base,
530 oblong, apex asymmetric, margin entire, reddish-purple, apex slightly ciliate. *Stamens*
531 10, strongly dimorphic, all bent to one side of the flower at anthesis giving the flower a
532 zygomorphic appearance; antesealous stamens filaments 5–6 mm long, reddish-purple,
533 flat, glabrous, connectives prolonged below the thecae ca. 0.5 mm long (not including
534 the descending appendage), purple, glabrous, with two dorsal appendages, one
535 descending, 3–4.5 mm long, acuminate, purple, the other appendage a mere hump, ca.
536 0.25 mm long, broadly rounded, purple, distant 2–2.5 mm from the tip of descending
537 appendage, anthers 3.5–5 mm long, lanceolate, color unknown, glabrous, slightly
538 curved, opening by one dorsally inclined pore, thecae with smooth surface; antepetalous
539 stamens filaments 5–6 mm long, reddish-purple, flat, glabrous, connectives prolonged
540 below the thecae ca. 0.25 mm long (not including the descending appendage), abruptly
541 inflated from ca. 2.5 mm of the tip of the thecae, purple in the apical portion and cream
542 in the inflated portion, glabrous, with two dorsal appendages, one descending, 3.5–5
543 mm long, falcate, purple, the other ascending, 0.25–0.75 mm long, blunt, purple, distant
544 1.25–1.5 mm from the tip of descending appendage, anthers 4.5–5 mm long, lanceolate,
545 color unknown, glabrous, slightly curved, opening by one dorsally inclined pore, thecae
546 with smooth surface. *Ovary* 5-locular, superior, 3 × 3–3.5 mm, spheroid and slightly 5-
547 costate, light purple, not exceeding the hypanthium length, glabrous; style 13–15.5 mm
548 long, reddish-purple, glabrous, incurved at the apex and opposite to the anthers at

549 anthesis; stigma punctiform and minutely papillate, ca. 0.5 mm wide, purple. *Fruits* and
550 *seeds* not seen.

551

552 **Specimens examined**

553 PERU. Cajamarca: Prov. San Ignacio, Dist. San José de Lourdes, CP Camana, 1750–
554 1900 m, 05°01'S, 78°54'W, 04 Mar 1997 (fl.), *J. Campos & S. Corrales 3393* (MOL,
555 NY, USM), bottom of the cerro Picorana, 2100 m, 04°59'25"S, 78°54'05"W, 01 Dec
556 1998 (fl.), *C. Díaz & S. Fernández 10150* (HUT, MOL, USM).

557

558 **Comments**

559 *Meriania franciscana* was previously known only from Andean forests from Ecuador
560 (Province of Zamora Chinchipe) (Ulloa Ulloa and Homeier 2008), and now a new
561 locality is recorded in the Department of Cajamarca in northern Peru (Fig. 11).

562 *Meriania franciscana* belongs to the *M. macrophylla* complex (Wurdack 1978, Ulloa
563 Ulloa and Homeier 2008), characterized by campanulate corollas, strongly dimorphic
564 stamens, and antepetalous stamens with inflated connectives. The *M. macrophylla*
565 complex comprises six species distributed from southern Mexico (States of Chiapas) to
566 northwestern South American (Colombia, Ecuador, Peru and Venezuela) (Wurdack
567 1978, Almeda 1993, Ulloa Ulloa and Homeier 2008, Bussmann and Paniagua 2012,
568 Almeda et al. 2020).

569

570 *Meriania franciscana* and *M. ninakurorum* (Bussmann & Paniagua) E. Cotton &
571 Balslev are the only species of this complex occurring in Peru, the latter also in the
572 northern part of the country from Department of Amazonas. These species are also the
573 only ones within the complex that do not present connectives with descending bifid

574 appendages. *Meriania franciscana* is distinguished from *M. ninakurorum* by the
575 petioles with projections (Fig. 10A-B; vs. without projections in *M. ninakurorum*), leaf
576 blades $7.5\text{--}14.2 \times 4.3\text{--}6$ cm (vs. $23\text{--}32 \times 9\text{--}15$ cm), reddish-purple petals (vs. pink) and
577 connectives with ascending appendages (vs. without ascending appendages). A detailed
578 comparison of *M. franciscana* with the other species in the *M. macrophylla* complex
579 can be found in Ulloa Ulloa and Homeier (2008).

580

581 The Peruvian population of *M. franciscana* differs from the typical population by the
582 usually smaller leaf blades $7.5\text{--}14.2 \times 4.3\text{--}6$ cm (vs. $10\text{--}21 \times 4.5\text{--}9.5$ cm) with the apex
583 acute to obtuse, rarely emarginate (vs. acute to apiculate), and the smaller inflorescences
584 $15\text{--}20 \times 5.5\text{--}13.8$ cm (vs. $19.3\text{--}31.3 \times 13.4\text{--}22.3$ cm). Although the projections on the
585 petioles were not mentioned in the original description of *M. franciscana*, this can be
586 seen in the type material. On the other hand, comparing the Peruvian specimens with
587 the Figure 1D and the scale of the original description by Ulloa Ulloa and Homeier
588 (2008) the anther morphology and dimensions are the same in both cases. Therefore, the
589 petiole projections and the stamen morphology allow us to conclude that the Peruvian
590 population belongs to *M. franciscana*.

591

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596

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599

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602 DGEFFS and N° 061-2020-MINAGRI-SERFOR-DGGSPFFS.

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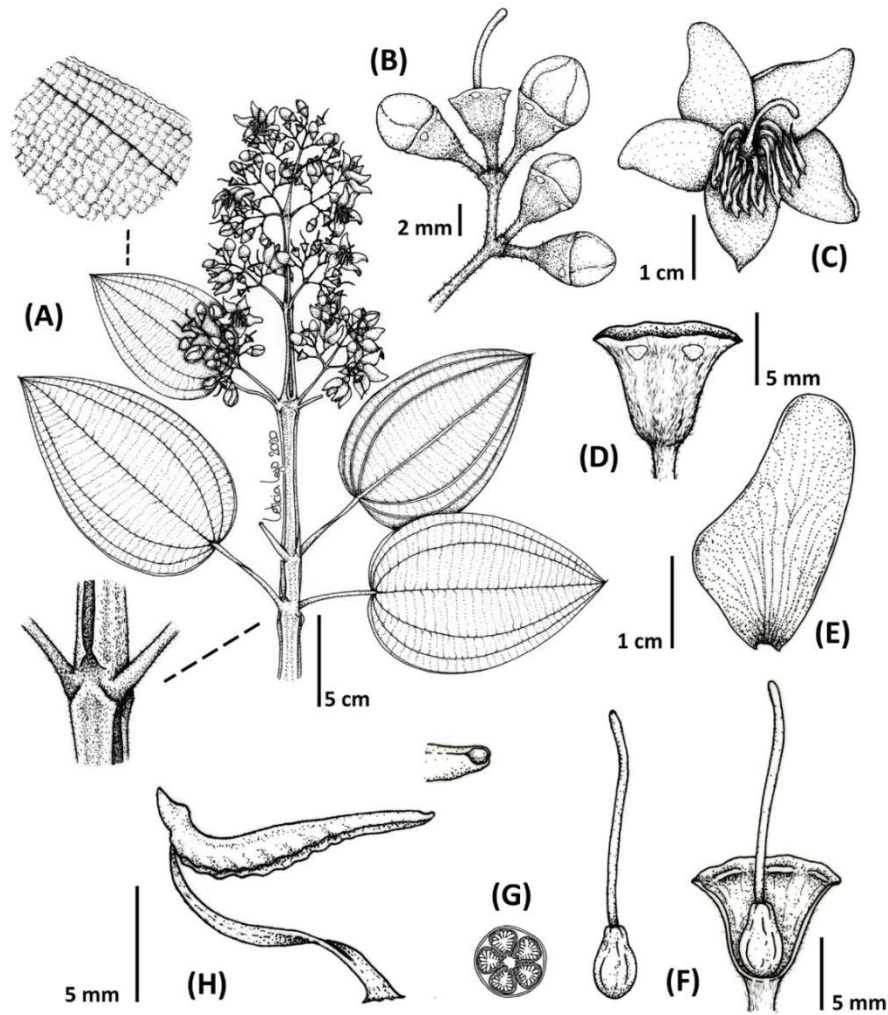
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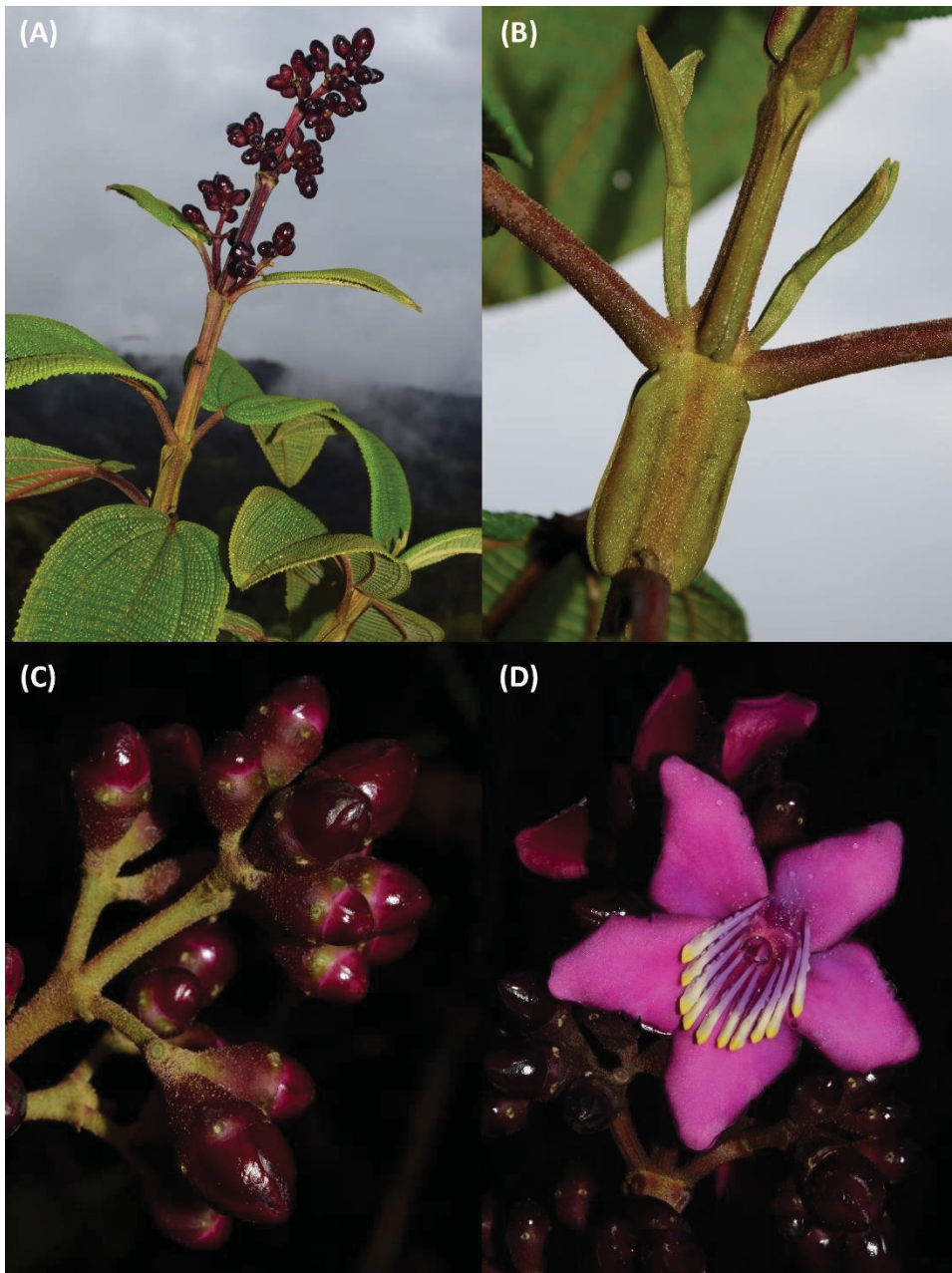
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735 Figure 1. *Meriania penningtonii*. A. Terminal fertile branch with inflorescence, and
 736 details of bullate surface and winged internodes. B. Inflorescence branch. C. Flower at
 737 anthesis. D. Hypanthium and calyx. E. Petal. F. Style and ovary (left) and longitudinal
 738 section of flower with petals and stamens removed (right). G. Transversal section of the
 739 ovary. H. Stamen, lateral view, with detail of pore orientation. From *T.D. Pennington et*
 740 *al.* 17639 (MOL). Drawing by Leticia Lajo.

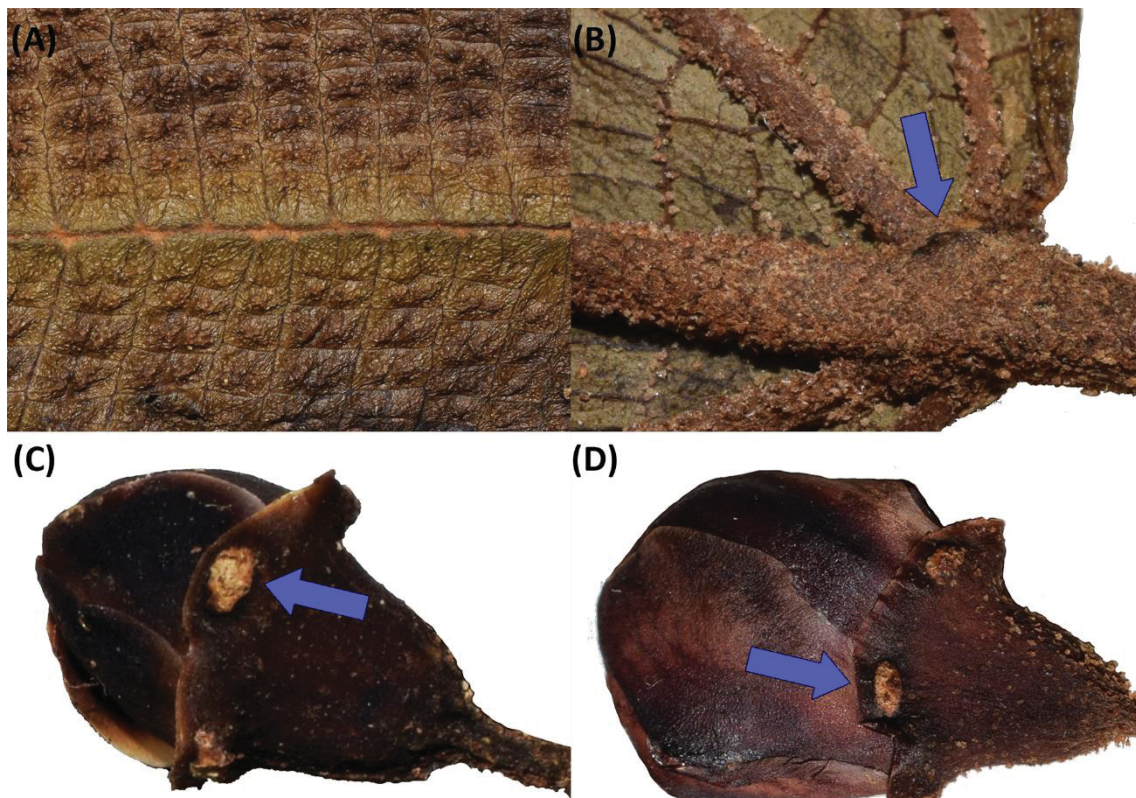
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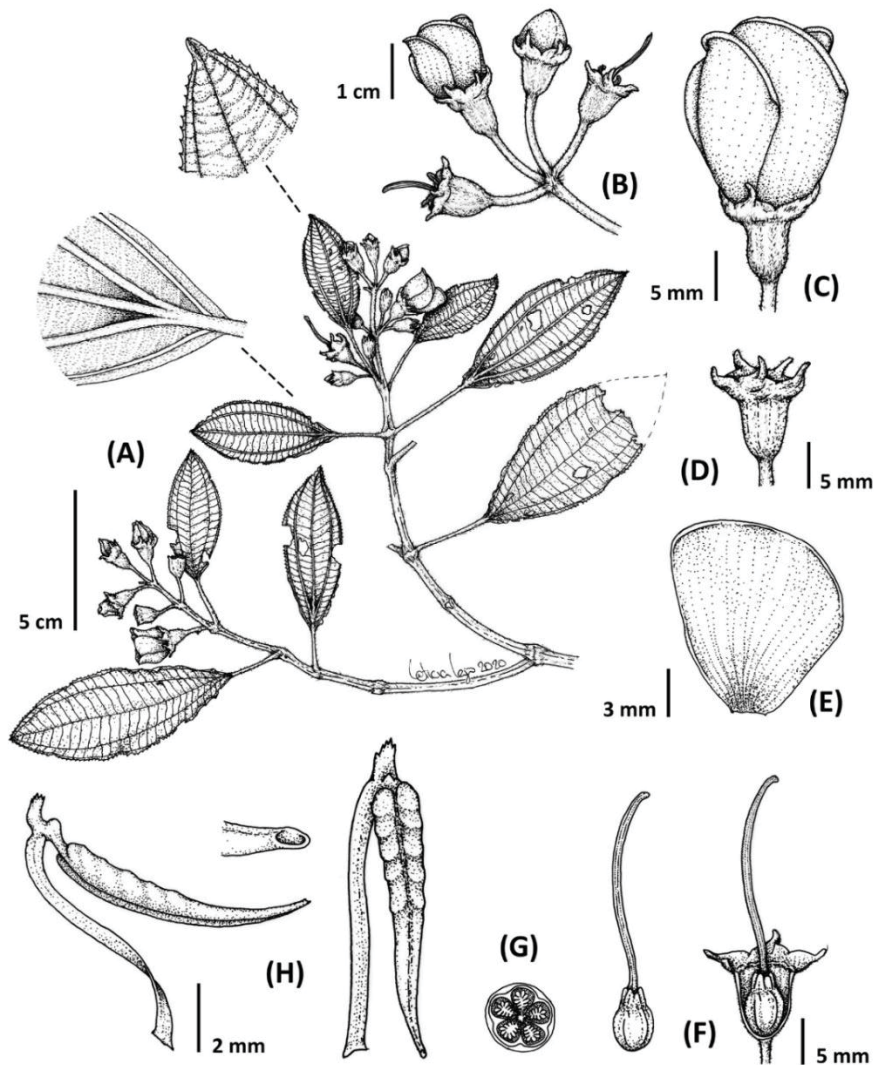
743 Figure 2. *Meriania penningtonii*. A. Terminal fertile branch with inflorescence. B.744 Winged internodes. C. Flower buds. D. Flower at anthesis, apical view. A-B from *R.*745 *Fernandez-Hilario et al. 2036*, C from *R. Fernandez-Hilario et al. 2026*, D from *R.*746 *Fernandez-Hilario et al. 2046*. Photos by Robin Fernandez.

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749 Figure 3. *Meriania penningtonii*. A. Bullate adaxial surface on the leaves. B. Projections
 750 (glands) on the transition zone from the petiole to the midvein. C-D. Detail of the
 751 whitish callus-shaped dorsal projections on the calyx. A-B and D from *T.D. Pennington*
 752 *et al.* 17639, C from *S. Almeyda & C. Castillo 18*. Photos by Robin Fernandez.



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754 Figure 4. *Meriania dazae*. A. Terminal fertile branch with inflorescences, and details of

755 leaf apex and domatia on abaxial surface. B. Inflorescence branch. C. Flower at

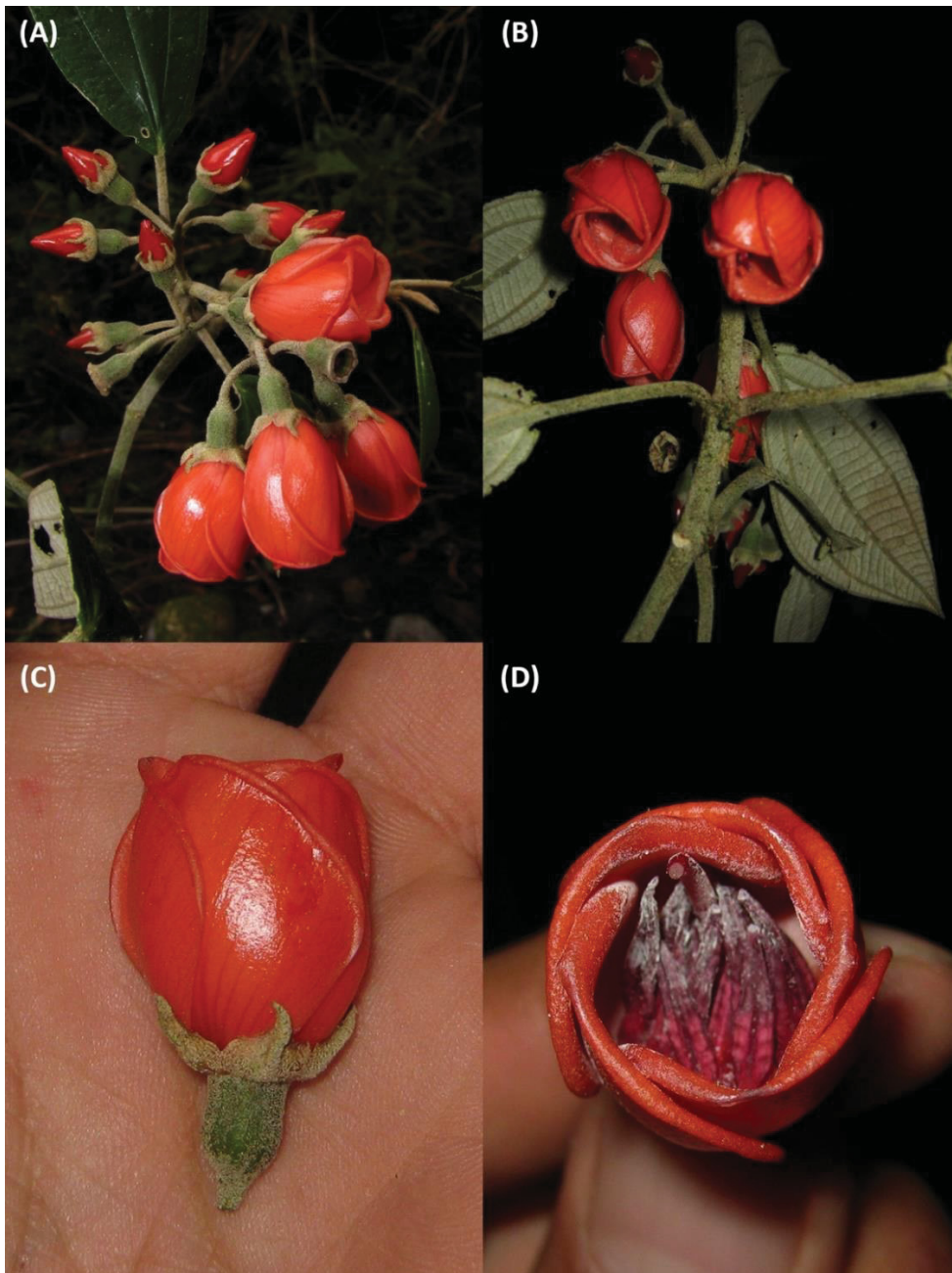
756 anthesis. D. Hypanthium and calyx. E. Petal. F. Style and ovary (left) and longitudinal

757 section of flower with petals and stamens removed (right). G. Transversal section of the

758 ovary. H. Stamen in lateral view (left) and dorsal view (right), with detail of pore

759 orientation. From *J.L. Marcelo et al. 6568 (MOL)*. Drawing by Leticia Lajo.

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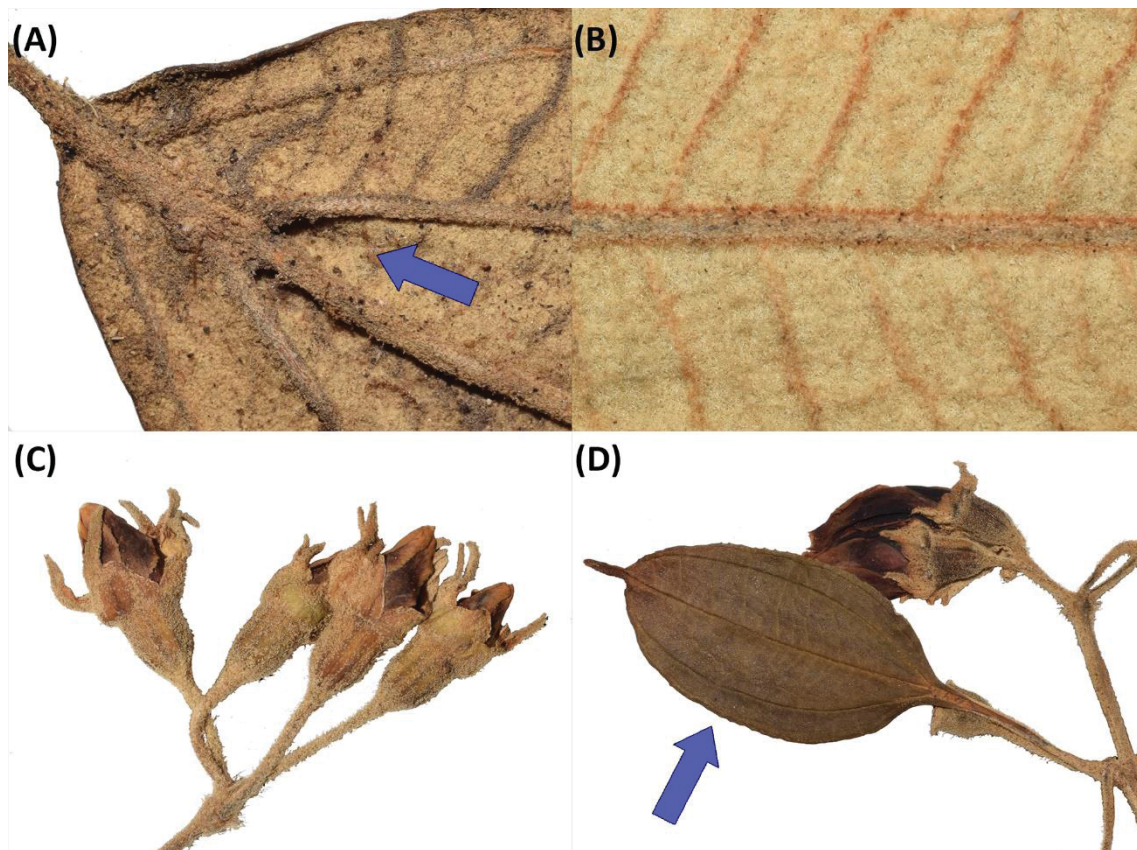


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762 Figure 5. *Meriania dazae*. A-B. Terminal fertile branches with inflorescences. C.763 Flower at anthesis, lateral view. D. Flower at anthesis, apical view. A from *J.L. Marcelo*764 *et al.* 6568, B-D from *R. Fernandez-Hilario et al.* 169. Photos by José L. Marcelo (A)

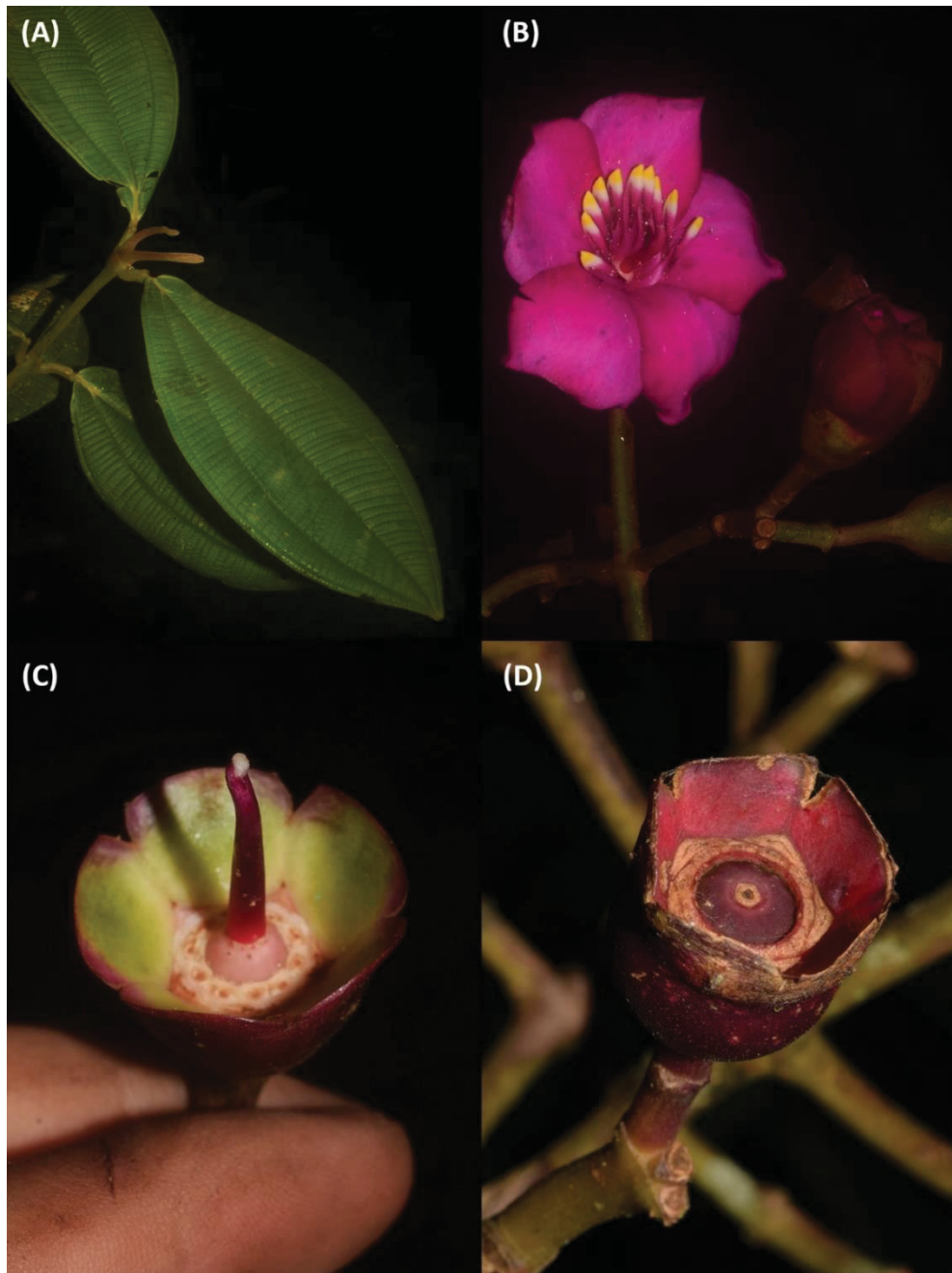
765 and Robin Fernandez (B-D).

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768 Figure 6. *Meriania dazae*. A. Leaf base, abaxial view, with domatia at the convergence
 769 of the midvein and the secondary veins. B. Leaf blade, abaxial surface. C. Umbel and
 770 flowers at the apex of the inflorescence branch. D. Additional bract on the
 771 inflorescence. A and C from *J.L. Marcelo et al. 6568*, B and D from *J.L. Marcelo et al.*
 772 *6528*. Photos by Robin Fernandez.

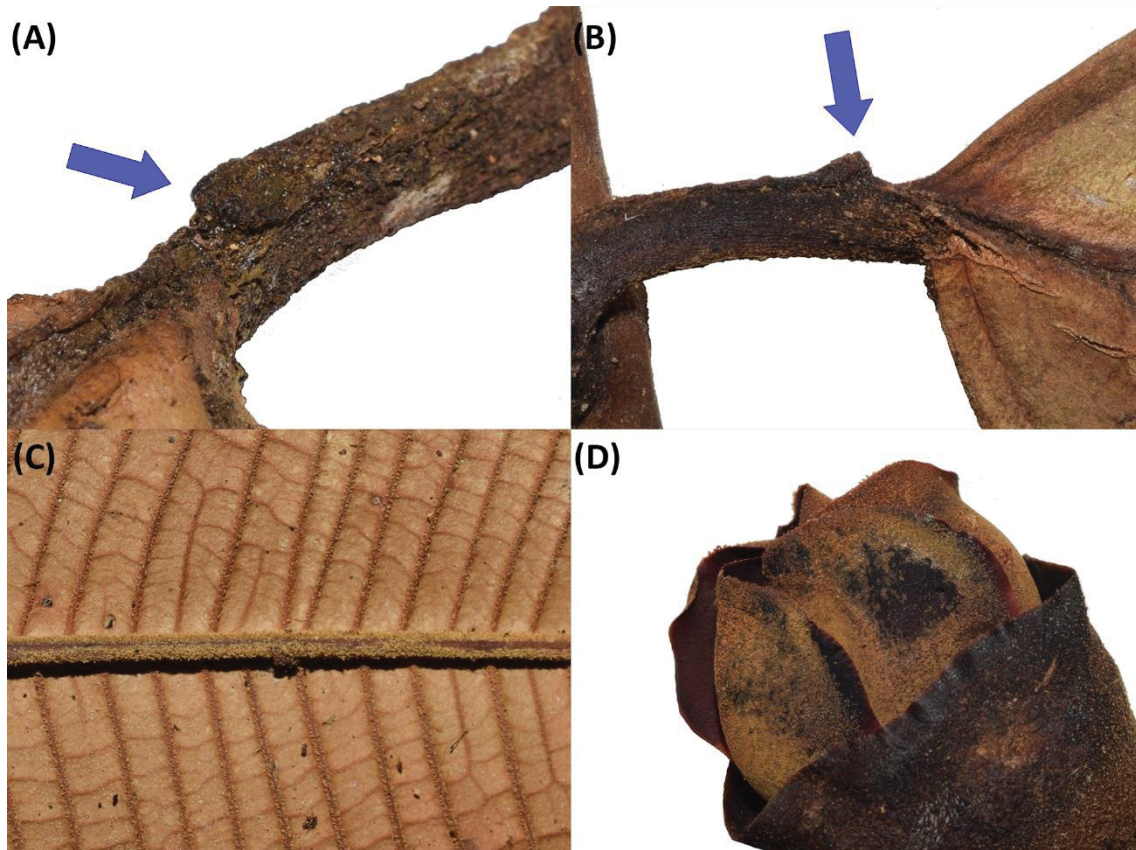


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774 Figure 7. *Meriania drakei*. A. Terminal sterile branch. B. Inflorescence with one flower775 at anthesis. C. Flower, petals and stamens removed. D. Mature fruit. A-C from *R.*776 *Fernandez-Hilario et al. 1775*, D from *R. Fernandez-Hilario et al. 1937*. Photos by

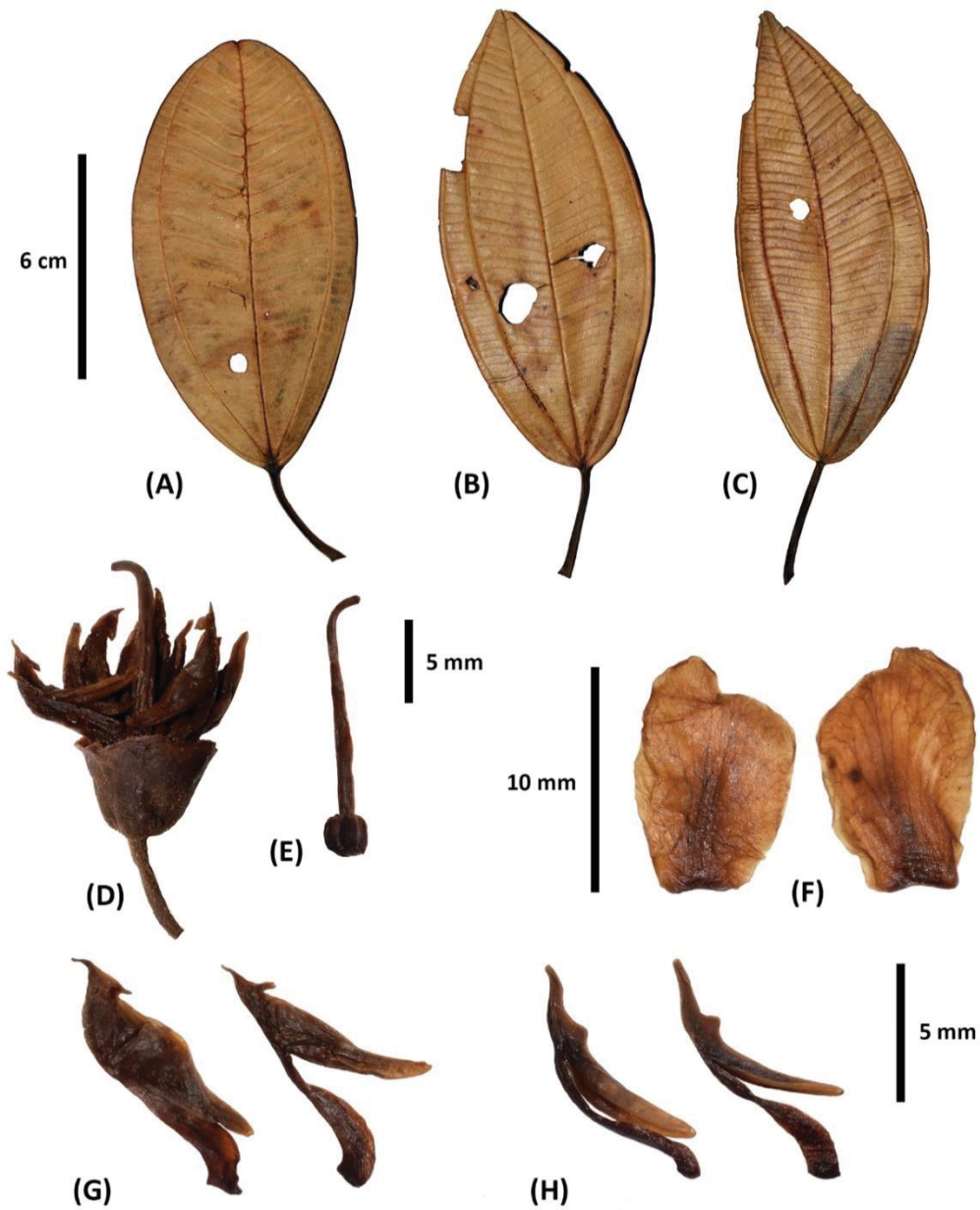
777 Robin Fernandez.

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780 Figure 8. *Meriania drakei*. A-B. Apical projections on petioles. C. Leaf blade, adaxial
 781 surface. D. Flower bud with detail of densely puberulent petals. A from R. *Fernandez-*
 782 *Hilario et al. 1937*, B-D from R. *Fernandez-Hilario et al. 1775*. Photos by Robin
 783 Fernandez.



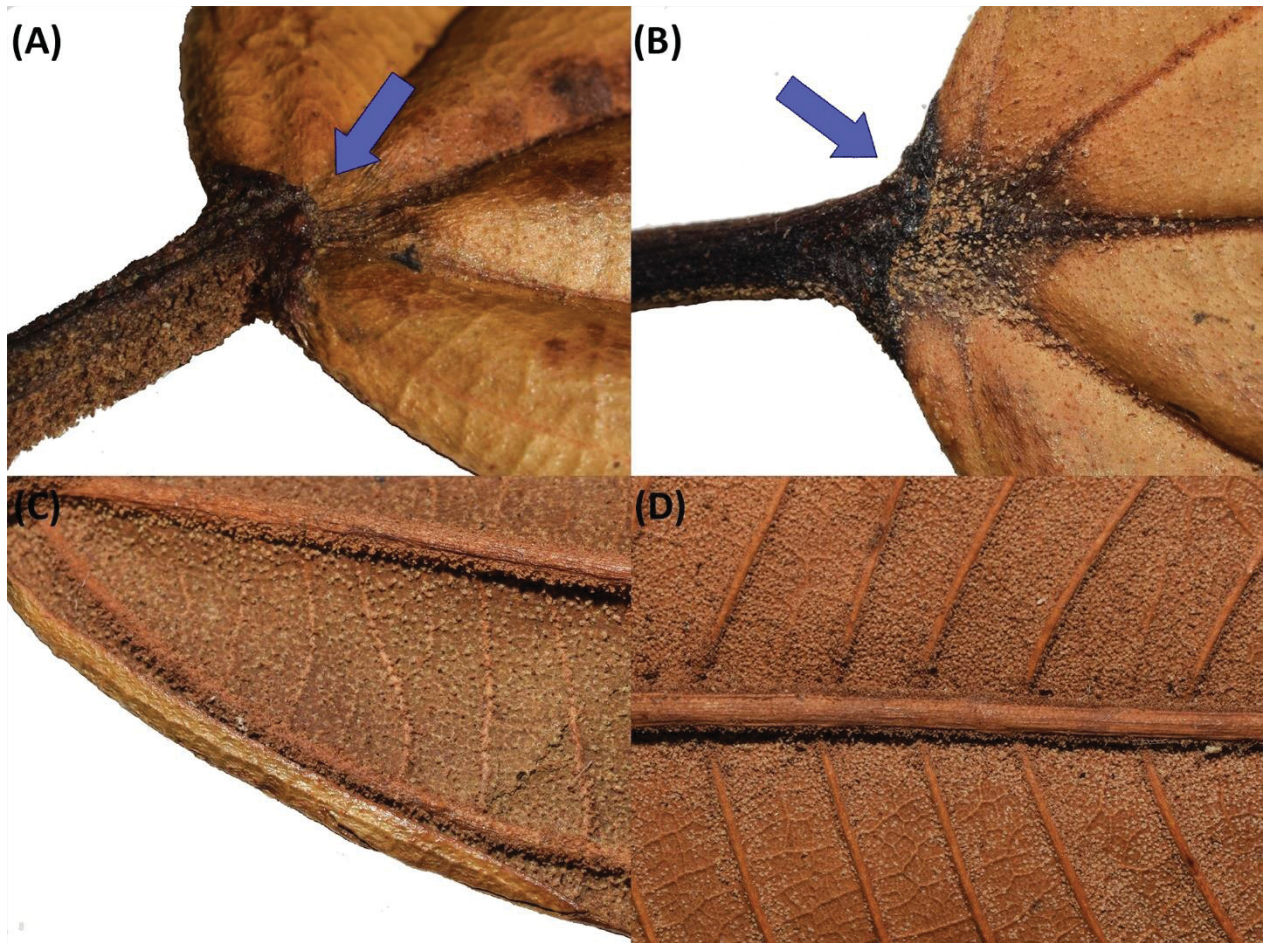
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785 Figure 9. *Meriania franciscana*. A-C. Leaves, adaxial view. D. Flower with petals

786 removed. E. Style and ovary. F. Petals. G. Antepetalous stamens, lateral view. H.

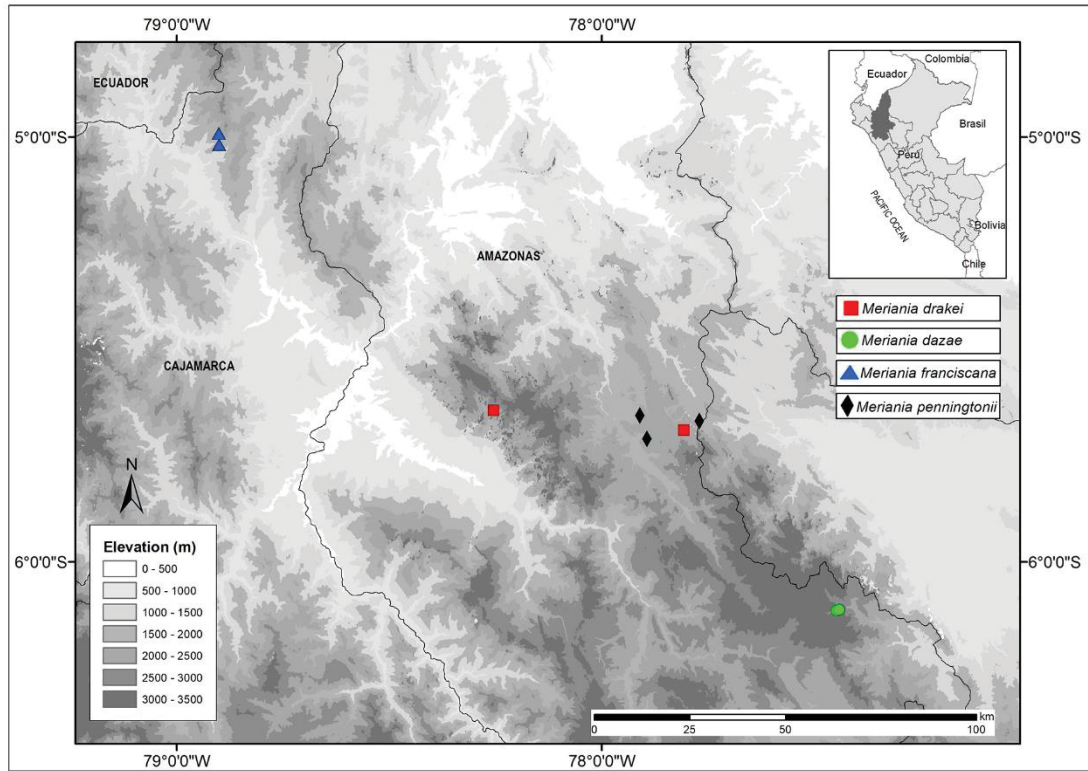
787 Antesepalous stamens, lateral view. A and F from *J. Campos & S. Corrales 3393*, B-E788 and G-H from *C. Díaz & S. Fernández 10150*. Photos by Robin Fernandez.

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790

791 Figure 10. *Meriania franciscana*. A-B. Apical projections on petioles. C. Leaf blade,
 792 abaxial surface, detail of the slightly revolute leaf margin at the base. D. Leaf blade,
 793 abaxial surface. A and C from *C. Díaz & S. Fernández 10150*, B and D from *J. Campos*
 794 *& S. Corrales 3393*. Photos by Robin Fernandez.



795

796 Figure 11. Distribution map of *Meriania dazae*, *M. drakei*, *M. franciscana* and *M.*797 *penningtonii* in Peru.

5 CAPÍTULO 3 – NINE NEW SPECIES AND A NEW COUNTRY RECORD FOR *MERIANIA* (MELASTOMATACEAE) FROM PERU

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

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Abstract

Nine new species of *Meriania* and a new record for Peru are described and illustrated here. The new species are *Meriania bicentenaria* and *Meriania vasquezii* from Pasco, *Meriania bongarana*, *Meriania callosa* and *Meriania juanjil* from Amazonas, *Meriania hirsuta* from Piura, *Meriania megaphylla* from La Libertad, *Meriania sumatika* from Cusco, and *Meriania escalerensis* from Loreto-San Martín border. Following the IUCN criteria, *Meriania megaphylla* is categorised as Data Deficient (DD) as it is only known from one collection made in 1914, *Meriania bicentenaria* and *Meriania sumatika* are categorised as Endangered (EN), and the rest of the new species are categorised as Critically Endangered (CR). In addition to these new species, *Meriania zunacensis*, from Ecuador, is recorded for the first time for the Andean forests of Amazonas. With these discoveries, northern Peru (Departments of Amazonas, Cajamarca and Piura) concentrates 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 of the genus.

Key words: Amazonas, Andean forests, Andean Tepuis, Cusco, La Libertad, Meranieae, Neotropics, Pasco, Piura, Taxonomy

Introduction

Meriania (Melastomataceae) was established by Swartz in 1798 based on collections from Jamaica, and currently comprises 121 species of shrubs, trees and occasionally climbers, distributed from Southeast Mexico and the Greater Antilles to Eastern Brazil and Bolivia (Michelangeli & al. 2015; Michelangeli & al. 2020). Along with *Adelobotrys* DC., *Axinaea* Ruiz & Pav., *Centronia* D. Don, *Graffenrieda* DC., *Macrocentrum* Hook. f., *Maguireanthus* Wurdack and *Salpinga* Mart. ex DC., it forms the Neotropical tribe Meranieae (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 malpighiaceae trichomes, with an entire calyx, which can be lobed, subcalyptrate or calyptrate 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 (Goldenberg & al. 2016, 2020) has led to the discovery of many new species. Despite these breakthroughs, there are still many undescribed species, mainly because of 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), covering 12 species in total. Since then, different works have increased the number of recognised species to 24 through new descriptions and new records, being 15 of those species recorded in the northern 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 the ongoing taxonomic revision of *Meriania* for Peru, we present nine new species and a new country record. All of them were found during botanical expeditions

in the Peruvian Andes and the revision of herbarium material. We provide morphological descriptions along with comments on related species and diagnostic characteristics, conservation status and geographic distribution.

Materials and methods

The descriptions were made through examination of herbarium specimens deposited in AMAZ, CUZ, HOXA, HSP, HUT, KUELAP, NY, MOL, UPGB and USM (herbarium acronyms follow Thiers 2021). 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/>) herbarium were consulted. Indument terminology, trichome classification and fruit type follow Beentje (2010), Wurdack (1986) and Baumgratz (1983–1985), respectively. For the inflorescence description we considered ‘few-flowered’, ‘submultiflorous’, and ‘multiflorous’ as inflorescences with less 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 (*M. 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*), and information on colors of floral parts are derived from our own field observations supplemented by label information and photographs provided by collaborators. A complete description is provided for the new record 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 (Jørgensen & al. 2014), Colombia (Almeda & al. 2020; Mendoza-Cifuentes 2021), Ecuador (Wurdack 1980; Jørgensen & León-Yáñez 1999), Peru (Macbride 1941; Brako & Zarucchi 1993), and Venezuela (Wurdack 1973; Hokche & al. 2008), and examination of the protologues of the newly described *Meriania* species and the 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 two new species was assigned following the 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.** – Holotype: Peru, Pasco, Prov. Oxapampa, Dist. Oxapampa, Abra Oxapampa-Villa Rica, 2300–2500 m, 10°40'36"S, 75°18'55"W, 06 Aug 2004 (fl., fr.), R. Vásquez, A. Monteagudo, L. Valenzuela, J. Perea & A. Peña 30366 (HOXA accession no. 10648!; isotypes: NY barcode 03785787!, USM accession no. 215491!). Fig. 1–3.

Diagnosis — A species differing from other species of *Meriania* by the combination of roughened to dendritic trichomes evenly covering the adaxial surface of leaves, calyces with rounded lobes and without dorsal projections, campanulate, fuchsia to light fuchsia corollas, strongly dimorphic stamens, stamen connectives with acuminate to falcate descending dorso-basal appendages, and antepetalous stamens with inflated connectives.

Morphological description — **Tree** up to 35 m tall and 50 cm DBH; young branches and petioles puberulent with roughened to dendritic trichomes up to ca. 0.13 mm long, sparse to moderate on the young branches, moderate to dense on petioles. **Young branches** terete, 4–6 mm diam., lacking wings, nodes without interpetiolar flaps. **Leaves** opposite, isophyllous, sometimes slightly anisophyllous. **Petioles** terete, 2.4–6 cm, with an adaxial projection (scutum) on the insertion of the petiole with the leaf blade, up to ca 0.5 mm high, sometimes inconspicuous or obscured by the trichomes. **Leafblades** 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 the leaf apex, tertiary (transversal nerves) 33–48 on each side of the primary, percurrent, 1–7 mm distant from each other, midvein, secondary and tertiary veins impressed, and reticulation barely visible on the adaxial

surface, midvein and secondary veins salient, tertiary veins prominent and reticulation barely visible on the abaxial surface; adaxial surface flat, brown, glabrous or sparsely puberulent with roughened to dendritic trichomes, denser near the base, up to ca. 0.13 mm long; abaxial surface light brown, midvein, secondary veins, tertiary veins, reticulation and surface densely pubescent with roughened to dendritic trichomes up to ca. 0.13 mm long, evenly covering the entire surface. **Inflorescences** a terminal panicle, erect, 15.6–30 × 6.7–17 cm, multiflorous; the axis and peduncle moderately puberulent with trichomes similar to the ones on twigs and petioles. *Peduncle* 4.8–8.2 cm long, terete. *Main axis* 7.5–16.5 cm, terete. *Paraclades* in 5–7 pairs, the proximal 5.9–11 cm long, the distal 1.8–2.8 cm long; flowers in 4-flowered umbels in the branchlet ends. *Bracts* foliaceous, persistent, 10.6–16 × 4.3–6.5 cm, petioles 3.2–7.3 cm long, shape and indumentum similar to the ones on the leaves. *Bracteoles* not seen (either absent or early caducous). **Flowers** (4-)5-merous, with campanulate corollas. *Pedicels* 3.5–6 mm long, greenish to light purple, moderately puberulent with trichomes similar to the ones on the 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 ca. 0.13 mm long, similar to those on the pedicels, inner surface glabrous to sparsely puberulent with trichomes similar to those on the pedicels; torus glabrous. *Calyx* opening regularly, greenish to light purple, outer surface glabrous to sparsely puberulent with trichomes up to ca. 0.13 mm long, similar to the 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, fuchsia to light fuchsia, apex sometimes slightly ciliate. **Stamens** (8-)10, strongly dimorphic, all bent to one side of the flower at anthesis giving the flower a zygomorphic appearance; antesealous stamens with filaments 5–6 mm long, deep pink, flat, glabrous, connectives not prolonged below the thecae, dark purple, glabrous, with two appendages, one descending dorso-basal, 3–4 mm long, acuminate, dark purple, the other appendage dorsal as a mere hump or inconspicuous, ca. 0.25 mm long, broadly rounded, dark purple, distant 4 mm from the tip of descending dorso-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 prolonged below the thecae ca. 0.25 mm long (not including the descending dorso-basal appendage), abruptly inflated from 1–1.5 mm of the tip of the thecae, purple at the apex, cream in the first half of the

inflated portion and light purple in the second half of the inflated portion, glabrous, with one descending dorso-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 with a smooth surface. *Ovary* (4-)5-locular, superior, 3–3.5 × 3–4 mm, spheroid and slightly 5-costate, pink, not exceeding the hypanthium length, glabrous; style 11.5–16 mm long, pink, glabrous, incurved at the apex and opposite to the anthers at anthesis; stigma punctiform and minutely papillate, ca. 0.5 mm wide, deep pink. **Fruits** capsular (velatidia), with persistent hypanthium and sepals; mature ovary 5 × 5.5 mm, spheroid, slightly costate, 1.5 mm exceeding the hypanthium length; fruiting pedicels 5–8 cm long. **Seeds** triangular-linear, ca. 0.5 mm long, numerous.

Additional specimens examined (paratypes) — PERU: Pasco, Prov. Oxapampa, Dist. Palcazú, without locality, 2200 m, 10°32'S, 75°23'W, 04 Oct 1984 (fr.), *D. Smith et al.* 8685 (F!); Dist. Oxapampa, camino a la Cordillera Yanachaga, 2400 m, 10°23'S, 75°27'W, 19 Jul 1984 (fr.), *D. Smith et al.* 7913 (F!, US!, USM!), camino Oxapampa-Abra Villa Rica, 2270 m, 10°39'23"S, 75°20'27"W, 10 Aug 2004 (fl.), *A. Monteagudo et al.* 6960 (HOXA!, NY!), camino Oxapampa-Villa Rica, km 37 en zona de amortiguamiento, 2462 m, 10°38'12"S, 75°24'45"W, 15 Mar 2006 (ster.), *S. Vilca et al.* 643 (HOXA!, USM!), Cuenca del río San Alberto, 2286, 10°32'39.90"S; 75°22'13.63"W, 01 Oct 2019 (ster.), *C. Llerena 23* (MOL!), same locality and data (fr.), *C. Llerena 32* (MOL!), CDS, Sector San Alberto - Entrada al Parque Nacional Yanachaga Chemillén, 2290 m, 10°32'25"S; 75°22'14"W, 10 Jun 2021 (fl.), *R. Villanueva-Espinoza 675* (MOL!), Parque Nacional Yanachaga Chemillén, 2420 m, 10°32'S, 75°21'W, 26 Aug 2002 (fl., fr.), *A. Monteagudo et al.* 3807 (AMAZ!, MOL!, NY!), Parque Nacional Yanachaga-Chemillén, cercanías del Refugio el Cedro, 2420 m, 10°32'51"S, 75°21'32"W, 26 Aug 2002 (fl., fr.), *A. Monteagudo et al.* 3808-A (HOXA!), San Alberto, 2457 m, 10°32'43.54"S, 75°21'37.14"W, 24 Mar 2014 (ster.), *R. Tupayachi et al.* 13589 (HSP!), San Alberto, 2457 m, 10°32'41.47"S, 75°20'29.34"W, 25 Mar 2014 (ster.), *R. Tupayachi et al.* 13601 (HSP!), Sector San Alberto, 2468 m, 10°32'45"S, 75°21'24"W, 17 Aug 2006 (fr.), *L. Cárdenas et al.* 715 (CUZ!, HOXA!, MOL!, USM!), PN Yanachaga-Chemillén, Sector San Alberto, zona de amortiguamiento, 2450 m, 10°19'S, 75°13'W, 16 Mar 2005 (fr.), *R. Rojas et al.* 3539 (HOXA!, NY!); Dist. Huancabamba, PN Yanachaga Chemillén, Fundo Osobamba. 2243 m, 10°23'34.7"S, 75°28'28.1"W, 25 Jun 2016 (fl.), *L. Valenzuela et al.* 30395 (USM!), Grapanazu, sector San Daniel, zona de

amortiguamiento del PN Yanachaga-Chemillén, 2236 m, 10°26'36"S, 75°26'21"W, 08 Jul 2004 (fl.), *J. Perea et al. 1445* (HOXA!, NY!), same locality and data (fl.), *J. Perea et al. 1449* (HOXA!, NY!), same locality, 10 Jul 2004 (fl., fr.), *J. Perea et al. 1467* (HOXA!, NY!), Acuzazu, 2200-2300 m, 10°30'24"S, 75°23'13"W, 06 Jul 2004 (fl., fr.), *R. Rojas et al. 3132* (HOXA!, NY!), PN Yanachaga Chemillen, Sector Quebrada Yanachaga, 2300 m, 10°23'45"S, 75°28'55"W, 19 Aug 2004 (fl.), *R. Vásquez et al. 30410* (HOXA!, NY!, USM!), same locality and data (fl.), *R. Vásquez et al. 30419* (HOXA!), same locality, 2407 m, 10°23'38"S, 75°28'36"W, 20 Set 2004 (fl., fr.), *J. Perea & J. Mateo 1781* (HOXA!, NY!), PN Yanachaga-Chemillen, parcela permanente 1.0 ha Oso Playa, 2200 m, 10°17'58"S, 75°36'35"W, 11 Nov 2006 (fr.), *A. Monteagudo et al. 13406* (NY!, USM!), Torre Bamba, 2550 m, 10°18'24"S, 75°35'06"W, 20 May 2004 (fr.), *R. Rojas et al. 2403* (HOXA!).

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

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

Phenology — Flowering takes place from June to September, and fruiting takes place from March to November.

Conservation status — *Meriania bicentenaria* is known from five localities, growing on indoors and surroundings of the Yanachaga-Chemillén National Park. Therefore, following IUCN (2012, 2019) guidelines and based on an estimated extent of occurrence of 304 km², we assign this species to the category Endangered [EN (B1a+biii)].

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 southern Mexico (state of Chiapas) to northwestern South American (Colombia, Ecuador, Peru and Venezuela)

(Wurdack 1978; Almeda 1993; Ulloa Ulloa & Homeier 2008; Busmann & Paniagua 2012; Almeda & al. 2020; Fernandez-Hilario & al. 2021).

Meriania bicentenaria, *M. franciscana* C.Ulloa & Homeier and *M. ninakurorum* (Busmann & 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 northern 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 dorso-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 petioles with projections (scutum) (vs. without projections in *M. ninakurorum*), and leaf blades $10\text{--}18.9 \times (2.9\text{--})5\text{--}8.4$ (vs. $23\text{--}32 \times 9\text{--}15$ cm). In addition, *M. bicentenaria* shares with *M. franciscana* the presence of an adaxial projection (scutum) on the insertion of the petiole with the leaf blade. However, *M. bicentenaria* differs from *M. franciscana* by its leaf blades with entire margins (vs. often slightly revolute at the base), abaxial surface densely pubescent evenly covering the entire surface (vs. sparsely to densely puberulent but without covering the entire surface), fuchsia to light fuchsia petals (vs. reddish-purple), and antepetalous stamen connectives without ascending appendages (vs with blunt ascending appendages).

2. *Meriania bongarana* Rob.Fern., R.Goldenb. & Michelang., **sp. nov.** – Holotype: Peru, Amazonas, Prov. Bongará, Dist. Yambrasbamba, Inmediaciones de la Estación Biologica Abra Patricia, 2320 m, $05^{\circ}41'32.91''\text{S}$, $77^{\circ}48'41.1''\text{W}$, 19-20 Feb 2020 (fl., fr.), R. Fernandez-Hilario, R. Villanueva & L. Pillaca 1930 (MOL!; isotypes: CUZ!, HOXA!, NY!, UPCB!). – Fig. 4–6.

Diagnosis — A species differing from all other species of *Meriania* by the combination of ferruginous indumentum evenly covering the adaxial surface of leaves, calyces 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 dorso-basal appendage.

Morphological description — **Tree** up to 5 m tall; young branches and petioles pubescent with sessile stellate trichomes, these up to ca. 0.10 mm long, moderate to dense on young branches, dense on petioles. **Young branches** terete-quadrangular, 5–6 mm diam., lacking wings, nodes without interpetiolar flaps. **Leaves** opposite, isophyllous. **Petioles** quadrangular, 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 the distal half to two-thirds, discolorous; venation acrodromous and suprabasal, with one pair of secondaries (lateral nerves), distant 3–4 mm from the base of the blade, and an additional pair of faint submarginal veins running up to the leaf apex, tertiary (transversal nerves) 31–33 on each side of the primary, percurrent, 1.5–3.5 mm distant from each other, midvein, secondary and tertiary veins impressed, and reticulation barely visible on the adaxial surface, midvein and secondary veins salient, tertiary veins prominent and reticulation visible on the 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 the entire surface, with pocket domatia at the convergence of the midvein and secondary veins. **Inflorescence** a terminal panicle, erect, 7.5–8.2 × 6.8–7 cm, submultiflorous; the axis and peduncle densely pubescent with trichomes similar to the ones on abaxial surface of the leaves, longer (up to 1 mm long) on the 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 paraclades and two nodes, the subdistal node with 4 flowers, the distal node with an umbel. **Paraclades** in one proximal pair, 3.7–4.2 cm long; flowers in 4–5-flowered umbels in the branchlet ends. **Bracts** foliaceous, persistent, 8–9.7 × 3.5–4.2 cm, petioles 1.5–1.8 cm long, shape and indumentum similar to the ones on the leaves; sometimes with one pair of additional bracts on paraclades of the main axis, 5.5 × 6.8 cm, petioles 1.2–1.7 cm long. **Bracteoles** not seen (either absent or early caducous). **Flowers** 5–merous, pendant, with campanulate corollas. **Pedicels** 7–9 mm long, ferruginous, densely pubescent with trichomes similar to the ones on the inflorescence axis, up to ca. 0.75 mm. **Hypanthium** 6.5–7 × 4.5 mm, campanulate, ferruginous, outer surface pubescent puberulent with trichomes similar to the ones on pedicels, inner surface glabrous; torus glabrous. **Calyx** opening regularly, ferruginous, outer surface densely pubescent with trichomes similar to the ones on pedicels, inner surface glabrous; tube 2–2.5 mm long; lobes 2–2.5 × 5–7 mm, acute, each with a claw-shaped dorsal projection, 1.5–2.5 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 the flower at anthesis giving the flower a zygomorphic appearance; filaments 8–8.5 mm, pink to magenta, semiterete, glabrous; connectives prolonged below the thecae 1 mm (not including the descending dorso-basal appendage), magenta, glabrous, with one descending dorso-basal appendage, ca. 1 mm long, slightly crown-shaped, with rounded to irregular lobes up to ca. 0.13 mm; anthers 8.5–9 mm long, lanceolate, magenta, glabrous, with its apical third slightly inflexed, opening by one dorsally inclined pore, thecae with a slightly corrugated surface. *Ovary* 5–6-locular, superior, basally fused with the hypanthium, the free portion ca. 5 × 3.5 mm, ovate and slightly 5–6-costate, color magenta, not exceeding the hypanthium length, glabrous; style 25.5–27 mm long, magenta, glabrous, incurved at the apex and opposite to the anthers at anthesis; stigma punctiform and minutely papillate, ca. 0.75 mm wide, whitish. **Fruits** capsular (velatidia), with a persistent hypanthium and caducous sepals; mature ovary ca. 7 × 6.5 mm, spheroid, slightly costate, completely concealed by hypanthium; fruiting pedicels 15–17 mm long. **Seeds** triangular-linear, ca. 0.75 mm long, numerous.

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

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

Phenology — Flowering and fruiting take place in February.

Conservation status — The only locality recorded for *M. bongarana* is located between two protected areas, Alto Mayo Protection Forest and Nieva River Reserved Zone. However, the conserved forests in the 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 assign this species to the category Critically Endangered [CR (B2a+biii)].

Discussion — *Meriania bongarana* belongs to a group of species characterized by campanulate, reddish-orange corollas, and lobed calyx, usually with claw-shaped to falcate dorsal projections. The species of this group occur in the Andes from Venezuela to northern Peru, being *M. dazae* Rob.Fern., R.Goldenb. & Michelang. and *M. bongarana* the only species in this group recorded for Peru. Within this group the most similar species to *M. bongarana* are *M. cuneifolia* Gleason and *M. stellata* (Gleason) Wurdack, both are endemic to Ecuador. However, *Meriania bongarana* differs from the former by its hypanthia 6.5–7 mm long (vs. 4–5 mm in *M. cuneifolia*), petals 14–15.5 mm long (vs. 10–13.5 mm), isomorphic stamens (vs. dimorphic in size), and connectives prolonged below the thecae 1 mm (vs. prolonged 1.3–1.7 mm), and differs from the latter 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 dorso-basal appendages ca. 1 mm long (vs. 0.25–0.4 mm).

The only Peruvian species with features similar to *M. bongarana* is *M. dazae*. Nevertheless, both species can be distinguished by the color of the leaf blades on the abaxial surface (ferruginous in *M. bongarana* vs. whitish to cream in *M. dazae*), petals 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*, by sharing the campanulate, pink-orange to reddish-orange corollas. However, these two species have calyprate calyces without dorsal projections (vs. lobed calyces with falcate dorsal projections in *M. bongarana*) and with irregular dehiscence (vs. regular dehiscence). Furthermore, *Meriania 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. pseudo-lateral) and petals sizes (14–15.5 mm long vs 10 mm long). *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 dorso-basal appendages (vs. blunt), and magenta thecae (vs. cream).

3. *Meriania callosa* Rob.Fern., R.Goldenb. & Michelang., **sp. nov.** – Holotype: Peru, Amazonas, Prov. Bongará, Dist. Yambrasbamba, ruta desde CP Santa Rosa hacia bosque El Toro, 1950 m, 05°40'07.98"S, 77°55'30.04"W, 11 Nov 2020 (fl.), R. Fernandez-Hilario, W. Chuquitucto & A. Wong 2055 (MOL!; isotypes: HOXA!, KUELAP!, MOL!, NY!, UPCB!). – Fig. 7–9.

Diagnosis — A species differing from all other species of *Meriania* by the combination of nodes with interpetiolar flaps (0.5–3 mm long), glabrous hypanthia and calyces, calyces with callose dorsal projections, spreading, fuchsia corollas, isomorphic stamens, and stamen connectives with two appendages, one triangular descending dorso-basal appendage, and other dorsal appendage as a mere hump.

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. **Leafblades** 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 the primary, percurrent, 1–11.5 mm distant from each other, midvein, secondary and tertiary veins impressed, and reticulation visible on the adaxial surface, midvein and secondary veins salient, tertiary veins prominent and reticulation impressed on the 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** a terminal panicle, erect, 14–27.5 × 10–20 cm, few-flowered or submultiflorous; the axis and peduncles glabrous. **Peduncle** 2.4–12.3 cm, quadrangular. **Main axis** 6–12.5 cm, quadrangular. **Paraclades** in 3–4 pairs, the proximal 6–16.5 cm long, the distal 2–3.5 cm long; flowers in regular dichasia in the branchlet ends. **Bracts** foliaceous, persistent, sometimes caducous, 12–18.2 × 9.2–11.2 cm, petioles 12–25 mm long, shape and indumentum similar to the ones on the leaves; sometimes with one pair on pair of additional bracts on subproximal nodes of the 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 the ones on the bracts. **Flowers** 5-merous, with spreading corollas. *Pedicels* 5–7 mm long, green, glabrous. *Hypanthium* ca. 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 the rest of the calyx and hypanthium when dry. *Petals* 44 × 38–40 mm, 8 mm wide at base, strongly asymmetric obovate, apex rounded, margin entire, fuchsia, glabrous. *Stamens* 10, isomorphic, all bent to one side of the flower at anthesis giving the flower a zygomorphic appearance; filaments 18–19 mm, purple, flat, glabrous; connectives not prolonged below the thecae, dark purple in the thecae, glabrous, with two appendages, one descending dorso-basal, 5.5–6 mm long, triangular, yellow, the other dorsal as a mere hump, ca. 0.25 mm long, rarely inconspicuous, acute, dark purple, distant 5.5–5.8 mm from the tip of the descending dorso-basal appendage; anthers 13–14 mm long, lanceolate, dark purple, glabrous, straight, opening by one dorsally inclined pore, thecae with a smooth surface. *Ovary* 5-locular, superior, basally fused with the hypanthium, the free portion ca. 7.5 × 7 mm, ovoid and slightly 5-lobed, light purple, 2.5 mm exceeding the hypanthium length, glabrous; style ca. 19.5 mm long, light purple, glabrous, incurved at the apex and opposite the anthers at anthesis; stigma punctiform and minutely papillate, 1 mm wide, cream. **Fruits** capsular (velatidia), with persistent hypanthium and calyx; mature ovary ca. 11 × 11–12 mm, spheroid, 4–8 mm exceeding the hypanthium length; fruiting pedicels 11.5 mm long. **Seeds** triangular-linear, ca. 1.25 mm long, numerous.

Additional specimens examined (paratypes) — PERU: Amazonas, Prov. Bongará, Dist. Yambrasbamba, ruta desde CP Santa Rosa hacia bosque El Toro, 1970 m, 05°40'09.22"S, 77°55'30.05"W, 11 Nov 2020 (fl. bud, fr.), R. Fernandez-Hilario et al. 2056 (HOXA!, MOL!, NY!, UPCB!); Prov. Rodríguez de Mendoza, Dist. Mariscal Benavides, CP Izcuchaca, 1880 m, 06°19'40"S; 77°31'05"W, 30 Aug 1998 (fr.), R. Vásquez & J. Campos 25339 (NY!), same locality, 11 Apr 2001 (fl.), H. van der Werff et al. 16941 (NY!, USM!).

Distribution and ecology — *Meriania callosa* is a tree endemic to high-elevation montane forests in the Districts of Mariscal Benavides and Yambrasbamba (Amazonas, Peru), between 1880–1970 m, on moderate to strong slopes. Common tree species in the locality “CP Santa Rosa” (Fernandez-Hilario et al. 2055, 2056) include *Alzatea verticillata* Ruiz

& Pav. (Alzateaceae), *Cecropia angustifolia* Trécul (Urticaceae), *Ficus mutisii* Dugand (Moraceae), *Graffenrieda emarginata* Triana (Melastomataceae), *Meriania penningtonii* Rob.Fern., R.Goldenb. & Michelang. (Melastomataceae) and *Ladenbergia riveroana* Standl. (Rubiaceae).

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

Phenology — Flowering takes place in April and November, and the fruiting take place in August and November.

Conservation status — *Meriania callosa* is known from two localities, the CP Santa Rosa and the CP Izcuchaca, 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 assign this species to the category Critically Endangered [CR (B2a+biii)].

Discussion — *Meriania callosa* is clearly distinguished from other species within the genus by the combination of nodes with interpetiolar flaps (0.5–3 mm long), glabrous flowers, spreading, fuchsia 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. hernandoi* Uribe, *M. tetragona* (Cogn.) Wurdack, *M. sanguinea* Wurdack may present them. In these species, the projections are less conspicuous and often difficult to see in herbarium material. In addition, *M. hernandoi* (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* Rob.Fern., R.Goldenb. & Michelang. 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* the later 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, Humberto Mend. & Almeda (Colombia), although in this species the callose projections are much more evident than in *M. callosa* (see Fig. 4B in Mendoza-Cifuentes & al. 2014). *Meriania callosa* is distinguished from *M. fantastica* by leaf blades size (11–16 × 6.8–10.4 cm vs. 15.5–31 × 10.4–20 cm), petals color (fuchsia vs. orange) and stamen relative size (isomorphic vs. dimorphic in size).

Among Peruvian species, *Meriania callosa* resembles *M. megaphylla* (also describes here) and *M. zunacensis* D.Fernández & Dellinger (also in Ecuador). All of them have interpetiolar flaps and spreading corollas, but *M. callosa* differs from the others by lacking projections on the insertion of the petioles with the leaf blade. *Meriania callosa* also differs from *M. megaphylla* by its 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 in *M. megaphylla*), hypanthia ca. 8.5 × 19 mm (vs. 4.5–5 × 4–4.5 mm), and stamen connectives with dorsal appendages as mere humps (vs. blunt ascending), and differs from *M. zunacensis* by its flowers on branchlet ends arranged in regular dichasia (vs. 4–5-flowered umbels in *M. zunacensis*) and ovary ca. 7.5 × 7 mm (vs. 13–14.5 × 7–7.5 mm).

4. *Meriania escalerensis* Rob.Fern., R.Goldenb. & Michelang., **sp. nov.** – Holotype: Peru, Loreto, Prov. Alto Amazonas, Dist. Balsapuerto, Cordillera Escalera, Campamento Cumbre – Alto Cachiyacu, 1930 m, 05°52'02.1"S, 76°46'29.3"W, 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!). – Fig. 9–11.

Diagnosis — A species differing from other species of *Meriania* by the combination of ferruginous indumentum, calyptrate calyces with circumscissile dehiscence, spreading, fuchsia corollas, isomorphic stamens, and stamen connectives with two appendages, one triangular descending dorso-basal appendage and 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 ca. 0.3 mm long. **Young branches** quadrangular, 5–5.5 mm diam., lacking wings, nodes without interpetiolar flaps. **Leaves** opposite, isophyllous to slightly anisophyllous. **Petioles** semiterete, 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 obtuse, base cordate, margin moderately denticulate on the distal two-thirds, slightly discoloured; venation acrodromous and basal, with two pairs of secondaries (lateral nerves), and an additional pair of faint submarginal veins running up to the leaf apex, tertiary (transversal nerves) 30–41 on each side of the primary, percurrent, 1.5–7 mm distant from each other, midvein, secondary and tertiary veins impressed, and reticulation barely visible on the adaxial surface, midvein and secondary veins salient, tertiary veins prominent and reticulation visible on the abaxial surface; adaxial surface flat, golden brown when dry, glabrous to sparsely setulose on the veins with similar trichomes to the 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 similar trichomes similar to the ones on petioles, denser on the veins. **Inflorescences** a terminal panicle, erect, ca. 22 × 14 cm, submultiflorous or multiflorous; the axis and peduncle densely setulose with trichomes similar to the ones on terminal twigs, longer (up to ca. 0.75 mm long) on the nodes. *Peduncle* 4.5–7 cm long, quadrangular. *Main axis* 15.7–16.5 cm, quadrangular. *Paraclades* in 6 pairs, the proximal 9–10 cm long, the distal 2.2–2.5 cm long; the flowers in regular dichasia in the branchlet ends. *Bracts* foliaceous, persistent or caducous, 2.9 × 0.9 cm, elliptic, petioles 7.5–8 mm long, indument denser than the ones on the leaves. *Bracteoles* not seen (either absent or early caducous). **Flowers** 5-merous, erect, with spreading corollas. *Pedicels* 2.5–3 mm long, ferruginous, densely setulose with trichomes similar to the ones on peduncle and axis up to 0.3 mm long. *Hypanthium* ca. 4.5 × 7 mm, campanulate, ferruginous, outer surface densely setulose with trichomes similar to the ones on the pedicels, inner surface glabrous; torus glabrous. *Calyx* with circumscissile dehiscence, ferruginous, outer surface densely setulose with trichomes similar to the ones on the pedicels, inner surface glabrous; sepals fused, forming a calyptra, 8–9.5 mm long, conic and acuminate, without dorsal projections. *Petals* ca. 21 × 14 mm, ca. 2.5 mm wide at base, obovate, apex rounded, margin entire, pink, glabrous. *Stamens* 10, isomorphic, all bent to one side of the flower giving the flower a zygomorphic appearance; filaments ca. 8.5 mm long, pink, flat, glabrous; connectives not prolonged below the thecae, light purple in the distal half of thecae, cream in the proximal half of thecae, with two appendages, one descending dorso-basal, ca. 3.75 mm long, triangular, cream, the other ascending dorsal, ca. 0.75 mm long, blunt, cream, distant 3–3.5 mm from the tip of descending dorso-basal appendage; anthers ca. 7.5 mm long, lanceolate, magenta on the apex and cream to the base, glabrous, straight, opening by one dorsally inclined pore,

thecae with a corrugated surface. *Ovary* 5-locular, superior, ca. $5 \times 4\text{--}4.5$ mm, ovate and 10-lobed, with an apical ring of 10 tooth, 1 mm long, pink, ca. 1 mm exceeding the hypanthium length, glabrous; style ca. 10 mm long, pink, glabrous, slightly incurved at the apex and opposite the anthers at anthesis; stigma punctiform and minutely papillate, ca. 0.4 mm wide, whitish. **Fruits** and **seeds** not seen.

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

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

Phenology — Flowering take place in September.

Conservation status — *Meriania escalerensis* is known from only a single collection, found in 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 assign this species to the category Critically Endangered [CR (B2a)].

Discussion — *Meriania escalerensis* may be related to the *Meriania* “brachycera” group (Mendoza-Cifuentes & Fernández-Alonso 2012), based on the presence of ferruginous indumentum, calyprate 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 petioles 1.2–2.2 cm long (vs. 2.7–3.8 cm), erect inflorescences (vs. pendule), and hypanthia and calyces with same length of trichomes, up to 0.3 mm (vs. clearly longer trichomes in 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. 7–8-merous) and petals ca. 21 mm long (vs. 29–42 mm).

The only Peruvian species with calyptrate calyces are *M. acida* and *M. tomentosa*, the former endemic to northern Peru and the latter distributed from Venezuela to Bolivia. Nevertheless, *M. acida* and *M. tomentosa* have calyces with irregular dehiscence and campanulate, reddish-orange corollas, whereas *M. escalerensis* has calyces with circumscissile dehiscence and spreading, fuchsia corollas. In addition, *M. acida* presents leaf blades with acute bases and *M. tomentosa* with obtuse to rounded bases (vs. cordate in *M. escalerensis*).

Currently, there are two species that grow in the Peruvian sub-Andean Cordilleras, *Meriania escalerensis* in the Cordillera Escalera (Loreto-San Martín border) and *M. microflora* Rob.Fern., R.Goldenb. & Michelang. in 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 color of the petals (ca. 21 mm and fuchsia vs. 4–4.5 mm and white), and the shape of the stamens (isomorphic vs. strongly dimorphic).

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

Diagnosis — A species differing from other species of *Meriania* by the combination of branches and leaves with hirsute indumentum (trichomes up to 4 mm long), campanulate,

deep red corollas, slightly dimorphic stamens, stamen connectives with one almost perpendicular dorso-basal appendage to the thecae, and antesealous stamen connectives with laterally expanded dorso-basal appendages.

Morphological description — **Shrub** up to 1.5 m tall; young branches and petioles hirsute with elongate fluted trichomes, these up to 4 mm long, moderate to dense on young branches, dense on petioles. **Young branches** terete or quadrangular, 5–7 mm 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 discoloured; venation acrodromous and basal, with three pairs of secondaries (lateral nerves), and an additional pair of faint submarginal veins running up to the leaf apex, tertiary (transversal nerves) 14–16 on each side of the primary, percurrent, 2–8 mm distant from each other, midvein, secondary and tertiary veins impressed, and reticulation visible on the adaxial surface, midvein, secondary and tertiary veins prominent and reticulation impressed on the abaxial surface; adaxial surface bullate, black when dry, densely hirsute with trichomes similar to the ones on petioles; abaxial surface dark brown when dry, moderately hirsute with trichomes similar to the ones on petioles, denser on the 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 the ones on petioles. **Pedicels** 15–18 mm long, color unknown, glabrous. **Hypanthium** 4–4.5 × 7–7.5 mm, campanulate, color unknown, glabrous; torus glabrous. **Calyx** opening regularly, color unknown, glabrous; tube 1.5 mm long; lobes repand; with 5 slightly callose dorsal projections, whitish and much lighter than the rest of the 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 the flower giving the flower a zygomorphic appearance; antepetalous stamens filaments ca. 8.5 mm long, color unknown, flat, glabrous, connectives prolonged below the thecae ca. 0.3 mm long (not including the perpendicular appendage), color unknown, with one almost perpendicular dorso-basal appendage to the thecae, ca. 3 mm long, acute, and with a rounded projection, ca. 0.5 mm long, with an irregular surface, color unknown, distant 1 mm from the tip of appendage, anthers ca. 6.5 mm long, lanceolate, color unknown, glabrous, straight or with its apex slightly reflexed, opening by one slightly dorsally inclined pore, thecae with a smooth surface; antesealous stamens with shape and size

similar to the antepetalous stamens, the only difference being the connectives with laterally expanded perpendicular dorso-basal appendages. *Ovary* 5-locular, superior, ca. 4×4.5 mm, spheroidal and 5-lobed, color unknown, ca. 0.25 mm exceeding the hypanthium length, glabrous; style 12–13 mm long, color unknown, glabrous, slightly incurved at the apex and opposite to the anthers at anthesis; stigma punctiform and minutely papillate, ca. 1 mm wide, color unknown. **Fruits** and **seeds** not seen.

Additional specimens examined (paratypes) — PERU: Piura, Prov. Ayabaca [Huancabamba], Dist. El Carmen de la Frontera, Carretera Sapalache-Cerro Chinguelas, 3035 m, 05°08'23.6"S, 79°23'45.4"W, 03 Sep 2016 (sterile), *F. A. Michelangeli et al.* 2636 (NY!, USM!).

Distribution and ecology — *Meriania hirsuta* is known only from two localities, about 5 km away from each other, between 2150 and 3035 m of elevation. This plant inhabits the montane forests of the eastern 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 province). Also, this species occurs in the core of the Amotape-Huancabamba zone, which is home of many other endemic species of Melastomataceae (Bussmann & Paniagua 2012; Bussmann & Paniagua 2013; Burke & al. 2017; Paredes-Burneo & al. 2018; Michelangeli & Paredes-Burneo 2019; Fernandez-Hilario & al. 2021a).

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

Phenology — Flowering take place in April.

Conservation status — The short range of occurrence of *M. 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 (MINAM 2016). Therefore, following IUCN (2012, 2019) guidelines and based on an estimated area of occupancy of 8 km², we assign this species to the category Critically Endangered [CR (B2biii)].

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* Humberto Mend. & Fern.Alonso (trichomes up to 4.5 mm long), *M. horrida* C.Ulloa & Achá (up to 12 mm long) and *M. mutisii* (Humb. & Bonpl.) Humberto Mend. & Fern.Alonso (up to 4.5 mm long). However, *M. arizae* and *M. mutisii* belong to *Meriania* “brachycera” group (Mendoza-Cifuentes & Fernández-Alonso 2012) characterized by its calyptrate calyces with circumscissile dehiscence and spreading corollas, whereas *M. hirsuta* presents calyces with repand lobes and regular dehiscence, and campanulate corollas. On the other hand, *Meriania horrida* presents 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 dorso-basal appendages to the thecae), *Meriania hirsuta* seems to be closely related with species of the *Meriania radula* complex, formed by *M. almedae* Wurdack, *M. radula* (Benth.) Triana, *M. tetragona* and *M. sanguinea*. The species in this complex are glabrous or setulose and have isomorphic stamens, whereas *M. hirsuta* presents hirsute indument and slightly dimorphic stamens. The laterally expanded appendage of antesealous 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 dorso-basal appendages (vs. perpendicular dorso-basal in *M. hirsuta*), and ascending dorsal appendages of the antesealous stamens (vs. absent in *M. hirsuta*), except *M. amischophylla* that presents dorsal appendages as mere humps and *M. weberbaueri* which lacks dorsal appendages.

The location of the inflorescences on the branches in *M. 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 axillar 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-)5 nodes.

6. *Meriania juanjil* Rob.Fern., R.Goldenb. & Michelang., **sp. nov.** – 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. 1601214!, NY barcode 02499960!, P barcode 05225706!, US barcode 02925052!). Fig. 6, 13.

Diagnosis — A species differing from all other species of *Meriania* by the combination of elliptic leaf blades (10.8–12.7 × 2.7–3 cm) with moderate puberulent indumentum on the abaxial surfaces, 3-plinerved 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 on young branches with stellulate trichomes up to ca. 0.13 mm long, sparsely to moderately on petioles with stellate trichomes up to ca. 0.13 mm long. **Young branches** quadrangular, 4–5.5 mm 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, discolorous; venation acrodromous and suprabasal, with one pair of secondaries (lateral nerves), distant 3–4.5 mm from the base of the blade, and an additional pair of faint submarginal veins running up to the leaf apex, tertiary (transversal nerves) 27–32 on each side of the primary, percurrent, 1.5–5 mm distant from each other, midvein and secondary veins impressed, tertiary veins and reticulation barely to not visible on the adaxial surface, midvein and secondary veins salient, tertiary veins prominent, and reticulation impressed on the 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 ca. 0.13 mm long intermixed with elongated slightly roughened trichomes up to ca. 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 the convergence of the

midvein and secondary veins. **Inflorescences** a pseudo-lateral panicle (initially terminal but overtopped by the developing axillary bud), erect, 6.8–10 × 4.8–8.3 cm, submultiflorous or multiflorous; the axis and peduncle moderately puberulent with stellate trichomes up to ca. 0.13 intermixed with elongated trichomes with a substellate base up to 0.75 mm, longer (up to 1.5 mm long) on the nodes. *Peduncle* 1.8–2.4 cm long, quadrangular. *Main axis* 5.2–5.9 cm, quadrangular, with 2(-3) pairs of proximal paraclades and two nodes, the subdistal node with 3 pairs of flowers, the distal node with an umbel. *Paraclades* in the proximal pairs, 3.8–4.5 cm long; flowers in 5–7-flowered umbels in the branchlet ends. *Bracts* foliaceous, persistent, 7–10.5 × 1.8–2.9 cm, petioles 1.6–3.4 cm long, shape and indument similar to the ones on the leaves; sometimes with one pair of additional bracts on subproximal paraclades of the main axis, 4.1–6.5 × 1–1.6 cm, petioles 1.8–2 cm long. *Bracteoles* not seen (either absent or early caducous). **Flowers** 5-merous, pendant, with campanulate corollas. *Pedicels* 6–8 mm long, color unknown, moderately puberulent covered with trichomes similar to the ones on peduncle and axis. *Hypanthium* ca. 3.5 × 4 mm, campanulate, color unknown, outer surface moderately puberulent covered by trichomes similar to the ones on pedicels, inner surface glabrous; torus glabrous. *Calyx* opening irregularly, color unknown, outer surface moderately puberulent with stellate trichomes up to ca. 0.13 mm long, inner surface sparsely puberulent with similar trichomes; sepals 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, ca. 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 the flower giving the flower a zygomorphic appearance; filaments 6.5–7 mm long, color unknown, flat, glabrous; connectives prolonged below the thecae ca. 0.5 mm (not including the descending dorso-basal appendage), color unknown, glabrous, with one descending dorso-basal appendage, ca. 0.75 mm long, acute; anthers 5.5–6 mm long, lanceolate, color unknown, glabrous, straight or with its apical slightly reflexed, opening by one slightly dorsally inclined pore, thecae with a smooth surface. *Ovary* 5-locular, superior, free, ca. 3 × 2.5 mm, oblong and slightly 5-lobed, color unknown, not exceeding the hypanthium length, glabrous; style ca. 22.5 mm long, color unknown, glabrous, slightly incurved at the apex and opposite to the anthers at anthesis; stigma punctiform and minutely papillate, ca. 0.8 mm wide, color unknown. **Fruits** and **seeds** not seen.

Distribution and ecology — *Meriania juanjil* is a shrub endemic to high-elevation montane forests in the Bongará province in the Department of Amazonas, on moderate slopes at 2200–2300 m.

Etymology — The specific epithet “juajil” refers to the name applied by local people in Bongará to the Melastomataceae. The epithet is based on a word used in apposition, and therefore to be maintained (see Art. 23.1, ICBN; Turland & al. 2018).

Phenology — Flowering take place in June.

Conservation status — *Meriania juanjil* is known from only a single collection, found in the Bongará province. Currently, the conserved 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 assign this species to the category Critically Endangered [CR (B2a+biii)].

Discussion — *Meriania juanjil* is clearly distinguished from other species within the genus by the combination of subcalyptrate calyces with small conic dorsal projections (0.5 mm long) and irregular dehiscence, campanulate, pink-orange corollas and isomorphic stamens. The sepals closely connate in bud, forming a subcalyptra or calyptra, are a feature present in other genera within Meranieae (such as *Centronia* and *Graffenrieda*) and outside the tribe (e.g., *Alloneuron*, *Miconia*, *Mouriri*, *Wurdastom*). *Meriania* species with these characteristics can be separated in two artificial groups, the first one with species with spreading corollas (e.g., *M. brachycera* (Naudin) Humberto Mend. & Fer.Alonso, *M. escalerensis*, *M. kirkbridei* 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, *Meriania juanjil* is similar to *M. denticulata* (Ecuador) and *M. vasquezii* (Peru, see comments under that species 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-plinerved [vs. 5(-7)-plinerved], 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 describes here) and *M. tomentosa*] but none of them have dorsal projections on the calyx. *Meriania escalerensis* differs from the other species by its calyxes 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); and *M. juanjil* differs from the latter by its abaxial surface of the leaves 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.** – Holotype: Peru, La Libertad, Prov. Pataz, Dist. Ongón, valle del río Mixiollo, 2000–2100 m, 04 Aug 1914 (fl.), *A. Weberbauer 7048* (MOL barcode 00003237!; isotypes: MOL-fragment barcode 00003236!, F-fragment accession no. 628681!). Fig. 6, 14.

Diagnosis —A species differing from other species of *Meriania* by the combination of 4-winged and quadrangular branches, interpetiolar flaps (5–8 mm long), large leaf blades (21–29.4 × 14.8–22 cm), spreading, reddish-purple corollas, isomorphic stamens, and stamen connectives with two appendages, one triangular descending dorso-basal appendage, and the other blunt ascending dorsal appendage.

Morphological description — **Scandent shrub**; young branches and petioles glabrous. **Young branches** quadrangular, 4-winged, 5–11 mm diam., nodes with interpetiolar flaps, 5–8 mm long. **Leaves** opposite, slightly anisophyllous. **Petioles** quadrangular, 7.6–11.6 cm long, with an adaxial projection (scutum), on the insertion of the petiole with the leaf blade, up to ca. 1 mm tall, obscured by the trichomes. **Leaf blades** coriaceous, 21–29.4 × 14.8–22 cm, ovate, apex broadly obtuse, base cordate, margin finely serrulate, concolorous; venation acrodromous and basal, with three pairs of secondaries (lateral nerves), and an additional pair of faint submarginal veins running up to the leaf apex, tertiary (transversal nerves) 38–40 on each side of the primary, percurrent, 2–10 mm distant from each other, midvein, secondary and tertiary veins impressed, and reticulation visible on the adaxial surface, midvein and secondary veins salient, tertiary veins and

reticulation prominent on the abaxial surface; adaxial surface bullate; both surfaces light olive when dry, glabrous. **Inflorescence** a terminal panicle, erect, ca. 25.9×10 cm, multiflorous; the axis and peduncle glabrous. *Peduncle* ca. 8.9 cm long, quadrangular, 4-winged. *Main axis* ca. 15.6 cm long, quadrangular, 4-winged. *Paraclades* in 5 pairs, the proximal ca. 8.8 cm long, the distal ca. 2.2 cm long; flowers in 5-flowered umbels in the branchlet ends. *Bracts* foliaceous, persistent, $3.7\text{--}6 \times 1.5\text{--}1.8$ cm, petioles 8–13 mm long, shape and indumentum similar to the ones on the leaves. *Bracteoles* not seen (either absent or early caducous). **Flowers** 5-merous, with spreading corollas. *Pedicels* 6–8 mm long, color unknown, glabrous to sparsely puberulent with short trichomes, up to ca. 0.10. *Hypanthium* $4.5\text{--}5 \times 4\text{--}4.5$ mm, campanulate, color unknown, outer and inner surface glabrous to sparsely puberulent with trichomes similar to the ones on the pedicels; torus glabrous. *Calyx* opening regularly, color unknown, outer and inner surface glabrous to sparsely puberulent with trichomes similar to the ones on the pedicels; tube 1.5–2 mm long; lobes repand; with 5 blunt dorsal projections, ca. 0.5 mm long. *Petals* $20.5\text{--}22.5 \times 19\text{--}21$ 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 the flower at anthesis giving the flower a zygomorphic appearance; filaments 10.5–11 mm long, color unknown, flat, glabrous; connectives not prolonged below the thecae, color unknown, glabrous, with two appendages, one descending dorso-basal, 4–4.5 mm long, triangular, the other ascending dorsal, ca. 0.75 mm long, blunt, distant ca. 4.5 mm from the tip of the descending dorso-basal appendage; anthers 8–8.5 mm long, lanceolate, color unknown, glabrous, straight, opening by one dorsally inclined pore, thecae with a corrugated surface. *Ovary* 5-locular, superior, ca. 4.5×3 mm, oblong, color unknown, not exceeding the hypanthium length, glabrous; style 11.5–13.5 mm long, color unknown, glabrous, incurved at the apex and opposite to the anthers at anthesis; stigma punctiform and minutely papillate, ca. 0.5 mm wide, color unknown. **Fruits** and **seeds** not seen.

Distribution and ecology — *Meriania megaphylla* is a shrub endemic to high-elevation montane forests in the Pataz province (Department of La Libertad), between 2000–2100 m. This vegetation is part of the relict montane forests from the western slopes of the Andes in northwestern Peru (see Weigend & al. 2005).

Etymology — The specific epithet refers to the unusually large leaves of this species.

Phenology — Flowering takes place in August.

Conservation status — *Meriania megaphylla* is known from a single collection made in 1914. Increased deforestation in recent years and the presence of artisanal mining threatens 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).

Discussion — *Meriania megaphylla* is clearly distinguished from other species within the genus by the combination of quadrangular and 4-winged internodes, nodes with interpetiolar flaps, an adaxial projection (scutum) on 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), 21–29.4 × 14.8–22 cm leaf blades (vs. 7–12 × 3–9 cm), and spreading, reddish-purple corollas (vs. campanulate, deep red corollas).

Due to the large bullate leaf blades and spreading, reddish-purple corollas, the type specimen of *M. megaphylla* (Weberbauer 7048) have been erroneously identified as *M. tetraquetra* Triana, a poorly known species endemic to northern 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 northern Peru. These species are trees with bullate leaves, spreading corollas, reddish-purple petals, isomorphic stamens, and stamen connectives with two appendages, one triangular descending dorso-basal appendage and the other dorsal appendage as 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, ca. 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 being trees and shrubs with the exception of *M. selvaflorensis* Humberto Mend. (Colombia) which has a lianescent habit. The lianescent habit is also present in other genera within of the Meranieae (*Adelobotrys* and *Graffenrieda*). However, according to the label information in *Weberbauer 7048*, *Meriania megaphylla* has a scandent habit. *Meriania megaphylla* is easily distinguishable from *M. 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).

8. *Meriania sumatika* Rob.Fern., R.Goldenb. & Michelang., **sp. nov.** – Holotype: Peru, Cusco, Prov. Urubamba, Dist. Machupichu, Santuario Histórico de Machupichu y en Camino Inca, 2060 m, 13°09'10"S, 72°31'00"W, 14–22 Oct 1987 (fl., fr.), *P. Nuñez & J. Arque 8369* (CUZ accession no. 15097!; isotypes: F accession no. 2028864!, US barcode 02925646!). Fig. 15–16.

Diagnosis — A species differing from other species of *Meriania* by the combination of 10-costate hypanthium (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 descending dorso-basal appendage, and the other blunt ascending dorsal appendage, and antesepalous stamen connectives with laterally expanded dorso-basal 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, sparse to dense on young branches, dense on petioles. **Young branches** quadrangular, 2.5–4.5 mm 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 the distal half to two-thirds, discoloured; venation acrodromous and

suprabasal, with one two of secondaries (lateral nerves), the first pair distant 2–3 mm from the base of the blade, the second pair distant 5–10 mm from the base of the blade, and an additional pair of faint submarginal veins running up to the leaf apex, tertiary (transversal nerves) 30–40 on each side of the primary, percurrent, 2–10 mm distant from each other, midvein, secondary and tertiary veins impressed, and reticulation barely visible on the adaxial surface, midvein and secondary veins salient, tertiary veins prominent and reticulation visible or barely visible on the abaxial surface; adaxial surface flat, olive-green when dry, glabrous or with sparse elongated trichomes with greatly roughened base, denser near the 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 the ones on the petioles, covering almost the entire surface. **Inflorescence** a terminal panicle, erect, 10–22.5 × 12–23 cm, few-flowered; the axis and peduncle densely tomentose with trichomes similar to the 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, the subdistal node with 2 flowers, the distal node with a dichasium. *Paraclades* in the ones proximal pairs, 5.5–11.7 cm long; flowers in regular dichasia in the branchlet ends. *Bracts* foliaceous, persistent, 9.9–11.5 × 2.8–6.6 cm, petioles 1.1–3.7 cm long, shape and indumentum similar to the ones on the leaves; sometimes with one pair of additional bracts on proximal nodes of the main axis, ca. 6 × 1.6 cm, petioles 1 cm long. *Bracteoles* (in *Huamantupa et al. 2060*) caducous, 17–20 mm long, lanceolate, indumentum similar to the ones on the bracts. **Flowers** 5–merous, with spreading corollas. *Pedicels* ca. 6 mm long, ferruginous, densely tomentose, the trichomes up to 1 mm long, similar to the ones on the inflorescence axis. *Hypanthium* ca. 9.5 × 10.5–11 mm, campanulate, 10-costate, ridges irregular and obscured by the trichomes, up to 2–5 mm high, ferruginous, outer surface densely tomentose to villose with trichomes similar to the 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 the 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 the flower at anthesis giving the flower a zygomorphic appearance; antesealous stamens filaments 28–29 mm

long, purple, flat, glabrous, connectives not prolonged below the thecae, dark purple in the thecae, white in the transition to the descending dorso-basal appendage, with very short and irregular projections on the dorsal surface from the tip of the descending dorso-basal appendage to the base of the ascending dorsal appendage, with two appendages, one descending dorso-basal, laterally expanded, 7–8 mm long, acute and crowned, yellow, the other ascending dorsal, ca. 1 mm long, blunt, purple, distant 4.5–5 mm from the tip of descending dorso-basal appendage, anthers 14–15 mm long, lanceolate, dark purple, glabrous, with its apical third slightly reflexed, opening by one dorsally inclined pore, thecae with a corrugated surface; antepetalous stamens filaments 24–25 mm long, purple, flat, glabrous, connectives not prolonged below the thecae, dark purple in the thecae, white in the transition to the descending dorso-basal appendage, with very short and irregular projections from the tip of the descending dorso-basal appendage to the base of the ascending dorsal appendage, denser on the dorsal surface, with two appendages, one descending dorso-basal, 12–13 mm long, acute, yellow, the other ascending dorsal appendage, ca. 1 mm long, blunt, purple, distant 7–7.5 mm from the tip of descending dorso-basal appendage, anthers 15.5–16 mm long, lanceolate, dark purple, glabrous, straight, opening by one dorsally inclined pore, thecae with a corrugated surface. *Ovary* 5-locular, superior, free, ca. 6.5 × 4 mm, oblong, color unknown, not exceeding the hypanthium length, glabrous; style ca. 15 mm long, reddish-purple, glabrous, incurved at the apex and opposite to the anthers at anthesis; stigma punctiform and minutely papillate, ca. 0.75 mm wide, color unknown. **Fruits** capsular (velatidia), with a persistent hypanthium, clearly 10-costate, ridges up to 4.5 mm high, sepals caducous; mature ovary ca. 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.

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

Distribution and ecology — *Meriania sumatika* is a tree 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 1800–2900 m. Individuals of this new species have been previously recorded by Alfaro & al. (2018), as *Meriania tomentosa*, in “Wiñaywayna” and growing accompanied by *Aniba coto* (Rusby) Kosterm. (Lauraceae), *Gordonia fruticosa* (Schrad.) H. Keng (Theaceae), *Hieronyma oblonga* (Tul.) Müll. Arg. (Phyllanthaceae), *Meliosma peytonii* A.H. Gentry (Sabiaceae) and *Myrcia fallax* (Rich.) DC. (Myrtaceae).

Etymology — The specific epithet comes from the Quechua “sumaq” (= beautiful) and “tika” (= flower), referring to large showy flowers of this species. Since this species epithet is arbitrarily taken from the Quechua language, its spelling is to be maintained (see Art. 23.2, ICBN; Turland & al. 2018).

Phenology — Flowering takes place in February, May and October, and fruiting takes place in May and October.

Conservation status — All *Meriania sumatika* specimens were collected in the Machu Picchu National Sanctuary (except *Huamantupa et 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 assign this species to the category Endangered [EN (B2a+biii)].

Discussion — *Meriania sumatika* is clearly distinguished from other species within the genus by the combination of 10-costate hypanthium, spreading, reddish-purple corollas, 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 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 calyces with *M. costata*. Nevertheless, *Meriania sumatika* differs from *M. costata* by its spreading, reddish-purple

corollas (vs. campanulate, reddish-orange), petals 46–55 mm long (vs. 22 mm), and stamen connectives not prolonged below the thecae (vs. 1.5–1.7 mm prolonged).

Among the 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 southern Peru. These species are trees with tomentose to villose indumentum, calyces with dorsal projections, spreading corollas, fuchsia to reddish-purple petals, dimorphic stamens, and antesealous stamen connectives with laterally expanded descending dorso-basal appendages. Within this group *M. sumatika* can be distinguished by its 10-costate hypanthium (vs. terete in the other species), calyx 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 *M. 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).

We placed *Huamantupa et al. 2060* (in flower bud) in *M. sumatika* with reservation, because it presents slightly costate hypanthia and calyces with smaller dorsal projections (4–5 mm vs. 14.5–15.5 mm). In addition, this specimen come from a locality located 41 km away from the others.

9. *Meriania vasquezii* Rob.Fern., R.Villanueva & Michelang., **sp. nov.** – Holotype: Peru, Pasco, Prov. Oxapampa, Dist. Chontabamba, Ulcumano Lodge, 2244 m, 10°38'08"S, 75°25'39"W, 23 Feb 2021 (fl.), R. Vásquez, L. Valenzuela, E. Pinche & C. Rojas 45480 (HOXA!; isotypes: MO!, MOL!, UPCB!). Fig. 3, 17, 18.

Diagnosis — A species differing from other species of *Meriania* by the combination of leaf blades with dense villose indumentum on the abaxial surfaces, inflorescences with

flowers in regular dichasia in the branchlet ends, subcalyptrate calyx with small dorsal projections (ca. 3 mm long) and irregular dehiscence, campanulate, fuchsia corollas, dimorphic stamens and antesealous stamen connectives with laterally expanded descending dorso-basal 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 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 the distal half and entire to obscurely denticulate on the proximal half, discolorous; venation acrodromous and suprabasal, with one or two pairs of secondaries (lateral nerves), distant 3–7 mm from the base of the blade, and an additional pair of faint submarginal veins running up to the leaf apex, tertiary (transversal nerves) 40–44 on each side of the primary, percurrent, 2–9 mm distant from each other, midvein, secondary and tertiary veins impressed, reticulation barely visible on the adaxial surface, midvein and secondary veins salient, tertiary veins and reticulation prominent on the abaxial surface; adaxial surface slightly bullate, dark when dry, glabrous or with sparse elongated trichomes with a substellate base, denser near the 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 substellate base up to 2.5 mm long, evenly covering the entire surface. **Inflorescences** a terminal panicle, erect, 26.5–29.5 × 12.3–14 cm, submultiflorous; the axis and peduncle densely tomentose with elongated trichomes with a substellate base up to 1 mm long, longer (up to 2.5 mm long) on the nodes. **Peduncle** ca. 7.5 cm long, quadrangular. **Main axis** 18.1–18.3 cm, quadrangular. **Paraclades** in 4 pairs, the proximal 10.5–14.7 cm long, the distal 3.9–4 cm long; flowers in regular dichasia in the branchlet ends. **Bracts** foliaceous, persistent, 16.5–19.1 × 9.3–10.5 cm, petioles 2.2–3.4 cm long, shape and indumentum similar to the ones on the leaves. **Bracteoles** caducous, ca. 20 × 1 mm, linear, indumentum similar to the ones on peduncle and axis. **Flowers** 5-merous erect, with campanulate corollas. **Pedicels** 9–12 mm long, golden brown, densely tomentose to villose covered with trichomes similar to the ones on peduncle and axis. **Hypanthium** ca. 11 × 7 mm, campanulate, sometimes slightly costate, ridges obscured by the trichomes, up to 0.75

mm high, golden brown, outer surface densely tomentose to villose covered by trichomes similar to the ones on the pedicels, inner surface glabrous; torus glabrous. *Calyx* opening irregularly, golden brown, outer surface densely tomentose to villose covered by trichomes similar to the ones on the pedicels, inner surface glabrous; sepals closely connate in bud, forming a subcalyptra, 7.5–8.5 mm long, each with a small claw-shaped dorsal projection, ca. 3 mm long, at maturity splitting irregularly. *Petals* 25–31 × 23–26 mm, ca. 4 mm wide at base, obovate and slightly asymmetric, apex rounded, margin entire, fuchsia, glabrous. *Stamens* 10, dimorphic, all bent to one side of the flower giving the flower a zygomorphic appearance; antesealous stamens with filaments 12–13.5 mm long, light purple, glabrous; connectives prolonged below the thecae ca. 1 mm (not including the descending dorso-basal appendage), purple, glabrous, with two appendages, one descending dorso-basal, laterally expanded, 3–3.5 mm long, acute and slightly crowned, light purple, the other appendage dorsal as a mere hump, ca. 0.5 mm, broadly rounded, light purple, distant 1.5–2 mm from the tip of descending dorso-basal appendage, anthers ca. 11.5 mm long, lanceolate, purple, glabrous, straight or with its apical portion slightly reflexed, opening by one dorsally inclined pore, thecae with a corrugate surface; antepetalous stamens with filaments 12–13 mm long, light pink, glabrous; connectives prolonged below the thecae 1–1.5 mm (not including the descending dorso-basal appendage), purple, glabrous, with one descending dorso-basal appendage, 2.5–3 mm long, triangular, light purple, anthers ca. 12 mm long, lanceolate, purple, glabrous, straight or with its apical portion slightly reflexed, opening by one dorsally inclined pore, thecae with a corrugate surface. *Ovary* 5-locular, superior, free, ca. 6 × 4 mm, oblong and slightly 5-lobed, color unknown, not exceeding the hypanthium length, glabrous; style ca. 20 mm long, purple, glabrous, slightly incurved at the apex and opposite to the anthers at anthesis; stigma punctiform and minutely papillate, ca. 1 mm wide, whitish. **Fruits** and **seeds** not seen.

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

Etymology — It is an honor 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).

Phenology — Flowering takes place in February.

Conservation status — *Meriania vasquezii* is known from only a single collection, found in the Oxapampa province. Increased fieldwork in montane and premontane forests in this region has led to the discovery of several species of Melastomataceae in recent years (Cárdenas & al. 2014; Michelangeli & al. 2018; Michelangeli & Goldenberg 2021). Therefore, the effective protection of the diverse habitats in the Oxapampa province is a high priority. Following IUCN (2012, 2019) guidelines and based on an estimated area of occupancy of 4 km², we assign this species to the category Critically Endangered [CR (B2a+biii)].

Discussion — *Meriania vasquezii* is clearly distinguished from other species within the genus by the combination of subcalyptrate calyces with small claw-shaped dorsal projections (ca. 3 mm long) and irregular dehiscence, campanulate, fuchsia corollas, dimorphic stamens, and antesealous stamen connectives with laterally expanded dorso-basal appendages. The species with calyptrate 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 fuchsia petals. Also, the only Peruvian species with a subcalyptrate calyx and campanulate corolla is *M. juanjil*.

In Peru, the species of *Meriania* with sepals closely connate in bud can be separated into two artificial groups; species with calyptrate calyces [*M. acida*, *M. escalerensis* (also describes here) and *M. tomentosa*] and species with subcalyptrate calyces (*M. juanjil* and *M. vasquezii*). Nevertheless, *M. vasquezii* is easily distinguishable within of 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* by sharing subcalyptrate calyces with dorsal projections and campanulate corollas, but both species can be distinguished by the leaf blades 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 in branchlet ends (regular dichasia vs. 5–7-flowered umbels), and length and

color 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 Fernández-Fernández & al., Phytotaxa 458: 7. 2020. – Holotype: Ecuador, Prov. Tungurahua, Cantón Baños, Parroquia Río Negro, Sector El Topo, Estación Científica Río Zuñac, Fundación EcoMinga, 1568 m, 01°22.593'S, 78°09.213'W, 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 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), on the insertion of the petiole with the leaf blade, up to ca. 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, discolorous; 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 the leaf apex, tertiary (transversal nerves) 29–40 on each side of the primary, percurrent, 1.5–14 mm distant from each other, midvein, secondary and tertiary veins impressed, and reticulation barely visible on the adaxial surface, midvein and secondary veins salient, tertiary veins prominent and reticulation visible or barely visible on the 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. **Inflorescence** a terminal panicle, erect, 17.5–33 × 21–33 cm, multiflorous; the axis and peduncle glabrous. **Peduncle** 5.5–14.5 cm long, quadrangular and slightly ribbed. **Main axis** 13–26 cm long, quadrangular and slightly ribbed. **Paraclades** in 4 pairs, the proximal 14.5–23.5 cm long, the distal 3.5 cm long; flowers in 4–5-flowered umbels in the branchlet ends. **Bracts** foliaceous, persistent, 15.3–20 × 10.3–11 cm, petioles 3–4.5 cm long, shape and indumentum similar to the ones on the leaves. **Bracteoles** not seen (either absent or 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. *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 the flower at anthesis giving the flower a zygomorphic appearance; filaments 19–19.5 mm, light reddish-purple, flat, glabrous; connectives not prolonged below the thecae, purple in the thecae, light purple in the transition to the descending dorso-basal appendage, glabrous, with one descending dorso-basal appendage, 6–7 mm long, triangular, cream; anthers 13–14.5 mm long, lanceolate, purple, glabrous, straight, opening by one dorsally inclined pore, thecae with a smooth surface. *Ovary* 5-locular, superior, free, 13–14.5 × 7–7.5 mm, ovate and 5-lobed, with apical ring of the 5 tooth, ca. 1 mm long, reddish-purple, 6 mm exceeding the hypanthium length, glabrous; style 15.5–16 mm long, reddish-purple, glabrous, incurved at the apex and opposite to the anthers at anthesis; stigma punctiform and minutely papillate, ca. 1 mm wide, whitish. **Fruits** capsular (velatidia), with persistent hypanthium and sepals; mature ovary 13–14.5 × 8.5–11 mm, pyriform, slightly costate, 12–13 mm exceeding the hypanthium length; fruiting pedicels 15–17 mm long. **Seeds** not seen.

Specimens examined – PERU: Amazonas, Prov. Amazonas, Dist. Vista Alegre, entre Vista Alegre y La Ventana a Naciento del Río Negro, 1500–1640 m, 06°08'S, 77°18'W, 02 Jul 1998 (fl., fr.), *I. Sánchez et al.* 9610 (F!); Prov. Bagua, La Peca, 1850–1900 m, 14 Jun 1978 (fl. bud), *A. Gentry et al.* 23012 (USM!, US!); Prov. Bongará, Dist. Yambrasbamba, inmediaciones de la Estación Biológica Abra Patricia, trochas cercanas a la estación, 2280 m, 05°41'43.40"S, 77°48'47.91"W, 19–20 Feb 2020 (fl., fr.), *R. Fernandez-Hilario et al.* 1920 (HOXA!, KUELAP!, MOL!, NY!, UPCB!), trocha Lechuza en la Estación Biológica Abra Patricia, 2123 m, 05°41'18.89"S, 77°48'23.68"W, 21 Feb 2020 (fl.), *R. Fernandez-Hilario et al.* 1938 (HOXA!, MOL!, UPCB!).

Distribution and ecology — *Meriania zunacensis* is a tree in high-elevation montane forests and elfin forests in the Amazonas, Bagua and Bongará provinces in the Department of Amazonas, between 1500–2280 m. Populations of this species occur in conserved forests.

Phenology — Flowering takes place in February, June and July, and fruiting takes place in February and July.

Comments — During the preparation of this work we found specimens that did not correspond to any Peruvian species, and we were in the process to describe them as a new taxon. However, the recent publication of *Meriania zunacensis* made us realize that these Peruvian specimens belonged to the same 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), and now we add three new localities in the Department of Amazonas in northern 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, *Meriania 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).

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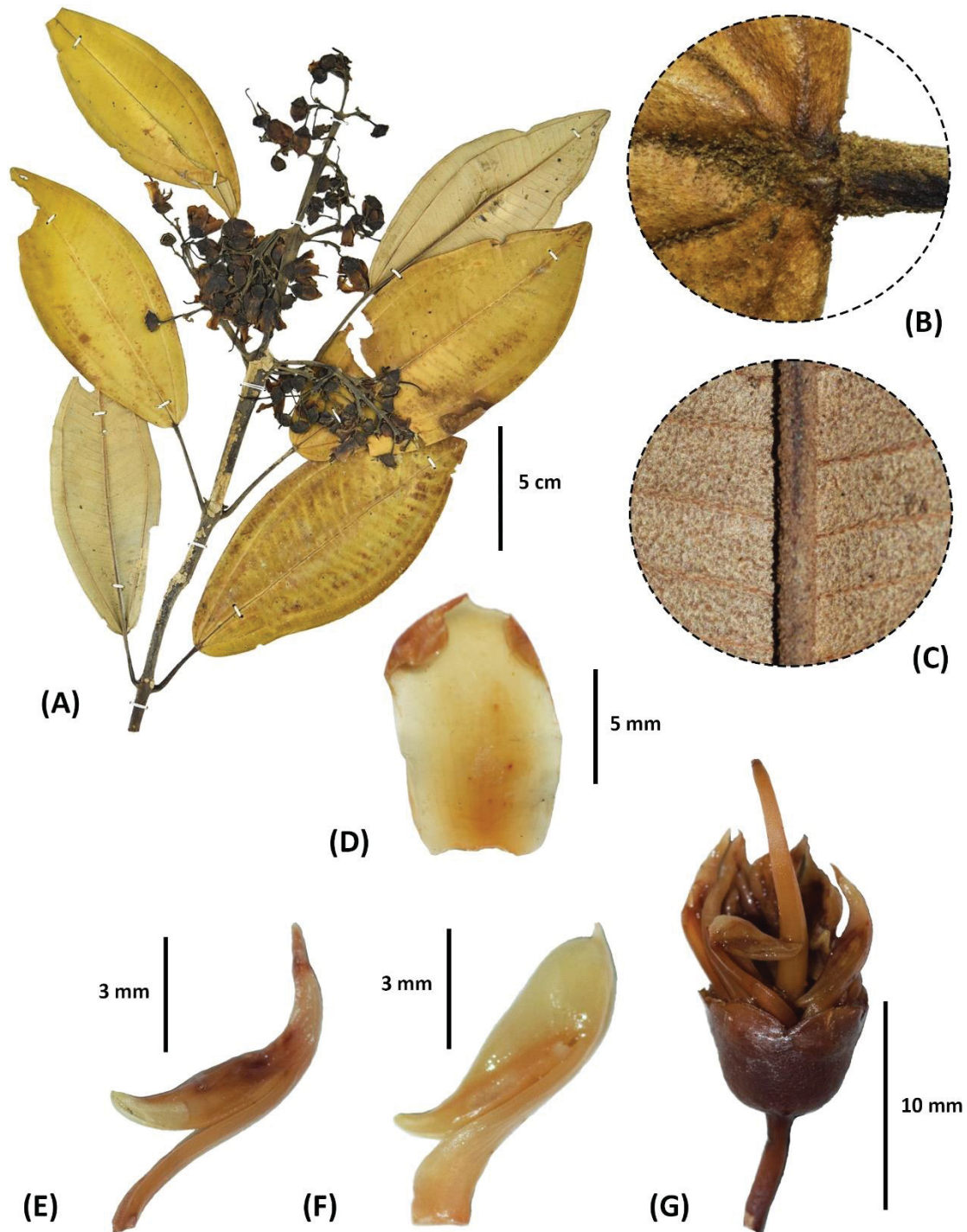


Figure 1. *Meriania bicentenaria*. A. Terminal fertile branch with inflorescence. B. Detail of the base of the leaf blade. C. Detail of the abaxial leaf surface. D. Petal. E. Antesepalous stamens, lateral view. F. Antepetalous stamen, lateral view. G. Flower with petals removed. A-C from *A. Monteagudo et al.* 6960; D-G from *R. Villanueva-Espinoza* 675.

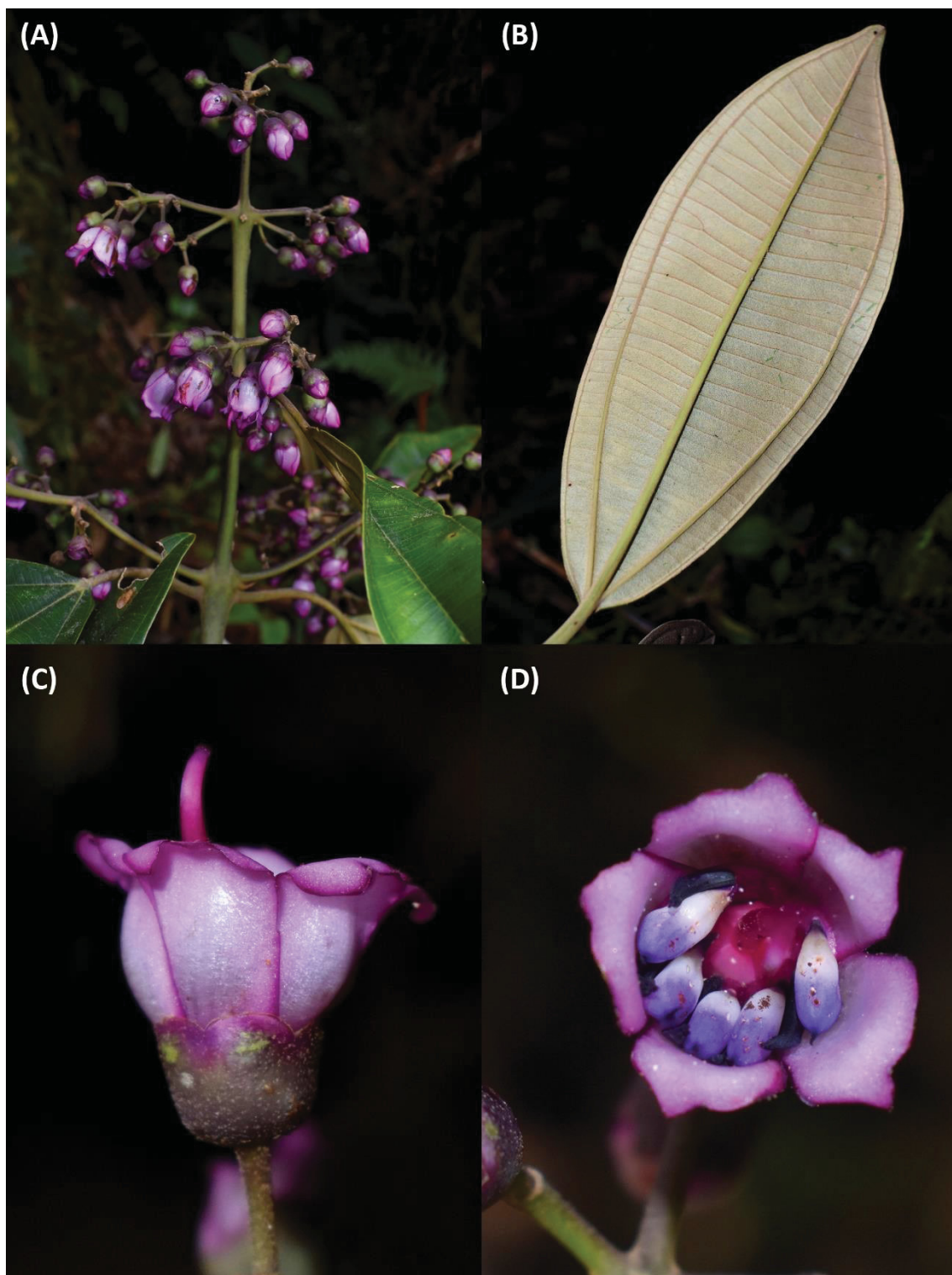


Figure 2. *Meriania bicentenaria*. A. Terminal fertile branch. B. Leaf blade, abaxial view. C. Flower at anthesis, lateral view. D. Flower at anthesis, apical view. From *R. Villanueva-Espinoza 675*. Photos by Rosa Villanueva-Espinoza.

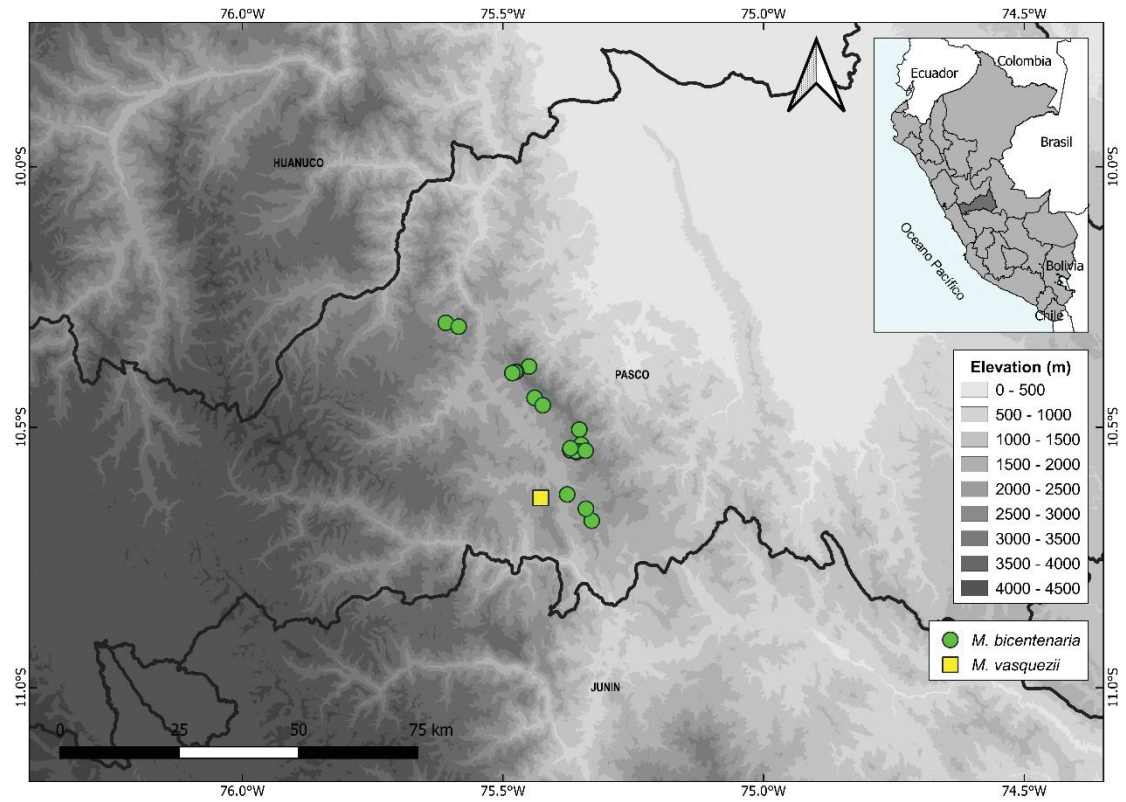


Figure 3. Distribution map of *M. bicentenaria* and *M. vasquezii*.

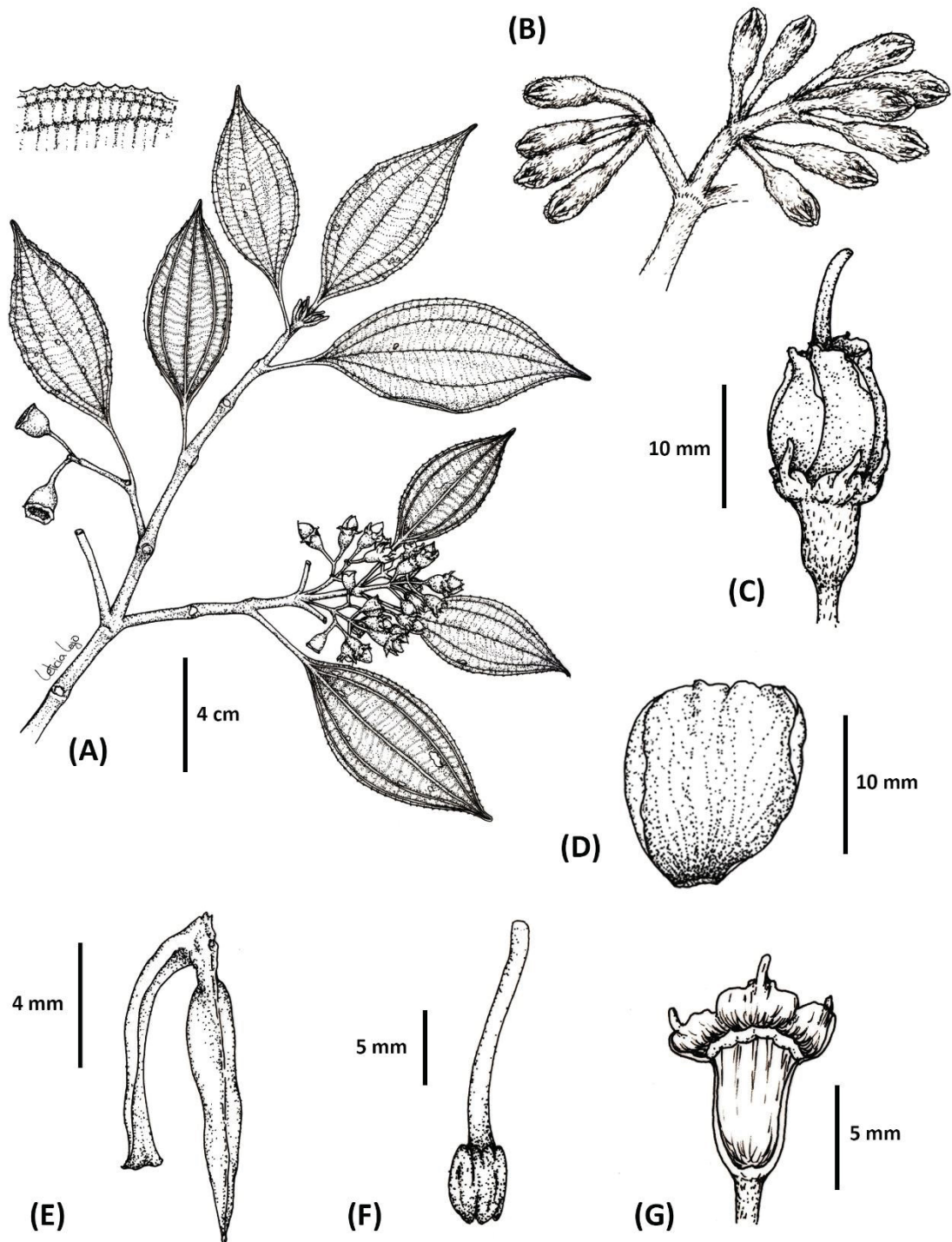


Figure 4. *Meriania bongarana*. A. Terminal fertile branch with inflorescence with detail of the margin leaf. B. Inflorescence branch. C. Flower at anthesis, lateral view. D. Petal. E. Stamen, lateral view. F. Ovary and style. G. Longitudinal section of the hypanthium and calyx. A-D from R. Fernandez-Hilario et al. 1930. Drawing by Leticia Lajo.



Figure 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 *et al.* 1930. Photos by Robin Fernandez.

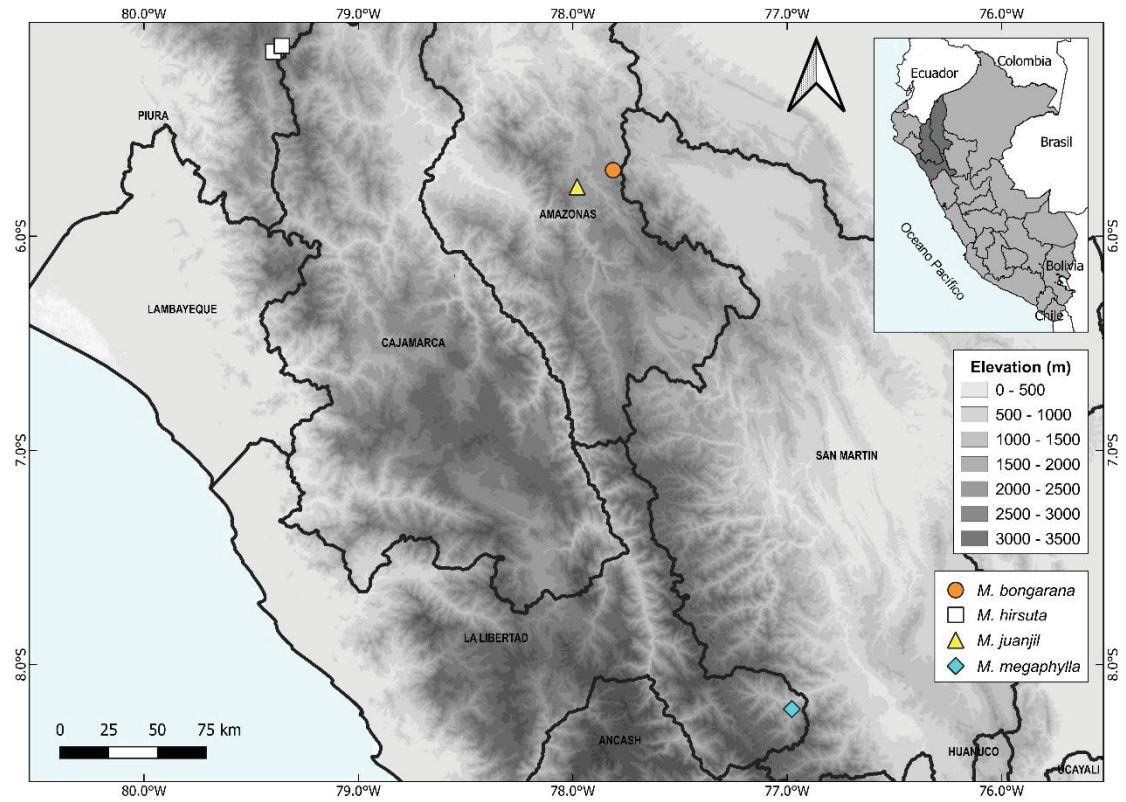


Figure 6. Distribution map of *M. bongarana*, *M. hirsuta*, *M. juanjil* and *M. megaphylla*.

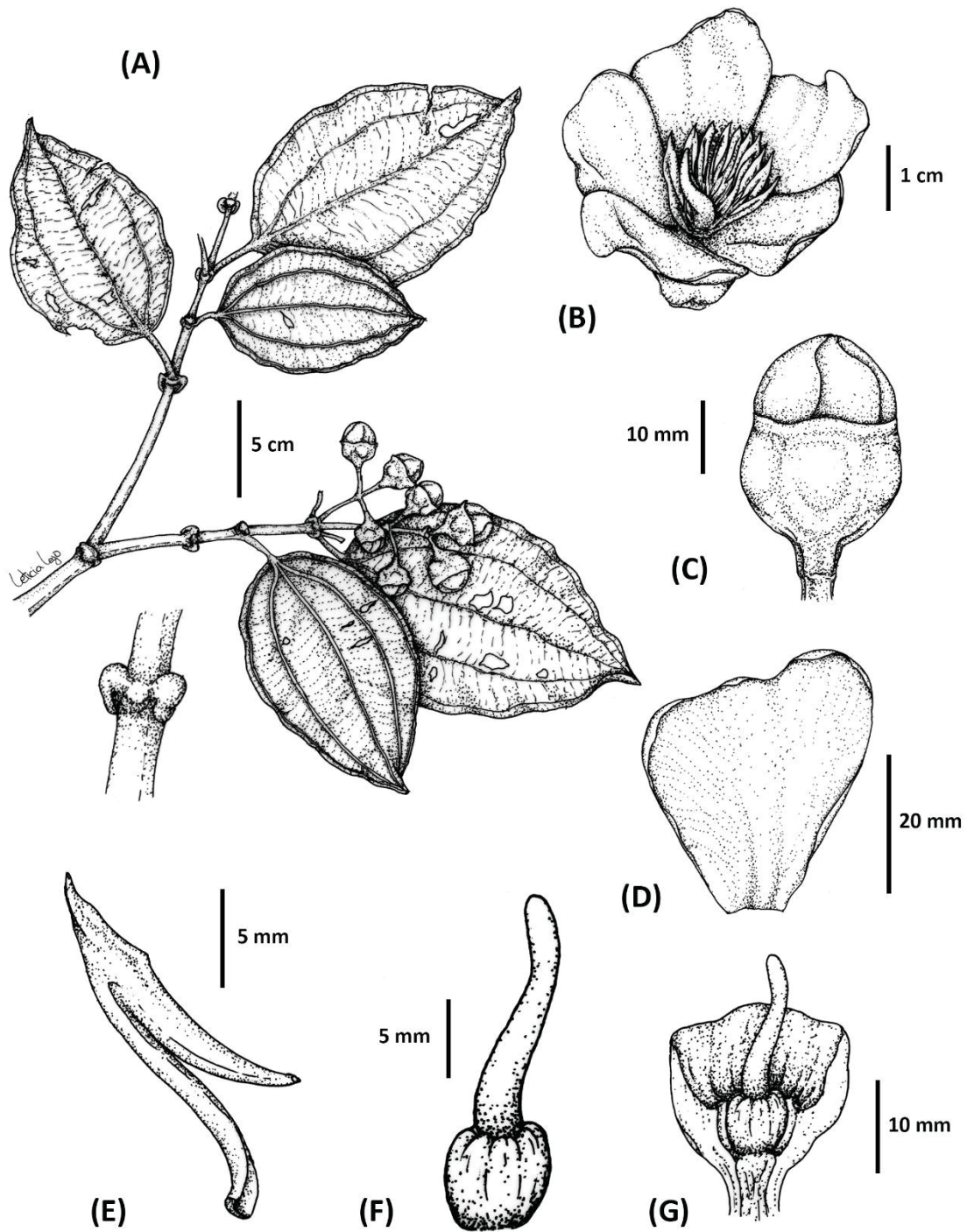


Figure 7. *Meriania callosa*. A. Terminal fertile branch with inflorescence with detail of the interpetiolar flap. B. Flower at anthesis, apical view. C. Flower bud. D. Petal. E. Stamen, lateral view. F. Ovary and style. G. Longitudinal section of the flower with the petals and stamens removed. A-G from R. Fernandez-Hilario *et al.* 2055. Drawing by Leticia Lajo.

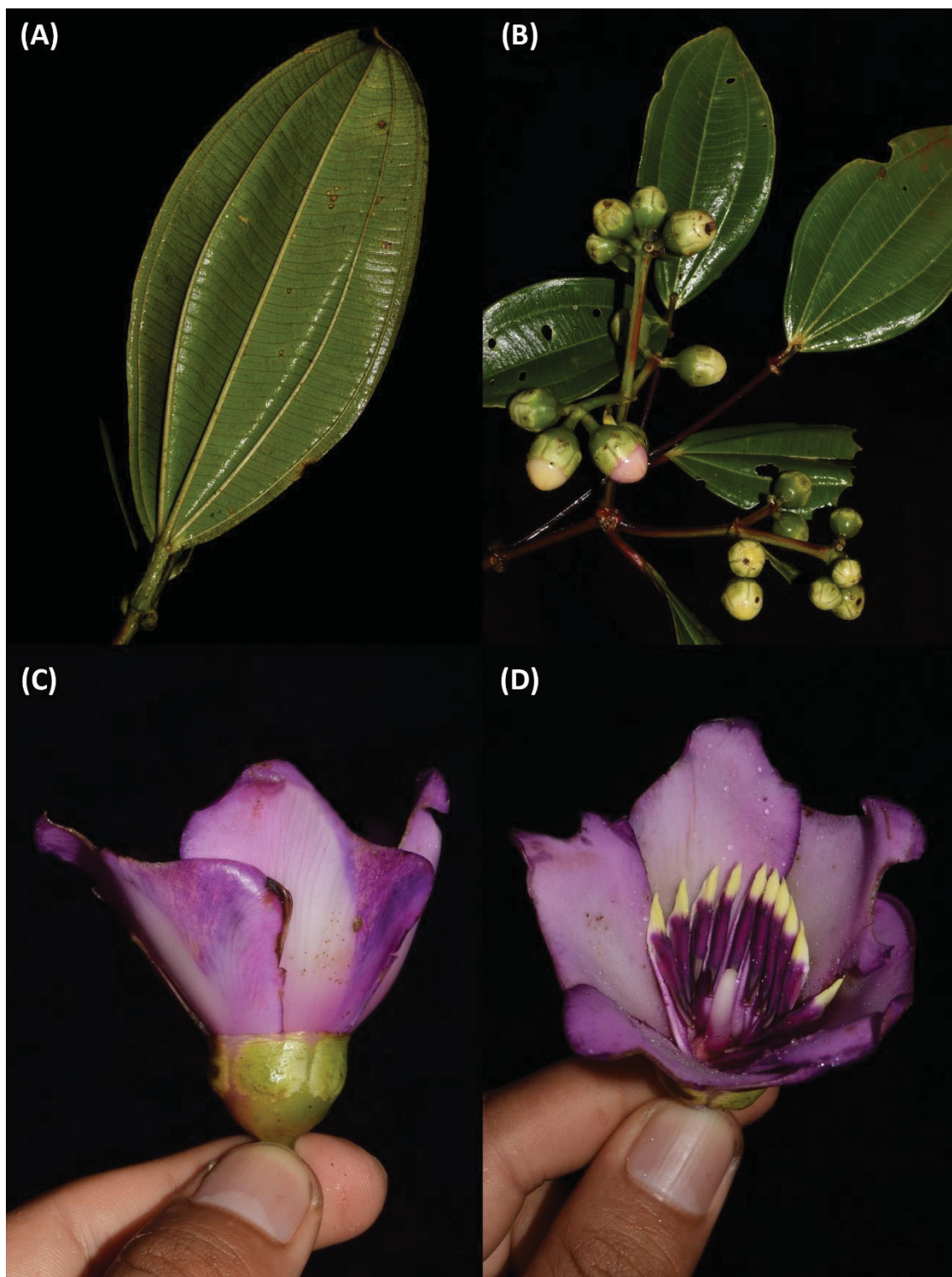


Figure 8. *Meriania callosa*. A. Leaf blade, abaxial view. B. Inflorescence with flower buds. C. Flower at anthesis, lateral view. D. Flower at anthesis, apical view. A-D from *R. Fernandez-Hilario et al. 2055*. Photos by Robin Fernandez.

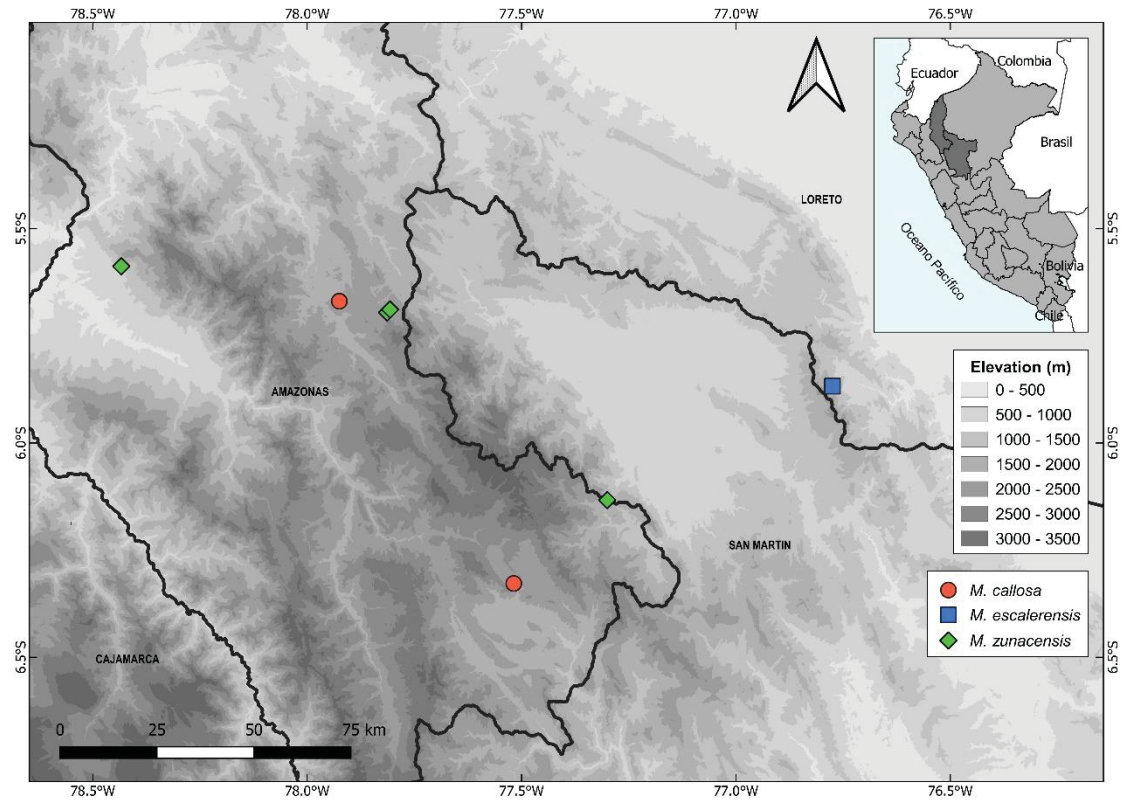


Figure 9. Distribution map of *M. callosa*, *M. escalerensis* and *M. zunacensis*.

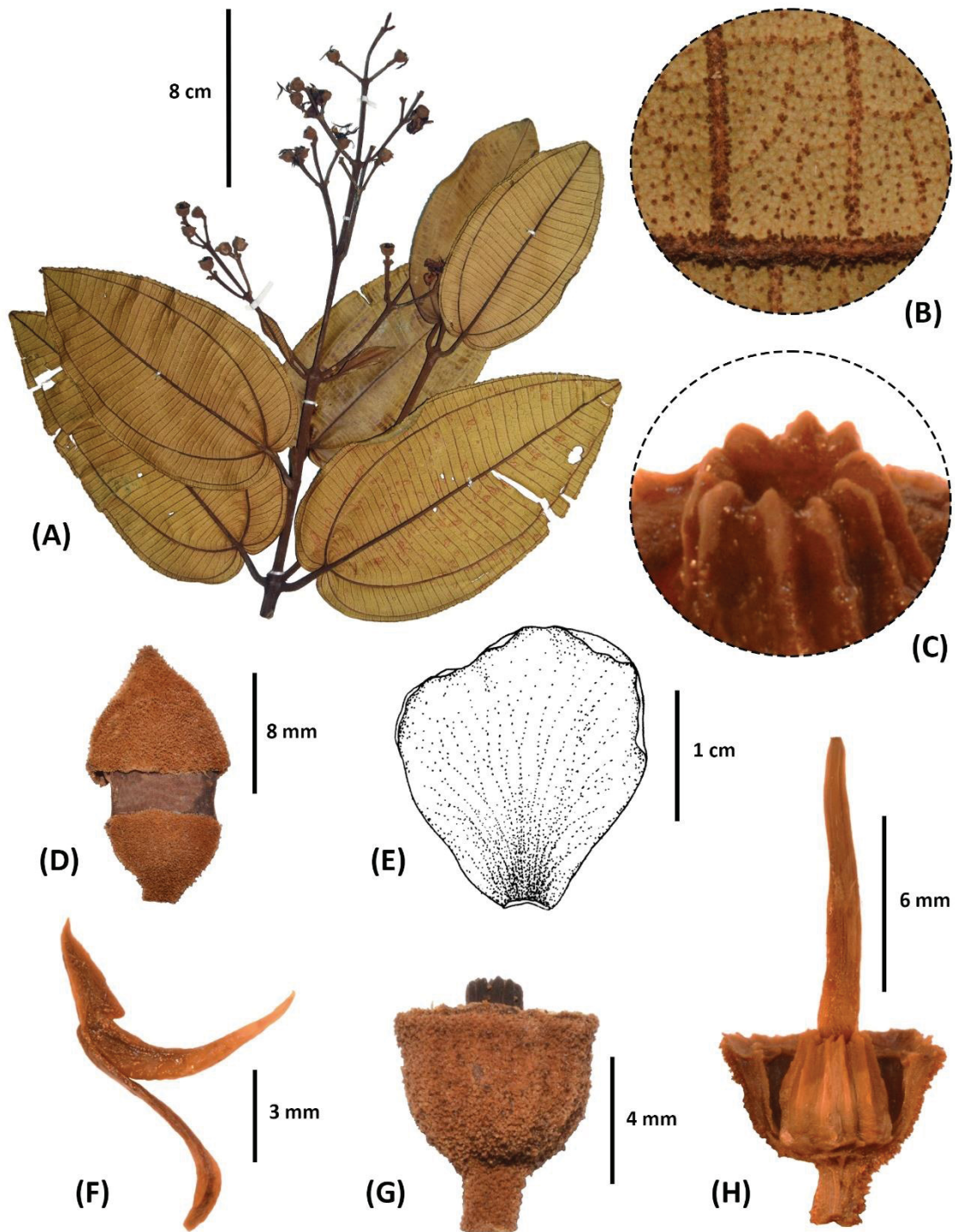


Figure 10. *Meriania escalerensis*. A. Terminal fertile branch with inflorescence. B. Detail of the abaxial leaf surface. C. Detail of the apex of the ovary. D. Flower bud, lateral view. E. Petal. F. Stamen, lateral view. G. Flower with petals, stamens and style removed. H. Longitudinal section of the flower with petals and stamens removed. A-H from *M. Ríos et al.* 3316. Drawing by Leticia Lajo (E).

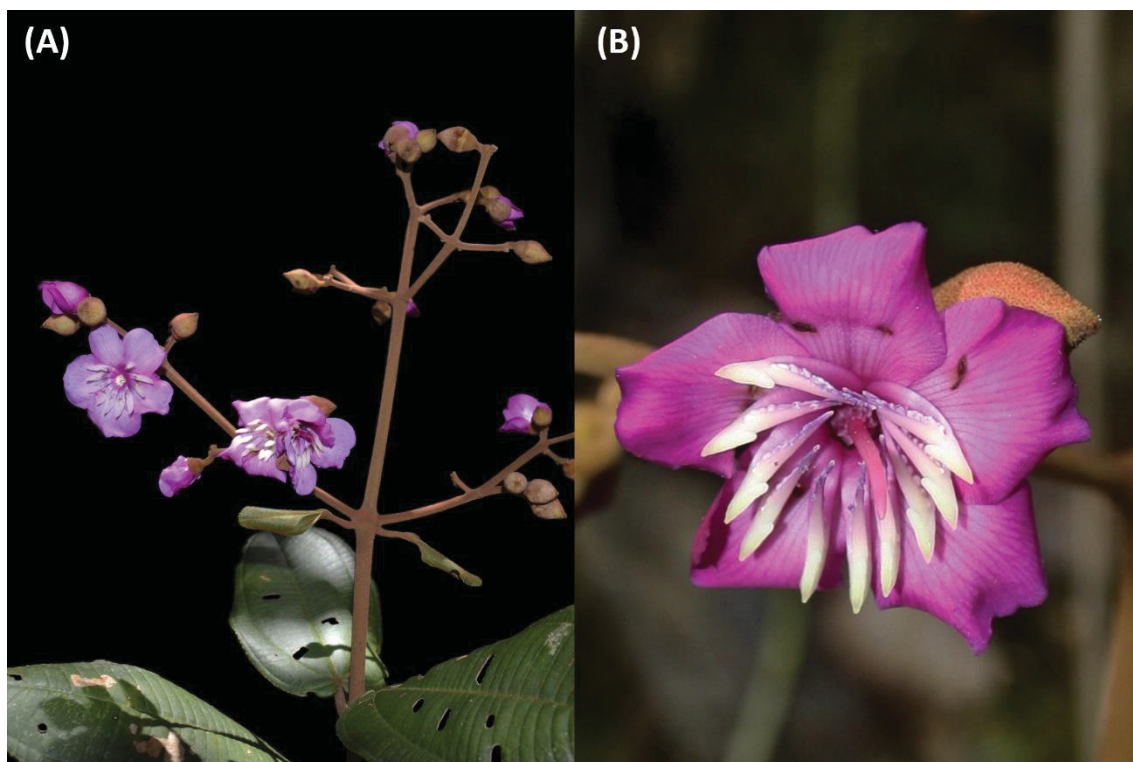


Figure 11. *Meriania escalerensis*. A. Terminal fertile branch with inflorescence. B. Flower at anthesis, apical view. A-B from *M. Ríos et al. 3316*. Photos by Luis Torres.

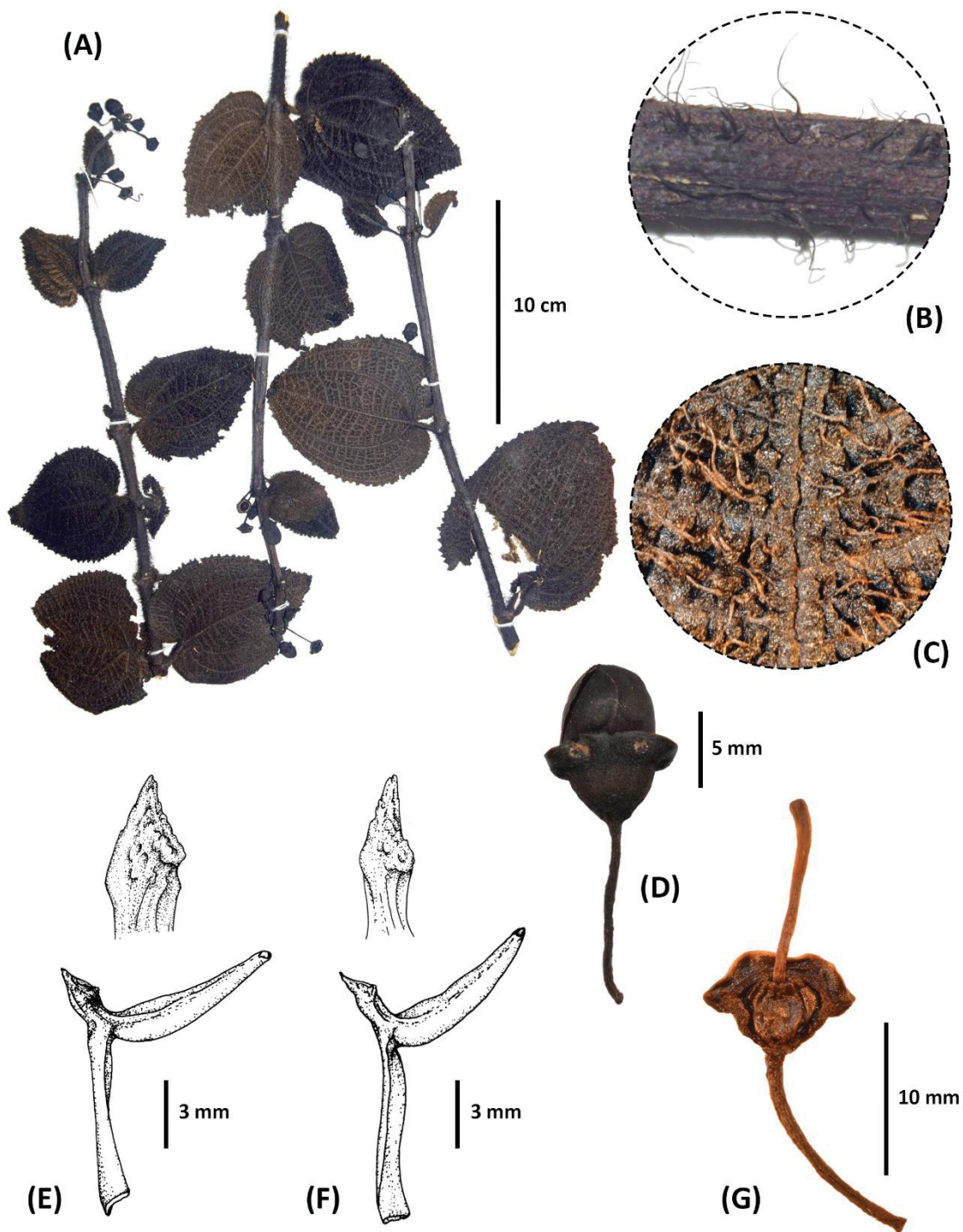


Figure 12. *Meriania hirsuta*. A. Terminal fertile branches with inflorescences. B. Detail of the hirsute internode. C. Detail of the adaxial leaf surface. D. Flower bud, lateral view. E. Antesepalous stamens, lateral view, with detail of the perpendicular dorso-basal appendage. F. Antepetalous stamens, lateral view, with detail of the perpendicular dorso-basal appendage. G. Longitudinal section of the flower with petals and stamens removed. A-G from S. Baldeón & J. Campos 5373. Drawing by Leticia Lajo (E-F).

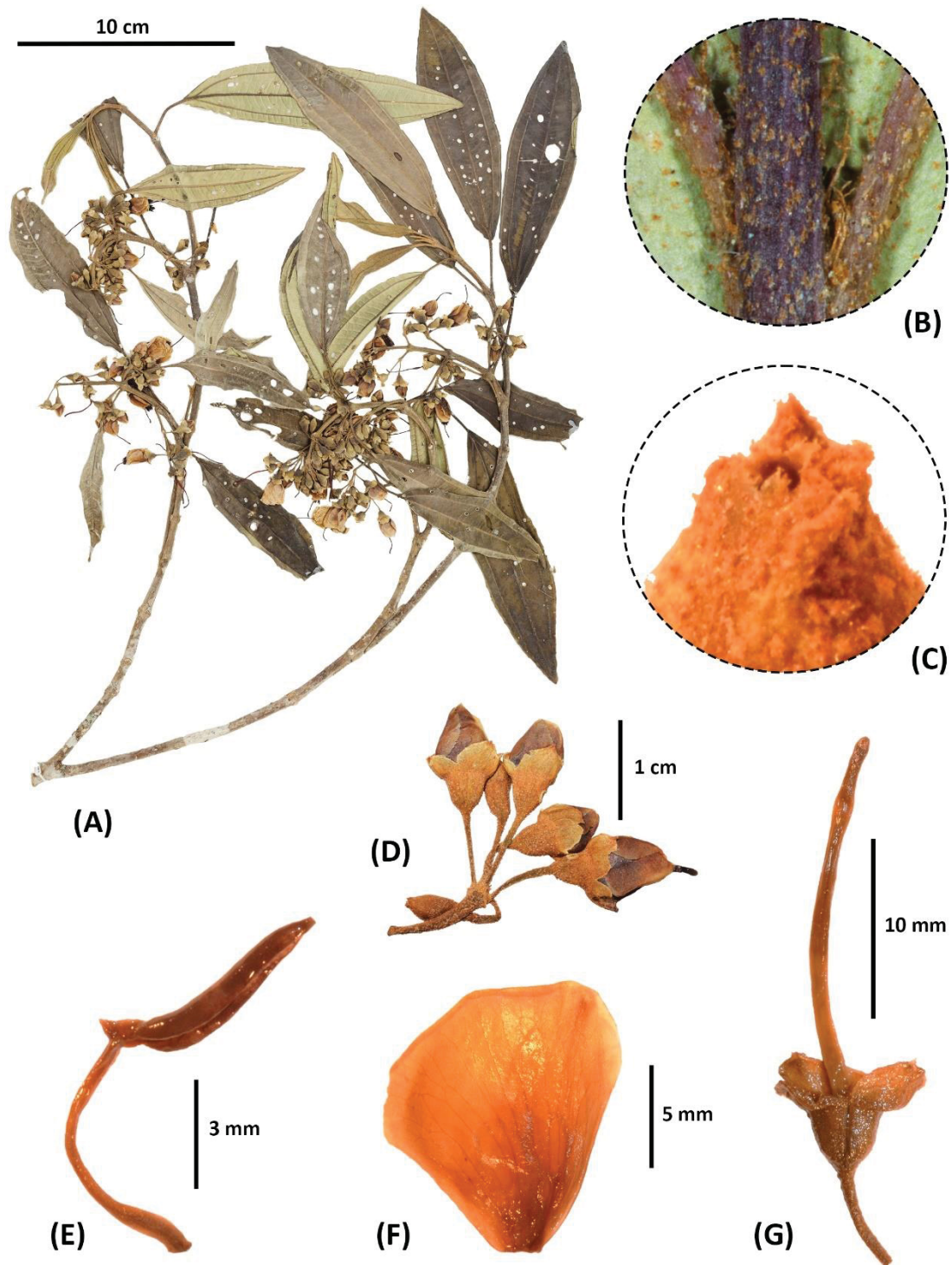


Figure 13. *Meriania juanjil*. Terminal fertile branch with inflorescences. B. Detail of the convergence of the midvein and secondary veins, abaxial view. C. Detail of the apex of the calyx. D. Inflorescence branch. E. Stamen, lateral view. F. Petal. G. Flower with petals and stamens removed. A-G from *J. Wurdack 1054*.

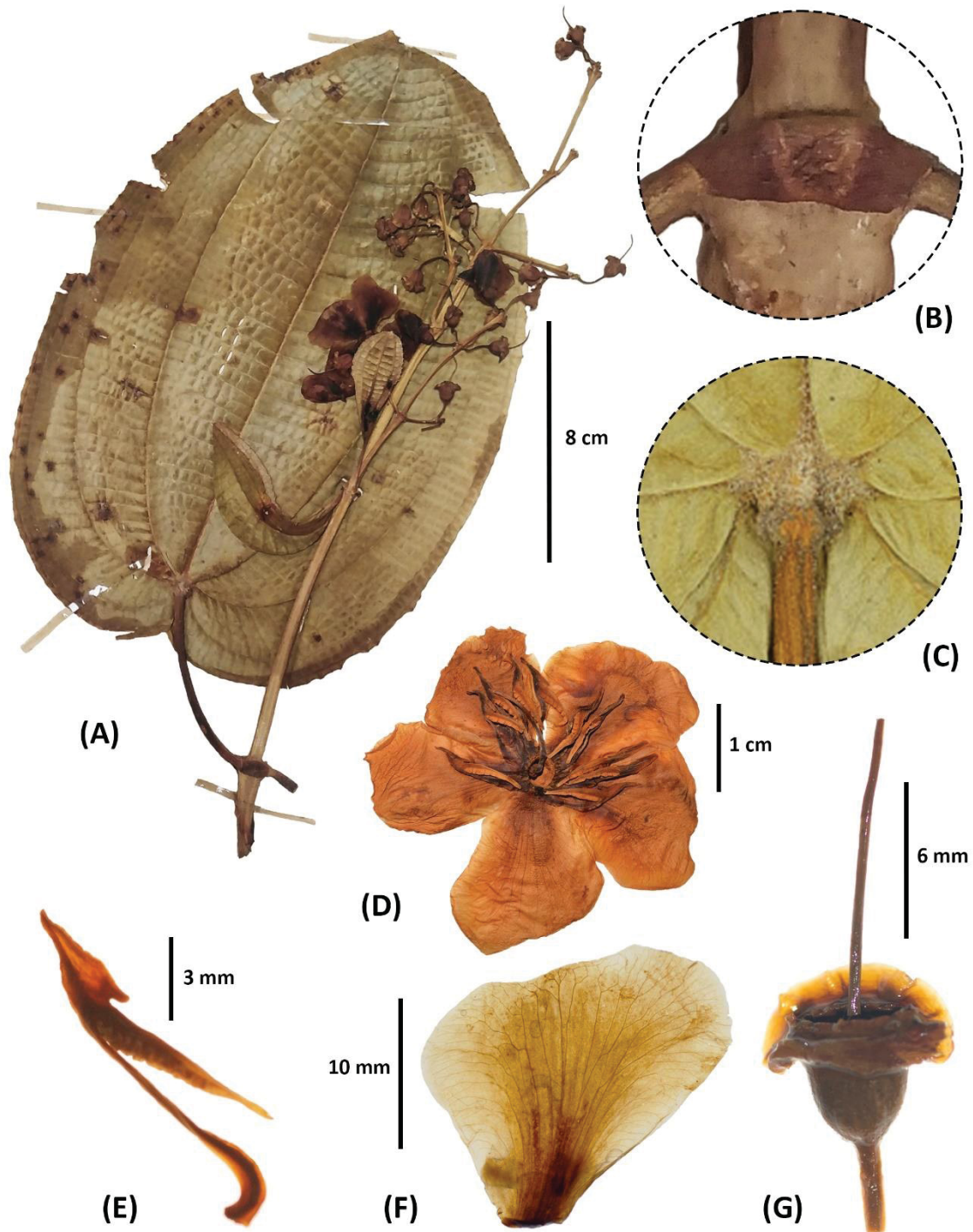


Figure 14. *Meriania megaphylla*. A. Terminal fertile branch with inflorescence. B. Detail of the interpetiolar flap. C. Detail of the base of the leaf blade. D. Flower at anthesis, apical view. E. Stamen, lateral view. F. Petal. G. Flower with petals and stamens removed. A-G from A. Weberbauer 7048.

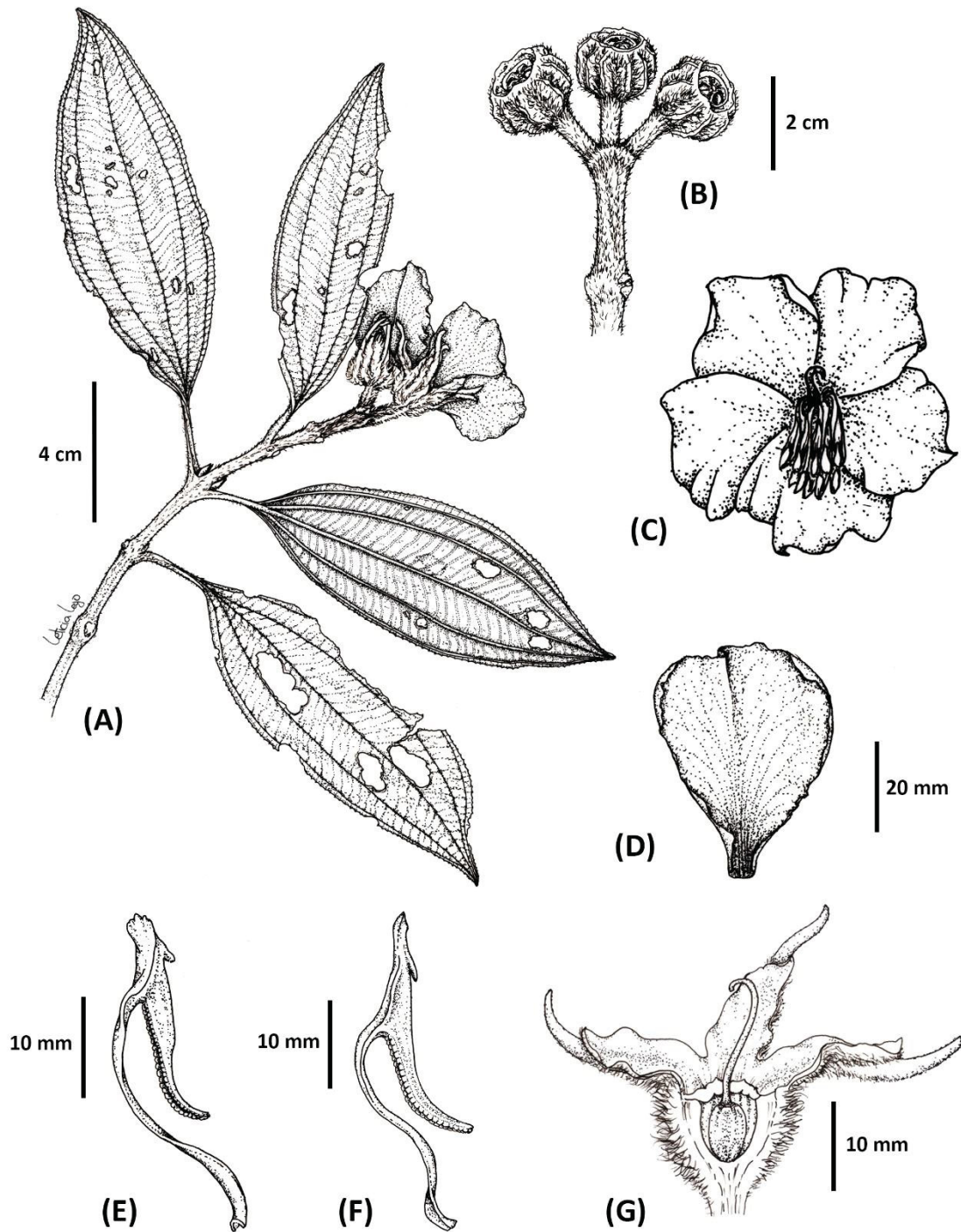


Figure 15. *Meriania sumatika*. A. Terminal fertile branch with inflorescence. B. Inflorescence branch. C. Flower at anthesis, lateral view. D. Petal. E. Antesepalous stamen, lateral view. F. Antepetalous stamen, lateral view. G. Longitudinal section of the flower with petals and stamens removed. A from *W. Galiano et al.* 6410; B-G from *P. Nuñez & J. Arque* 8369. Drawing by Leticia Lajo.

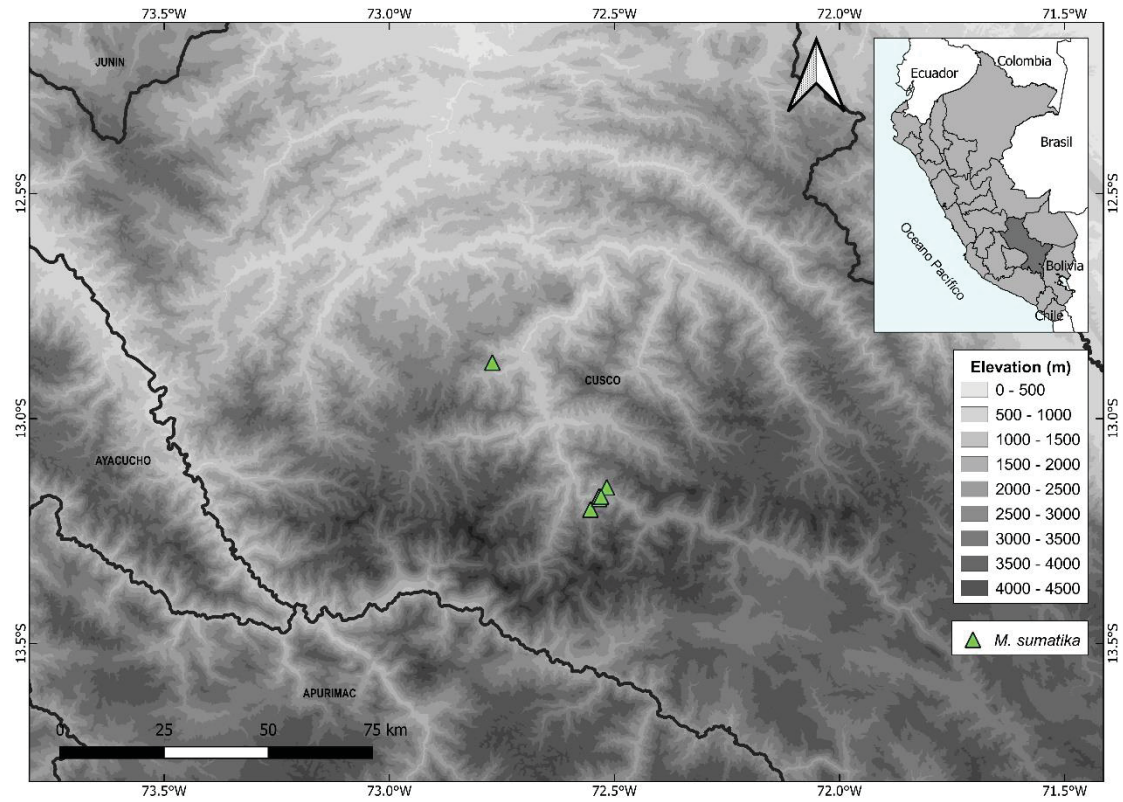


Figure 16. Distribution map of *Meriania sumatika*.

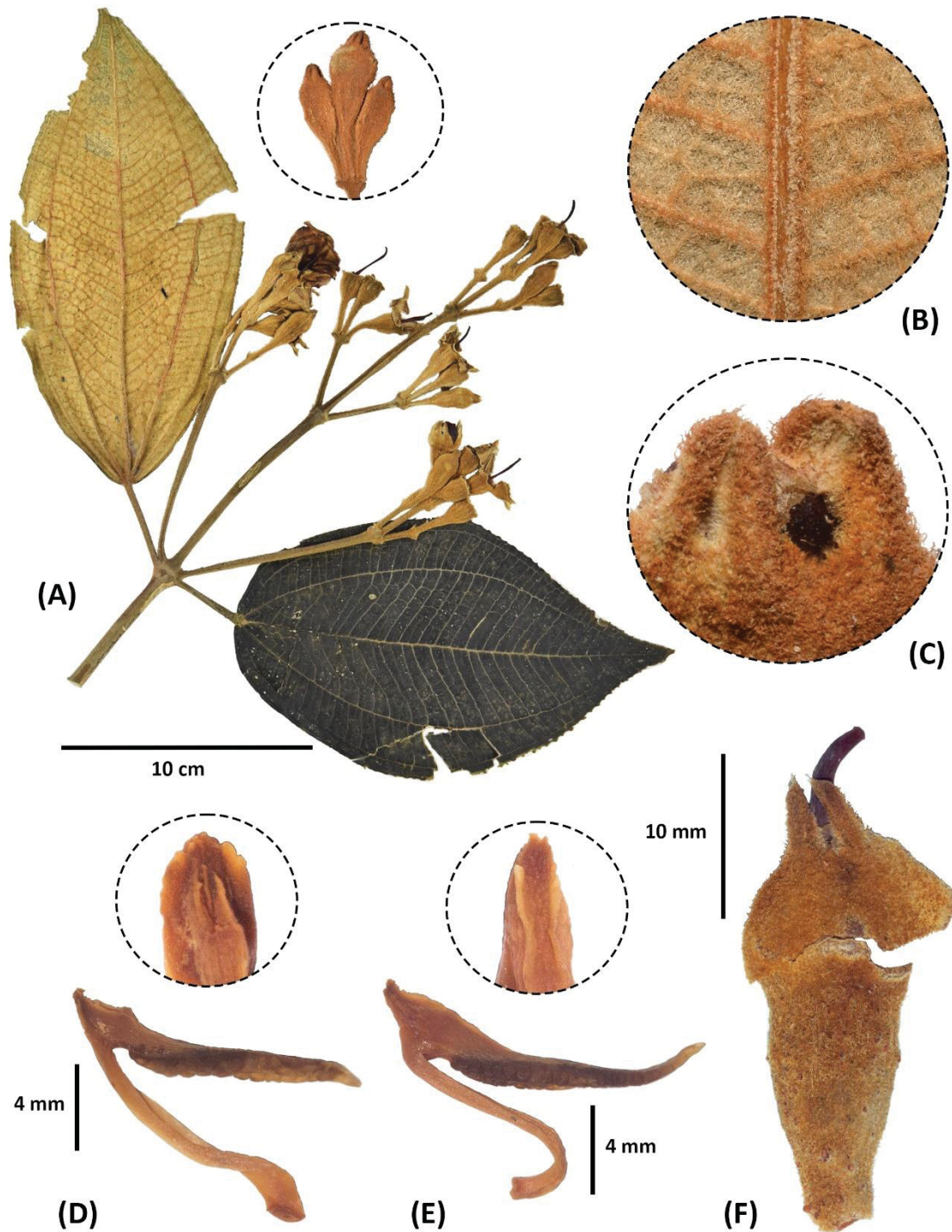


Figure 17. *Meriania vasquezii*. A. Terminal fertile branch with inflorescence and detail of the inflorescence branch. B. Detail of the abaxial leaf surface. C. Detail of the apex of the calyx. D. Antesepalous stamen, lateral view, with detail of the descending dorso-basal appendage. E. Antepetalous stamen, lateral view, with detail of the descending dorso-basal appendage. F. Flower with petals and stamens removed. A-F from R. Vásquez *et al.* 45480.



Figure 18. *Meriania vasquezii*. A. Terminal fertile branch with inflorescence. B. Detail of the inflorescence. C. Flower at anthesis, apical view. D. Immature fruit. A-D from *R. Vásquez et al.* 45480. Photos by Rodolfo Vásquez.

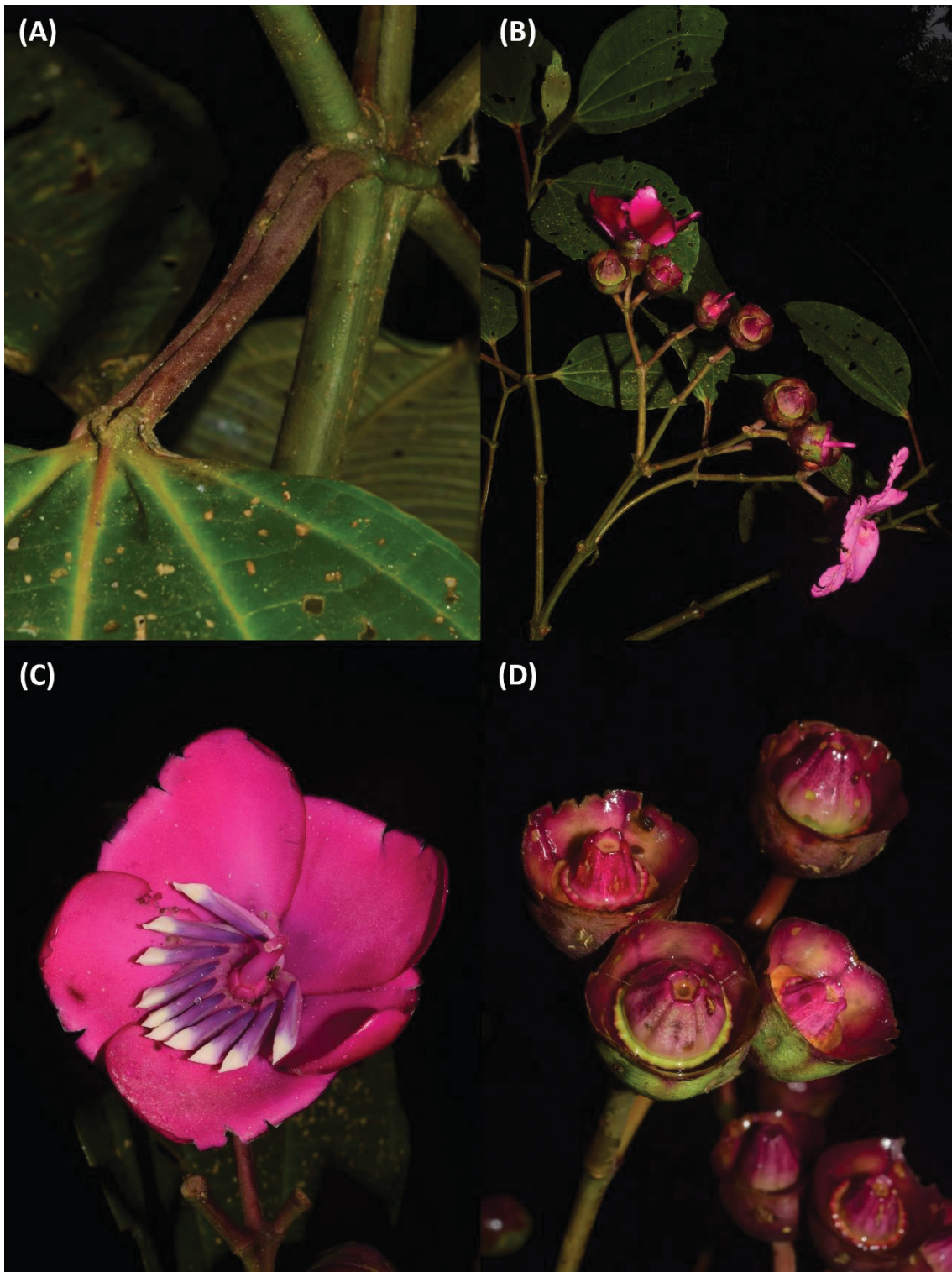


Figure 19. *Meriania zunacensis*. A. Node with interpetiolar flap and adaxial projection on the petiole apex. B. Terminal fertile branch with inflorescence. C. Flower at anthesis, apical view. D. Immature fruits. A-D from R. *Fernandez-Hilario et al.* 1920. Photos by Robin Fernandez.

6 CAPÍTULO 4 – A SYNOPSIS OF *MERIANIA* (MELASTOMATACEAE: MERIANIEAE) IN PERU

A synopsis of *Meriania* (Melastomataceae: Meranieae) in Peru*

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Abstract

A Peruvian synopsis of the *Meriania* is presented here, thirty-six species are recognized, twenty-five of which are endemics. This synopsis includes a key, illustrations, comments on affinities, distribution and phenology. Peru now is the country with the second highest diversity of the genus. Also, the departments with the highest number of species are Amazonas (18 species), Cajamarca (10 species) and San Martín (9 species), and twenty-four species are located within Amotape-Huancabamba Zone in the northern Peru. *Meriania* in Peru is characterized by being trees and shrubs, lacks malpighiaceae trichomes, inflorescence in panicle, rarely dichasium, cyme or solitary, (4-)5–6-merous flowers, usually large, with lobed, subcalyptrate or calyptrate calyces with regular, irregular or circumscissile dehiscence, spreading to campanulate corollas, stamen connectives with dorsal and dorso-basal appendages, anthers usually with a dorsally inclined pore, and capsular fruits. *Meriania peltata*, previously known only from Colombia and Ecuador, is herein reported for the first time for the Peruvian flora. We propose one new combination, *Meriania sessilifolia* (Cogn.) Rob.Fern., R.Goldenb. & Michelang. Lectotypes for *Axinaea purpurea*, *Centronia sessilifolia*. *Graffenrieda acida*, *Meriania prunifolia*, *M. raimondii*, *M. rugosa*, *M. spruceana* and *Pachymeria rigida* are also designated.

Resumen

La sinopsis peruana de *Meriania* es presentada aquí, treinta y seis especies son reconocidas, de las cuales veinticinco son endémicas. Esta sinopsis incluye una clave, ilustraciones, comentarios de afinidades, distribución y fenología. Perú ahora es el segundo país con la mayor diversidad del género. Además, los departamentos con el mayor número de especies son Amazonas (18 especies), Cajamarca (10 especies) y San Martín (9 especies), y veinticuatro especies están localizadas dentro de la Zona de Amotape-Huancabamba en el norte del Perú. *Meriania* en Perú es caracterizado por presentar árboles y arbusto, sin tricomas malpigiáceos, inflorescencias en panículas, raramente en dicasios, cimas o flores solitarias, flores (4-)5–6-meras, usualmente grandes, con cálices caliptrados o subcaliptrados con dehiscencia regular, irregular o circumcisil, corolas patentes o campanuladas, conectivos de los estambres con apéndices dorsales y dorso-basales, anteras usualmente con un poro dorsalmente inclinado, y frutos capsulares. *Meriania peltata*, previamente solo conocida para Colombia y Ecuador, es reportada aquí por primera vez para la flora peruana. También proponemos una nueva combinación, *Meriania sessilifolia* (Cogn.) Rob.Fern., R.Goldenb. & Michelang. Además, designamos lectotipos para *Axinaea purpurea*, *Centronia sessilifolia*. *Graffenrieda acida*, *Meriania prunifolia*, *M. raimondii*, *M. rugosa*, *M. spruceana* y *Pachymeria rigida*.

Key words

Andean forests, *Axinaea*, *Centronia*, Merianieae, montane forests, Neotropics,
Taxonomy

Palabras clave

Bosques andinos, *Axinaea*, *Centronia*, Merianieae, bosques montanos, Neotrópico,
Taxonomía

Introduction

Melastomataceae Juss., in the order Myrtales Reichb. (APG IV 2016), is a family of mostly tropical and sub-tropical trees, shrubs, climbers, and herbs comprising approximately 5750 species in 177 genera (Renner 1993, Michelangeli *et al.* 2020). It is the sixth richest family of vascular plants in Peru with more than 660 species and 43 genera (Brako & Zarucchi 1993, Ulloa Ulloa *et al.* 2004, Paredes-Burneo *et al.* 2018, Torres *et al.* 2019). Tribe Merianieae Triana is neotropical and has eight genera (Figure 1); *Adelobotrys* DC., *Axinaea* Ruiz & Pav., *Centronia* D.Don, *Graffenrieda* DC., *Macrocentrum* Hook.f., *Maguireanthus* Wurdack, *Meriania* Sw. and *Salpinga* Mart. ex DC. (Michelangeli *et al.* 2020), this tribe can be recognized by the diplostemonous flowers, anthers with dorsal appendages, capsular fruits, and predominantly pyramidal seeds (Renner 1993, Mendoza-Cifuentes & Fernández-Alonso 2010).

Historically, the generic delimitations within Merianieae have been unclear (Wurdack 1973, 1976; Almeda 1993; Mendoza-Cifuentes & Fernández-Alonso 2010). For example, some of the characteristics traditionally used to distinguish *Centronia* are inconsistent and may be present in related genera. *Centronia* had 16–18 accepted species (Wurdack 1973, Lozano & Becerra 1999), and was traditionally characterized by the presence of large flowers, calyptrate calyces with irregular or circumscissile dehiscence, and stamen connectives with dorso-basal appendages and dorsal appendages (Wurdack 1973). However, due to inconsistent of these characters, many species have been transferred to *Meriania* (Wurdack 1976, 1987; Almeda 1993; Mendoza-Cifuentes & Fernández-Alonso 2012), and others ones have been synonymized under *Meriania* (Wurdack 1976, Mendoza-Cifuentes & Fernández-Alonso 2012, Mendoza-Cifuentes 2021) or *Wurdastom* B.Walln. (Mendoza-Cifuentes 2020). Currently, *Centronia* has five species; *C. laurifolia* D.Don, *C. neblinae* Wurdack, *C. reticulata* Triana, *C. sessilifolia* Cogn. (transferred to *Meriania* here) and *C. vaupesana* Wurdack (Michelangeli *et al.* 2020). All of them (except *C. sessilifolia*) lack large flowers and dorsal appendages in the stamen connectives. On the other hand, *Graffenrieda* has 68 species (Michelangeli *et al.* 2020), and is distinguished from other genera in the Merianieae by its usually smaller flowers, stamen connectives with dorso-basal appendages and anther pores ventrally inclined (Wurdack 1973, 1980; Almeda *et al.* 2014). Also, phylogenetic analyses of the tribe Merianieae have shown that *C. laurifolia* is resolved within *Graffenrieda* (Dellinger *et al.* 2018, Caetano *et al.* 2020).

Therefore, *Centronia* species (except *C. sessilifolia*) have floral characters consistent with *Graffenrieda* and may be better placed there.

Meriania currently comprises 121 species distributed from Southeast Mexico and the Greater Antilles to Eastern Brazil and Bolivia (Michelangeli *et al.* 2015, 2020). The last comprehensive revisions of *Meriania* were elaborated by Triana (1872) and Cogniaux (1891), covering 28 and 39 species respectively. It was classified into five sections (*Adelbertia*, *Eumeriania*, *Davya*, *Pachymeria* and *Umbellata*), which were recognized based on characters of inflorescences, calyces and stamen connectives. Regional floristic works of Melastomataceae have included taxonomic treatments for *Meriania* in Brazil (Chiavegatto & Baumgratz 2008, Goldenberg 2009, Fagundes & Santos 2016), Colombia (Mendoza-Cifuentes 2021), Costa Rica (Almeda 2007), Ecuador (Wurdack 1980), Greater Antilles (Michelangeli *et al.* 2015), Guyana (Wurdack 1993), Mesoamerica (Almeda 2009) and Venezuela (Wurdack 1973). In Peru, the last revision of the genus was made by Macbride (1941) where he recognized 12 species in total, but some of these would later be treated under other genera (see doubtful and excluded taxa here). Subsequently, new species and transferred species were added to the Peruvian *Meriania* (Wurdack 1964, 1966, 1971, 1976, 1981), reaching the 15 species listed by Brako & Zarucchi (1993) in their checklist of the Peruvian flora. In the following 28 years, 52 new species of Melastomataceae were published for Peru (Wallnöfer 1996, 1999; Baumgratz 1999; Freire-Fierro 2001; Schulmann 2003; Bussman *et al.* 2010; Morales-Puentes & Penneys 2010; Sagástegui *et al.* 2010; Bussman & Paniagua 2012; Ulloa Ulloa *et al.* 2012; Bussmann 2013; Cárdenas *et al.* 2014; Cotton *et al.* 2014; Michelangeli *et al.* 2014; Ocampo & Almeda 2014; Penneys *et al.* 2015; Burke *et al.* 2017; Burke & Michelangeli 2018; Michelangeli & Goldenberg 2018, 2020; Michelangeli & Paredes-Burneo 2018; Fernandez-Hilario *et al.* 2020, 2021a, 2021b), almost all of them coming from the Andes, and highlighting 16 new species for *Miconia* and 13 for *Meriania*. In the latter case, if new records are added (Paredes-Burneo *et al.* 2018; Fernandez-Hilario *et al.* 2021a, 2021b), the number of species increases to 17, which represents 47% of all the *Meriania* species currently recognised for Peru (36 species in this treatment). Although *Meriania* is a woody genus with large, showy flowers, it is surprising that no recent taxonomic treatment has been done for Peru. Similar diversity patterns in the Peruvian Andes can be observed in genera such as *Macrocarpaea* (Gentianaceae; e.g., Grant 2004) and *Magnolia* (Magnoliaceae; e.g., Vázquez-García *et al.* 2002), which are woody genus with large, showy flowers too, and where the greatest discovery of new species has taken place in recent years. Probably unexplored areas or areas with few collections hold many new species to be discovered in different Andean genera. Therefore, the effective protection of the diverse Andean habitats is a high priority.

As part of the ongoing taxonomic revision of *Meriania* for Peru, we have conducted botanical expeditions in the Peruvian Andes mainly during 2020 and reviewed herbarium material. We now present a synopsis of the genus with a key to the 36

recognized species, 25 endemics to Peru, illustrations, comments on affinities, nomenclatural notes, and distribution and phenological information.

Materials and methods

We examined herbarium specimens collected in Peru deposited in AMAZ, CPUN, CUZ, F, HAO, HOXA, HSP, HUT, KUELAP, MOL, NY, UPCB, US and USM (herbarium acronyms follow Thiers 2021). Some of the examined specimens are indicated with the acronym ABERG, which refers to the herbarium of Andes Biodiversity and Ecosystem Research Group. The specimens from the digital collections at F (<https://collections-botany.fieldmuseum.org>), L (<http://bioportal.naturalis.nl/>), MO (<https://tropicos.org>), P (<https://science.mnhn.fr>), U (<http://bioportal.naturalis.nl/>) and US (<https://collections.nmnh.si.edu/search/botany/>) were consulted. Lectotypes designated here were chosen in correspondence with the rules of the International Code of Nomenclature (ICN) (Turland *et al.* 2018).

A morphological species concept has been used in this study, which establishes that consistent differences in morphology, separated by gaps, are considered evidence of the existence of separate species (see Judd 2007). The combination of several discontinuous morphological characters was used to recognize the species. Indument terminology and fruit type follow Beentje (2010) and Baumgratz (1983–1985), respectively. The distribution maps were made in software QGIS version 3.18.1 (QGIS Development Team 2021), and to analyse the species richness of *Meriania* we used grid size of 0.5°. Comments on the distribution and morphological differences among Andean species of *Meriania* were made based on checklists and taxonomic treatments for Bolivia (Jørgensen *et al.* 2014), Colombia (Almeda *et al.* 2021, Mendoza-Cifuentes 2021), Ecuador (Wurdack 1980, Jørgensen & León-Yáñez 1999), Peru (Macbride 1941, Brako & Zarucchi 1993), and Venezuela (Wurdack 1973, Hokche *et al.* 2008). Additionally, we examined the protologues of the newly described *Meriania* species and the type specimens through JSTOR Global Plants Initiative portal (<https://plants.jstor.org>).

Taxonomic Treatment

Meriania Sw., **nom. cons.**, **Fl. Ind. Occ. 2: 823, t. 15. 1798.** (Figures 2–6).

Type species: *Rhexia leucantha* Sw., type cons. [= *Meriania leucantha* (Sw.) Sw.].

Trees or **shrubs**, rarely **climbers**, distal branchlets glabrous or with various indument types. **Young branches** terete, quadrangular or 4-angulate; nodes with interpetiolar lines, flaps or without modifications. **Leaves** opposite, isophyllous to slightly anisophyllous. **Petioles** with projections or without modifications. **Leaf blades** petiolate or sessile, sometimes subpeltate or peltate; venation acrodromous basal or suprabasal; glabrous or covered with various indument types. **Inflorescences** a terminal or pseudo-lateral

(initially terminal but overtopped by the developing axillary bud) panicles, rarely dichasia, cymes or solitary flowers. **Flowers** (4-)5–6-merous; diplostemonous; with spreading to campanulate corollas. *Hypanthium* terete to costate; glabrous or covered with various indument types. *Calyx* lobed, subcalytrate or calytrate; dehiscence regular, irregular or circumscissile; with dorsal projections, acicular, claw-shaped, conic, callose, blunt or obsolete; glabrous or covered with various indument types. *Petals* oblong, obovate, slightly obovate or strongly asymmetrically obovate; glabrous, rarely slightly ciliate or puberulent. *Stamens* isomorphic to strongly dimorphic, all bent to one side of the flower at anthesis giving the flower a zygomorphic appearance; filaments flat to semiterete; connectives sometimes prolonged below the thecae or abruptly inflated, with two appendages, one dorso-basal and the other dorsal, the former descending or almost perpendicular to the thecae, sometimes laterally expanded, the latter obsolete to ascending; anthers usually opening by one dorsally inclined pore, thecae with smooth to corrugated surfaces. *Ovary* superior, sometimes $\frac{1}{2}$ inferior, usually glabrous; style incurved at the apex and opposite to the anthers at anthesis, glabrous. **Fruits** capsular (velatidia), with persistent hypanthium, calyx persistent or caducous; mature ovary exceeding the hypanthium length or completely concealed by the hypanthium. **Seeds** triangular-linear, numerous.

Distribution and habitat:—Peru presents 36 species of *Meriania* which 25 are endemics, and 24 are found in the northern Peru within Amotape-Huancabamba Zone (see Weingend 2002) (Table 1). In this zone are located the areas with highest species density and the departments with the highest number of species in Peru; Amazonas (18 species), Cajamarca (10 species) and San Martín (9 species) (Figure 6). Peruvian species of *Meriania* grow mainly in the eastern flanks of the Andes in premontane forests, montane forests, elfin forests and subparamos at 350–3500 m, but two species (*M. escalerensis* and *M. microflora*) grow in the sub-Andean cordilleras (Andean Tepuis sensu Neill *et al.* 2014).

Key to the genera of Merianieae in Peru

1. Tiny herbs generally less than 50 cm tall, or occasionally subshrubs up to 1.5 m tall; fruits with mature hypanthia costate with 8–10 evident ribs..... 2
 - Shrubs, vines, trees more than 1 m tall; fruits with mature hypanthia terete, sometimes slightly angled or costate in *Adelobotrys* and *Meriania* (with 10 evident ribs in *Meriania sumatika*, but in this case trees 5–20 m tall)..... 3
2. Inflorescences solitary or in pairs; stamen connectives with one dorso-basal appendage *Macrocentrum andinum*
 - Inflorescences in unilateral scorpioid cymes with more than 10 flowers (with 1–4 flowers in *S. peruviana*); stamen connectives with two appendages, one dorso-basal and the other dorsal *Salpinga*
3. Stamen connectives with two appendages, one dorso-basal and the other dorsal..... 4
 - Stamen connectives only with one dorso-basal appendage..... 5

4. Vines or occasionally shrubs with malpighiaceae trichomes; stamen connectives with bifid ascending dorsal appendages or at least apically bilobed..... *Adelobotrys*
 - Shrubs, trees or rarely scandent glabrous or with various indument types but never with malpighiaceae trichomes; stamen connectives with dentiform dorsal appendages or as mere humps, if it is ascending then blunt, apically sagitate or trilobed..... *Meriania* p.p.
5. Inflorescences erect, pseudo-pendulous or pendulous; stamen connectives from both cycles with bulbous dorso-basal appendages, except some species with 4-merous flowers but in these cases always with pendulous inflorescences (see comments below *Meriania rubriflora*)..... *Axinaea*
 - Inflorescences erect (except pendulous in *M. rubriflora*); stamen connectives from both cycles with dorso-basal appendage not bulbous (but antepetalous stamens of *Meriania macrophylla* complex with connectives inflated)..... 6
6. Hypanthia and calyces with various indument types; petals less than 4 mm long, if it more than 4 mm long then hypanthia and calyces setose; connective stamens with dorso-basal appendages always descending; anthers with pores ventrally inclined *Graffenrieda* (includes *Centronia*)
 - Hypanthia and calyces with various indument types but never setose; petals more than 9.5 mm long; connective stamens with dorso-basal appendages descending or almost perpendicular to the thecae; anthers with pores dorsally inclined *Meriania* p.p.

Key to the species of *Meriania* in Peru

1. Leaf blades with dentate-undulate revolute auricles at the base, and punctiform abaxial surfaces *M. cuzcoana*
 - Leaf blades without auricles (but *M. neillii* and *M. rigida* sometimes with revolute bases), and abaxial surface not punctiform 2
2. Inflorescences solitary, in simple cymes or dichasia 9-flowered (often reduced to 5-flowered) 3
 - Inflorescences in panicles with more than 10 flowers (but see comments below *M. hirsuta*) 5
3. Calyx calyptate with irregular dehiscence *M. sessilifolia*
 - Calyx lobed with regular dehiscence..... 4
4. Terminal branches and leaf blades glabrous; leaf blades 7.7–10 cm long; hypanthium terete *M. speciosa*
 - Terminal branches and abaxial leaf blades moderately to densely furfuraceous; leaf blades 2.3–8.2 cm long; hypanthium costate..... *M. prunifolia*
5. Leaf blades bullate; corolla campanulate and deep red; stamen connectives with dorsal-basal appendages almost perpendicular to thecae 6
 - Leaf blades flat to bullate; corolla spreading or campanulate, white, pink-orange to reddish-orange, or fuchsia to reddish-purple but never deep red (except red in *M. rubriflora*); stamen connectives with dorsal-basal appendages not perpendicular to thecae 9

6. Nodes with developed interpetiolar flaps 7
 - Nodes with only interpetiolar lines, not flaps 8
7. Internodes quadrangular and 4-winged; petioles with abaxial tuberculate projections on the transition zone from the petiole to the midvein *M. tetragona*
 - Internodes terete-quadrangular; petioles with abaxial liguliform projections on the transition zone from the petiole to the midvein *M. sanguinea*
8. Branches, petioles, and both leaf surfaces hirsute; antesealous stamen connectives with dorso-basal appendages laterally expanded *M. hirsuta*
 - Branches, petioles, and abaxial leaf surfaces moderately to densely setulose; stamen connectives from both cycles with dorso-basal appendages not laterally expanded *M. radula*
9. Antepetalous stamens with inflated connectives 10
 - Stamens from both cycles without inflated connectives 13
10. Leaf blades subpeltate to peltate, and more than 8.4 cm wide 11
 - Leaf blades neither subpeltate nor peltate, less than 8.1 cm wide 12
11. Leaf blades peltate; antepetalous stamen connectives with bifid descending dorso-basal appendages *M. peltata*
 - Leaf blades subpeltate; antepetalous stamen connectives with falcate descending dorso-basal appendages *M. ninakurorum*
12. Leaf abaxial surface densely pubescent, the trichomes evenly covering the entire surface; petals fuchsia to light fuchsia; antepetalous stamen connectives without dorsal appendages *M. bicentenaria*
 - Leaf abaxial surface sparsely to densely puberulent, the trichomes not covering the entire surface; petals reddish-purple; antepetalous stamen connectives with blunt ascending dorsal appendages *M. franciscana*
13. Stamens strongly dimorphic (connectives with different shapes, sizes and colors), antepetalous stamen connectives with apically trilobed or sagitate ascending dorsal appendages 14
 - Stamens dimorphic (connectives with different shapes and sizes but with similar colors) or isomorphic, stamen connectives from both cycles without dorsal appendages, with dentiform dorsal appendages, with blunt ascending dorsal appendages or dorsal appendages as mere humps 15
14. Petioles with adaxial and lateral liguliform projections on the apex; corolla white; antepetalous stamen connectives with apically trilobed ascending dorsal appendages *M. microflora*
 - Petioles without projections; corolla fuchsia; antepetalous stamen connectives with apically sagitate ascending dorsal appendages *M. urceolata*
15. Corolla campanulate, pink-orange to reddish-orange (except fuchsia in *M. vasquezii* and red in *M. rubriflora*) 16
 - Corolla spreading, fuchsia to reddish-purple 22
16. Calyx calyprate or subcalyprate, with irregular dehiscence 17
 - Calyx neither calyprate nor subcalyprate, with regular dehiscence 20
17. Calyx calyprate, without dorsal projections 18
 - Calyx subcalyprate, with dorsal projections 0.5–3 mm long 19

18. Inflorescences with flowers in regular cymes in the branchlet ends; petals 20–24 mm long..... *M. tomentosa*
- Inflorescences with flowers in 5–6-flowered umbels in the branchlet ends; petals 9–10 mm long..... *M. acida*
19. Leaf blades 10.8–12.7 × 2.7–3 cm, abaxial surface sparsely to moderately puberulent, trichomes not covering the entire surface..... *M. juanjil*
- Leaf blades 16.5–23.5 × 9.3–10.7 cm, abaxial surface densely villose, evenly covering the entire surface..... *M. vasquezii*
20. Nodes with robust interpetiolar flaps; inflorescences pendulous..... *M. rubriflora*
- Nodes without interpetiolar flaps; inflorescences erect..... 21
21. Abaxial leaf surface tomentose with whitish to cream trichomes when dry; petals 19.5–24 mm long..... *M. dazae*
- Abaxial leaf surface pubescent with ferruginous trichomes when dry; petals 14–15.5 mm long..... *M. bongarana*
22. Calyx calyprate, with circumscissile dehiscence..... *M. escalerensis*
- Calyx not calyprate, with regular dehiscence..... 23
23. Stamens dimorphic; antesepalous stamen connectives with descending dorso-basal appendages laterally expanded..... 24
- Stamens isomorphic; stamen connectives from both cycles with descending dorso-basal appendages not laterally expanded..... 28
24. Leaves essentially sessile (petioles up to 3 mm long), base truncate..... *M. amischophylla*
- Leaves with petioles longer than 8 mm, base acute, attenuate or obtuse (rarely broadly obtuse in *M. weberbaueri*)..... 25
25. Stamen connectives without dorsal appendages..... *M. weberbaueri*
- Stamen connectives with blunt ascending dorsal appendages..... 26
26. Hypanthium 10-costate, with longitudinal ridges up to 2.5 mm high.... *M. sumatika*
- Hypanthium terete, without ridges..... 27
27. Inflorescences, hypanthia, and calyces densely tomentose, the trichomes evenly covering the entire surfaces..... *M. vargasii*
- Inflorescences, hypanthia, and calyces sparsely to densely furfuraceous, the trichomes not evenly covering the entire surfaces..... *M. vilcabambensis*
28. Nodes with robust interpetiolar flaps (sometimes small in *M. callosa*)..... 29
- Nodes without interpetiolar flaps..... 31
29. Internodes quadrangular and 4-winged; stamen connectives with blunt ascending dorsal appendages..... *M. megaphylla*
- Internodes quadrangular, but not winged; stamen connectives with dorsal appendages as mere humps or obsolete..... 30
30. Petioles 25–50 mm long, with an adaxial projection (scutum) on the transition zone from the petiole to the midvein..... *M. zunacensis*
- Petioles 10–22 mm long, without projections..... *M. callosa*
31. Petioles with an apical adaxial projection; petals abaxially moderately to densely puberulent..... *M. drakei*

- Petioles without projections; petals glabrous 32
- 32. Leaf blades with entire margins, and the adaxial surfaces flat..... 33
- Leaf blades with denticulate margins, and the adaxial surfaces flat to bullate 34
- 33. Flowers 6-merous; calyx without dorsal projections..... *M. neillii*
- Flowers 5-merous; calyx with thick, callose dorsal projections..... *M. rigida*
- 34. Leaf venation with 1 pair of secondary veins (lateral nerves) and an additional pair of faint submarginal veins *M. rugosa*
- Leaf venation with 2 pairs of secondary veins (lateral nerves) and an additional pair of faint submarginal veins 35
- 35. Internodes quadrangular and 4-winged, wings 1-3-5 mm high; calyx with callose dorsal projections, whitish and much lighter than the rest of the calyx and hypanthium when dry *M. penningtonii*
- Internodes quadrangular, without wings; calyx with small conic dorsal projections, of the same color as the rest of the calyx and hypanthium when dry... *M. tetraquetra*

1. *Meriania acida* (Markgr.) Wurdack, *Phytologia* 35: 5 (1976). Basionym: *Graffenrieda acida* Markg., *Notizbl. Bot. Gart. Berlin-Dahlem* 13: 462 (1937). Type:—**PERU. Cajamarca:** Prov. Cutervo, Tambillo, 26 Aug 1878 (fl.), *A. Raimondi 3341* (lectotype, designated here: USM! [accession no. 1629g]; isolectotypes: USM! [accession nos. 1628a, 1628b, 1628e, 1628h, 1629c, 1629d, 1629f], US!-fragment [barcode 001201396]). Remanescent syntypes:—**PERU. Cajamarca:** Prov. Cutervo, Tambillo, 26 Aug 1878, *A. Raimondi 3695* (fl.) (USM! [accession no. 1629e]), *A. Raimondi 3813* (fl.) (USM! [accession nos. 1629m, 1629n, 1629ñ]), *A. Raimondi 4844* (ster.) (USM! [accession no. 1629j]), *A. Raimondi 6126* (fl.) (USM! [accession no. 1629m]). **COLOMBIA. Antioquia:** S. Augusto, 25 Dec 1879, *Kalbreyer 1293* (not located). (Figures 7–8).

Comments:—*Meriania acida* is known only from the original material collected by A. Raimondi in 1878. It is characterized by its calyptrate calyces without dorsal projections and campanulate, reddish-orange corollas. In Peru there are three other species with calyptrate calyces (*M. tomentosa*, *M. escalerensis* and *M. sessilifolia*). However, *M. escalerensis* and *M. sessilifolia* have spreading, reddish-purple corollas. In addition, *M. escalerensis* has calyces with circumscissile dehiscence (vs. irregular in *M. acida*) and stamen connectives with blunt ascending dorsal appendages (vs. a mere hump). On the other hand, *M. sessilifolia* shares with *M. acida* the calyces with irregular dehiscence but the former is clearly distinguishable by its sessile leaves [vs. clearly petiolate, (1.5-)2.2–3.4 cm long]. The Peruvian species most similar to *M. acida* is *M. tomentosa*, but they can be differentiated by the petal length (9–10 mm long vs. 2–2.4 cm long) and the shape of the descending dorso-basal appendages of the stamen connectives (acute vs. blunt).

Based on a collection made in Amazonas (*Wurdack 1054*), Wurdack (1964, 1976) considered *M. acida* to be closely related to *M. denticulata* (Gleason) Wurdack, from Ecuador, because both would share subcalyptrate calyces and small dorsal projections

on the calyx. However, after a detailed analysis we considered that *Wurdack 1054* should be an undescribed species, *M. juanjil* recently published (Fernandez-Hilario *et al.* 2021b). *Meriania acida* is easily distinguishable from *M. juanjil* by its calyptrate calyx without dorsal projections (vs. subcalyptrate with acute dorsal projections), abaxial leaf blades with trichomes evenly covering the entire surface (vs. trichomes only on the nerves) and inflorescences 19.9–32.3 cm long (vs. 6.8–10 cm long).

Nomenclatural notes:—Markgraf (1937) cited in the protologue five Peruvian specimens (*Raimondi 3341, 3695, 3813, 4844* and *6126*) and one Colombian specimen (*Kalbreyer 1293*), so these specimens must be considered as syntypes conforming with Art. 9.6 of the ICN (Turland *et al.* 2018). According to Art. 9.3 and 9.12 of the ICN (Turland *et al.* 2018), we chose *Raimondi 3341* for lectotypification because it has the highest number of fertile sheets.

Distribution and phenology:—*Meriania acida* is apparently endemic to northern Peru and only present in the department of Cajamarca. Although the original material collected by A. Raimondi does not give details of its habitat, *Meriania acida* probably grows in montane forest relicts. It has been collected in flower in June.

Specimens examined:—PERU. **Cajamarca:** Prov. Cutervo, Tambillo, 26 Aug 1878, *A. Raimondi 3536* (ster.) (USM!), *A. Raimondi 6240* (ster.) (USM!), *A. Raimondi 6319* (ster.) (USM!).

2. *Meriania amischophylla* Wurdack, *Phytologia* 48: 238 (1981). Type:—PERU. **Loreto [Huánuco]:** Prov. Coronel Portillo, Dist. Padre Abad, la cumbre de la Divisoria, 1500–1600 m, 6 Feb 1978 (fl.), *J. Schunke 9842* (holotype: US! [barcode 00120355]); isotypes: AAU!, F! [accession no. 2010208], MO! [accession no. 2796540], NY! [barcode 00228949], U! [barcode U0282674], USM! [accession no. 88597]). (Figures 9–10).

Comments:—*Meriania amischophylla* is easily distinguishable from other Peruvian species by its essentially sessile leaves (petioles up to 3 mm long), calyces with regular dehiscence, spreading, reddish-purple corollas and antesealous stamen connectives with laterally expanded descending dorso-basal appendages and dorsal appendages as mere humps. Laterally expanded dorso-basal appendages have only observed in six other Peruvian species (*M. hirsuta*, *M. sumatika*, *M. vargasii*, *M. vasquezii*, *M. vilcabambensis* and *M. weberbaueri*). Within this group, *M. amischophylla* is more closely related to *M. weberbaueri*, with which it shares spreading, fuchsia to reddish-purple corollas and stamen connectives without ascending dorsal appendages. However, *M. amischophylla* differs from *M. weberbaueri* by its sessile leaves (vs. 1.3–5.1 cm long) and distinctly suprabasal secondary veins (vs. basal to slightly suprabasal). *Meriania sumatika*, *M. vargasii* and *M. vilcabambensis* have stamen connectives with ascending dorsal appendages, *M. vasquezii* has calyces with irregular dehiscence, and *M. hirsuta* has campanulate, deep red corollas.

Sessile or subsessile leaves are an unusual character in the Andean species of *Meriania*, occurring only in *M. amischophylla*, *M. amplexicaulis* Wurdack, *M. mexiae* Wurdack and *M. sessilifolia*. *Meriania amplexicaulis* (Ecuador) is the most closely related to *M. amischophylla* due to its similar indumentum and calyx with regular dehiscence and dorsal projections. However, the former differs by its petals 16–18 cm long (vs. 19–32 cm), stamens with connectives prolonged below the thecae (vs. not prolonged) and antesepalous stamen connectives with ascending appendages (vs. a mere hump).

Distribution and phenology:—*Meriania amischophylla* is endemic to Peru and restricted to the Cordillera La Divisoria in the Huánuco-Ucayalí border, and grows in montane forests at 1500–1600 m. It has been collected in flower from February to April.

Specimens examined:—**PERU. Huánuco:** Prov. Leoncio Prado, Dist. Hermilio Valdizán, la Divisoria, carretera a Pucallpa, 1600 m, 24 Apr 1980 (fl.), *J. Schunke 11374* (NY!, US!).

3. *Meriania bicentenaria* Rob.Fernandez, R.Rojas & Michelang. in Fernandez-Hilario *et al.*, Willdenowia (2021). Type:—**PERU. Pasco:** Prov. Oxapampa, Dist. Oxapamapa, Abra Oxapampa-Villa Rica, 2300–2500 m, 10°40'36"S, 75°18'55"W, 06 Aug 2004 (fl., fr.), *R. Vásquez, A. Monteagudo, L. Valenzuela, J. Perea & A. Peña 30366* (holotype: HOXA! [accession no. 10648]; isotypes: NY! [barcode 03785787], USM! [accession no. 215491]). (Figures 10–12).

Comments:—*Meriania bicentenaria* is part of to the *M. macrophylla* complex (see comments under *M. franciscana* for diagnostic characteristics) and differs from other species of *Meriania* by the combination of densely pubescent abaxial leaf blades, with roughened to dendritic trichomes evenly covering entire surface, calyces with rounded lobes and without dorsal projections, campanulate, fuchsia to light fuchsia corollas, strongly dimorphic stamens, antepetalous stamens with inflated connectives, and antepetalous stamen connectives without dorsal appendages. Among Peruvian species, *M. bicentenaria* most closely resembles *M. franciscana* but differ by the indument on abaxial leaf blades (densely pubescent vs. sparsely to densely puberulent), petals color (fuchsia to light fuchsia vs. reddish-purple), and the dorsal appendages of the antepetalous stamen connectives (absent vs. blunt ascending). A detailed comparison of *M. bicentenaria* with other related species can be found in Fernandez-Hilario *et al.* (2021b).

Distribution and phenology:—*Meriania bicentenaria* is a tree endemic to central Peru (Department of Pasco) and grows in montane forests at 2200–2550 m. It has been collected in flower from June to September, and in fruit from March to November.

Specimens examined:—PERU. Pasco: Prov. Oxapampa, Dist. Palcazú, without locality, 2200 m, 10°32'S, 75°23'W, 04 Oct 1984 (fr.), *D. Smith et al.* 8685 (F!); Dist. Oxapampa, camino a la Cordillera Yanachaga, 2400 m, 10°23'S, 75°27'W, 19 Jul 1984 (fr.), *D. Smith et al.* 7913 (F!, US!, USM!), camino Oxapampa-Abra Villa Rica, 2270 m, 10°39'23"S, 75°20'27"W, 10 Aug 2004 (fl.), *A. Monteagudo et al.* 6960 (HOXA!, NY!), camino Oxapampa-Villa Rica, km 37 en zona de amortiguamiento, 2462 m, 10°38'12"S, 75°24'45"W, 15 Mar 2006 (ster.), *S. Vilca et al.* 643 (HOXA!, USM!), Cuenca del río San Alberto, 2286, 10°32'39.90"S; 75°22'13.63"W, 01 Oct 2019 (ster.), *C. Llerena 23* (MOL!), same locality and data (fr.), *C. Llerena 32* (MOL!), CDS, Sector San Alberto - Entrada al Parque Nacional Yanachaga Chemillén, 2290 m, 10°32'25"S; 75°22'14"W, 10 Jun 2021 (fl.), *R. Villanueva-Espinoza 675* (MOL!), Parque Nacional Yanachaga Chemillén, 2420 m, 10°32'S, 75°21'W, 26 Aug 2002 (fl., fr.), *A. Monteagudo et al.* 3807 (AMAZ!, MOL!, NY!), Parque Nacional Yanachaga-Chemillén, cercanías del Refugio el Cedro, 2420 m, 10°32'51"S, 75°21'32"W, 26 Aug 2002 (fl., fr.), *A. Monteagudo et al.* 3808-A (HOXA!), San Alberto, 2457 m, 10°32'43.54"S, 75°21'37.14"W, 24 Mar 2014 (ster.), *R. Tupayachi et al.* 13589 (HSP!), San Alberto, 2457 m, 10°32'41.47"S, 75°20'29.34"W, 25 Mar 2014 (ster.), *R. Tupayachi et al.* 13601 (HSP!), Sector San Alberto, 2468 m, 10°32'45"S, 75°21'24"W, 17 Aug 2006 (fr.), *L. Cárdenas et al.* 715 (CUZ!, F!, HOXA!, MOL!, NY!, USM!), PN Yanachaga-Chemillén, Sector San Alberto, zona de amortiguamiento, 2450 m, 10°19'S, 75°13'W, 16 Mar 2005 (fr.), *R. Rojas et al.* 3539 (HOXA!, NY!); Dist. Huancabamba, PN Yanachaga Chemillén, Fundo Osobamba. 2243 m, 10°23'34.7"S, 75°28'28.1"W, 25 Jun 2016 (fl.), *L. Valenzuela et al.* 30395 (USM!), Grapanazu, sector San Daniel, zona de amortiguamiento del PN Yanachaga-Chemillén, 2236 m, 10°26'36"S, 75°26'21"W, 08 Jul 2004 (fl.), *J. Perea et al.* 1445 (HOXA!, NY!), same locality and data (fl.), *J. Perea et al.* 1449 (HOXA!, NY!), same locality, 10 Jul 2004 (fl., fr.), *J. Perea et al.* 1467 (HOXA!, NY!), Acazazu, 2200-2300 m, 10°30'24"S, 75°23'13"W, 06 Jul 2004 (fl., fr.), *R. Rojas et al.* 3132 (HOXA!, NY!), PN Yanachaga Chemillén, Sector Quebrada Yanachaga, 2300 m, 10°23'45"S, 75°28'55"W, 19 Aug 2004 (fl.), *R. Vásquez et al.* 30410 (HOXA!, NY!, USM!), same locality and data (fl.), *R. Vásquez et al.* 30419 (HOXA!), same locality, 2407 m, 10°23'38"S, 75°28'36"W, 20 Set 2004 (fl., fr.), *J. Perea & J. Mateo 1781* (HOXA!, NY!), PN Yanachaga-Chemillén, parcela permanente 1.0 ha Oso Playa, 2200 m, 10°17'58"S, 75°36'35"W, 11 Nov 2006 (fr.), *A. Monteagudo et al.* 13406 (NY!, USM!), Torre Bamba, 2550 m, 10°18'24"S, 75°35'06"W, 20 May 2004 (fr.), *R. Rojas et al.* 2403 (HOXA!).

4. *Meriania bongarana* Rob.Fern., R.Goldenb. & Michelang. in Fernandez-Hilario *et al.*, Willdenowia (2021). Type:—**PERU. Amazonas:** Prov. Bongará, Dist. Yambrasbamba, Inmediaciones de la Estación Biologica Abra Patricia, 2320 m, 05°41'32.91"S, 77°48'41.1"W, 19-20 Feb 2020 (fl., fr.), *R. Fernandez-Hilario, R. Villanueva-Espinoza & L. Pillaca 1930* (holotype: MOL!; isotypes: CUZ!, HOXA!, NY!, UPCB!). (Figures 13–15).

Comments:—*Meriania bongarana* is distinguishable by the combination of ferruginous indumentum evenly covering the adaxial surface of leaves, calyces with claw-shaped dorsal projections (1.5–2.5 mm long), campanulate, pink-orange corollas, petals 14–15.5 mm long, isomorphic stamens, connectives prolonged below the thecae and stamen connectives with slightly crown-shaped descending dorso-basal appendages. Among Peruvian species, *M. bongarana* most closely resembles *M. dazae* but differ by the indument on the abaxial leaf blades (ferruginous pubescent vs. whitish to cream tomentose), petals length (19.5–24 mm long vs. 14–15.5 mm long), and the dorsal appendages of the stamen connectives (absent vs. a mere hump). A detailed comparison of *M. bongarana* with other related species can be found in Fernandez-Hilario *et al.* (2021b).

Distribution and phenology:—Known only from the type specimen, *Meriania bongarana* is endemic to northern Peru (Department of Amazonas) and grows in montane forest at 2320 m. It has been collected in flower and fruit in February.

5. *Meriania callosa* Rob.Fern., R.Goldenb. & Michelang. in Fernandez-Hilario *et al.*, Willdenowia (2021). Type:—**PERU. Amazonas:** Prov. Bongará, Dist. Yambrasbamba, ruta desde CP Santa Rosa hacia bosque El Toro, 1950 m, 05°40′07.98″S, 77°55′30.04″W, 11 Nov 2020 (fl.), *R. Fernandez-Hilario, W. Chuquitucto & A. Wong 2055* (holotype: MOL!; isotypes: HOXA!, KUELAP!, MOL!, NY!, UPCB!). (Figures 8, 16, 17).

Comments:—This species is distinguishable by the combination of nodes with interpetiolar flaps (0.5–3 mm long), glabrous hypanthia and calyces, calyces with callose dorsal projections, spreading, fuchsia corollas, isomorphic stamens, stamen connectives with two appendages, one triangular descending dorso-basal appendage, and other dorsal appendage as a mere hump. Among Peruvian species, *M. callosa* most closely resembles *M. zunacensis* but differ by the projections on the insertion of the petioles with the leaf blades [absent vs. present (scutum)], petioles length (10–22 mm vs. 25–50 mm), and the dorsal projections on calyces (callose vs. absent). A detailed comparison of *M. callosa* with other related species can be found in Fernandez-Hilario *et al.* (2021b).

Distribution and phenology:—*Meriania callosa* is endemic to northern Peru (Department of Amazonas) and grows in montane forests at 1880–1970 m. It has been collected in flower in April and November, and fruit in August and November.

Specimens examined:—**PERU. Amazonas:** Prov. Bongará, Dist. Yambrasbamba, ruta desde CP Santa Rosa hacia bosque El Toro, 1970 m, 05°40′09.22″S, 77°55′30.05″W, 11 Nov 2020 (fl. bud, fr.), *R. Fernandez-Hilario et al. 2056* (HOXA!, MOL!, NY!, UPCB!); Prov. Rodríguez de Mendoza, Dist. Mariscal Benavides, CP Izcuchaca, 1880 m, 06°19′40″S; 77°31′05″W, 30 Aug 1998 (fr.), *R. Vásquez & J.*

Campos 25339 (NY!), same locality, 11 Apr 2001 (fl.), *H. van der Werff et al. 16941* (NY!, USM!).

6. *Meriania cuzcoana* Wurdack, *Phytologia* 13: 71 (1966). Type:—**PERU. Cusco:** Prov. Paucartambo, laderas boscosas de Pillahuata, 2000 m, 9–10 May 1945 (fl.), *C. Vargas 5107* (holotype: US! [barcode 00120364]; isotypes: CUZ! [2 sheets]). (Figures 18–20).

Comments:—*Meriania cuzcoana* can be easily recognized as the only Peruvian species of *Meriania* with revolute auricles at the base of the leaf blades. This feature is present in other Andean *Meriania* species (e.g., *M. ardyae* D.Fernández & Dellinger and *M. selvaflourensensis* Humberto Mend.), but none have auricles with dentate-undulate margins such as in *M. cuzcoana*. The presence of revolute auricles is a common feature in *Axinaea* species, and within that genus four species have auricles similar to the ones in *M. cuzcoana* (*A. floribunda* Triana, *A. grandifolia* Triana, *A. macrophylla* Triana and *A. quitensis* Benoist). However, *M. cuzcoana* is clearly distinguished from *Axinaea* by the lack of bulbous dorso-basal appendages of the stamen connectives (Cotton *et al.* 2014, Dellinger *et al.* 2014).

The dorsal appendages of the stamen connectives in *M. cuzcoana* are variable in size; they can be inconspicuous as in *Michelangeli et al. 1908* or evident as in *Vargas 5107* (up to 0.5 mm long). Likewise, the margin of the leaf blades can be variable; it is usually entire, but it is seldom slightly denticulate. Among the Peruvian species, the closest one related to *M. cuzcoana* is *M. neillii*, because both species share glabrous leaves and spreading, reddish-purple corollas. However, *M. cuzcoana* is distinguished by its punctiform abaxial leaf blades (vs. without dots in *M. neillii*), 5-merous flowers (vs. 6-merous), and stamen connectives with white descending dorso-basal appendages (vs. yellow).

The specimen *Chambi s.n.* (fl. bud) has cuneate base leaf blades and suprabasal venation, with the secondary veins sometimes asymmetrical, but it retains the revolute auricles with dentate-undulate margins. Although the tertiary venation pattern, inflorescence structure and flower buds are similar to those observed in *M. cuzcoana*, we placed this specimen with reservation here.

Distribution and phenology:—*Meriania cuzcoana* is endemic to southern Peru and recorded in the La Convención and Paucartambo provinces (Department of Cusco), and grows in montane forests at 2000–3000 m. It has been collected in flower from March to August and in fruit in June.

Specimens examined:—**PERU. Cusco:** Prov. La Convención, Dist. Maranura, Mesapelada, 2450 m, 12°54'33"S, 72°37'06"W, 19 Apr 2004 (fl.), *W. Galiano et al. 6136* (NY!); Dist. Ocobamba, Mesa pelada, 2613 m, 12°54'13"S, 72°37'06"W, 23 Mar 2004 (fl.), *L. Valenzuela et al. 3147* (NY!); Dist. Quellouno, Lacco, 2741 m,

12°36'44"S, 72°14'37"W, 16 Jun 2006 (fl.), *L. Valenzuela et al.* 6904 (NY!, USM!), 2650 m, 12°37'31"S, 72°14'03"W, 18 Jun 2006 (fr.), *L. Valenzuela et al.* 6939 (NY!). Prov. Paucartambo, Dist. Challabamba, carretera Paucartambo-Pillcopata, Pacchayoc, 2395 m, 13°09'25.92"S, 71°35'54.24"W, 14 Jun 2012 (fl.), *F. A. Michelangeli et al.* 1908 (NY!, USM!); Dist. Kosñipata, Parque Nacional Manu, km 8 de la trocha unión, 2500 m, 13°05'18.60"S, 71°34'28.56"W, 29 Jul 2003 (fl.), *M. Raurau et al.* 71 (ABERG!), 2500 m, 13°05'18.82"S, 71°34'28.56"W, 03 Aug 2003 (fl.), *W. Farfán et al.* 976 (ABERG!, USM!), 2500 m, 13°05'38"S, 71°34'26"W, 21 Jul 2017 (fl.), *F. Sinca et al.* 1627 (ABERG!), EB Wayquecha, 3000 m, 13°10'S, 71°35'W, Jul 2010 (fl. bud), *P. Chambi & J. Chambi s.n.* (USM!).

7. *Meriania dazae* Rob.Fern., R.Goldenb. & Michelang., *Nordic J. Bot.* 39(3)-e02669: 6 (2021). Type:—**PERU. Amazonas:** Prov. Rodríguez de Mendoza, Dist. Vista Alegre, along Salas Creek, 2750 m, 06°06'50.58"S, 77°26'48.21"W, 06 Aug 2012 (fl., fr.), *J.L. Marcelo-Peña, R. Fernandez-Hilario & J. Santos* 6568 (holotype: MOL! [barcode 000001]; isotype: MOL! [barcode 000002]). (Figures 8, 21, 22).

Comments:—*Meriania dazae* belongs in a group of species characterized by campanulate, reddish-orange corollas and lobed calyx, usually with claw-shaped dorsal projections. Within this group, *M. dazae* can be differentiated by the combination of elongated trichomes evenly covering the adaxial surface of leaves, calyces with claw-shaped dorsal projections 1–4.5 mm long, petals 19.5–24.0 mm long, isomorphic stamens and stamen connectives with two appendages, one crown-shaped descending dorso-basal appendage and the other dorsal appendage as a mere hump. Among Peruvian species, *M. dazae* most closely resembles *M. bongarana* but differ by indument on the abaxial leaf blades (whitish to cream tomentose vs. ferruginous pubescent), petals length (19.5–24 mm long vs. 14–15.5 mm long), and the dorsal appendages of the stamen connectives (a mere hump vs. absent). A detailed comparison of *M. dazae* with other related species can be found in Fernandez-Hilario *et al.* (2021a).

Distribution and phenology:—*Meriania dazae* is endemic to northern Peru and recorded in only one locality in the Vista Alegre Omia Regional Conservation Area in the Department of Amazonas, and grows in montane forests at 2650–2750 m. It has been collected in flower and fruit in June.

Specimens examined:—**PERU. Amazonas:** Prov. Rodríguez de Mendoza, Dist. Vista Alegre, Vista Alegre Regional Conservation Area, near to the camp no. 1 and Salas Creek, 2650 m, 06°06'42.52"S, 77°26'23.28"W, 04 Aug 2012 (fl.), *R. Fernandez-Hilario et al.* 169 (MOL!, UPCB!), along Salas Creek, 2650 m, 06°06'44.20"S, 77°26'27.51"W, 04 Aug 2012 (fl.), *J.L. Marcelo-Peña et al.* 6528 (MOL!), 2750 m, 06°06'50.58"S, 77°26'48.21"W, 06 Aug 2012 (fl.), *J.L. Marcelo-Peña et al.* 6559 (MOL!).

8. *Meriania drakei* (Cogn.) Wurdack, Mem. New York Bot. Gard. 16: 3 (1967).
 Basionym: *Axinaea drakei* Cogn. in A.DC. & C.DC., Monogr. Phan. 7: 447. Type:
ECUADOR: Quebrar near Loja, 09 Nov 1881 (fl.), *Poortman 149* (lectotype, first step designated by Wurdack 1980, second step designated by Fernandez-Hilario *et al.* 2021a: P! [barcode P00228665]; isolectotypes: BR!-fragment [barcode BR0000005628759], F!-fragment [accession no. 935562], P! [barcode P0228664]). (Figures 8, 23).

Comments:—*Meriania drakei* can be easily recognized by its externally puberulent petals, and it is also the only Peruvian species with a swollen adaxial appendage on the apex of the petiole. Although Mendoza-Cifuentes (2021) mentions that this character is not constant in the Colombian populations, it is constant in the leaves of the Peruvian specimens examined. Other species such as *M. bicentenaria*, *M. franciscana*, *M. megaphylla* and *M. zunacensis* have an adaxial projections (scutum) on the insertion of the petiole with the leaf blade, but in *M. bicentenaria* and *M. franciscana* sometimes those can be obscured by trichomes. However, *M. drakei* is easily distinguishable from all of them by the indumentum on the petals (externally puberulent vs. glabrous). A detailed comparison of *M. drakei* with related species can be found in Fernandez-Hilario *et al.* (2021a).

Distribution and phenology:—*Meriania drakei* occurs from southern Colombia to northern Peru (Department of Amazonas in montane forests at 2120–2280 m). It has been collected in flower in December and in fruit in February.

Specimens examined:—**PERU. Amazonas:** Prov. Utcubamba, Dist. Cajaruro, Buffer Zone of the Cordillera del Colán National Sanctuary, 2280 m, 05°38'32.22"S, 78°15'13.32"W, 19-22 Dec 2019 (fl.), *R. Fernandez-Hilario et al. 1775* (HOXA!, MOL!, NY!, UPCB!, USM!). Prov. Bongará, Dist. Yambrasbamba, Lechuza pathway of the Abra Patricia Biological Station, 2120 m, 05°41'18.89"S, 77°48'23.68"W, 21 Feb 2020 (fr.), *R. Fernandez-Hilario et al. 1937* (HOXA!, MOL!, UPCB!).

9. *Meriania escalerensis* Rob.Fern., R.Goldenb. & Michelang. in Fernandez-Hilario *et al.*, Willdenowia (2021). Type:—**PERU. Loreto:** Prov. Alto Amazonas, Dist. Balsapuerto, Cordillera Escalera, Campamento Cumbre – Alto Cachiyacu, 1930 m, 05°52'02.1"S, 76°46'29.3"W, 22 Sep 2013 (fl.), *M. Ríos, T. Mori, D. Neill, L. Torres & C. Vriesendorp 3316* (holotype: AMAZ!; isotypes: F! [accession no. 2323926], USM! [accession no. 287375]). (Figures 15, 24, 25).

Comments:—This species is recognized by its ferruginous indumentum, calyptrate calyces with circumscissile dehiscence, spreading, fuchsia corollas, isomorphic stamens, and stamen connectives with two appendages, one triangular descending dorso-basal appendage and the other blunt ascending dorsal appendage. Figures of *M. escalerensis* and a detailed comparison with related species can be found in Fernandez-Hilario *et al.* (2021b). Among Peruvian species, *M. escalerensis* most closely resembles *M. acida* but differ by the calyx dehiscence (circumscissile vs. irregular), shape and

color of corollas (spreading and fuchsia vs. campanulate and reddish-orange), and the dorsal appendages of the stamen connectives (blunt ascending vs. absent). A detailed comparison of *M. escalerensis* with other related species can be found in Fernandez-Hilario *et al.* (2021b).

Distribution and phenology:—Known only from the type specimen, *Meriania escalerensis* is endemic to northern Peru, in the Cordillera Escalera (Loreto-San Martín border) and grows in elfin forests at 1950 m. It has been collected in flower in September.

10. *Meriania franciscana* C.Ulloa & Homeier, *Anales Jard. Bot. Madrid* 65(2): 383 (2008). *Meriania macrophylla* subsp. *franciscana* (C.Ulloa & Homeier) Humberto Mend., *Acta Bot. Mex.* 128(e1734): 72 (2021). Type:—**ECUADOR. Zamora-Chinchipec:** Reserva San Francisco, road Loja-Zamora, ca 35 km from Loja, 1890 m, 03°58'S, 79°04'W, 28 Jul 2007 (fl.), *J. Homeier* 2625 (holotype: QCNE! [barcode QCNE225593]; isotypes: GOET! [barcode GOET011446], LOJA! [barcode 213337], M! [barcode M-0274973], MO! [barcode MO-2161006], NY! [barcode 01287741], QCA! [barcode 144072]). (Figures 8, 26).

Comments:—*Meriania franciscana* belongs to the *M. macrophylla* complex (Wurdack 1978, Ulloa Ulloa & Homeier 2008, Bussmann & Paniagua 2012, Fernandez-Hilario *et al.* 2021b), characterized by campanulate corollas, strongly dimorphic stamens and antepetalous stamens with inflated connectives. *Meriania bicentenaria*, *M. franciscana*, *M. ninakurorum* and *M. peltata* are the only species of this complex occurring in Peru. Within this group *M. franciscana* can be distinguished by its adaxial appendages (scutum) on the insertion of the petiole with the leaf blade, glabrous to sparsely puberulent abaxial leaf blades, lobed calyces, antepetalous stamen connectives with blunt ascending dorsal appendages and antesealous stamen connectives with dorsal appendages as a mere hump.

The specimen *Fernandez-Hilario et al.* 2034 collected in Amazonas shares the same morphological characteristics of leaves and inflorescences as the population recorded in Cajamarca. However, it has truncate calyces and antepetalous stamen connectives without dorsal appendages. This difference suggests that the Amazonas population probably corresponds to a different subspecies. Therefore, more material needs to be collected and reviewed before a conclusion can be drawn.

In his review of *Meriania* for Colombia, Mendoza-Cifuentes (2021) considered that all the species from the *M. macrophylla* complex (except *M. ninakurorum* which was not treated by him) should be recognized as subspecies of a broadly defined *M. macrophylla*. However, *M. franciscana* differs from the Colombian species from that group because it does not have bifid descending dorso-basal appendages. Although this feature may be variable within the same inflorescence in some species of the complex (Mendoza-Cifuentes 2021), none of the Colombian species of the *M. macrophylla*

complex have antepetalous stamen connectives with ascending dorsal appendages, or antesealous stamen connectives with dorsal appendages as a mere hump, as is the case in *M. franciscana*. For this reason, we don't consider *M. franciscana* to be a subspecies of *M. macrophylla* and recognized it as a separate species.

Distribution and phenology:—*Meriania franciscana* occurs from southern Ecuador (Zamora-Chinchipe province) to northern Peru (Departments of Amazonas and Cajamarca in montane forests at 1750–2370 m). It has been collected in flower in March, November and December, and in fruit in August and November.

Specimens examined:—**PERU. Amazonas:** Prov. Bongará, Dist. Yambrasbamba, inmediaciones de CP Miraflores, 1980 m, 05°42'13.19"S, 77°55'47.64"W, 10 Nov 2020 (fl., fr.), *R. Fernandez-Hilario et al.* 2034 (HOXA!, MOL!, UPCB). **Cajamarca:** Prov. San Ignacio, Dist. Huarango, CP Selva Andina, camino hacia la captación de agua, 2378 m, 05°03'50"S, 78°43'19"W, 25 Aug 2007 (fr.), *J. Perea et al.* 2775 (NY!), Dist. San José de Lourdes, CP Camana, 1750-1900 m, 05°01'S, 78°54'W, 04 Mar 1997 (fl.), *J. Campos & S. Corrales* 3393 (MOL!, NY!, USM!), bottom of cerro Picorana, 2100 m, 04°59'25"S, 78°54'05"W, 01 Dec 1998 (fl.), *C. Díaz & S. Fernández* 10150 (HUT!, MOL!, NY!, USM!).

11. *Meriania hirsuta* Rob.Fern., Paredes & Michelang. in Fernandez-Hilario *et al.*, Willdenowia (2021). Type:—**PERU. Piura:** Prov. Huancabamba, Dist. El Carmen de la Frontera, Río Samaniego margen izquierda, Zona de Amortiguamiento del Santuario Nacional Tabaconas-Namballe, 2150 m, 05°06'43.1"S, 79°21'25.7"W, 28 Apr 2003 (fl.), *S. Baldeón & J. Campos* 5373 (holotype: USM! [accession no. 273379]). (Figures 27, 28)

Comments:—*Meriania hirsuta* belongs to the *M. radula* complex (see comments under *M. radula* for diagnostic characteristics) and is recognisable within the complex by the combination of branches and leaves with hirsute indumentum (trichomes up to 4 mm long), slightly dimorphic stamens, and antesealous stamen connectives with laterally expanded perpendicular dorso-basal appendages. *Meriania arizae* Humberto Mend. & Fern.Alonso, *M. horrida* C.Ulloa & Achá and *M. mutisii* (Humb. & Bonpl.) Humberto Mend. & Fern.Alonso have similar indumentum to *M. hirsuta*, but all of them have flat adaxial leaf surfaces (vs. bullate in *M. hirsuta*) and spreading, reddish-purple corollas (vs. campanulate and deep red). A detailed comparison of *M. hirsute* with related species can be found in Fernandez-Hilario *et al.* (2021b).

The location of the inflorescences on the branches in *M. 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 axillar fascicles (8–10-flowered) or as one terminal panicle (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 are longer than 18 cm and with more than (4-)5 nodes.

Distribution and phenology:—*Meriania hirsuta* is endemic to northern Peru (Department of Piura) and grows in montane forests at 2150–3035 m. It has been collected in flower in April.

Specimens examined:—PERU. **Piura:** Prov. Ayabaca [Huancabamba], Dist. El Carmen de la Frontera, Carretera Sapalache-Cerro Chinguelas, 3035 m, 05°08'23.6"S, 79°23'45.4"W, 03 Sep 2016 (sterile), *F. A. Michelangeli et al.* 2636 (NY!, USM!).

12. *Meriania juanjil* Rob.Fern., R.Goldenb. & Michelang. in Fernandez-Hilario *et al.*, Willdenowia (2021). Type:—PERU. **Amazonas:** Prov. Bongará, Montane rainforest along Yambrasbamba-Pomacocha trail between Yambrasbamba and Yanayacu, 2200–2300 m, 26 Jun 1962 (fl.), *J. Wurdack 1054* (holotype: USM! [accession no. 27403]; isotypes: F! [accession no. 1601214], NY! [barcode 02499960], P! [barcode 05225706], US! [barcode 02925052]). (Figures 8, 28).

Comments:—*Meriania juanjil* differs from the other Peruvian species of *Meriania* by the combination of elliptic leaf blades (10.8–12.7 × 2.7–3 cm) with moderate puberulent indumentum on the abaxial surface, subcalyptrate calyx with small conic dorsal projections (ca. 0.5 mm long) and irregular dehiscence, campanulate, pink-orange corollas, isomorphic stamens and stamen connectives prolonged below the thecae. Among Peruvian species, *M. juanjil* most closely resembles *M. acida* but differ by the width of leaf blades (2.7–3 cm vs. 5–8 cm), calyx shape (subcalyptrate vs. calyptrate), and dorsal projections on the calyces (small conic, ca. 0.5 mm long vs. absent). A detailed comparison of *M. juanjil* with other related species can be found in Fernandez-Hilario *et al.* (2021b).

Distribution and phenology:—Known only from the type specimen, *Meriania juanjil* is endemic to northern Peru (Department of Amazonas) and grows in montane forests at 2200–2300 m. It has been collected in flower in June.

13. *Meriania megaphylla* Rob.Fern., R.Goldenb. & Michelang. in Fernandez-Hilario *et al.*, Willdenowia (2021). Type:—PERU. **La Libertad:** Prov. Pataz, Dist. Ongón, valle del río Mixiollo, 2000–2100 m, 04 Aug 1914 (fl.), *A. Weberbauer 7048* (holotype: MOL! [barcode 00003237]; isotypes: MOL!-fragment [barcode 00003236], F!-fragment [accession no. 628681]). (Figures 15, 29).

Comments:—The distinctive characters of *M. megaphylla* include its quadrangular and 4-winged internodes, nodes with interpetiolar flaps, large leaf blades (21–29.4 × 14.8–22 cm), adaxial projections (scutum) on the transition zone from the petiole to the midvein, spreading, reddish-purple corollas, isomorphic stamens, and stamen connectives with two appendages, one triangular descending dorso-basal appendage,

and the other blunt ascending dorsal appendage. Among Peruvian species, *M. megaphylla* most closely resembles *M. zunacensis* but differ by the adaxial leaf surfaces (bullate vs. flat), petals length (20.5–22.5 mm vs. 40–50 mm), and the dorsal appendages of the stamen connectives (blunt ascending vs. absent). A detailed comparison of *M. megaphylla* with other related species can be found in Fernandez-Hilario *et al.* (2021b).

Distribution and phenology:—Known only from the type specimen, *Meriania megaphylla* is endemic to northern Peru (Department of La Libertad) and grows in montane forests at 2000–2100 m. It has been collected in flower in August.

14. *Meriania microflora* Rob.Fern., R.Goldenb. & Michelang., *Phytotaxa* 456(1): 87 (2020). Type:—**PERU. Amazonas:** Prov. Condorcanqui, Dist. Santiago, Cerros Kampankis, serranía entre los ríos Santiago y Morona, desde río Marañón hasta frontera con Ecuador, Campamento 2, Qda. Katerpisa, 710 m, 04°02′17.35″S, 77°33′45.50″W, 09 Aug 2011 (fl.), *I. Huamantupa 15552* (holotype: USM! [accession no. 360020]; isotypes: F! [accession no. 2307857], NY! [barcode 03240851]). (Figures 30, 31, 36).

Comments:—This species has the smallest flowers in *Meriania* (petals 4–4.5 mm long), and it is readily recognizable among Peruvian species by the combination of nodes without interpetiolar flaps, abaxial and lateral liguliform appendages on the apex of the petioles, spreading, white corollas, stamen connectives with multilobed descending dorso-basal appendages and antepetalous stamen connectives with apically trilobed ascending dorsal appendages. White corollas and lobed ascending dorsal appendages are features more common among Brazilian species of *Meriania*, but none of these species have stamen connectives with descending dorso-basal appendages, or projections on the petioles. A detailed comparison of *M. microflora* with related species can be found in Fernandez-Hilario *et al.* (2020).

Distribution and phenology:—Known only from the type specimen, *Meriania microflora* is endemic to Peru and has been recorded only in the Cordillera Kampankis in the Amazonas-Loreto border in sub-Andean forests at 710 m. It has been collected in flower in August.

15. *Meriania neillii* Humberto Mend., *Acta Bot. Mex.* 128(e1734): 85 (2021). Type:—**ECUADOR. Napo:** Southern slopes of Vulcano Sumaco, Hollin – Loreto road, km 40, 1200 m, 11 Feb 1989 (fl.), *D. Neill & M. Asanza 8887* (holotype: CAS [n.s.]; isotypes: MO! [barcode MO-1716563], NY! [barcode 02500066]). (Figures 32–34).

Comments:—*Meriania hexamera* Sprague has been traditionally considered a widely distributed species from Colombia to Peru. However, Mendoza-Cifuentes (2021) considers that *M. hexamera* is restricted to Colombia and that the populations in Ecuador, Peru and southern Colombia correspond to a new species (*M. neillii*).

According to him, the main differences between them would be the thickness of the stems (2.2–4 mm in diameter in *M. neillii* vs. 4–9 mm in diameter in *M. hexamera*) and petioles (1–1.6 mm in diameter vs. 2–3.5 mm in diameter), and the pattern of venation (one pair of secondary veins vs. two pairs of secondary veins). However, some specimens cited under *M. hexamera* (e.g., *Lawrence 420*) by Humberto-Mendoza (2021) have thin stems and petioles. Likewise, *Cuatrecasas 9139* and *Franco 5312* have leaf blades with one pair of secondary veins and one pair of faint submarginal veins but were cited under *M. hexamera*. The only notable difference provided by Mendoza-Cifuentes (2021) is the apex of the ovaries (with lobes 0.3–1 mm long in *M. neillii* vs. with a ring 2–4 mm long in *M. hexamera*). Because the delimitation between *M. hexamera* and *M. nielli* is unclear, we choose for the moment to refer to the Peruvian populations as *M. neillii* with reservations.

Meriania neillii is the most widely distributed *Meriania* species in Peru, and it is easily recognisable by its glabrous leaves, leaf blades with entire margins and clearly parallel tertiary venation, and 6-merous flowers with spreading, reddish-purple corollas. It can be confused with *M. franciscana*, but this has adaxial projections on the insertion of the petiole with the leaf blade (vs. absent in *M. neillii*), 5-merous flowers (vs. 6-merous), and strongly dimorphic stamens (vs. isomorphic). *Meriania neillii* could be related to *M. cuzcoana* which also has 6-merous flowers and with similar corollas, but see comments under *M. cuzcoana* for differences.

Peruvian populations of *M. neillii* usually have stable characteristics; the calyces do not have dorsal projections and the leaf blades have slightly suprabasal venation. The leaf blades have obtuse to slightly rounded bases, however in many specimens the bases are slightly revolute giving the appearance of acute or cuneate bases. Nevertheless, there are some atypical specimens; *Nuñez & Alanya 13322* (fr.) has slightly narrowly cordate bases and *Graham 6143* (fl.) has flowers smaller than usual (hypanthium plus calyx 6–6.5 mm long vs. 7.5–10 mm long). The venation in *M. neillii* usually consists of a main vein, one pair of secondary veins (lateral veins) and one pair of faint submarginal veins (e.g., *Baldeón et al. 3069*, *Graham 6143*, *Nuñez 13322*). Nevertheless, in some specimens the submarginal veins are more evident, and there is a larger space between the submarginal veins and the margin of the leaf blades, where an additional third pair of faint veins can be observed (e.g., *Campos & Corrales 3608*, *Campos & Díaz 4386*, *Monteagudo 15855*). This later pattern of venation can also be observed in the type of *M. neillii*. For this reason, we could consider that *M. neillii* may have up to two pairs of secondary veins.

Distribution and phenology:—*Meriania neillii* is widely distributed from southern Colombia to southern Peru, and occurs in almost all Peruvian Andean departments (from Amazonas to Cusco) in montane forest and rarely in premontane forest at (700–)1000–2300 m. It has been collected in flower from February to December, and in fruit from March to November.

Specimens examined:—PERU. Amazonas: path from Chachapoyas to Moyobamba, 2700-3300 m, Jan 1930 (ster.), *L. Williams 7598* (F!); near the border with Dept. San Martín, 2000 m, 03 Apr 2001 (fl.), *H. van der Werff et al. 16639* (NY!). Prov. Bongará, montane rainforest along Yambrasbamba Trail between Yambrasbamba and Yanayacu, 2200-2300 m, 05°41'S, 77°48'W, 26 Jun 1962 (fl., fr.), *J. Wurdack 1050* (F!, NY!, USM!, US!); Shillac, norte del camino de Pedro Ruíz, 2300 m, 05°49'S, 78°01'W, 31 Aug-02 Sep 1983 (fl.), *D. Smith & S. Vasquez 4868* (USM!); Dist. Shipasbamba, Shilla, 1850-1900 m, 06 May 1981 (fr.), *K. Young & M. Eisenberg 381* (NY!); Dist. Yambrasbamba, Buenos Aires, 1860-2000 m, 02-26 Mar 1967 (fl.), *S. Tillet 673-310* (US!, USM!), Centro de Investigación de la ONG Neotropical Primate Conservation y bosque "El Toro", 2000 m, 05°39'17.05"S, 77°54'51.30"W, 22-28 Jul 2018 (fr.), *R. Fernandez-Hilarario et al. 1431* (MOL!), ruta desde CP Santa Rosa hacia bosque El Toro, 2160 m, 05°40'41.13"S, 77°55'12.72"W, 11 Nov 2020 (fl. bud), *R. Fernandez-Hilarario et al. 2057* (HOXA!, MOL!, NY!, UPCB!). Prov. Luya, Dist. Camporendon, Tullanya, 1700-2000 m, 06°09'07"S, 78°21'05"W, 27 Nov 1996 (fl.), *R. Vásquez et al. 211859* (HUT!, MOL!, USM!). **Ayacucho:** Prov. La Mar, Machete, 1100 m, 26 Oct 2000 (ster.), *L. Vargas 03* (USM!). **Cajamarca:** Prov. Jaén, Dist. Chirinos, Las Pirias, 14 Jul 2005 (fr.), *J.L. Marcelo-Peña & A. Castillo 1709* (MOL!). Prov. San Ignacio, camino arriba de Nuevo Trujillo cerca de Santa Fe, 1182-1600 m, 05°01'09"S, 78°52'11"W, 16 Mar 2012 (fl.), *F. A. Michelangeli et al. 1756* (NY!); Dist. Huarango, Poblado Selva Andina, trocha comunal, 1613 m, 05°03'02"S, 78°45'14"W, 25 Apr 2007 (fl., fr.), *J. Perea & J. Mateo 3085* (NY!), Poblado Selva Andina, trocha de captación de agua, 1798 m, 05°03'37"S, 78°45'13"W, 18 Apr 2007 (fl.), *J. Perea & J. Mateo 2969* (NY!); Dist. San José de Lourdes, 1650 m, 05°00'43"S, 78°54'09"W, 14 Feb 2000 (fl. bud), *J. Campos & R. Vásquez 6382* (MOL!, NY!, USM!), alrededores de Camaná, 1850 m, 05°01'00"S, 78°54'00"W, 22 Mar 1997 (fl., fr.), *J. Campos & S. Corrales 3608* (MOL!, NY!, USM!), localidad Estrella del Oriente, 1600-1700 m, 04°57'00"S, 78°59'00"W, 04 Sep 1997 (fr.), *J. Campos & P. Díaz 4386* (HUT!, MOL!, NY!, USM!). Prov. San Ignacio, 12.67 km SW de San Ignacio, 2.88 km de Alto Ihuamaca, 2151 m, 05°12'48.1"S, 79°05'44.9"W, 07 Jun 2011 (ster.), *M. Samain et al. 2011-131* (USM!). **Cusco:** Prov. La Convención, Dist. Echaratí, Lactahuaman, 1650 m, 12°51'55"S, 73°30'40"W, 14 Jul 1998 (ster.), *S. Baldeón et al. 3069* (USM!), San Antonio, pie de carretera, 1744 m, 12°25'S, 72°32'W, 23 Aug 2005 (fl.), *G. Calatayud et al. 3470* (NY!). Prov. Paucartambo, Kosñipata, San Pedro, 900 m, 13°05'S, 71°10'W, 28 Mar 1991 (fr.), *P. Nuñez & N. Alanya 13322* (CUZ!, NY!, USM!), Santa Isabel – San Pedro, 1250 m, 25 Nov 1965 (fl.), *C. Vargas 16965* (CUZ!), (fl.), *16995* (US!); Dist. Kosñipata, road from Pillawata to Patria, 1190 m, 05 Feb 1975 (fl.), *T. Plowman & W. Davis 4995* (US!). **Huánuco:** Prov. Puerto Inca, Dist. Yuyapichis, CCNN Tahuantinsuyo, Reserva Comunal El Sira, 1568 m, 09°25'20.1"S, 74°44'05"W, 02 May 2014 (fl.), *L. Valenzuela et al. 27578* (HOXA!). **Junín:** Prov. Satipo, Dist. Llaylla, 1430 m, Feb 2005 (ster.), *E. Castro 35* (MOL!), Donato, 1635 m, 11°27'39"S, 74°38'07"W, 25 Oct 2019 (fl., fr.), *I. Revilla 3484* (HSP!). **Pasco:** Prov. Oxapampa, Dist. Huancabamba, PNYCH, parte alta de la trocha Tunqui-Cajonpata, 1940 m, 10°16'21"S, 75°30'26"W, 02 Nov 2007 (fl., fr.), *A. Monteagudo et al. 15855* (HOXA!, MOL!, NY!),

USM!); Dist. Palcazú, Alto Lagarto, 700 m, 10°11'57"S, 75°21'23"W, 03 Dec 2007 (fl.), *R. Rojas et al.* 4817 (HOXA!, USM!), Palcazú, 2100 m, 10°32'S, 73°23'W, 28 Sep 1984 (fr.), *D. Smith* 8556 (US!, USM!). **Piura:** Prov. Huancabamba, Dist. El Carmen de la Frontera, Rosario bajo, entre el Tambo y Pan de Azúcar, 1935-2250 m, 04°56'23.99"S, 79°18'57.45"W, 25 Apr 2006 (fl.), *A. Cano et al.* 16342 (USM!). **Ucayali:** Prov. Coronel Portillo, Dist. Iparia, falta al cerro Ariapo, Reserva Comunal El Sira, 1800 m, 09°28'16"S, 74°34'54"W, 23 Sep 2011 (fl.), *J. Graham* 6143 (MOL!, NY!).

16. *Meriania ninakurorum* (Bussmann & Paniagua) E.Cotton & Balslev, *Sci. Danic. Biol.* 4: 108 (2014). Basionym: *Axinaea ninakurorum* Bussmann & Paniagua, *Arnaldoa* 19(1): 23 (2012). Type: **PERU. San Martín:** Prov. Huallaga, Dist. Bolivar, cloud forest surrounding "Pampa Hermosa" around old Chacha and Inca settlement, with high amount of old Cedrela, 2400 m, 06°59'32"S, 77°39'16"W, 24 May 2011 (fl.), *R.W. Bussmann, N. Paniagua, C. Vega & L. Cotrina* 17067 (holotype: HAO! [accession no. 20106]; isotypes: CAS! [barcode 474651], M! [barcode M-0274715], MO! [barcodes MO-2695409, MO-2822726, MO-2822727, MO-2822728], NY! [barcode 02059485]). (Figures 15, 37).

Comments:—*Meriania ninakurorum* in one of the four Peruvian species (along with *M. bicentenaria*, *M. franciscana* and *M. peltata*) that form part of the *M. macrophylla* complex. These species (except *M. peltata*) differ from the other species of the complex by the stamen connectives lacking bifid descending dorso-basal appendages. Also, *M. ninakurorum* can be recognized by its subpeltate leaf blades 17.2–27.7 × 8.1–15.5 cm, petioles without projections, truncate or repand calyces, 5-merous flowers, pink petals, stamen connectives without dorsal appendages, and antepetalous stamen connectives with falcate descending dorso-basal appendage. *Meriania ninakurorum* could be confused with *M. franciscana* and *M. peltata*. However, *M. franciscana* differs by its antepetalous stamen connectives with blunt ascending dorsal appendages, antesepalous stamen connectives with dorsal appendages as a mere hump and leaves with an adaxial projections (scutum) on the insertion of the petiole with the leaf blade, and *M. peltata* differs by its large leaf blades (22.8–28.7 × 13.3–16.7 cm), and antepetalous stamen connectives with bifid descending dorso-basal appendages.

Meriania ninakurorum was described as a species with isomorphic stamens, although even the illustration and photos (see Fig. 1 and 2 in Bussmann & Paniagua 2012) show strongly dimorphic stamens. Probably due to this misinterpretation this species was originally described as *Axinaea*. Nevertheless, *M. ninakurorum* has only antepetalous stamens with inflated connectives from almost the middle of the thecae, which is a diagnostic characteristic for species of the *M. macrophylla* complex. All species in *Axinaea* have both antepetalous and antesepalous stamen connectives with bulbous dorso-basal appendages (except species with 4-merous flowers) (Cotton *et al.* 2014).

Distribution and phenology:—Known only from the type specimen, *Meriania ninakurorum* is endemic to northern Peru (Department of San Martín) and occurs in only locality in montane forests at 2400 m. It has been collected in flowers in May.

17. *Meriania peltata* L.Uribe, *Caldasia* 8(40): 532 (1962). *Meriania macrophylla* subsp. *peltata* (L.Uribe) Humberto Mend., *Acta Bot. Mex.* 128(e1734): 73 (2021). Type:—**COLOMBIA, Cundinamarca:** bosques abajo del Salto de Tequendama, cerca a El Ermitaño, 2200 m, 18 May 1959 (fl., fr.), *L. Uribe Uribe 3285* (holotype: COL! [barcode COL000003288]; isotypes: AAU!, COL! [barcodes COL000016055, COL000003289, COL000003290], ENCB! [ENCB008627], F! [accession no. 1810513]. GH! [barcode 00072676], MO! [barcode MO-313849], NY! [barcodes 00228973, 02500165], US! [barcodes 00120384, 00120385], VEN! [barcode 111520]). (Figures 8, 38).

Comments:—We place with reservations under *M. peltata* a population collected in northern Peru and identified by H. Mendoza in 2009 (see label of identification on *Llatas & Suarez 2762*), which differs from the typical form (Colombia) by its truncate to repand calyces (vs. evident and irregular lobed). *Meriania peltata* was previously known only from Andean forests from Ecuador and Colombia (Fernández-Fernández 2010, Almeda *et al.* 2021), and now a new locality is recorded in the Department of Cajamarca in northern Peru.

Meriania peltata is one of the four Peruvian species (along with *M. bicentenaria*, *M. franciscana* and *M. ninakurorum*) that form part of the *M. macrophylla* complex (see comments under *M. franciscana* for diagnostic characteristics). It can be differentiated from the other ones by the combination of peltate leaves (vs. subpeltate in *M. ninakurorum*, and not peltate in *M. bicentenaria* and *M. franciscana*) and stamen connectives with bifid descending dorso-basal appendages (vs. acuminate to falcate in the other three species).

Distribution and phenology:—*Meriania peltata* occurs from the Colombia to northern Peru (Department of Cajamarca in montane forests at 2120–2280 m). It has been collected in flower in July.

Specimens examined:—**PERU. Cajamarca:** Prov. Cutervo, Dist. San Andrés, Grutas de San Andrés, 2200 m, 15 Jul 1990 (fl.), *S. Llatas & Suarez 2762* (F!, US!); Dist. Santo Tomás, PN Cutervo, cerca de la catarata Santa Rosa, 2400 m, 06°10'52.39"S, 78°45'31.97"W, 26 Nov 2020 (ster.), *R. Fernandez-Hilario et al. 2093* (HOXA!, MOL!, UPCB!).

18. *Meriania penningtonii* Rob.Fern., R.Goldenb. & Michelang., *Nordic J. Bot.* 39(3)-e02669: 2 (2021). Type:—**PERU. San Martín [Amazonas]:** Rioja to Pedro Ruíz, border with Amazonas [near to CP Buenos Aires], 1800 m, 05°45'S, 77°40'W, 04 Dec 2003 (fl.), *T.D. Pennington, R.T. Pennington & A. Daza 17639* (holotype: MOL!

[barcode 000003]; isotypes: E! [barcode E00177820], K! [barcode K000544378], MOL! [barcodes 000004, 000005]). (Figures 39–41).

Comments:—*Meriania penningtonii* is clearly distinguished by its quadrate 4-winged internodes (the wings projections up to 3.5 mm high), the nodes without interpetiolar flaps, callose dorsal projections on the calyces, and spreading, reddish-purple corollas. Other species such as *M. tetragona* (Ecuador and Peru) and *M. nobilis* Triana (Colombia) have quadrangular-alate internodes, but none of these species have evident winged projections. Additionally, the dorsal projections on the calyx are whitish and much lighter than the rest of the calyx and hypanthium when dry, which makes *M. penningtonii* easily recognisable. *Meriania callosa*, *M. fantastica* Alvear, Humberto Mend. & Almeda and *M. rigida* have spreading corollas and calyces with callose dorsal projections, but in these species the projections are never whitish when dry. A detailed comparison of *M. penningtonii* with other related species can be found in Fernandez-Hilario *et al.* (2021a).

Distribution and phenology:—*Meriania penningtonii* is endemic to northern Peru (Department of Amazonas) and occurs in montane forests at 1800–2200 m. It has been collected in flower in July and December.

Specimens examined:—**PERU. Amazonas:** Prov. Bongará, Dist. Yambrasbamba, “El Toro” forest located in the farming community of Yambrasbamba, 2100 m, 05°39'16.9"S, 77°54'36.9"W, 23 Jul 2015 (fl. bud), *S. Almeyda & C. Castillo 18* (MOL!, UPCB!), Abra Patricia-Alto Nieva Private Conservation Area, Abra Patricia, from the highway to the muntain top, 1950-2200 m, 05°40'03.67"S, 77°46'14.56"W, 20 Jul 2014 (fl.), *Y.F. Deng et al. 1660* (USM!), near to CP Miraflores, 1960 m, 05°42'16.44"S, 77°55'54.18"W, 10 Nov 2020 (fl. bud), *R. Fernandez-Hilario et al. 2030* (HOXA!, MOL!, NY!), from CP Santa Rosa to El Toro, 2000 m, 05°40'15.03"S, 77°55'26.60"W, 11 Nov 2020 (fl.), *R. Fernandez-Hilario et al. 2058* (HOXA!, MOL!, NY!, UPCB!), from CP La Florida to the Don Ilario's farm, 2100 m, 05°40'21.68"S, 77°57'16.02"W, 12 Nov 2020 (fl.), *R. Fernandez-Hilario et al. 2072* (HOXA!, MOL!, UPCB!).

19. *Meriania prunifolia* D.Don, Mem. Wern. Nat. Hist. Soc. 4: 323 (1823). Type:—**PERU:** without locality, no date (fr.), *H. Ruiz & J. Pavón s.n.* (lectotype, designated here: MA! [barcode MA813829]; isolectotypes: BR! [barcode 00000562904], F!-fragment [accession nos. 843473, 1026676], FI! [barcode FI004715], G-destroyed [negative at F], G!-fragment [barcode G00219817], K! [barcode K000329450]). (Figures 15, 42).

Comments:—This species is easily recognisable by the combination of the smallest leaf blades recorded within the genus (2.3–8.2 × 1.4–3.2 cm), pseudo-lateral (initially terminal but overtopped by developing axillary buds) or terminal solitary flowers, and calyces with long acicular dorsal projections. To date, the flowers of *M. prunifolia* are

unknown, because the few known specimens have been collected in fruit. However, the fruits have calyces with acicular dorsal projections and ribbed hypanthia, which are characteristics present in some *Meriania* species. Because the complete morphology of the flowers is not known, it is not possible to establish affinities of *M. prunifolia* with other species of the genus.

Nomenclatural notes:—Don (1823) cited in the protologue “*Pavón h.* (v. s. in *Herb. Lamb.*)”. However, none of the sheets seen by us have any label or annotation indicating that it corresponds to the Ruiz & Pavón specimen purchased by A. B. Lambert. Therefore, *Ruiz & Pavón s.n.* must be considered as a syntype conforming with Art. 9.6 of the ICN (Turland *et al.* 2018). According to Art. 9.3 and 9.12 of the ICN (Turland *et al.* 2018), we chose as lectotype the only sheet housed in MA.

Distribution and phenology:—*Meriania prunifolia* is endemic to northern Peru (Department of San Martín) and occurs in premontane forests at 350–750 m. It has been collected in fruit in May, July and December.

Specimens examined:—**PERU. San Martín:** Prov. Mariscal Caceres, Dist. Tocache Nuevo, desembocadura del río Mishollo (margén derecha del río Huallaga), 350-380 m, 25 Jul 1973 (fr.), *J. Schunke 6426* (US!), Palo Blanco, al oeste del Puente, a orilla de la quebrada en bosque alto, 600-700 m, 04 Dec 1972 (fr.), *J. Schunke 5667* (F!, NY!, U!, US!), Cerro de Palo Blanco, al borde de la quebrada con mucha sombra, 700-750 m, 26 May 1980 (fr.), *J. Schunke-Vigo 11712* (AMAZ!, NY!, US!, USM!).
Without locality: no date (fr), *A. Raimondi 1987* (USM!).

20. *Meriania radula* (Benth.) Triana, Trans. Linn. Soc. London 28(1): 66 (1871) [1872]. Basionym: *Axinaea radula* Benth. Pl. Hartw. [Bentham] 130 (1844). Type:—**ECUADOR. Loja:** in Cerro San Francisco prope Loxa, no date (fl., fr.), *Hartweg s.n.* (lectotype, designated by Wurdack 1980: K! [barcode K000329444]). (Figures 35, 43, 44).

Axinaea purpurea Ruiz & Pav., Syst. Veg. Fl. Peruv. Chil. 1: 122. 1798. Type:—**PERU. Huánuco:** Muña, no date (fl., fr.), *H. Ruiz & J. Pavón s.n.* (lectotype, designated here: MA! [barcode MA813832]; isolectotypes: B-destroyed [negative at F], BM! [barcodes BM000939005, BM000939006], F! [accession nos. 842789, 844825], HAL! [barcode HAL120101], MA! [barcodes MA813830, MA813831]).

Miconia incarum J.F.Macbr., Trop. Woods no. 17: 12. 1929. Type:—**PERU. Huánuco:** at head of canyon 6 miles south of Mito, 3000 m, 01-05 Aug 1922 (fl.), *J.F. Macbride & W. Featherstone 1867* (holotype: F! [accession no. 518362]).

Comments:—*Meriania radula* belongs to the *M. radula* complex which is characterized by the combination of ovate bullate leaf blades, campanulate, deep red corollas and stamen connectives with dorso-basal appendages perpendicular to the

thecae. This complex consists of *M. almedae* Wurdack, *M. hirsuta*, *M. radula*, *M. tetragona* and *M. sanguinea* Wurdack. Within this complex, *M. radula* is easily recognisable by its nodes without interpetiolar flaps and adaxial tuberculate projections on the apex of the petioles. Also, *M. radula* is the only species with abaxial densely setulose leaf blades, evenly covering the entire surface.

The dorsal projections on the calyx in *M. radula* are whitish when dry and contrast with of the rest of the calyx and hypanthium. Among the Peruvian species, this feature occurs in *M. penningtonii* and is less conspicuous in *M. hirsuta*. Some specimens of *M. penningtonii* have even been erroneously determined as species of the *M. radula* complex. However, *M. radula* is easily distinguishable from *M. penningtonii* by its terete internodes (vs. quadrangular and 4-winged) and campanulate, deep red corollas (vs. spreading, reddish-purple).

Nomenclatural notes:—*Axinaea purpurea* and *A. radula* were published in 1798 and 1844, respectively. However, the specific epithet of the former was not available in *Meriania* due to the existence of *M. purpurea* Sw., published in 1798. Therefore, following Art. 11.4 of the ICN (Turland *et al.* 2018), for the combination in *Meriania*, the oldest legitimate name should be used (*A. radula*).

According to Art. 9.10 of the ICN (Turland *et al.* 2018), we have to consider that Wurdack (1980) did an inadvertent lectotypification of *A. radula* when he wrote “*Hartweg s.n. (K, holotype)*” in his treatment of Melastomataceae for the Flora of Ecuador. Also, we chose as lectotype of *A. purpurea* the sheet housed in MA that best matches the illustration published in Ruiz & Pavón (1957, see pl. CDX), conforming with Art. 9.3 and 9.12 of the ICN (Turland *et al.* 2018).

Distribution and phenology:—*Meriania radula* occurs in Ecuador and Peru, and it is recorded from Amazonas to Pasco in subparamos and elfin forests at 2850–3500 m. It has been collected in flower from February to November, and in fruit in March, August and September.

Specimens examined:—**PERU. Amazonas:** Prov. Chachapoyas, road Balsas to Chachapoyas, upper eastern Calla-Calla slopes at pass, 3000-3300 m, 02 Jun 1998 (fl.), *M. Weigend et al.* 98/339 (CPUN!, F!, USM!); Trail to Laguna de Los Cóndores, surroundings of Laguna Esperanza/Siete Lagunas, 3275-3500 m, 06°48'44"S, 77°42'59"W, 26 Jun 2010 (fl.), *R. Bussmann et al.* 16485 (MO!, NY!); Upper slopes of Puma-urcu east-southeast of Chachapoyas, 2700-3000 m, 01 Jun 1962 (fl.), *J. Wurdack* 658 (F!, NY!, P!, U!, US!, USM!); Dist. Leymebamba, km 397 de la carretera, 27 km de Leymabamba, 2300-3540 m, 06°43'44"S, 77°53'18"W, 13 Mar 2012 (fl., fr.), *F. A. Michelangeli et al.* 1732 (NY!, USM!), path from Atalaya to La Muralla Karst, 3300-3400 m, 06°49'18"S, 77°44'00"W, 04 Jul 2010 (fl.), *R. Bussmann et al.* 16617 (MO!, NY!). Prov. Rodríguez de Mendoza, Dist. Vista Alegre, bosque ribereño, 26 Aug 2012 (fl.), *J.L. Marcelo-Peña et al.* 7258 (MOL!), (fr.), 7267 (MOL!). **Cajamarca:** Prov.

Hualgayoc, Hacienda Taulis, Río La Quina above La Playa, 2850 m, 04 Sep 1964 (fl., fr.), *P. Hutchinson & K. von Bismarck 6500* (F!, NY!, US!, USM!). Prov. Sana Cruz, Dist. Pulán, parte baja de la quebrada Cocan, ladera oeste, 3280 m, 02 Nov 2001 (fl.), *I. Sánchez & M. Sánchez 11109* (CPUN!, F!), Parte Oeste del campamento La Zanja, Sector San Pedro Norte, 3320 m, 06 Jun 2004 (fl.), *G. Iberico & L. Dávila 636* (CPUN!). **La Libertad:** Prov. Bolívar, Nevado de Cajamarquilla, 09 Sep 1946 (fl.), *R. Ferreyra 1265* (USM!). Prov. Pataz, valle del río Mixiollo, encima de Ongón, 3200 m, 03 Aug 1914 (fl.), *A. Weberbauer 7032* (F!, MOL!, US!). **Pasco:** Prov. Oxapampa, Dist. Huancabamba, PNYCH, La Colmena Trocha Erica, 3320 m, 10°27'13"S, 75°26'33"W, 19 Aug 2008 (fl.), *L. Valenzuela et al. 11528* (HOXA!, USM!). **San Martín:** Prov. Huallaga, Dist. Bolívar, surrounding "Pampa Hermosa" around old Chacha and Inca settlement, 3000 m, 07°02'07"S, 77°40'29"W, 24 May 2011 (fl.), *R. Bussmann et al. 17087* (F!, HAO!, L!, MO!). Prov. Mariscal Caceres, Bosquecillo, Parque Nacional Río Abiseo, 3400 m, 21 Jun 1988 (fl. bud), *B. León & K. Young 2008* (USM!); Río Abiseo National Park, forest near lake in Chochos valley, 3050 m, 07°30'S, 77°30'W, 13 Feb 1986 (fr.), *K. Young 2771* (F!); Puerta del Monte, 3450 m, 21 Nov 1989 (fl. bud), *K. Young 1952* (USM!); Dist. Huicungo, Sector Los Chochos, lado occidental del Parque Nacional Río Abiseo, 3400 m, 07°38'30.03"S, 77°28'50.89"W, 19 Jul 2016 (fl.), *D. Páredes et al. 604* (MOL!).

21. *Meriania rigida* (Benth.) Triana, Trans. Linn. Soc. London 28(1): 66 (1871) [1872]. *Chastenaea rigida* (Benth.) Naudin, Ann. Sci. Nat., Bot., ser. 3, 18: 123 (1852). Basionym: *Pachymeria rigida* Benth., Pl. Hartw. [Bentham] 130 (1844). Type:—**ECUADOR. Loja:** in montibus prope Loja, 1842 (fl.), *Hartweg 735* (lectotype, first step designated by Wurdack 1980, second step designated here: K! [barcode K000329439]; isolectotypes: BM! [barcode BM000939007], BR!-fragment [barcode 000005313341], F!-fragment [accession no. 1026704], G-destroyed [negative at F], K! [specimen from the right-hand side of sheet, barcode K000329440], LD! [barcode 1403377], S! [accession no. S05-3270]). Possible remanescent syntype:—**ECUADOR:** Eastern andes, 900 ft., (fl.), *no collector 355* (K! [barcode K000329438]). (Figures 36, 45, 46).

Comments:—This species can be recognized by the combinations of elliptic to oblong leaf blades, glabrous to sparsely puberulent abaxial leaf blades, with thick, callose dorsal projections, 5-merous flowers with isomorphic stamens, stamen connectives with triangular descending dorso-basal appendages, and dentiform dorsal appendages. Due to the shape of the leaf blades and appendages of the stamen connectives, *M. rigida* can be confused with *M. neillii*. However, the later can be differentiated by its 6-merous flowers and calyces without dorsal projections.

Paredes-Burneo *et al.* (2018) first recorded the presence of *M. rigida* in Peru based on material collected in Huancabamba (Department of Piura). But there are other populations in Peru that can be attributed to *M. rigida* and there is variability among them all. The populations in Piura (*Michelangeli et al. 2635* and *Paredes et al. 526*)

have elliptic to broadly elliptic leaf blades $7\text{--}15.5 \times 2.6\text{--}5.2$ cm and slightly lobed calyces, while the population in Amazonas (*Fernandez-Hilario et al. 1931* and *1934*) has moderately puberulent leaves, oblong leaf blades $5.2\text{--}9 \times 4.7\text{--}6.5$ cm and calyces with conspicuous lobes. On the other hand, the specimens *Tarazona et al. P8-49* and *Tarazona et al. P1-23* (both in fl. bud) collected in the Amazonas-San Martín border have small leaf blades ($3.2\text{--}5 \times 1.4\text{--}2.5$ cm) with revolute bases and smaller flowers (hypanthium plus calyx $6.5\text{--}7.5$ mm long). The Peruvian populations that best match with the typical population of *M. rigida* in Loja (Ecuador) are in the Department of Cajamarca (*Campos et al. 5892* and *Díaz & Fernández 10217*), these specimens have glabrous leaves, leaf blades $5.6\text{--}9.3 \times 2.5\text{--}3.8$ cm with revolute bases and hypanthium plus calyx $10\text{--}11$ mm long.

Despite the variability in the populations, all the specimens have the same inflorescence structure is the same; it is a terminal panicle with short basal paraclades, main axis with three nodes and flowers on branchlet ends arranged in regular dichasia. Additionally, within each specimen examined, the stamen connectives have dorsal appendages that can be dentiform, truncate or inconspicuous. For the moment, we include with reservations all the Peruvian populations mentioned under the name *M. rigida*.

Nomenclatural notes:—According to Art. 9.10 of the ICN (Turland *et al.* 2018), we have to consider that Wurdack (1980) did an inadvertent lectotypification (first-step) of *M. rigida* when he wrote “*Hartweg 735 (K, holotype)*” in his treatment of Melastomataceae for the Flora of Ecuador. However, there are two sheets of *Hartweg 735* housed in K. Therefore, we designate the sheet K000329439 as the lectotype (second-step), conforming with Art. 9.17 (Turland *et al.* 2018).

Distribution and phenology:—*Meriania rigida* occurs in Ecuador and northern Peru (Departments of Amazonas, Cajamarca, Piura and San Martín in montane forests at $2050\text{--}2800$ m). It has been collected in flower in February, April, October and December, and in fruit in September.

Specimens examined:—**PERU. Amazonas:** Prov. Bongará, Dist. Yambrasbamba, colina cruzando la carretera al lado opuesta de la Estación Biológica Abra Patricia, 2360 m, $05^{\circ}41'57.08''\text{S}$, $77^{\circ}48'33.83''\text{W}$, 21 Feb 2020 (fl.), *R. Fernandez-Hilario et al. 1934* (HOXA!, KUELAP!, MOL!, NY!, UPCB!), inmediaciones de la Estación Biológica Abra Patricia, trochas cercanas a la estación, 2280 m, $05^{\circ}41'34.49''\text{S}$, $77^{\circ}48'34.94''\text{W}$, 19-20 Feb 2020 (fl.), *R. Fernandez-Hilario et al. 1931* (CUZ!, HOXA!, KUELAP!, MOL!, NY!, UPCB!), without locality, $05^{\circ}36'52.69''\text{S}$, $77^{\circ}46'16.10''\text{W}$, 29 Mar 2016 (fl. bud), *M. Tarazona et al. P8-49* (MOL!). **Cajamarca:** Prov. San Ignacio, Dist. San José de Lourdes, base del cerro Picorana, $2050\text{--}2160$ m, $04^{\circ}59'25''\text{S}$, $78^{\circ}54'05''\text{W}$, 04 Dec 1998 (fl.), *C. Díaz & S. Fernández 10217* (HUT!, NY!, USM!), Picorana, $2250\text{--}2300$ m, $04^{\circ}58'00''\text{S}$, $78^{\circ}53'01''\text{W}$, 02 Dec 1998 (fl. bud), *J. Campos et al. 5892* (MOL!, USM!). **Piura:** Prov. Huancabamba, Dist. El Carmen de la Frontera, Carretera

Sapalache-Cerro Chingelas, 6.5 despues de Sapalache, catarata de Chorro Blanco, 2780 m, 05°08'09.7"S, 79°24'12.7"W, 03 Set 2016 (fr.), *F. A. Michelangeli et al.* 2635 (NY!, USM!), Cerro Chinguela, catarata Chorro Blanco, 2803 m, 05°07'48.72"S, 79°24'10.08"W, 25 Oct 2015 (fl.), *D. Paredes et al.* 526 (NY!, USM!), SOJO, Proyecto Minero Río Blanco, 2540 m, 04°53'58.88"S, 79°22'03.51"W, 20-21 Jun 2005 (ster.), *A. Cano et al.* 15729 (USM!). **San Martín:** Prov. Rioja, Dist. Pardo Miguel, without locality, 05°38'58.36"S, 79°44'26.81"W, 03 Apr 2016 (fl. bud), *M. Tarazona et al.* P1-23 (MOL!).

22. *Meriania rubriflora* Michelang. & R.Goldenb., *Phytotaxa* 374(3): 190 (2018).

Type:—**PERU. Pasco:** Prov. Oxapampa, Dist. Huancabamba, Sector Oso Playa, camino a la parcela Oso Playa, 2565 m, 10°19'05"S, 75°36'28"W, 25 Jun 2006 (fl.), *L. Cárdenas, A. Monteagudo, A. Peña, J. Mateo & R. Francis* 458 (holotype: USM!; isotypes: CUZ!, HOXA! [accession no. 26984], MO!, MOL!, P! [barcode P04801621], USM!). (Figure 10).

Comments:—Among Peruvian species of *Meriania*, this species is unusual by the combination of developed interpetiolar flaps, large pendulous inflorescences (27–34 cm long), 4-merous flowers with red corollas. Although some Andean (*M. arizae*, *M. mexiae*, *M. sararensis* Humberto Mend. & Fern.Alonso and *M. selvaflorensis*) and Brazilian (*M. baumgratziana* R.Goldenb. & Michelang., *M. glazioviana* Cong., *M. longipes* Triana and *M. tetramera* Wurdack) species of *Meriania* exhibit pendulous inflorescences, this characteristic is more common in *Axinaea*. Many species of *Axinaea* have pseudo-lateral inflorescences, which can be interpreted as somewhat pendulous (see Cotton *et al.* 2014), but there are species that have evident and large pendulous inflorescences. Peruvian species with this characteristic are *A. crassinoda* Triana, *A. dependens* Ruiz & Pav. ex D.Don, *A. fernando-cabiesii* Bussmann, J.A.Gruhn & A.Glenn, *A. mertensioides* Wurdack, *A. oblongifolia* (Cogn.) Wurdack, *A. pendula* E.Cotton, *A. reginae* Bussmann, J.A.Gruhn & A.Glenn and *A. sessilifolia* Triana. Within this group only *A. crassinoda*, *A. pendula* and *A. dependens* have developed interpetiolar flaps, 4-merous flowers and red corollas. *Meriania rubriflora* (Department of Pasco) is morphologically close to *A. dependens* (Departments of Huánuco and Pasco) by sharing leaf blades and inflorescences similar in size and shape. However, the former can be differentiated by its branches sparsely to moderately covered with glandular projections (vs. moderately to densely furfuraceous in *A. dependens*) and petals 11.7–12.3 mm long (vs 8–10 mm long).

Although Michelangeli & Goldenberg (2018) considered *M. rubriflora* as a species of *Meriania* species based on its stamen connectives without bulbous dorso-basal appendages, Cotton *et al.* (2014) in their revision of *Axinaea* indicated that species with 4-merous flowers have stamen connectives with elliptical appendages instead of the bulbous dorso-basal appendages characteristic of *Axinaea*. Even the illustrations of *A. crassinoda* (see Eves' drawing on *Mathews* 3212 in K) or *A. pendula* (see Fig. 58 in Cotton *et al.* 2014) show stamen connectives like those of *M. rubriflora* (see Fig. 3 in

Michelangeli & Goldenberg 2018). The species of *Axinaea* with 4-merous flowers can be considered intermediate forms between *Axinaea* and *Meriania*, which would also be the case of the *Meriania macrophylla* complex by their antepetalous stamens with inflated connectives. Recent phylogenetic studies have resolved *Axinaea* species within *Meriania* (Dellinger *et al.* 2018, 2019), and further studies are needed to resolve whether *Meriania* and *Axinaea* should be considered as separate genera.

Distribution and habitat:—*Meriania rubriflora* is endemic to central Peru (Department of Pasco) and occurs in montane forests at 2480–2560 m. It has been collected in flower in June.

Specimens examined:—**PERU. Pasco:** Prov. Oxapampa, Dist. Huancabamba, Sector Oso Playa, margen izquierda del río, 2497 m, 10°19'28"S, 75°36'07"W, 20 Jun 2006 (fl.), *L. Cárdenas 407* (CUZ!, HOXA!, MOL!), remanente de bosque, 2480 m, 10°19'21"S, 75°34'11"W, 26 Jun 2004 (fl.), *R. Rojas & J. Perea 3073* (HOXA!, NY!), Zona de amortiguamiento del Parque Nacional Yanachaga Chemillen, 2567 m, 10°19'05"S, 75°36'28"W, 25 Jun 2008 (fl. bud), *A. Monteagudo et al. 16516* (HOXA!).

23. *Meriania rugosa* Markgr., Notizbl. Bot. Gart. Berlin-Dahlem 13: 460 (1937). Type:—**PERU. Amazonas:** Prov. Rodríguez de Mendoza, valle de Huayabamba, Mar 1889 (fl.), *A. Raimondi 1866* (lectotype, designated here: USM! [accession no. 1670a]). Remanescent syntype:— **PERU. Amazonas:** Prov. Rodríguez de Mendoza, entre Cochamal y Sta. Rosa, valle de Huayabamba, Apr 1869 (ster.), *A. Raimondi 1796* (USM! [accession no. 1670f]). (Figures 41, 47, 48).

Comments:—We have placed a group of specimens collected in the south of the department of Amazonas under *M. rugosa* s.l. All specimens of *M. rugosa* share elliptic leaf blades, suprabasal venation, one pair of secondary nerves, 5-merous flowers with spreading, reddish purple corollas, and isomorphic stamens. However, there is a high amount of variability across localities, sometimes in very close populations; *Boeke 2052* and *Bussmann et al 16614* are located across the Lajasbamba mountain range (Chachapoyas province), and have densely puberulent stems, bullate leaf blades and stamen connectives with dentiform dorsal appendages. The type of *M. rugosa* (Rodríguez de Mendoza province) and *van der Werff et al. 17006* (Chachapoyas province) show slightly bullate leaf blades, calyces with blunt dorsal projections 2–3 mm long, anthers 9–9.5 mm long, and stamen connectives without dorsal appendages. The northern specimens *Michelangeli et al. 1704* and *van der Werff et al. 24958* (Bongará province) have flat leaf blades, calyces without dorsal projections, anthers 9.5–10 mm long, and stamen connectives with dentiform dorsal appendages.

Although there are clearly distinguishable forms that could be recognised as distinct entities (species or subspecies), in the central distribution of *M. rugosa* s.l. there are specimens that could be considered intermediate forms. For example, *Michelangeli et al. 1725* (Chachapoyas province) has flat leaf blades, calyces with small conic dorsal

projections ca. 0.5 mm, stamen connectives with dorsal appendages as a mere hump to dentiform, and connectives prolonged below the thecae ca. 0.5 mm. Also, *Pennington et al. 17862* (Rodríguez de Mendoza province) has puberulent stems and abaxial leaf blades, calyces with blunt dorsal projections 2 mm long, anthers 5–6 mm, and stamen connectives without dorsal projections. For this reason, we place all forms mentioned here under our concept of *M. rugosa* s.l.

Based on all of this, perhaps the best option is to consider *M. rugosa* as a highly variable species, but united by elliptic leaf blades, suprabasal venation, one pair of secondary nerves, 5-merous flowers with spreading, reddish purple corollas, and isomorphic stamens. The Peruvian species closely related to *M. rugosa* s.l. are *M. penningtonii* and *M. tetraquetra* (see comments under this species for difference). *Meriania pennintoni* is clearly differentiated by its ovate leaf blades (vs. elliptic in *M. rugosa*), basal venation (vs. suprabasal), quadrangular and 4-winged internodes (vs. quadrangular) and callose dorsal projections on the calyx (vs. absent, small conic or blunt).

Nomenclatural notes:—Markgraf (1937) cited as types the specimens *Raimondi 1796* and *1866* in the protologue of *M. rugosa*, which we have located in the A. Raimondi collection housed at USM. These specimens must be considered as syntypes conforming with Art. 9.6 of the ICN (Turland *et al.* 2018). According to Art. 9.3 and 9.12 of the ICN (Turland *et al.* 2018), we chose as lectotype the only sheet with flowers (*Raimondi 1866*).

Distribution and phenology:—*Meriania rugosa* is endemic to northern Peru (Department of Amazonas) and occurs in montane forests at 1880–2800 m. It has been collected in flower in February, March, April, May, July, August and November, and in fruit in June and July.

Specimens examined:—PERU. Amazonas: Partly along main road Jumbilla-Pedro Ruiz, partly along road to Tialango, 2080 m, 05°52'31"S, 76°46'36"W, 03 Nov 2012 (fl.), *H. van der Werff et al. 24958* (HOXA!, NY!); Road E of Chachapoyas between Pupos and Molinopampa, 1980-2340 m, 06°15'S, 77°40'W, 14 Feb 1985 (fl.), *J. Luteyn & E. Cotton 11402* (NY!, USM!); Izuchaca, 1880 m, 06°19'40"S, 77°31'05"W, 11 Apr 2001 (fl. bud), *H. van der Werff et al. 16943* (NY!). Prov. Bongará, 0.5-2 km al sur de Nuevo Gualulo, 2400-2108 m, 05°51'11.6"S, 77°54'19.5"W, 11 Mar 2012 (fl.), *F. A. Michelangeli et al. 1704* (NY!, USM!). Prov. Chachapoyas, moist scrub forest on south side of Molinopampa-Diosan pass, 2700-3100 m, 08 Aug 1962 (fl.), *J. Wurdack 1617* (F!, NY!, US!, USM!); remnants of forest a few km past Molinopampa, 2450 m, 06°12'S, 77°40'W, 13 Apr 2001 (fl.), *H. van der Werff et al. 17006* (MOL!, NY!, USM!); scrub forest along Río Ventilla 1-2 km, west of Molinopampa, 2350-2400 m, 23-25 Jul 1962 (fr.), *J. Wurdack 1483* (F!, NY!, US!, USM!); Dist. Leymebamba, Leymebamba-Lajasbamba trail, 28 Jun 1977 (fr.), *J. Boeke 2052* (NY!, US!, USM!), trail from Atalaya to Leymebambaa, 2800 m, 06°44'39"S, 77°47'18"W, 04 Jul 2010 (fl.), *R.*

Bussmann et al. 16614 (NY!); Dist. Molinopampa, 2-3 km al oeste del pueblo, 38 km de Chachapoyas, a lo largo del Río Ventilla, 2400 m, 06°12'36.8"S, 77°40'49"W, 12 Mar 2012 (fl.), *F. A. Michelangeli et al. 1725* (NY!, USM!). Prov. Rodríguez de Mendoza, Dist. San Nicolás, carretera R. de Mendoza Rioja, Laguna Huamanpata, 2000 m, 06-09 May 2005 (fl.), *T. Pennington et al. 17862* (MOL!).

24. *Meriania sanguinea* Wurdack, Mem. New York Bot. Gard. 16: 4 (1967). Type:—**ECUADOR. Azuay:** The eastern cordillera, 1-8 km north of the village of Sevilla de Oro, 2400-2700 m, 12 Jul – 12 Aug 1945 (fl.), *W. Camp E-4620* (holotype: US! [barcode 00120387]; isotypes: COL! [barcode COL000003291], GH! [barcode 00072677], NY! [barcode 00228976], U! [barcode U0004073]). (Figures 35, 49, 50).

Comments;—*Meriania sanguinea* belongs to the *M. radula* complex (see comments under *M. radula* for diagnostic characteristics) along with *M. almedae*, *M. hirsuta*, *M. radula* and *M. tetragona*. Although specimens of this species are usually misidentified as *M. radula* or *M. tetragona*; *M. sanguinea* can be recognized from the other Peruvian species in the complex by its abaxial liguliform projections on the transition zone from the petiole to the midvein, while *M. hirsuta* has no projections, *M. radula* has small abaxial tuberculate projections and *M. tetragona* has abaxial tuberculate projections. In addition, only *M. sanguinea* and *M. tetragona* have nodes with interpetiolar flaps and both can be differentiated by their internodes (terete-quadrangular in *M. sanguinea* vs. quadrangular and winged in *M. tetragona*).

Some Peruvian species of *Axinaea* (*A. crassinoda*, *A. dependens* and *A. pendula*) are usually confused with *M. sanguinea* for sharing large inflorescences and campanulate, red corollas. However, these species of *Axinaea* can be differentiated by their pendulous inflorescences and 4-merous flowers (vs. erect inflorescences and 5-merous flowers in *M. sanguinea*). In addition, no Peruvian species of *Axinaea* have abaxial projections on the transition zone from the petiole to the midvein (vs. liguliform appendages in *M. sanguinea*) and usually have pseudo-lateral inflorescences (vs. terminal).

Distribution and phenology:—*Meriania sanguinea* is distributed from Colombia to Peru, and occurs from the department of Piura to Pasco in montane forests and elfin forests at 1900–3300 m. It has been collected in flower in almost every month except April, May, July and September, and in fruit in January, February, March, May and September.

Specimens examined:—**PERU. Amazonas:** Prov. Chachapoyas, Dist. Leymebamba, Cordillera Yasgolga, east of peak, close to Refugio "Laurel", 2789 m, 06°41'44"S, 77°41'24"W, 18 Jun 2009 (fl.), *R. Bussmann et al. 15624* (HUT!, MO!). Prov. Bongará, Dist. Florida, desde toma de agua en San Lorenzo hacia CP Vista Alegre, 2480 m, 05°48'42.83"S, 78°01'36.70"W, 17-18 Feb 2020 (fl., fr.), *R. Fernandez-Hilarario et al. 1896* (HOXA!, MOL!, NY!, UPCB!); Dist. Yambrasbamba, Colina cruzando la carretera al lado opuesta de la Estación Biológica Abra Patricia,

2360 m, 05°41'57.08"S, 77°48'33.83"W, 21 Feb 2020 (fl.), *R. Fernandez-Hilario et al.* 1933 (MOL!, UPCB!). **Cajamarca:** Prov. Jaén, alrededores laguna Corazón de San Miguel, Tabaconas, 3300 m, 02 Dec 2011 (fl.), *L. García & Y. Tenorio* 8361 (HUT!). Prov. San Ignacio, Cerro Coyona, SN Tabaconas Namballe, 2700-2857 m, 05°16'31"S, 79°16'06"W, 21 Nov 1998 (fl.), *J. Campos et al.* 5816 (NY!). **Huánuco:** Prov. Huánuco, Dist. Chinchao, Caserío San Pedro de Carpish. Alrededor del túnel de Carpish, 3011 m, 09°43'09"S, 76°05'43"W, 04 Feb 2002 (fl.), *H. Beltrán & I. Salinas* 5052 (USM!), San Pedro de Carpish, 2770-2820 m, 09°43'14"S, 76°06'53"W, 01 May 2005 (fr.), *I. Salinas* 1003 (USM!), San Pablo de Carpish y alrededores del túnel, 2660 m, 09°42'05.58"S, 76°04'56.28"W, 17-18 Jan 2020 (fl., fr.), *R. Fernandez-Hilario et al.* 1847 (HOXA!, MOL!, NY!, UPCB!). **Pasco:** Prov. Oxapampa, Dist. Huancabamba, P.N. Yanachaga-Chemillen, Sector San Daniel, entre la laguna San Daniel y pajonal al oeste de la laguna, 2375 m, 10°26'03.27"S, 75°27'26"W, 18 Feb 2018 (ster.), *F. A. Michelangeli & S. Riva* 2952 (HOXA!, NY!, USM!), Dist. Oxapampa, PNYCH - Estación Biológica San Alberto, Abra Esperanza, 2903 m, 10°31'43"S, 75°21'17"W, 17 Feb 2012 (fl., fr.), *R. Vásquez & L. Valenzuela* 37768 (HOXA!), Abra Esperanza, camino a la laguna, 2828 m, 10°32'52"S, 75°21'04"W, 10 Dec 2010 (fl.), *E. Briceño & R. Rivera* 494 (NY!), Sector San Alberto. Camino hacia el ojo de agua, a 30 min del refugio, 2877 m, 10°31'45"S, 75°21'08"W, 13 Oct 2006 (fl.), *L. Cárdenas & R. Francis* 855 (CUZ!, HOXA!, USM!), Sector San Alberto, en el Abra Esperanza y alrededores, 2780 m, 10°31'55"S, 75°20'59"W, 02 Oct 2007 (fl.), *L. Hernani & A. Peña* 355 (HOXA!, NY!, USM!), Sector San Alberto, sendero entre Abra Esperanza y bosque esclerófilo, 2825 m, 10°31'51.3"S, 75°21'04.4"W, 21 Mar 2016 (fr.), *F. A. Michelangeli et al.* 2743 (NY!, USM!). **Piura:** Prov. Huancabamba, Dist. El Carmen de la Frontera, Carretera Sapolache-Cerro Chingelas, 9.5 km después de Sapolache, 3055 m, 05°08'23.6"S, 79°23'45.4"W, 03 Sep 2016 (fr.), *F. A. Michelangeli et al.* 2618 (NY!, USM!); Dist. Rosario Alto, Cordillera de los Andes, 2125 m, 04°55.9'S, 79°18.7'W, 02 Aug 2004 (fl.), *J. Campos et al.* 10243 (USM!). **San Martín:** Prov. Rioja, along road Rioja-Pedro Ruiz, El Mirador, 1900 m, 26 Mar 1998 (fl. bud), *H. van der Werff et al.* 15745 (MO!).

25. *Meriania sessilifolia* (Cogn.) Rob.Fern., R.Goldenb. & Michelang., **comb. nov.** Basionym: *Centronia sessilifolia* Cogn., in A.DC. & C.DC., Monogr. Phan. 7: 459 (1891). Type:—**PERU. Piura:** Huancabamba, 02 Dec 1881 (ster.), *Poortmann* 223 (lectotype, designated here: P! [barcode P00228659]; isolectotypes: BR!-fragment [barcode 000005628971], F!-fragment [accession no. 935561], P! [barcode P00228660]). Remanescent syntype:—**PERU. Piura:** Huancabamba, 19 Jan 1883 (fl.), *Poortmann* 484 (P! [barcode P00228661]). (Figures 36, 51, 52).

Comments:—*Centronia* was traditionally characterized by the presence of large flowers, calyptate calyces with circumscissile dehiscence, and stamen connectives with dorsal appendages (Wurdack 1973). However, the first and third character are notoriously absent in the type of the genus (*C. laurifolia* D.Don). For this reason and other inconsistent characters within *Centronia* many species have recently been

transferred to *Meriania* (Almeda 1993, Mendoza-Cifuentes & Fernández-Alonso 2012). Also, phylogenetic analyses of the tribe Meranieae have shown that *C. laurifolia* is resolved within *Graffenrieda* (Dellinger *et al.* 2018, Caetano *et al.* 2020) (see additional comments in the introduction). On other hand, *Centronia sessilifolia* have large flowers, calyptrate calyces with irregular dehiscence and spreading, reddish-purple corollas. These characteristics are present in other *Meriania* species and, therefore, we transfer *C. sessilifolia* to *Meriania* here as previously suggested by Mendoza-Cifuentes & Fernández-Alonso (2012).

The original material of *M. sessilifolia* (Department of Piura) consists of sterile specimens (*Poortmann 223*) with leaf blades $5.3\text{--}6.8 \times 1.8\text{--}2.3$ cm, and another one (*Poortmann 484*) with only three flowers without stamens. Whereas the specimens of the Department of Cajamarca have leaf blades $11.8\text{--}20.8 \times 4.8\text{--}7.5$ cm. However, all specimens share sessile leaves with suprabasal venation and calyptrate calyces. Although the Cajamarca population may correspond to an undescribed species, for the moment we consider it with reservations as *M. sessilifolia*.

The only other Peruvian species with sessile leaves is *M. amischophylla* but it is easily differentiated from *M. sessilifolia* by its lobed calyces with claw-shaped dorsal projections (vs. calyptrate calyces without dorsal projections). Probably *M. maguirei* Wurdack (endemic to Ecuador) is the species most closely related to *M. sessilifolia* by sharing calyptrate calyces with irregular dehiscence and spreading, reddish purple corollas. However, *M. maguirei* can be easily differentiated by petiolate leaves (vs. sessile in *M. sessilifolia*), leaf blades with acute bases (vs. truncate) and small conic dorsal projections in the calyx (vs. absent).

Nomenclatural notes:—Cogniaux (1891) cited as type “*Poortmann in hb. Drake*” in the protologue of *Centronia sessilifolia*. But the sheets P00228659, P00228660 (both from *Poortmann 223*) and P00228661 (*Poortmann 484*) have labels indicating that they belonged to E. Drake’s herbarium, so these specimens must be considered as syntypes conforming with Art. 9.6 of the ICN (Turland *et al.* 2018). Therefore, according to Art. 9.3 and 9.12 of the ICN (Turland *et al.* 2018), we chose *Poortmann 223* for lectotypification because it allows to observe the sessile leaves that characterise *M. sessilifolia*.

Distribution and phenology:—*Meriania sessilifolia* is endemic to northern Peru (Departments of Piura and Cajamarca) and grows in montane forests at 2250–2350 m. It has been collected in flower in January and October, and in fruit in October.

Specimens examined:—PERU. **Cajamarca:** Prov. Cutervo, Dist. San Andrés, Las Grutas, 2350 m, 13 Oct 1987 (fl., fr.), *J.G. Sánchez 302* (F!, US!); Dist. Santo Tomás, ceca al lugar Playa Grande, 2300 m, 14 Oct 1987 (fl.), *I. Sánchez-Veja 4531* (CPUN!, F!, US!), PN Cutervo, rumbo hacia Playa Grande, 2250 m, $06^{\circ}11'25.35''$ S,

78°44'40.74"W, 27 Nov 2020 (fr.), *R. Fernandez-Hilario et al.* 2097 (CUZ!, HOXA!, KUELAP!, MOL!, NY!, UPCB!).

26. *Meriania speciosa* (Bonpl.) Naudin, *Ann. Sci. Nat., Bot.*, ser. 3, 18: 128 (1852). *Chaetogastra speciosa* (Bonpl.) DC., *Prodr.* 3: 131 (1828). Basionym: *Rhexia speciosa* Bonpl., *Monogr. Melast.* 2: 9, t. 4 (1806). Type:—**COLOMBIA. Cauca:** Prope Popayán, no date (fl.), *A. Bonpland* 2027 (lectotype, designated by Mendoza-Cifuentes 2021: P! [barcode P00136460]; isolectotypes: F! [accession no. 940290], P! [barcodes P00136461, P00136462], US! [barcode 00120188]). (Figures 15, 53).

Meriania spruceana Cogn. in A.DC. & C.DC., *Monogr. Phan.* 7: 426 (1891). *Meriania longifolia* var. *spruceana* (Cogn.) Cuatr., *Trab. del Mus. Nac. de Cienc. Nat. de Madrid* 33: 93. 1936. *Meriania longifolia* var. *spruceana* (Cogn.) J.F.Macbr., *Publ. Field Mus. Nat. Hist., Bot. Ser.* 13, pt. 4: 309 (1941), *isonym*. Type:—**PERU. San Martín:** In monte Campana prope Tarapoto, Aug 1856 (fl.), *R. Spruce* 4204 (lectotype, designated here: BR! [barcode 000005201327]; isolectotypes: B-destroyed [negative at F], BR! [barcode 000005201624], C! [barcode C10014729], E! [barcode E00285763], F!-fragment [accession no. 869148], G! [barcode G00319573], GH! [barcode 00072679], K! [barcodes K000006312, K000006313], LD! [barcode 1683604], NY! [barcode 00228979], P! [barcode P02274656], TCD! [barcode TCD0000734]).

For other synonyms see Mendoza-Cifuentes (2021).

Comments:—The Peruvian specimens of *M. speciosa* are easily recognisable by their elliptic leaf blades 7.7–10 × 1.3–2.1 cm, solitary inflorescences or sometimes in cymes, glabrous hypanthia and calyces, calyces with acute dorsal projections, spreading, reddish-purple corollas, isomorphic stamens, and stamen connectives with one triangular descending dorso-basal appendage. These characteristics are stable in all specimens examined. Historically, the Peruvian populations of *M. speciosa* have been recognised as a distinct entity, as *M. spruceana* (Cogniaux 1891, Brako & Zarucchi 1993) or *M. longifolia* var. *spruceana* (Macbride 1941). And these have been related to *M. candollei* Cogn., *M. grandidens* Triana, *M. lindenii* Cogn., *M. longifolia* (Naudin) Cogn., *M. speciosa* (Bonpl.) Naudin and *M. umbellata* H.Karst., all endemic to Colombia, except *M. longifolia* (also in Venezuela) and *M. speciosa* (also in Ecuador). These species have been traditionally accepted in different works (Almeda *et al.* 2021; Brako & Zarucchi 1993; Wurdack 1973, 1980). However, Mendoza-Cifuentes (2021) considered in his taxonomic revision of *Meriania* for Colombia that all of them are synonyms of *M. speciosa*. In fact, there is a lot of variability in all the specimens from Colombia and Venezuela, and it is not possible to clearly determine the morphological limits between the entities. Also, Mendoza-Cifuentes (2021) reported the presence of intermediate forms in the Colombian populations. Therefore, we have chosen to consider *M. speciosa* as a highly variable species for the moment.

Among Peruvian species, due to small leaf blades and solitary inflorescences, *M. speciosa* most closely resembles *M. prunifolia*. However, the former is easily distinguishable by its terminal branches and leaf blades glabrous (vs. moderately to densely furfuraceous in *M. prunifolia*), terete hypanthia (vs. costate), and calyces with acute dorsal projections (vs. aciculate).

Nomenclatural notes:—Cogniaux (1891) cited *Spruce 4204* as type in the protologue of *M. spruceana* but without indicating any herbarium, so it must be considered as a syntype conforming with Art. 9.6 of the ICN (Turland *et al.* 2018). Therefore, according to Art. 9.3 and 9.12 of the ICN (Turland *et al.* 2018), we chose as lectotype the sheet 000005201327 (BR) because contains a label indicating that it was part of A. Cogniaux's herbarium and probably that was the material he examined for the description of *M. spruceana*.

Distribution and phenology:—*Meriania speciosa* is distributed from Venezuela to northern Peru, and occurs in the departments of Amazonas and San Martín in premontane and montane forests at 900–1850 m. It has been collected in flower in January, February, March, April, May, August and September, and in fruit in April.

Specimens examined:—**PERU. Amazonas:** Prov. Rodríguez de Mendoza, Dist. Chirimoto, entre Zrumilla y Achamal, borde del camino, 1100 m, 12 Sep 2001 (fl.), *V. Quipuscoa* & *M. Vilchez 2709* (F!, HUT!); Dist. Vista Alegre, entre Valle Encantado y Salas, 1100–1853 m, 06°15'07.1"S, 77°16'23.2"W, 30 May 2008 (fl.), *V. Quipuscoa et al. 4063* (HSP!, HUT!). **San Martín:** Zepelacio, near Moyobamba, 1100 m, May 1934 (fl.), *G. Klug 3642* (F!, NY!, US!). Prov. Huallaga, Dist. Saposoa, alrededores de Monumentos Históricos de Buenos Aires (Zarumilla), 1440 m, 06°36'34"S, 77°21'30"W, 11 Aug 2000 (fl.), *V. Quipuscoa et al. 2036* (F!, HUT!). Prov. Lamas, Dist. Alonso de Alvarado, San Juan de Pacayzapa, al este del puente (Carretera a Moyobamba), 900 m, 12 Apr 1973 (fl., fr.), *J. Schunke 5906* (F!, NY!, U!, US!). Prov. San Roque, without locality, 1350–1500 m, Jan-Feb 1930 (fl.), *L. Williams 7010* (F!, NY!, US!).

27. *Meriania sumatika* Rob.Fern. R.Goldenb. & Michelang., in Fernandez-Hilario *et al.*, Willdenowia (2021). Type:—**PERU. Cusco:** Prov. Urubamba, Dist. Machupichu, Santuario Histórico de Machupicchu y en Camino Inca, 2060 m, 13°09'10"S, 72°31'00"W, 14–22 Oct 1987 (fl., fr.), *P. Nuñez & J. Arque 8369* (holotype: CUZ! [accession no. 15097]; isotypes: F! [accession no. 2028864], US! [barcode 02925646]). (Figures 20, 54).

Comments:—This species differs from other Peruvian species of *Meriania* by the combination of 10-costate hypanthium (ridges up to 4.5 mm high in fruit), calyx with large falcate dorsal projections (14.5–15.5 mm long), spreading, reddish-purple corollas, large petals (46–55 mm long), dimorphic stamens, stamen connectives with two appendages, one descending dorso-basal appendage (laterally expanded in the

antesepalous stamens), and the other blunt ascending appendage. Among Peruvian species, *M. sumatika* most closely resembles *M. vargasii* but differ by the hypanthia shape (10-costate vs. terete), petals length (46–55 mm vs. 20–24 mm), and anthers length (14–16 mm vs. 9–12 mm). A detailed comparison of *M. sumatika* with other related species can be found in Fernandez-Hilario *et al.* (2021b).

Distribution and phenology:—*Meriania sumatika* is endemic to southern Peru and grows in montane forests at 1800–2900 m. It has been collected in flower in February, May and October, and in fruit in May and October.

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

28. *Meriania tetragona* (Cogn.) Wurdack, *Phytologia* 9: 411 (1964). Basionym: *Axinaea tetragona* Cogn., *Bot. Jahrb. Syst.* 42(1): 137 (1908). Type:—**PERU. Amazonas:** Ad orientem a Chachapoyas versus, inter Tambo Almirante et Tambo Bagazán, 2700–2800 m, 30 Jul 1904 (fl.), *A. Weberbauer* 4430 (lectotype, designated by Burke & Michelangeli 2013: BR! [barcode 000008438300]; isolectotypes: B-destroyed [negative at F]). (Figures 35, 55, 56).

Meriania raimondii Markgr., *Notizbl. Bot. Gart. Berlin-Dahlem* 13: 461 (1937). Type:—**PERU. Cajamarca:** Cutervo, Apr 1879 (fl.), *A. Raimondi* 5727 (lectotype, designated here: USM! [accession no. 27390]). Remanescent syntype:—**PERU. Cajamarca:** Cutervo, Apr 1879, *A. Raimondi* 3156 (not located).

Comments:—*Meriania tetragona* belongs to the *M. radula* complex (see comments under *M. radula* for diagnostic characteristics) and is recognisable within the complex by the combination of alate-quadrangular internodes, nodes with interpetiolar flaps, glabrous to sparsely puberulent leaves and abaxial tuberculate projections on the transition zone from the petiole to the midvein. All specimens examined show stable characteristics, except *Fernandez-Hilario et al.* 2092 which has abaxial claw-shaped projections instead of tuberculate.

Due to internode morphology, *Meriania tetragona* could be confused with *M. penningtonii*, but the former differs in its campanulate, deep red corollas (vs. spreading, reddish-purple) and the presence of the interpetiolar flap (vs. absent). Also, *M. tetragona* could be confused with some red-flowered species of *Axinaea*, but these

species have pendulous inflorescences (vs. erect in *M. tetragona*) and 4-merous flowers (vs. 5-merous).

Nomenclatural notes:—Markgraf (1937) cited *Raimondi 3156* and *5727* as types in the protologue of *M. raimondii*, so both specimens must be considered as syntypes conforming with Art. 9.6 of the ICN (Turland *et al.* 2018). Therefore, according to Art. 9.3 and 9.12 of the ICN (Turland *et al.* 2018), we chose as lectotype the only sheet found (*Raimondi 5727*).

Distribution and phenology:—*Meriania tetragona* is distributed in Ecuador and Peru, and occurs from the department of Amazonas to Lambayeque in montane forests, elfin forests and subparamos at 2200–3200 m. It has been collected in flower almost year round except in September and December, and in fruit almost year round except in April and September.

Specimens examined:—**PERU. Amazonas:** Leimebamba-Balsas road, km 415, 28 Mar 1977 (fl., fr.), *J. Boeke 1822* (NY!); Path Chachapoyas-Moyobamba, 2700-3300 m, Jan 1930 (fr.), *L. Williams 7579* (F!); 18 kms SW of Leimebamba along road towards Balsas, 3000 m, 06°45'S, 77°48'W, 13 Feb 1985 (fl.), *J. Luteyn & E. Cotton 11379* (NY!, USM!). Prov. Bongará, Dist. Florida, Tierras de la Comunidad San Lorenzo, 3000 m, 06°45'21.89"S, 78°02'00.74"W, 17 Feb 2020 (fl., fr.), *R. Fernandez-Hilario et al. 1888* (HOXA!, KUELAP!, MOL!, NY!, UPCB!). Prov. Chachapoyas, Passim 20-17 km down E slope of Cerro Calla-Calla, 02 Jun 1966 (fl.), *G. Edwin & J. Schunke 3653* (F!, NY!); Cerros Calla-Calla, east side, 19 km above Leimebamba on the road to balsas, 3100 m, 04 Jun 1964 (fl., fr.), *P. Hutchinson & J. Wright 5507* (F!, NY!, P!, US!, USM!); Entre Leymebamba y Calla-Calla, 3100 m, 07 May 1970 (fl.), *I. Sánchez & W. Ruiz 537* (F!, NY!); Middle eastern Calla-Calla slopes, near kms 416-419 of Leimebamba-Balsas road, 2900-3100 m, 09 Jul 1962 (fl., fr.), *J. Wurdack 1250* (F!, NY!, US!, USM!); Jalca de Calla - Calla (Leymebamba - Balsas), 2800 m, 23 Oct 1965 (fr.), *A. Sagástegui 6057* (HUT!), 3100 m, 07 May 1970 (fl.), *A. Sagástegui 7462* (HUT!); Camino Chachapoyas - Celendin, entre Leymebamba y Calla - Calla, 3000 m, 06°45'S, 77°49'W, 27 May 1984 (fr.), *D. Smith & J. Cabanillas 7181* (USM!); Cordillera Calla - Calla, entre Leymebamba y Balsas, 3200-3300 m, 21 Aug 1963 (fl., fr.), *R. Ferreyra & C. Acleto 15311* (US!, USM!); Dist. Leymebamba, km 407 de la carretera, 19 km de Leymebamba, 3050-3095 m, 06°42'33.3"S, 77°51'09.7"W, 13 Mar 2012 (fr.), *F. A. Michelangeli et al. 1739* (NY!, USM!), A unos 12 km de Leymebamba, ruta Laguna de los Cóndores, borde del camino, 2500-3000 m, 06°44'S, 77°47'W, 19 Aug 1998 (fl.), *V. Quipuscoa et al. 1364* (F!, HUT!), Calla-Calla, Las Palmeras, 3000 m, 15-24 Nov 2004 (fl.), *T. Pennington et al. 17701* (MOL!). Prov. Luya, Las Palmas, entre Calla-Calla y Leymebamaba, 2900 m, 14 May 1967 (fl.), *I. Sánchez 365* (CPUN!, F!); Dist. Camporendon, Tullanya, cerro Hiucsocunga, 3200 m, 06°04'29"S, 78°18'44"W, 08 Dec 1996 (fr.), *R. Vásquez & R. Rojas 21977* (NY!, USM!). Prov. Rodríguez de Mendoza, Dist. Vista Alegre, Sector a una hora del campamento Ruinas quebrada Salas, 2834 m, 06°07'42.73"S, 77°26'06.42"W, 13 Aug 2012 (ster.), *J.L.*

Marcelo-Peña et al. 6785 (MOL!). Prov. Utcubamba, Dist. Cajaruro, Comunidad de Capollín, 2850 m, 05°38'27.02"S, 78°14'38.58"W, 12 Jan 2009 (fl.), *M. Chocce et al.* 5262 (USM!). **Cajamarca:** Prov. Chota, Near village of El Campamento, ca. 21 km of Huambos, 2870 m, 06°24'23"S, 79°01'19"W, 20 Apr 1993 (fl.), *M. Dillon et al.* 6433 (CPUN!, F!, US!). Prov. Cutervo, Cerros de Cutervo 2500-2600 m, 31 Jul 1946 (ster.), *R. Ferreyra* 823 (USM!); without locality, no date (ster.), *A. Raimondi* 5847 (USM!), 6546 (USM!); Dist. Cutervo, Apr 1879 (ster.), *A. Raimondi* 6507 (USM!); Dist. San Andrés, Entre el Molina y la Pucarilla, 2200 m, 15 Oct 1987 (fl.), *J. Sánchez* 337 (CPUN!, F!, US!); Dist. Santo Tomás, PN Cutervo, Sector Santa Rosa, 2700 m, 06°10'46.81"S, 78°46'02.20"W, 26 Nov 2020 (fl.), *R. Fernandez-Hilario et al.* 2092 (MOL!, UPCB!). Prov. Jaen, Cerro el Paramillo de Pomahuaca, 2670 m, 06 Nov 1999 (fr.), *C. Díaz* 10891 (MOL!, NY!, USM!); Dist. Sallique, El Espino, 3000 m, 05°41'S, 79°16'W, 11 Jul 2004 (fr.), *J.L. Marcelo-Peña et al.* 1661 (MOL!), El Páramo, 3200 m, 05°40'50"S, 79°16'20"W, 23 Jun 1998 (fl.), *C. Campos et al.* 5058 (NY!, USM!). Prov. Santa Cruz, Dist. Pulan, Cerro Campamento, alrededores de la catarata La Cuda - Margen izquierdo de la quebrada El Cedro, 3015 m, 03-04 Jul 2004 (fl.), *G. Iberico et al.* 765 (CPUN!), La Zaina, 2700 m, 12 Feb 2007 (fl.), *L. Santa Cruz* 1036 (USM!), 31 Jul 2007 (fl.), *L. Santa Cruz* 1993 (HUT!, USM!). **Lambayeque:** Prov. Ferreñafe, Dist. Cañaris, 3212 m 29 Apr 2010 (fl.), *M. Chocce et al.* 5726 (USM!). **Piura:** Prov. Huancabamba, Dist. El Carmen de la Frontera, Rosarios bajos, Proyecto Minero Río Blanco, Quebrada Parramata, 2500-2800 m, 04°53'27.5"S, 79°22'04.8"W, 14 Jul 2004 (fl.), *A. Cano et al.* 14767 (USM!).

29. *Meriania tetraquetra* Triana, Trans. Linn. Soc. London 28(1): 66 (1871) [1872]. Type:—**PERU. Amazonas:** Prov. Chachapoyas, without locality, no date (fl.), *M. Mathews s.n.* (holotype: K! [barcode K000329445]; isotypes: BR! [barcode 000005201983], F!-fragment [accession no. 1026686], G-destroyed [negative at F]). (Figures 41, 57, 58).

Comments:—In the protologue of this species, Triana described it as glabrous (“*glaberrimus*”) but it is sparsely to moderately puberulent. *Meriania tetraquetra* is characterized by its quadrangular internodes, nodes without interpetiolar flaps, ovate to oblong and slightly bullate leaf blades (9.3-)13–35 × (4.7-)9.1–19.7 cm, venation with two pairs of secondary veins and an additional pair of faint submarginal veins, calyces with small conic dorsal projections, spreading, reddish-purple corollas, isomorphic stamens, and stamen connectives with one triangular descending dorso-basal appendages. The most closely related Peruvian species is *M. rugosa*, but it is distinguished by its elliptic leaf blades 10.3–25.4 × 4.2–10.6 cm and venation with one pair of secondary veins.

Macbride (1941), in his treatment of *Meriania* for Peru, placed *Weberbauer* 7048 (which we have published as *M. megaphylla*) under *M. tetraquetra*. However, this specimen has quadrangular and winged internodes, and nodes with interpetiolar flaps. Probably because of this misidentification he considered *M. tetraquetra* related to *M.*

radula (“nearly the same as *M. radula* and perhaps not specifically separable”). Nevertheless, *M. tetraquetra* and *M. megaphylla* are not related to the *M. radula* complex, because of their flowers with spreading, reddish-purple corollas (vs. campanulate, deep red) and stamen connectives with descending dorso-basal appendages (vs. perpendicular to the thecae).

Distribution and phenology:—*Meriania tetraquetra* is endemic to northern Peru (Departments of Amazonas and San Martín) and grows in montane forests at 2240–3000 m. It has been collected in flower in May, August and September, and in fruit in September.

Specimens examined:—**PERU. Amazonas:** Prov. Chachapoyas, Dist. Leymebamba, alrededores de la Fila de la Culebra, 2246 m, 06°43′03.18″S, 77°37′26.76″W, 05 Sep 2004 (fl.), *V. Quipuscoa et al.* 3268 (HUT!). Prov. Rodríguez de Mendoza, Dist. Vista Alegre, Área de Conservación Regional Vista Alegre, camino hacia Cedrushco, a una hora del campamento Quebrada Salas, 2403 m, 06°06′24.01″S, 77°25′04.36″W, 17 Aug 2012 (fl.), *R. Fernandez-Hilario et al.* 251 (MOL!, NY!, UPCB!), a media hora del campamento Cedrushco, quebrada Salas, 2361 m, 06°06′23.66″S, 77°24′41.22″W, 21 Aug 2012 (fl.), *J.L. Marcelo-Peña et al.* 7103 (MOL!). **San Martín:** Prov. Mariscal Cáceres, PN Río Abiseo, across river from La Playa camp, 2600 m, 01 Sep 1985 (fr.), *K. Young 1531* (MOL!). Prov. Huallaga, Dist. Bolívar, Surrounding "Pampa Hermosa" around old Chacha and Inca settlement, 3000 m, 07°02′07″S, 77°40′29″W, 24 May 2011 (fl.), *R. Bussmann et al.* 17071 (F!, HAO!, MO!, NY!, US!).

30. *Meriania tomentosa* (Cogn.) Wurdack, *Phytologia* 35: 4 (1976). Basionym: *Centronia tomentosa* Cogn., *Bull. Acad. Roy. Sci. Belgique ser. 3*, 14: 943 (1887). Type:—**ECUADOR:** Ad margines sylvarum primaev in Andibus central aequadorensibus rara, 3000 m, 1876 (fl.), *E. André 4475* (lectotype, designated by Wurdack 1980: BR! [barcode 000005187867]; isolectotypes: CAS! [barcode 0001923], K! [barcodes K000329483, K000329484], NY! [barcode 00221501]). (Figures 34, 59, 60).

Rhexia excelsa Bonpl., *Monogr- Melast.* 2: 90, t. 34 (1813). *Osbeckia excelsa* (Bonpl.) Sprengler, *Syst. Veg.* 2: 312. 1825. *Graffenrieda excelsa* (Bonpl.) DC., *Prodr.* 3: 106 (1828). *Brachycentrum excelsum* (Bonpl.) Meissn., *Pl. Vasc. Gen.*: 81 (1838). *Centronia excelsa* (Bonpl.) Triana, *Trans. Linn. Soc. London* 28(1): 70, t. 5 (1871) [1872]. Type:—**ECUADOR:** Loxa, 1852 (fl.), *A. Bonpland 3335* (lectotype, first step designated by Wurdack 1980, second step designated by Humberto-Mendoza 2021: P! [barcode P00136435]; isolectotypes: F!-fragment [accession no. 937280], P! [barcode P00136436]).

Centronia tunguraguae S.F.Blake, Proc. Biol. Soc. Washington 35: 118 (1922).
Type:—**ECUADOR. Tungurahua:** Pondoá, on slopes of Mt. Tungurahua, 2745 m, 10 Mar 1921 (fl.), *W. Popenoe 1296* (holotype: US! [barcode 00120322]).

Centronia peruviana J.F.Macbr., Publ. Field Mus. Nat. Hist., Bot. Ser. 13, pt. 4: 327 (1941). Type:—**PERU. Huánuco:** Carpish, banks of a mountain stream, 2850 m, 09 Nov 1938 (fl.), *H.E. Stork & O.B. Horton 9928* (holotype: F! [accession no. 1052336]).

Comments:—*Meriania tomentosa* is the second most widely distributed *Meriania* species in Peru, and it is recognisable by its calyptrate calyces with irregular dehiscence and without dorsal projections, campanulate, reddish-orange corollas, isomorphic stamens, and cream anthers. In Peru there are three other species with calyptrate calyces (*M. acida*, *M. escalerensis* and *M. sessilifolia*), and two with subcalyptrate calyces (*M. juanjil* and *M. vasquezii*). Within these groups only *M. acida* shares similar calyces and corollas with *M. tomentosa*. However, *M. acida* has smaller flowers than *M. tomentosa*, hypanthia ca. 4.5 mm long vs. 8.5–9 mm long and petals 9–10 mm vs 20–24 mm long.

The original material of *M. tomentosa* exhibits indumentum covering the entire adaxial leaf blades, short trichomes on the hypanthium and calyx, linear bracteoles, and calyptrate calyces with a prolonged apiculum. Although most of the Peruvian specimens have the same indumentum on the leaves and shape of the bracteoles, there is variability among populations. The apex calyces vary from acute to moderately apiculate. Also, the most specimens distributed from the department of Amazonas to Huánuco (e.g., *Wurdack 1661*) showing denser indumentum and longer trichomes than the typical form. On the other hand, some specimens from the department of Amazonas (e.g., *Fernandez-Hilario et al. 1905*) have broadly elliptic bracteoles, even completely covering the flower buds. In the department of Pasco there are two clearly distinguishable forms, the former (e.g., *Michelangeli et al. 2884*) has ferruginous tomentose indumentum and evenly covered abaxial leaf blades, and the latter (e.g., *Cárdenas & Francis 450*) has setulose indumentum and sparsely to moderately covered abaxial leaf blades.

Although we have been able to find these different forms within *M. tomentosa*, in sterile or fruiting specimens is not possible to identify these forms. This is because it is necessary to examine the calyces and bracteoles, which are usually soon deciduous. For this reason, for the moment we have chosen to consider all Peruvian specimens examined under *Meriania tomentosa* s.l.

Nomenclatural notes:—Cogniaux (1887) cited *André 4473* as type in the protologue of *C. tomentosa* but without indicating any herbarium, so it must be considered as a syntype conforming with Art. 9.6 of the ICN (Turland *et al.* 2018). Humberto-Mendoza (2021) erroneously chose as lectotype the sheet K000329483 because, according to Art. 9.10 and 9.19 of the ICN (Turland *et al.* 2018), we have to consider that Wurdack (1980) did an inadvertent lectotypification of *C. tomentosa* when

he wrote “*André 4475 (BR, holotype)*” in his treatment of Melastomataceae for the Flora of Ecuador.

Bonpland (1813) did not cite any specimens in the protólogo of *R. excelsa* but the specimen *Bonpland 3335* is material original because is associated with the taxon, and so it must be considered as a syntype conforming with Art. 9.4 and 9.6 of the ICN (Turland *et al.* 2018). According to Art. 9.10 of the ICN (Turland *et al.* 2018), we have to consider that Wurdack (1980) did an inadvertent lectotypification (first-step) of *R. excelsa* when he wrote “*Bonpland 3335 (P, holotype)*” in his treatment of Melastomataceae for the Flora of Ecuador. However, there are two sheets of *Bonpland 3335* housed in P. Therefore, when Humberto-Mendoza (20121) chosen the sheet K000329439 as the lectotype he did a second-step lectotypification, conforming with Art. 9.17 (Turland *et al.* 2018).

Distribution and phenology:—*Meriania tomentosa* is widely distributed in the Andes from Venezuela to southern Peru, and occurs from the department of Amazonas to Cusco in montane forests at 2100–3100 m. It has been collected in flower almost all year round except in March, April and December, and in fruit almost all year round except in January, May, November and December.

Specimens examined:—**PERU. Amazonas:** Prov. Bongará, Dist. Florida, desde toma de agua en San Lorenzo hacia CP Vista Alegre, 2840 m, 05°48'17.71"S, 78°01'36.70"W, 17-18 Feb 2020 (fl.), *R. Fernandez-Hilario et al. 1905* (HOXA!, KUELAP!, MOL!, NY!, UPCB!); Dist. Jumbilla, Along road to Tialango, 2100 m, 05°52'31"S, 76°46'36"W, 04 Nov 2012 (fl.), *H. van der Werff et al. 25013* (HOXA!, HUT!, NY!); Dist. Yambrasbamba, Ruta desde CP La Florida hacia finca de Don Ilario, 2150 m, 05°40'17.71"S, 77°56'58.73"W, 12 Nov 2020 (fl.), *R. Fernandez-Hilario et al. 2070* (HOXA!, MOL!, NY!, UPCB!). **Prov. Chachapoyas,** Middle slopes of Cerro Yama-uma (Cerro Carán) above Taulia, 4-8 km south-southeast of Molinopampa, 2700-3000 m, 11 Aug 1962 (fl.), *J. Wurdack 1661* (F!, NY!, P!, US!, USM!); Dist. Leymebamba, Alrededor de la laguna de Los Cóndores, parte sur, 2500-2700 m, 06°51'05.28"S, 77°46'25.61"W, 16 Aug 1998 (fl.), *V. Quipuscoa et al. 1267* (F!, NY!). **Cajamarca:** Prov. Chota, Dist. Paccha, Rejo pampa, 2450 m, 21 Jul 1993 (fl.), *J. Sánchez 826* (CPUN!, F!). Prov. San Miguel, Bosque natural de Quellahorco, al noreste de la localidad de Tongod, 2700 m, 14 Sep 1991 (fl., fr.), *I. Sánchez & A. Briones 5788* (F!, NY!, US!). Prov. Santa Cruz, Dist. Pulán, El Progreso, 2700 m, 31 Jan 2006 (fl. bud), *L. Santa Cruz 184* (USM!), 04 Sep 2006 (fl.), *L. Santa Cruz 560* (USM!), Chilal, 2700 m, 04 Sep 2006 (fl.), *L. Santa Cruz 605* (USM!), 31 Jul 2007 (fl.), *L. Santa Cruz 1964* (USM!), La Zaina, 2700 m, 04 Sep 2006 (fl., fr.), *L. Santa Cruz 611* (USM!), Sector Pampa Verde, 2920 m, 06°48'6.19"S; 78°54'28.05"W, 16 Oct 2004 (fl.), *G. Iberico et al. 950* (CPUN!). **Cusco:** Prov. La Convención, Dist. Santa Ana, Tunquimayo, 2800 m, 13°03'S, 72°56'W, 13 Jun 2003 (fr.), *E. Suclli & V. Chama 965* (NY!); Dist. Quellouno, Lacco, 2741 m, 12°36'44"S, 72°14'37"W, 16 Jun 2006 (fr.), *L. Valenzuela et al. 6896* (NY!, USM!); Dist. Vilcabamba, frente a Yupancca, 2560-2640

m, 13°03'15"S, 72°55'59"W, 03 Jun 2002 (fl.), *W. Galiano et al.* 4298 (NY!). Prov. Paucartambo, EB Wayqecha, 3000 m, 13°10'S, 71°35'W, Mar 2010 (fr.), *P. Chambi s.n.* (USM!). Prov. Quishpicanchi, Dist. Marcapata, Sitio Culebrayoc, marca 1550 m en la trocha, 2463 m, 13°29'41.2"S, 70°53'16.2"W, 05 Jun 2012 (fr.), *F. A. Michelangeli et al.* 1799 (NY!, USM!), Comunidad de Unión Arasa, 2150 m, 13°29'40.92"S, 70°52'23.16"W, 26 Apr 2011 (fr.), *J. Wells & P. Centeno* 980 (USM!). **Huánuco:** Prov. Huánuco, Dist. Chinchao, Carpish, 2750 m, 09 Sep 1948 (fl. bud), *R. Scolnik* 1075 (NY!), ca. 47 km NNE of Huánuco on road to Tingo Maria, just below the Carpish pass, 2500-2600 m, 14 Jul 1981 (fl.), *M. Dillon* 2602 (F!), Trail from S entrance of Carpish tunnel to crest of ridge, 2740 m, 27 Feb 1978 (fr.), *J. Luteyn & M. Lebron-Luteyn* 5477 (NY!), West side of Carpish pass, 2800 m, 22 Oct 1959 (fl.), *B. Maguire & C. Maguire* 44432 (F!, NY!, US!). Prov. Pachitea, above La Molina near Panao, 12 Sep 1940 (fl.), *E. Asplund* 13691 (US!). **Junín:** Prov. Chanchamayo, Dist. San Ramón, Puyu Sacha, 2500 m, 11°05'46"S; 75°26'05"W, 01–11 Apr 2021 (fl.), *R. Villanueva-Espinoza* 546 (MOL!). **Pasco:** Prov. Oxapampa, Cordillera Yanachaga, road over shoulder of Cerro Pajonal to Villa Rica drainage, 12 km SE of Oxapampa, 2300-2500 m, 10°35'S, 75°20'W, 09 Oct 1982 (fl.), *R. Foster & D. Smith* 9072 (F!, NY!, US!, USM!); Road to Chacos, 2400-2700 m, 10°35'S, 75°06'W, 17 Jul 2003 (fl.), *H. van der Werff et al.* 18569 (NY!); Dist. Huancabamba, PNYCH, la Colmena-trocha Erica, 2300 m, 10°26'37"S, 75°26'15"W, 22 Aug 2008 (fl., fr.), *L. Valenzuela et al.* 11612 (HOXA!, NY!, USM!), PNYCH, sector Quebrada Yanachaga, 2265 m, 10°23'45"S, 75°28'55"W, 19 Aug 2004 (fl.), *R. Vásquez et al.* 30405 (HOXA!, NY!), Zona de amortiguamiento del PNYCH, 2407 m, 10°23'38"S, 75°28'36"W, 20 Sep 2004 (fl.), *J. Perea & J. Mateo* 1794 (HOXA!, NY!), Fundo Osobamba. PNYCH, 2243 m, 10°23'34.7"S, 75°28'28.1"W, 25 Jun 2016 (fl.), *L. Valenzuela et al.* 30448 (USM!), PNYCH, Quebrada Yanachaga, 2420 m, 10°23'21.6"S, 75°28'20.1"W, 20 Feb 2018 (fr.), *F. A. Michelangeli & S. Riva* 2973 (HOXA!, USM!), Sector Oso Playa. Camino a la parcela Oso Playa, 2565 m, 10°19'05"S, 75°36'28"W, 25 Jun 2006 (fl.), *L. Cárdenas et al.* 469 (CUZ!), Sector Oso Playa, Trocha a la parcela Oso Playa, 2370-2475 m, 10°19'20"S, 75°36'06"W, 24 Jun 2006 (fl.), *L. Cárdenas & R. Francis* 450 (HOXA!, USM!); Dist. Oxapampa, Chacos "Rincón Chacos", proyecto Apícola, 2750 m, 10°37'25"S, 75°17'43"W, 23 Jul 2010 (fl.), *R. Rojas et al.* 7361 (HOXA!, NY!), PNYCH, cercanías del refugio El Cedro, 2440-2500 m, 10°32'S, 75°21'W, 17 Aug 2002 (fl., fr.), *A. Monteagudo et al.* 3701 (HOXA!, NY!, USM!), 4429 (HOXA!, MOL!, NY!, USM!), PNYCH, flanco oriental del valle de Palcazu, a 20 minutos del Abra Esperanza, 2720 m, 10°31'56"S, 75°20'54"W, 19 Oct 2006 (fl.), *A. Monteagudo & R. Francis* 12900 (HOXA!, NY!), PNYCH, sector San Alberto, alrededores del refugio El Cedro, 2240 m, 10°32'42.4"S, 75°21'04.3"W, 22 Mar 2016 (fr.), *F. A. Michelangeli et al.* 2750 (NY!, USM!), PNYCH, sector San Alberto, camino del refugio El Cedro al Abra Esperanza, 2420-2700 m, 10°32'43"S, 75°21'30"W, 03 Oct 2007 (fl., fr.), *L. Hernani & A. Peña* 383 (HOXA!, NY!, USM!), PNYCH, sector San Alberto; claro alrededor del refugio El Cedro, 2415 m, 10°32'43.2"S, 75°21'29.8"W, 20 Jul 2017 (fl. bud, fr.), *F. A. Michelangeli et al.* 2884 (HOXA!, USM!), Sector San Alberto, camino al Abra Esperanza, 2400-2600 m, 10°32'43"S, 75°21'30"W, 15 Aug 2006 (fl., fr.), *L. Cárdenas*

et al. 693 (CUZ!, F!, HOXA!, MOL!, NY!), Sector San Alberto. Cercano al Refugio, 0.5 km, 2468 m, 10°32'45"S, 75°21'24"W, 18 Aug 2006 (fl.), *L. Cárdenas et al.* 733 (CUZ!), (fl.), 734 (HOXA!), Sector San Alberto. Zona superior al refugio aprox. 4 km, 2878 m, 10°31'45"S, 75°21'08"W, 12 Aug 2006 (fl.), *L. Cárdenas et al.* 661 (CUZ!), 669 (HOXA!, USM!), Zona de amortiguamiento PNYCH, parte media de la quebrada San Luis, 2200-2350 m, 10°33'55"S, 75°20'43"W, 18 Sep 2007 (fl., fr.), *A. Monteagudo et al.* 15094 (HOXA!, MOL!, NY!). **Piura:** Prov. Huancabamba, Loma Redonda (Sapalache-Chinguela), 2400 m, 15 Sep 1981 (fl., fr.), *A. Sagástegui et al.* 10188 (HUT!, NY!, US!); El paso de Huascar Rey (limite entre Dp de Piura y Cajamarca, ruta Huancabamba a Tabaconas), 2700 m, 11 Jul 1961 (fl.), *C. Friedberg* 322 (P!, US!, USM!); Dist. El Carmen de la Frontera, Carretera Sapalache-Cerro Chingelas, 9.5 km despues de Sapalache, 3035 m, 05°08'23.6"S, 79°23'45.4"W, 03 Sep 2016 (fr.), *F. A. Michelangeli et al.* 2620 (NY!, USM!), (fr.), 2623 (NY!, USM!). Prov. Morropón, Dist. Chalaco, Bosque Mijal, 2900 m, 30 Aug 2004 (ster.), *A. Córdova* 512 (MOL!). **San Martín:** Prov. Huallaga Dist. Bolivar, Surrounding "Pampa Hermosa" around old Chacha and Inca settlement, 2400 m, 06°59'32"S, 77°39'16"W, 24 May 2011 (fl.), *R. Bussmann et al.* 17068 (F!, MO!, NY!, US!), 07°02'07"S, 77°40'29"W, (fl.), *R. Bussmann et al.* 17069 (F!, MO!, NY!, US!). Prov. Mariscal Cáceres, Near Mirador, Río Abiseo National Park, 3000-3100 m, 14 Jul 1988 (fl.), *B. León* 2175 (US!).

31. *Meriania urceolata* Triana, Trans. Linn. Soc. London 28(1): 67 (1871) [1872]. Type:—**PERU. San Martín:** Prope Tarapoto, Peruvia orientalis, 1855-1856 (fl., fr.), *R. Spruce* 4439 (lectotype, designated by Chiavegato & Baumgratz 2011: K! [barcode K000006311]; isolectotypes: B-destroyed [negative at F], BR! [barcode 00000641173], E! [barcode E00504628], G! [barcodes G00074119, G00074120], GH! [barcode 00072680], K! [barcode K000006309], NY! [barcode 00228981], P! [barcode P00539048], W! [accession no. 1889-0012092]). Remanescent syntypes:—**BRAZIL:** Prope Panuré ad Rio Vaupés, Oct 1852-Jan 1853 (fl.), *R. Spruce* 2757 (BR! [barcode 00000641172], C! [barcode C10014730], K! [barcode K000006310], NY! [barcodes 00228982, 00228983], P! [barcodes P00539049, P00539050] W! [accession nos. 1889-0012082, 1889-0111908]). **GUYANA:** without locality, no date (fr.), *Parker s.n.* (K! [barcode K000329423]). (Figure 15).

Meriania paraensis Ducke, Arch. Jard. Bot. Rio de Janeiro 3: 224 (1922). Type:—**BRAZIL. Pará:** Campos do Ariramba, 150 m, 23 Set 1913 (fl.), *A. Ducke* 14854 (lectotype, designated by Wurdack 1993: RB! [barcode 00541448]; isolectotypes: MB [n.s.], MG [n.s.], US! [barcode 00120382]).

Comments:—This species is easily recognisable by the combination of ferruginous indumentum, ovate leaf blades with flat surfaces, spreading, fuchsia corollas, strongly dimorphic stamens, and stamen connectives with developed ascending dorsal appendages. The only Peruvian species of *Meriania* with similar appendages in the stamen connectives is *M. microflora*. However, it can be differentiated by its liguliform

projections on the apex of the petioles (vs. absent in *M. urceolata*), white petals 4–4.5 mm long (vs. fuchsia and 14–20 mm long in *M. urceolata*) and antepetalous stamen connectives with apically trilobed ascending dorsal appendages (vs. apically sagitate ascending).

Distribution and phenology:—*Meriania urceolata* is widely distributed from Venezuela to northern Peru and the eastern Brazil, and occurs in the department of San Martín in premontane forests at 800–1400 m. It has been collected in flower in January, November and December.

Nomenclatural notes:—Triana (1871) cited as types the specimens *Spruce 2757* and *4439* in the protologue of *M. urceolata*, so both specimens were considered as syntypes conforming with Art. 9.6 of the ICN (Turland *et al.* 2018). For this reason, *M. urceolata* was lectotypified by Chiavegato & Baumgratz (2011). Ducke (1887) cited *Ducke 14854* as type in the protologue of *M. paraensis* but without indicating any herbarium, so it must be considered as a syntype conforming with Art. 9.6 of the ICN (Turland *et al.* 2018). According to Art. 9.10 of the ICN (Turland *et al.* 2018), we have to consider that Wurdack (1993) did an inadvertent lectotypification of *M. paraensis* when he wrote “*Ducke 14854 (holotype RB)*” in his treatment of Melastomataceae for the Flora of the Guianas.

Specimens examined:—PERU. **San Martín:** Prov. Moyobamba, Habana, cerca de Moyobamba, 800-900 m, no date (fl.), *A. Weberbauer 4570* (MOL!), Habana, campo experimental INRENA, 820 m, 16 Nov 1996 (fl.), *I. Sánchez 8694* (F!, US!), Río Negro, 1400 m, 18 Jan 1961 (fl.), *F. Woytkowski 6222* (US!), Zepelacio, near Moyobamba, 1200-1600 m, Dec 1933 (fl.), *G. Klug 3451* (F!, NY!, US!).

32. *Meriania vargasii* Wurdack, *Phytologia* 13: 72 (1966). Type:—PERU. **Cusco:** Prov. La Convención, Hacienda Guayanay, 1800 m, 15 May 1960 (fl.), *C. Vargas 13240* (holotype: US! [barcode 00120390]; isotype: CUZ!). (Figures 20, 61).

Comments:—*Meriania vargasii* is related to a group of Peruvian species (*M. amischophylla*, *M. sumatika* and *M. weberbaueri*) that share densely tomentose to villose hypanthia and calyces, calyces with claw-shaped dorsal projections, spreading, fuchsia to reddish-purple corollas, and antesepalous stamen connectives with laterally expanded descending dorso-basal appendages. However, *M. amischophylla* has sessile leaves (vs. petiolate in *M. vargasii*) and *M. weberbaueri* has inflorescences with flowers in (3-)4–6(-7)-flowered umbels in the branchlet ends (vs. in regular dichasia in *M. vargasii*). On the other hand, some specimens of *M. sumatika* have been erroneously identified as *M. vargasii*, but the former differs by its 10-costate hypanthia (vs. terete in *M. vargasii*), petals 46–55 mm long (vs. 20–24 mm long) and anthers 14–16 mm long (vs. 9–12 mm long).

Meriania boliviensis Cogn., endemic to Bolivia, is related to *M. vargasii* by sharing similar indumentum, dorsal projections on the calyces, and petal length. Nevertheless, *M. vargasii* is easily differentiated by its petioles 0.8–1.5 cm long (vs. 1.1–4.4 cm long in *M. boliviensis*) and venation with the innermost pair of secondary veins distant 0.6–1.7 cm from the base of the leaf blades (vs. 0.9–3.9 cm).

All specimens examined have conspicuous claw-shaped dorsal projections on the calyces, except *Vargas 10644* which has small projections that do not exceed the length of the calyx lobes. Wurdack (1966) considered that this specimen might be a different variety because of its smaller flowers. For this reason, we include *Vargas 10644* under *M. vargasii* with reservations.

Distribution and phenology:—*Meriania vargasii* is endemic to southern Peru (Department of Cusco) and grows in montane forests at 1690–2080 m. It has been collected in flower from March to June, and in fruit in March, May and June.

Specimens examined:—**PERU. Cusco:** Prov. La Convención, Dist. Echarate, alturas de Papelpata, 2082 m, 12°45'06"S, 72°36'37"W, 21 May 2007 (fr.), *G. Calatayud et al. 3979* (NY!); Dist. Huayopata, localidad Amaybamba, Qda. Quinsapuncuyoc, 1690 m, 12°35'S, 72°18'W, 18 May 2005 (fl.), *G. Calatayud et al. 3181* (NY!), Balconpata, 2200 m, 12°51'01"S, 72°32'46"W, 16 Apr 2004 (fl.), *G. Calatayud et al. 2255* (CUZ!, NY!), San Cristobal, 2120 m, 12°58'51"S, 72°32'58"W, 06 May 2006 (fl.), *H. van der Werff et al. 21425* (NY!); Dist. Maranura, Mesa pelada, 2536 m, 12°33'S, 72°22'W, 21 Apr 2005 (fl.), *L. Valenzuela et al. 5600* (NY!), Mesapelada, 2400 m, 12°54'39"S, 72°37'25"W, 19 Apr 2004 (fl.), *W. Galiano et al. 6156* (CUZ!, NY!); Dist. Ocobamba, Mesa pelada, 1451 m, 12°57'06"S, 72°38'29"W, 25 Mar 2004 (fl., fr.), *L. Valenzuela et al. 3243* (NY!); Dist. Santa Ana, alrededores de Tunquimayo, 1800 m, 21 Apr 1952 (fl.), *C. Vargas 10644* (CUZ!, US!), Tunquimayo, 2800 m, 13°03'S, 72°56'W, 15 Jun 2003 (fr.), *E. Suelli & V. Chama 1015* (NY!); Dist. Vilcabamba, Paltaybamba, quebrada Fuentes Mayo, 1400 m, 13°01'38"S, 72°44'16"W, 08 Jun 2002 (fl.), *L. Valenzuela et al. 152* (CUZ!, NY!).

33. *Meriania vasquezii* Rob.Fern., R.Villanueva & Michelang. in Fernandez-Hilario *et al.*, Willdenowia (2021). Type:—**PERU. Pasco:** Prov. Oxapampa, Dist. Chontabamba, Ulcumano Lodge, 2244 m, 10°38'08"S, 75°25'39"W, 23 Feb 2021 (fl.), *R. Vásquez, L. Valenzuela, E. Pinche & C. Rojas 45480* (holotype: HOXA!; isotypes: MO!, MOL!, UPCB!). (Figure 10, 62, 63).

Comments:—*Meriania vasquezii* differs other Peruvian species of *Meriania* by the combination of leaf blades with dense tomentose indumentum on the abaxial surfaces, evenly covering the entire surfaces, inflorescences with flowers in regular dichasia in the branchlet ends, subcalyptrate calyx with small claw-shaped dorsal projections (3 mm long) and irregular dehiscence, campanulate, fuchsia corollas, dimorphic stamens and antesealous stamen connectives with laterally expanded descending dorso-basal

appendages. *Meriania juanjil* is the only Peruvian species shares subcalyptrate calyces with *M. vasquezii* but differ by the leaf blades size (10.8–12.7 × 2.7–3 cm vs. 16.5–23.5 × 9.3–10.7 cm), arrangement of flowers in branchlet ends (5–7-flowered umbels vs. regular dichasia), and length and color of the petals (11–13.5 mm long and pink-orange vs. 25–31 mm long and fuchsia). A detailed comparison of *M. vasquezii* with other related species can be found in Fernandez-Hilario *et al.* (2021b).

Distribution and phenology:—Known only from the type specimen, *Meriania vasquezii* is endemic to central Peru (Department of Pasco) and grows in montane forests at 2244 m. It has been collected in flower in February.

34. *Meriania vilcabambensis* Wurdack, *Phytologia* 21: 353 (1971). Type:—**PERU**. **Cusco:** Prov. La Convención, Cordillera Vilcabamba, Knox's Cascade, c. 1 km north of Camp 2 ½, NE 14 km walking distance from the Hacienda Luisiana and the Apurimac River, 1730 m, 12°35'S, 73°35'W, 28 Jun 1968 (fl.), *T. Dudley 10595* (holotype: US! [barcode 00120393]; isotype: US! [barcode 02925667]). (Figures 20, 64).

Comments:—*Meriania vilcabambensis* is a poorly known species, only the type has flowers at anthesis, and is characterized by its lobed calyces with small claw-shaped dorsal projections (ca. 3 mm long), dimorphic stamens, stamen connectives with ascending dorsal appendages and antesealous stamen connectives with laterally expanded descending dorso-basal appendages. *Meriania axinioides* Gleason, a species endemic to Bolivia, has leaves similar to *M. vilcabambensis*, but the former differs by its glabrous flowers (vs. granulose-furfurace in *M. vilcabambensis*), calyces with conical dorsal projections not exceeding the apex of the lobes (vs. small claw-shaped dorsal projections exceeding the apex of the lobes), and petals 9–10 mm long (vs. ca. 16 mm long).

Distribution and phenology:—*Meriania vilcabambensis* is endemic to southern Peru (Department of Cusco) and grows in montane forests at 1100–1730 m. It has been collected in flower in June.

Specimens examined:—**PERU**. **Cusco:** Prov. La Convención, Camp 2 ½, ca. 14 km walking distance NE from Hacienda Luisiana and the Apurimac River, 1730 m, 12°30'S, 73°30'W, 28 Jun 1968 (fl. bud), *T. Dudley 10583* (US!); Dist. Echarate, Km 59 al 61 del Derecho de Via del Gaseoducto Camisea, margen izquierdo del río Poyentimari, 1100–1150 m, 09 Apr 2007 (fl. bud), *S. Baldeón et al. 6719* (USM!), Santa Ana, Kepashiato, 1167 m, 12°44'02"S, 73°22'03"W, 19 Aug 2006 (fl. bud), *L. Valenzuela et al. 7494* (NY!, USM!).

35. *Meriania weberbaueri* J.F. Macbr., *Publ. Field Columb. Mus., Bot. Ser.* 4: 176 (1929). Type:—**PERU**. **Junín:** Prov. Jauja, Valley of the Rio Masamerich, tributary of the Rio Pangao, abajo del tambo Calabaza, 1700–1800 m, 07 May 1913 (fl.), *A.*

Weberbauer 6659 (holotype: F! [accession no. 548841]; isotypes: CAS! [barcode 0003308], GH! [barcode 00443873], MICH! [barcode 1111855], MOL! [accession nos. 00441, 00442, 00443, 00444], NY! [barcode 00228985], S! [accession nos. S05-3272, S09-12904], US! [barcodes 00120394, 00946246, 02925664]). (Figures 10, 65, 66).

Comments:—*Meriania weberbauerii* is related to *M. amischophylla* and *M. sumatika* by sharing densely tomentose to villose hypanthia and calyces, calyces with claw-shaped dorsal projections, spreading, fuchsia to reddish-purple corollas, and antesealous stamen connectives with laterally expanded descending dorso-basal appendages. However, *M. weberbauerii* differs from *M. amischophylla* by its 1.3–5.1 cm long petiolate leaves (vs. sessile) and antesealous stamen connectives without dorsal appendages (vs. a mere hump), and *M. weberbauerii* differs from *M. sumatika* by its terete hypanthia (vs. 10-costate) and petals 20–25 mm long (vs. 46–55 mm long).

Meriania weberbauerii inhabits the montane forests of the central Peruvian Andes (Huánuco, Pasco and Junín). In this region there are two other species (*M. tomentosa* and *M. vasquezii*) that can be confused with *M. weberbauerii*. In sterile or fruiting specimens it is almost impossible to differentiate these three species. *Meriania tomentosa* and *M. vasquezii* have calyprate and subcalyprate calyces, respectively, and both with irregular dehiscence, while *M. weberbauerii* has lobed calyces with regular dehiscence. However, in all three species the fruits have deciduous calyces. On the other hand, *M. weberbauerii* has inflorescences with flowers in (3-)4–6(-7)-flowered umbels in the branchlet ends (vs. in regular dichasia in *M. tomentosa* and *M. vasquezii*) and spreading corollas (vs. campanulate in *M. tomentosa* and *M. vasquezii*).

Distribution and phenology:—*Meriania weberbauerii* is endemic to the central Peru (Department of Huánuco, Junín and Pasco) and grows in montane forests at (910-)1700–2780 m. It has been collected in flower in February, March, June, August, September, October and December, and in fruit in March, April, July and September.

Specimens examined:—**PERU. Huánuco:** Carpish, entre Acomayo y Chinchao, 2600-2700 m, 11 Feb 1950 (fl.), *R. Ferreyra 6847* (MOL!, US!, USM!). **Junín:** Prov. Chanchamayo, Dist. San Ramón, Alto Pichita Fundo "Vista Alegre" – APRODES, 2200 m, 11°05'42"S, 75°25'57"W, 27-30 Mar 2002 (fl.), *A. Daza & A. Reyna 2249* (MOL!), (fl.), 2252 (MOL!), (fl.), 2257 (MOL!), 08-10 Dec 2002 (fl.), *A. Daza et al. 2056* (MOL!), Puyu Sacha, 2240 m, 11°05'41.77"S, 75°26'44.89"W, 13 Mar 2018 (fl.), *A. Daza 6522* (MOL!), 2230 m, 11°05'39.33"S, 75°26'43.44"W, 10-14 Mar 2020 (fl.), *S. Terreros & R. Villanueva-Espinoza 191* (MOL!, UPCB!), 2230 m, 11°05'26"S; 75°26'45"W, 14 Mar 2020 (fl.), *R. Villanueva-Espinoza & S. Terreros 470* (MOL!), 2100 m, 11°05'25"S; 75°26'00"W, 28 May to 04 Jun 2021 (fl.), *R. Villanueva-Espinoza 610* (MOL!). Prov. Satipo, Dist. Río Tambo, Parque Nacional Otishi, Comunidad Nativa Pichiquia, 2060 m, 11°22'28"S, 73°59'28"W, 11 Jul 2013 (fr.), *L. Valenzuela et al. 24853* (HOXA!). Prov. Tarma, Agua Dulce, 1800 m, 08 Mar 1948 (fl.), *F. Woytkowski 35430* (F!). **Pasco:** Prov. Oxapampa, Parque Nacional Yanachaga

Chemillen, 913 m, 10°19'48"S, 73°23'17.16"W, 18 Aug 2010 (fl.), *X. Ge et al. 361* (USM!); Dist. Huancabamba, PNYCH, Quebrada Yanachaga, 2380 m, 10°23'36.6"S, 75°28'28.9"W, 20 Feb 2018 (fl. bud), *F. A. Michelangeli & S. Riva 2976* (HOXA!, USM!), PNYCH, sector Quebrada Yanachaga, 2265 m, 10°23'45"S, 75°28'55"W, 19 Aug 2004 (fl., fr.), *R. Vásquez et al. 30433* (HOXA!, NY!, USM!), PNYCH, Sector Tunqui (Quebrada Muchuymayo), 1923 m, 10°17'53"S, 75°30'54"W, 11 Feb 2009 (fl. bud), *R. Vásquez et al. 35159* (HOXA!, MO!, USM!), Zona de amortiguamiento PNYCH (Quebrada Yanachaga), 2347 m, 10°23'49"S, 75°28'36"W, 16 Sep 2004 (fl., fr.), *J. Perea & J. Mateo 1769* (HOXA!, NY!); Dist. Oxapampa, Carretera al sector San Alberto del PNYCH, cerca de la planta hidroeléctrica, ca. 5 km de Oxapampa, 2150 m, 10°32'57"S, 75°22'27"W, 20 Mar 2016 (fl., fr.), *F. A. Michelangeli et al. 2714* (NY!, USM!), Localidad La Suiza Neva, 2200 m, 10°45'01"S, 75°30'01"W, 17 Apr 2010 (fr.), *R. Vásquez et al. 36471* (HOXA!, NY!, USM!), PNYCH, quebrada Yanachaga, 2370 m, 10°23'S, 75°28'W, 10 Jun 2003 (fl.), *R. Vásquez et al. 28104* (HOXA!, NY!), Sector Llamaquizú – La Colina, 2109 m, 10°35'56.4"S, 75°21'49.9"W, 02 Dec 2015 (fl.), *L. Valenzuela et al. 29236* (HOXA!), PNYCH, Sector San Alberto, en el Abra Esperanza y alrededores, 2780 m, 10°31'55"S, 75°20'59"W, 02 Oct 2007 (fl.), *C. Arias et al. 335* (HOXA!).

36. *Meriania zunacensis* D.Fernández & Dellinger, in Fernández-Fernández *et al.*, Phytotaxa 458: 7 (2020). Type:—**ECUADOR. Tungurahua:** Cantón Baños, Parroquia Río Negro, Sector El Topo, Estación Científica Río Zuñac, Fundación EcoMinga, 1568 m, 01°22.593'S, 78°09.213'W, 26 May 2018 (fl., fr.), *L. Jost, F. Recalde & S. Recalde 10600* (holotype: QCNE! [barcodes 243978, 243977]; isotype: QCNE! [barcode 243976]). (Figures 36, 67).

Comments:—Among Peruvian species of *Meriania*, it is distinguishable by combination of quadrangular and ribbed internodes, nodes with interpetiolar flaps, an adaxial projection (scutum) on the transition zone from the petiole to the midvein, leaf blades with flat adaxial surfaces, spreading, reddish-purple corollas, isomorphic stamens and pyriform mature ovaries. Among Peruvian species, *M. zunacensis* most closely resembles *M. callosa* and *M. megaphylla* (see comments under these species for differences). A detailed comparison of *M. zunacensis* with other related species can be found in Fernández-Fernández *et al.* (2020) and Fernandez-Hilario *et al.* (2021b).

Distribution and phenology:—*Meriania zunacensis* occurs in Ecuador and northern Peru (Department of Amazonas in montane forests at 1500–2280 m). It has been collected in flower in February, June and July, and in fruit in February and July.

Specimens examined:—**PERU. Amazonas:** Prov. Amazonas, Dist. Vista Alegre, entre Vista Alegre y La Ventana a Naciento del Río Negro, 1500–1640 m, 06°08'S, 77°18'W, 02 Jul 1998 (fl., fr.), *I. Sánchez et al. 9610* (F!); Prov. Bagua, La Peca, 1850–1900 m, 14 Jun 1978 (fl. bud), *A. Gentry et al. 23012* (USM!, US!); Prov. Bongará, Dist. Yambrasbamba, inmediaciones de la Estación Biológica Abra Patricia, trochas

cercanas a la estación, 2280 m, 05°41'43.40"S, 77°48'47.91"W, 19–20 Feb 2020 (fl., fr.), *R. Fernandez-Hilario et al. 1920* (HOXA!, KUELAP!, MOL!, NY!, UPCB!), trocha Lechuza en la Estación Biológica Abra Patricia, 2123 m, 05°41'18.89"S, 77°48'23.68"W, 21 Feb 2020 (fl.), *R. Fernandez-Hilario et al. 1938* (HOXA!, MOL!, UPCB!).

Specimens excluded

The following specimens could not be designated to any of the species recognised in this synopsis due to the lack of critical structures. Most specimens have only fruits or flowers with stamens in poor condition. Probably some of the specimens may correspond to undescribed species:—**PERU. Amazonas:** Prov. Bagua, ca. 20 km (by trail) E of La Peca, 2020 m, 13 Aug 1978 (fl. bud), *P. Barbour 2943* (US!). Prov. Bongará, Dist. Yambrasbamba, Inmediaciones de CP Miraflores, 2050 m, 5°42'03.74"S; 77°55'36.03"W, 10 Nov 2020 (fr.), *R. Fernandez-Hilario et al. 2031* (HOXA!, KUELAP!, MOL!, UPCB!, NY!), Ruta desde CP La Florida hacia finca de Don Ilario, 2150 m, 5°40'21.68"S; 77°57'16.02"W, 12 Nov 2020 (fr.), *R. Fernandez-Hilario et al. 2062* (HOXA!, KUELAP!, MOL!, UPCB!, NY!). Prov. Luya, Dist. Camporendon, Tullanya, Pascana, Pájaro Tigre, 2370 m, 06°06'33"S, 78°20'55"W, 4 Dec 1996 (fr.), *R. Vásquez & R. Rojas 21935* (NY!, USM!), same locality and data, (fr.), *R. Vásquez & R. Rojas 21943* (USM!). **Cajamarca:** Prov. Cutervo, Dist. San Andrés de Cutervo, Parque Nacional Cutervo, 2230 m, 06°10'S, 78°40'W, 10 Sep 1991 (fr.), *A. Gentry et al. 74649* (USM!). Prov. Hualgayoc, Hacienda Taulis, 2500 m, 13 Oct 1954 (fl.), *W. Rauh 2202* (US!), Hacienda Taulis, below Palmito on the road to the Casa Hacienda., 2500 m, 06°54'S, 79°03'W, 31 Aug 1964 (fl.), *P. Hutchison & K. von Bismarck 6393* (F!, NY!, USM!, US!). Prov. San Ignacio, Selva Andina, 2020 m, 04°59'22"S, 78°53'03"W, 19 Nov 1999 (fr.), *S. Flores & R. Vásquez 288* (NY!, USM!); Dist. Huarango, Nuevo Mundo, quebrada Santa Rosa (a dos horas de Pisaguas), 1700 m, 05°10'05"S; 68°32'00"W, 10 Nov 1997 (fr.), *J. Campos & S. Nuñez 4581* (MOL!, USM!, HUT!, NY!); Dist. San José de Lourdes, Campamento "Tomas", 2100 m, 04°59'37"S, 78°53'35"W, 16 Jun 2001 (fl. bud), *E. Vicuña et al. 291* (USM!, HUT!). Prov. Santa Cruz, ca. 4 km (por aire) ENE Montesecco, 2350 m, 06°51'26.28"S, 79°06'44.44"W, 16 Jun 1987 (fl.), *J. Santisteban & J. Guevara 182* (F!, HUT!, US!). **Cusco:** Prov. Calca, Dist. Yanatile, Estrella, 1567 m, 12°26'50"S; 72°30'05"W, 20 Oct 2005 (fr.), *E. Suclli et al. 2570* (NY!). Prov. La Convención, Dist. Echarati, Tingkanari, 2179 m, 12°15'46"S, 72°05'53"W, 11–12 May 2004 (fl. bud), *N. Salinas et al. 7251* (USM!); Dist. Huayopata, Abra Malaga, km 151 de la carretera, 3380 m, 13°06'8.61"S; 72°22'26.70"W, 28 Feb 2020 (ster.), *R. Fernandez-Hilario & S. Bejar 1997* (HOXA!, KUELAP!, MOL!, UPCB!), Carretera Quillabamba-Abra Malaga, km 151 en la carretera, 3362 m, 13°05'49.1"S; 72°22'37.5"W, 21 Jun 2012 (fr.), *F. A. Michelangeli et al. 1991* (NY!, USM!); Dist. Santa Ana, Bosque de Chuyapi, 2236 m, 12°56'55"S, 72°47'07"W, 17 Jul 2006 (fr.), *L. Valenzuela et al. 7237* (USM!). Prov. Paucartambo, Dist. Kosñipata, San Pedro, bosque en el borde de la carretera., 2210 m, 13°07'41"S; 71°34'39"W, 28 Oct 2007 (fl.), *R. Vásquez et al. 32932* (NY!). Prov. Quispicanchi,

Dist. Camanti, Community of Vitobamba. Trocha Jeferson, 1596 m, 13°19'47.28"S, 70°48'2.88"W, 17 Mar 2011 (fl.), *J. Wells et al.* 697 (USM!). Prov. Urubamba, Dist. Machupicchu, Aguas Calientes, Quebrada Alccamayo, 2050-2200 m, 13°09'02"S; 72°30'28"W, 28 Aug 2002 (fl., fr.), *I. Huamantupa & G. Calatayud* 2185 (NY!, USM!, CUZ!), Cerro Alcamayo, 2200 m, 13°09'S, 72°30'W, 19 Nov 2003 (fr.), *I. Huamantupa et al.* 3748 (CUZ!), in the streambed of the Rio Mandor 2.5 km from Machu Pichu (plot #69), 2055 m, 02 Jun 1982 (fl. bud), *B. Peyton & S. Tilney* 384 (US!). **Loreto:** Prov. Alto Amazonas, Dist. Balsapuerto, Cordillera Escalera, Field Museum Inventario Rápido #26, Campamento Cumbre - Alto Cachiyacu, 1930 m, 05°52'02.1"S; 76°46'29.3"W, 22 Sep 2013 (fl.), *M. Ríos et al.* 3318 (AMAZ!, F!). **Pasco:** Prov. Oxapampa, Dist. Huancabamba, Mallampampa, 2400 m, 75°45'W, 10°2'S, 22 Jan 1984 (fl.), *D. Smith & J. Canne* 5809 (USM!, US!). **Piura:** Prov. Huancabamba, Dist. El Carmen de la Frontera, Caserío Sagrado Corazón de Jesús, 1979 m, 4°57'07.55"S, 79°21'09.02"W, 29 Oct 2015 (fr.), *D. Paredes et al.* 570 (NY!, USM!).

Doubtful names and excluded taxa

Meriania dependens (Ruiz & Pav. ex D. Don) Naudin = *Axinaea dependens* Ruiz & Pav. ex D. Don. Notes:—This Peruvian species was treated as *M. dependens* by Naudin (1852) in his revision of the family. However, it has characteristics typical of *Axinaea* (see additional comments under *M. rubriflora*) and has been treated in that genus by Eves (1936), Macbride (1941) and Cotton *et al.* (2014).

Meriania intonsa Gleason = *Adelobotrys intonsus* (Gleason) Wurdack. Notes:—Species cited by Macbride (1941) in his treatment of *Meriania* for Peru. However, Wurdack (1969) transferred it to *Adelobotrys* because of the presence of malpighiaceae trichomes.

Meriania nobilis Triana. Notes:—Species cited by Macbride (1941) in his treatment of *Meriania* for Peru based in *Ruiz & Pavón s.n.* We have not been able to locate the specimen to verify the identification. Nevertheless, Macbride (1941) also indicated that the specimen was probably misidentified. *Meriania nobilis* is endemic to Colombia.

Meriania oblongifolia Cogn. = *Axinaea oblongifolia* (Cogn.) Wurdack. Notes:—Species cited by Macbride (1941) in his treatment of *Meriania* for Peru. However, Wurdack (1970) transferred it to *Axinaea* because of the presence of stamen connectives with bulbous dorso-basal appendages. This species has been treated under *Axinaea* by Cotton *et al.* (2014).

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TABLE 1. Distribution of *Meriania* species by department in Peru. (*) Endemic.

Species	Amazonas	Ayacucho	Cajamarca	Cusco	Huánuco	Junín	La Libertad	Lambayeque	Loreto	Pasco	Piura	San Martín	Ucayali
<i>Meriania acida</i> (*)			X										
<i>Meriania amischophylla</i> (*)					X								
<i>Meriania bicentenaria</i> (*)										X			
<i>Meriania bongarana</i> (*)	X												
<i>Meriania callosa</i> (*)	X												
<i>Meriania cuzcoana</i> (*)				X									
<i>Meriania dazae</i> (*)	X												
<i>Meriania drakei</i>	X												
<i>Meriania escalerensis</i> (*)									X				
<i>Meriania franciscana</i>	X		X										
<i>Meriania hirsute</i> (*)											X		
<i>Meriania juanjil</i> (*)	X												
<i>Meriania megaphylla</i> (*)							X						
<i>Meriania microflora</i> (*)	X												
<i>Meriania neillii</i>	X	X	X	X	X	X				X	X		X
<i>Meriania ninakurorum</i> (*)												X	
<i>Meriania peltata</i>			X										
<i>Meriania penningtonii</i> (*)	X												
<i>Meriania prunifolia</i> (*)												X	
<i>Meriania radula</i>	X		X		X		X			X		X	
<i>Meriania rigida</i>	X		X								X	X	
<i>Meriania rubriflora</i> (*)										X			
<i>Meriania rugosa</i> (*)	X												
<i>Meriania sanguinea</i>	X		X		X					X	X	X	
<i>Meriania sessilifolia</i> (*)			X										
<i>Meriania speciosa</i>	X											X	
<i>Meriania sumatika</i> (*)				X									
<i>Meriania tetragona</i>	X		X					X			X		
<i>Meriania tetraquetra</i> (*)	X											X	
<i>Meriania tomentosa</i>	X		X	X	X	X				X	X	X	
<i>Meriania urceolata</i>												X	
<i>Meriania vargasii</i> (*)				X									
<i>Meriania vasquezii</i> (*)										X			
<i>Meriania vilcabambensis</i> (*)				X									
<i>Meriania weberbaueri</i> (*)					X	X				X			
<i>Meriania zunacensis</i>	X												
Total	18	1	10	6	6	3	2	1	1	8	6	9	1

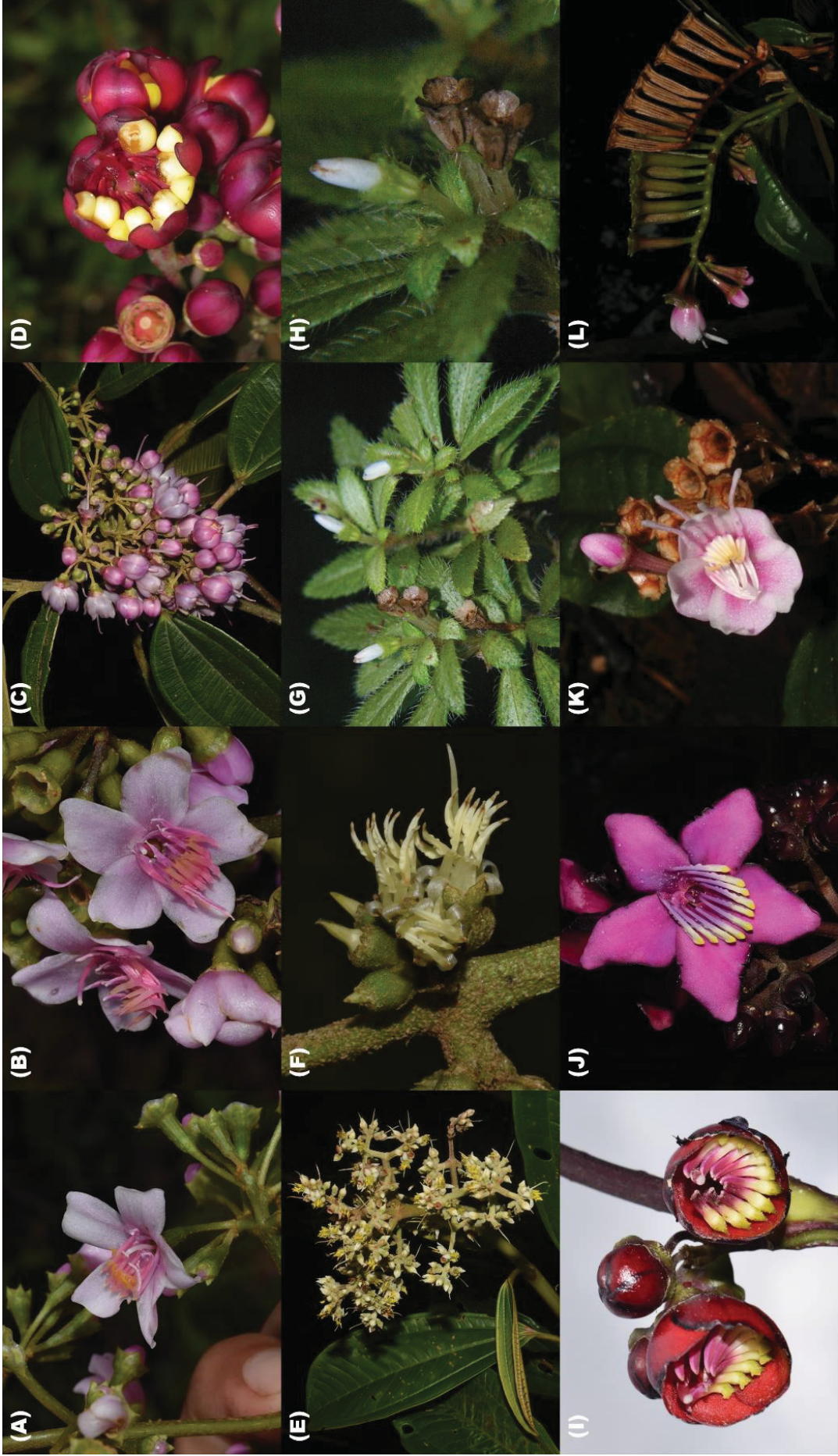


FIGURE 1. Genera of Merianieae in Peru. **A.** *Adelobotrys* (*R. Fernandez-Hilario & A. Vásquez 1591*). **B.** *Adelobotrys* (*R. Fernandez-Hilario et al. 1658*). **C.** *Axinaea* (*R. Fernandez-Hilario et al. 1426*). **D.** *Axinaea* (*R. Fernandez-Hilario et al. 195*). **E.** *Graffenrieda* (*R. Fernandez-Hilario et al. 1737*). **F.** *Graffenrieda* (*R. Fernandez-Hilario et al. 1662*). **G-H.** *Macrocentrum* (*R. Vásquez et al. 39321*). **I.** *Meriania* (*R. Fernandez-Hilario et al. 2092*). **J.** *Meriania* (*R. Fernandez-Hilario et al. 1931*). **K-L.** *Salpinga* (*J. P. Janovec 3248*). Photos by Robin Fernandez-Hilario (A-F and I-J); Rodolfo Vásquez (G-H) and Jhon P. Janovec (K-L).



FIGURE 2. Morphological characteristics of Peruvian *Meriania*. **A.** Interpetiolar line (*M. tomentosa*; R. W. Bussmann et al. 17068). **B.** Interpetiolar flap (*M. zunacensis*; R. Fernandez-Hilario et al. 1920). **C.** Winged internode (*M. penningtonii*; R. Fernandez-Hilario et al. 2072). **D.** Winged internode (*M. tetragona*; R. Fernandez-Hilario et al. 2092). **E.** Adaxial projection (scutum) in the transition zone from the petiole to the midvein (*M. zunacensis*; R. Fernandez-Hilario et al. 1920). **F.** Swollen adaxial projection on the petiole apex (*M. drakei*; R. Fernandez-Hilario et al. 1775). **G.** Liguliform abaxial projections in the transition zone from the petiole to the midvein (*M. sanguinea*; R. Fernandez-Hilario et al. 1896). **H.** Tuberculate abaxial projections in the transition zone from the petiole to the midvein (*M. tetragona*; F. A. Michelangeli et al. 1739). **I.** Spreading corolla (*M. rigida*; R. Fernandez-Hilario et al. 1931). **J.** Campanulate corollas (*M. dazae*; J. L. Marcelo-Peña et al. 6568). **K.** Fruits with mature ovaries exceeding the hypanthia length (*M. sanguinea*; F. A. Michelangeli et al. 2743). **L.** Fruits with mature ovaries completely concealed by the hypanthia (*M. tomentosa*; F. A. Michelangeli et al. 1799). Photos by Rainer W. Bussmann (A); Robin Fernandez-Hilario (B-G and I-J); and Fabián A. Michelangeli (H, K and L).

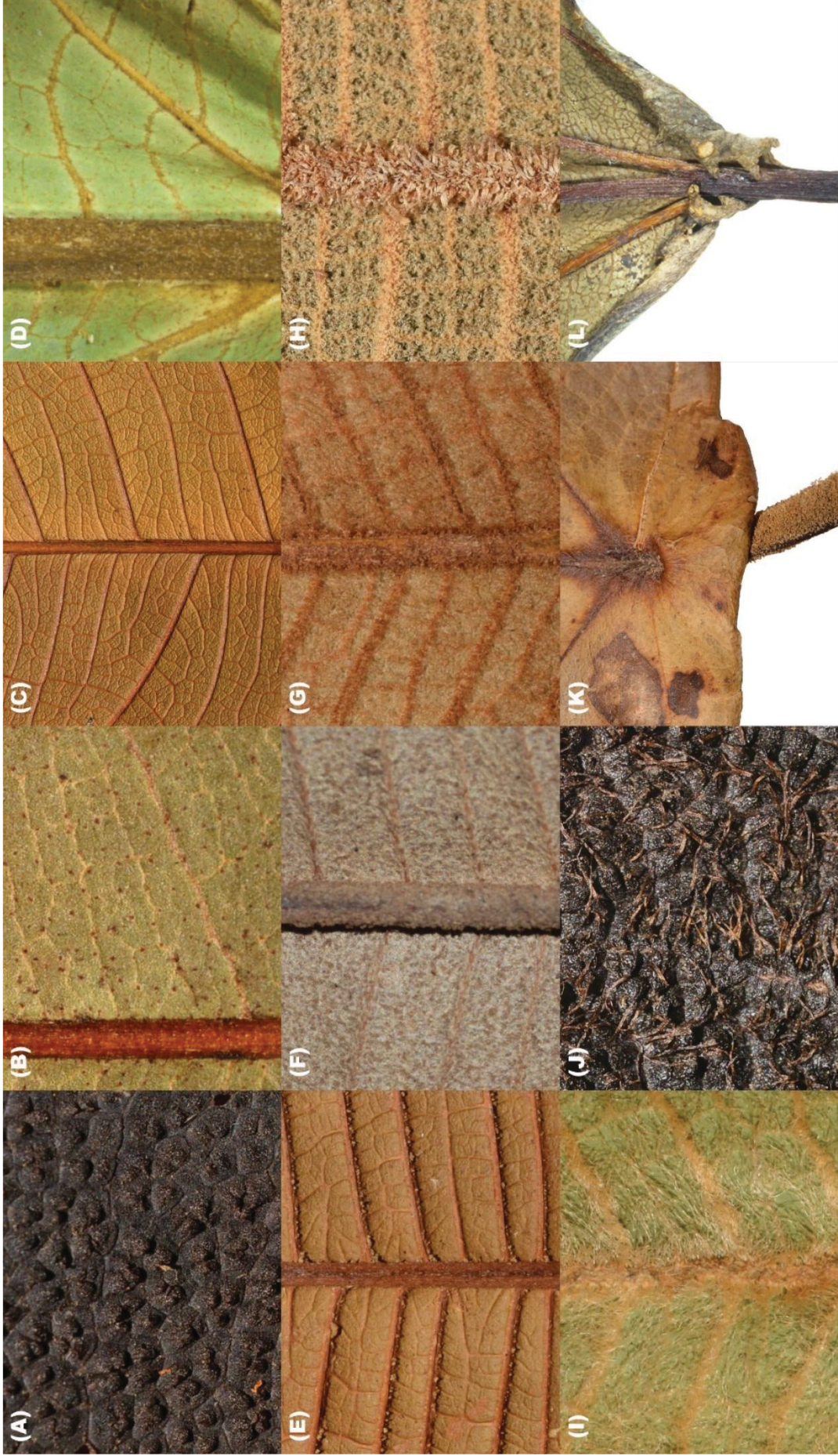


FIGURE 3. Morphological characteristics of Peruvian *Meriania*. **A.** Bullate adaxial leaf surface (*M. sanguinea*; R. Fernandez-Hilario et al. 1896). **B.** Punctiform abaxial leaf surface (*M. cuzcoana*; W. Farfán et al. 976). **C.** Glabrous abaxial leaf surface (*M. callosa*; R. Fernandez-Hilario et al. 2055). **D.** Furfuraceous abaxial leaf surface (*M. vilcabambensis*; L. Valenzuela 7494). **E.** Puberulent abaxial leaf surface (*M. drakei*; R. Fernandez-Hilario et al. 1775). **F.** Pubescent abaxial leaf surface (*M. bicentenaria*; A. Monteagudo et al. 6960). **G.** Tomentose abaxial leaf surface (*M. tomentosa*; R. Fernandez-Hilario et al. 1905). **H.** Setulose abaxial leaf surface (*M. radula*; D. Páredes et al. 604). **I.** Villose abaxial leaf surface (*M. sumatika*; I. Huamantupa et al. 2060). **J.** Hirsute abaxial leaf surface (*M. hirsuta*; S. Baldeón & J. Campos 5373). **K.** Peltate leaf base (*M. peltata*; R. Fernandez-Hilario et al. 2093). **L.** Leaf base with dentate-undulate revolute auricles (*M. cuzcoana*; L. Valenzuela et al. 6904).

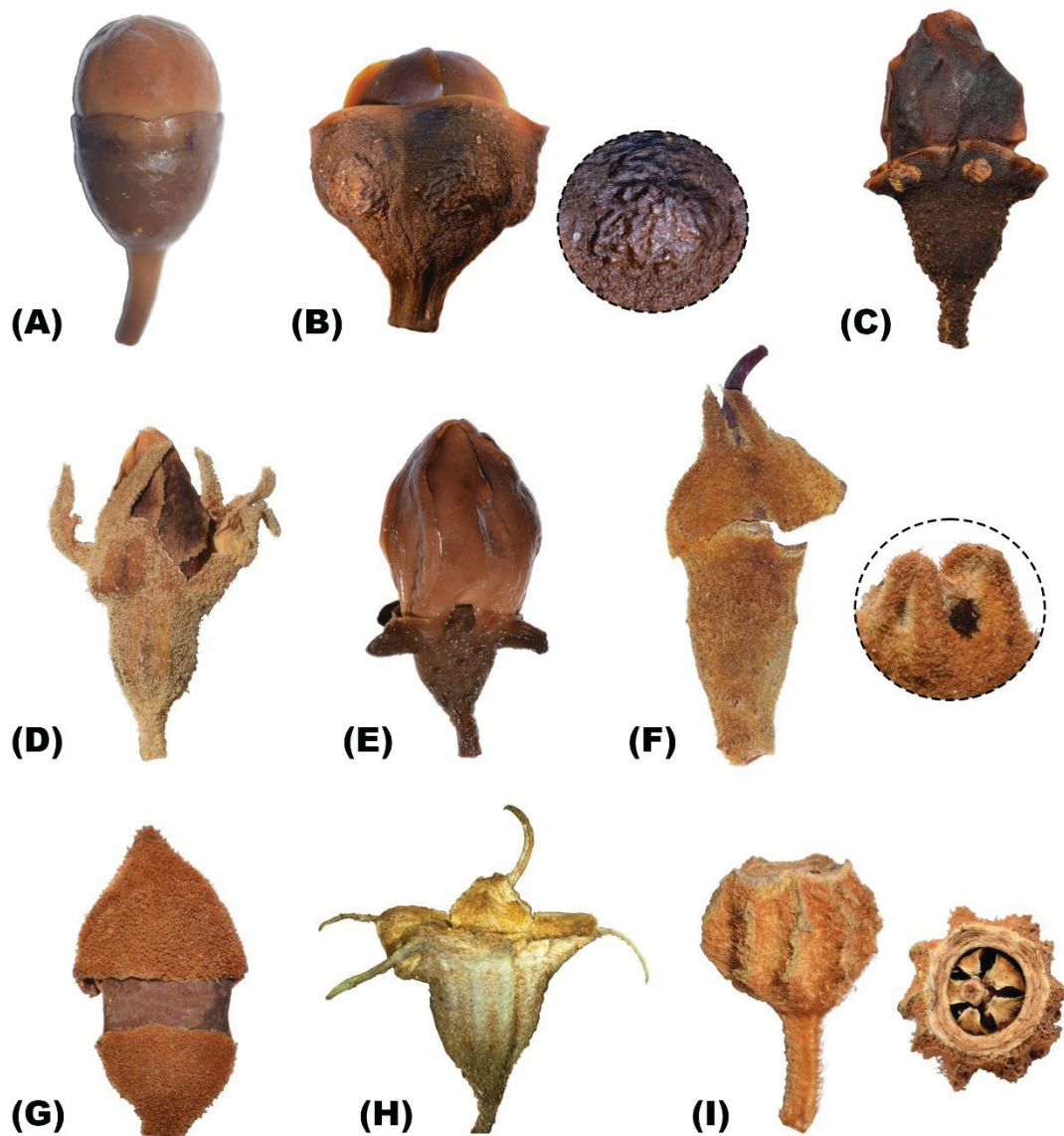


FIGURE 4. Morphological characteristics of Peruvian *Meriania*. **A.** Calyx lacks dorsal projections (*M. hexamera*; I. Revilla 3484). **B.** Calyx with callose dorsal projections (left), and detail of a dorsal projection (right) (*M. callosa*; R. Fernandez-Hilario et al. 2055). **C.** Calyx with whitish callose dorsal projections (*M. penningtonii*; R. Fernandez-Hilario et al. 2072). **D.** Calyx with claw-shaped dorsal projections (*M. dazae*; J. L. Marcelo-Peña et al. 6568). **E.** Calyx with blunt dorsal projections (*M. rugosa*; H. van der Werff 17006). **F.** Subcalyprate calyx with small claw-shaped projections and irregular dehiscence (left), and detail of the subcalyprate calyx apex (right) (*M. vasquezii*; R. Vásquez et al. 45480). **G.** Calyprate calyx with circumscissile dehiscence (*M. escalerensis*; M. Ríos et al. 3316). **H.** Calyx with aciculate dorsal projections and slightly costate hypanthium (*M. prunifolia*; J. Schunke 11712). **I.** Costate hypanthium with 10 evident ribs (left) and apical view (right) (*M. sumatika*; P. Nuñez & J. Arque 8369).

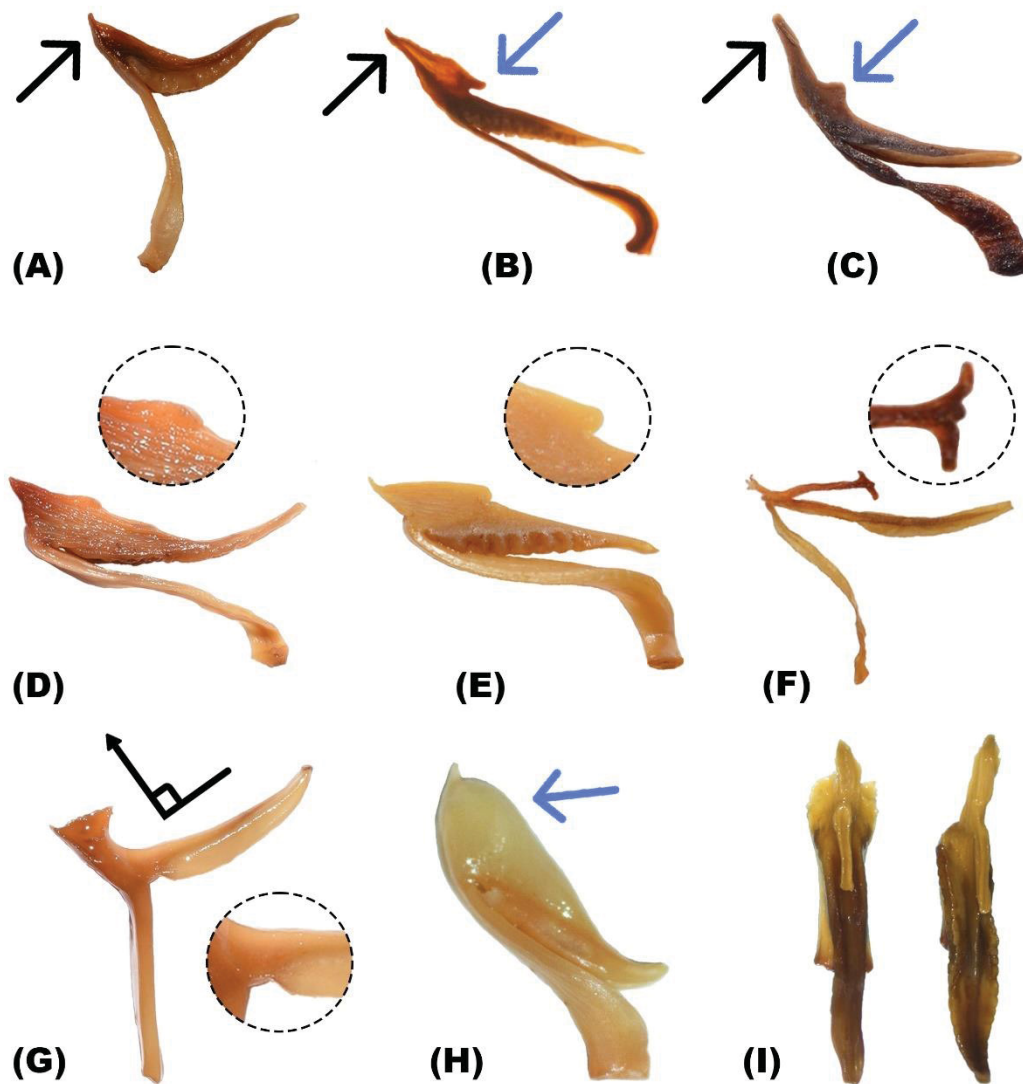


FIGURE 5. Morphological characteristics of Peruvian *Meriania*. **A.** Stamen with a triangular descending dorso-basal appendage (black arrow) but no dorsal appendage (*M. tetraquetra*; R. Fernandez-Hilario & A. Vásquez 251). **B.** Stamen with a triangular descending dorso-basal appendage and blunt ascending dorsal appendage (blue arrow) (*M. megaphylla*; A. Weberbauer 7048). **C.** Stamen with an acuminate descending dorso-basal appendage (black arrow) and dorsal appendage as a mere hump (blue arrow) (*M. franciscana*; C. Díaz & S. Fernández 10150). **D.** Stamen with a triangular descending dorso-basal appendage and dorsal appendage as a mere hump, and detail of the dorsal appendage (*M. rugosa*; F. A. Michelangeli et al. 1725). **E.** Stamen with a triangular descending dorso-basal appendage and dentiform dorsal appendage, and detail of the dorsal appendage (*M. hexamera*; I. Revilla 3484). **F.** Stamen with a multilobed descending dorso-basal appendage and apically trilobed ascending dorsal appendage, and detail of the dorsal appendage apex (*M. microflora*; I. Huamantupa et al. 15552). **G.** Stamen with an almost perpendicular dorso-basal appendage to the theca, and detail of the prolonged connective below the theca (*M. tetragona*; R. Fernandez-Hilario et al.

2092). **H.** Stamen with inflated connective (blue arrow) (*M. bicentenaria*; R. Villanueva-Espinoza 675). **I.** Antesepalous stamen with laterally expanded dorso-basal appendage (left) and antepetalous stamen with dorso-basal appendage not laterally expanded (right) (*M. vilcabambensis*; L. Valenzuela 7494).

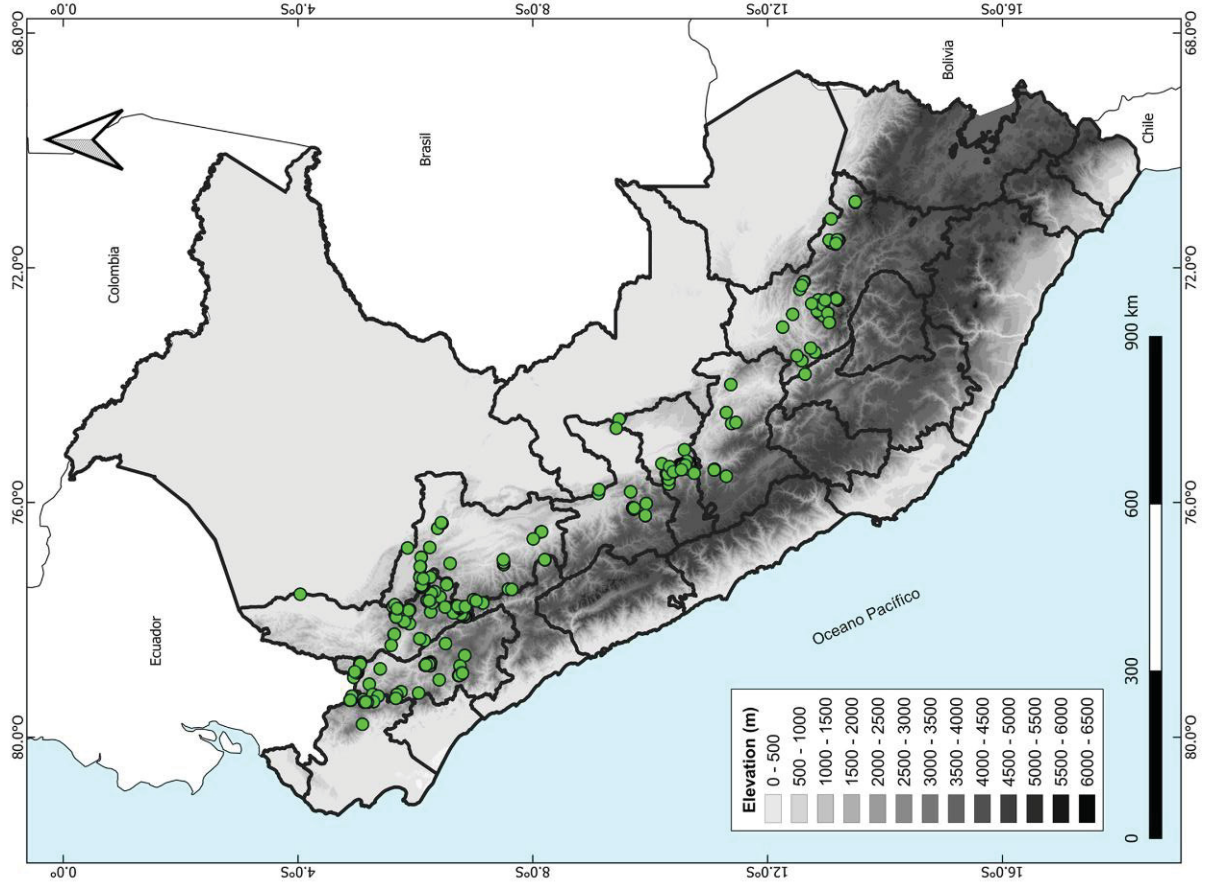
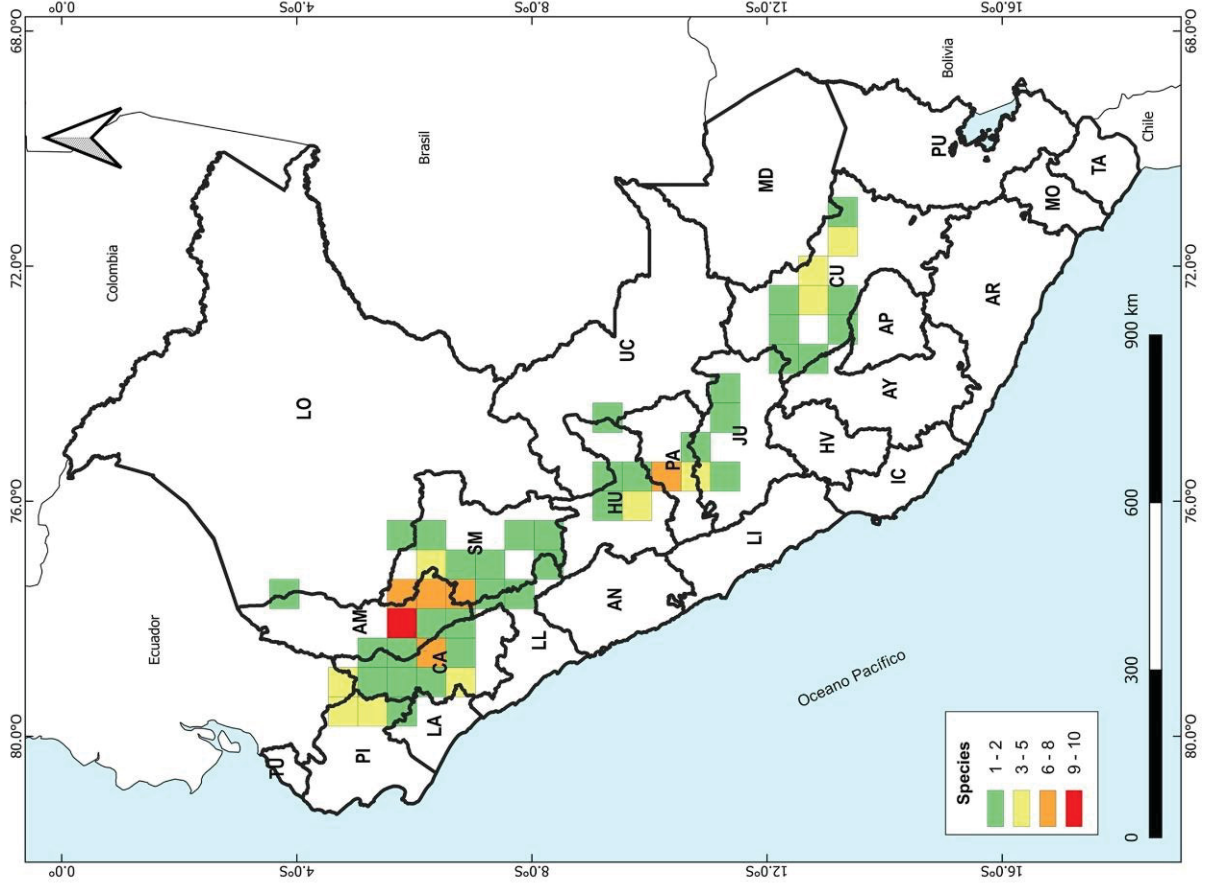


FIGURE 6. Map with location of the examined *Meriania* specimens in this treatment (left), and map with species richness showing the most diverse grids (right). Departmental abbreviations: AM (Amazonas), AN (Ancash), AP (Apurímac), AR (Arequipa), AY (Ayacucho), CA (Cajamarca), CU (Cusco), HU (Huánuco), HV (Huancavelica), IC (Ica), JU (Junín), LA (Lambayeque), LL (La Libertad), LI (Lima), LO (Loreto), MD (Madre de Dios), MO (Moquegua), PA (Pasco), PI (Piura), PU (Puno), SM (San Martín), TA (Tacna), TU (Tumbes) and UC (Ucayali).

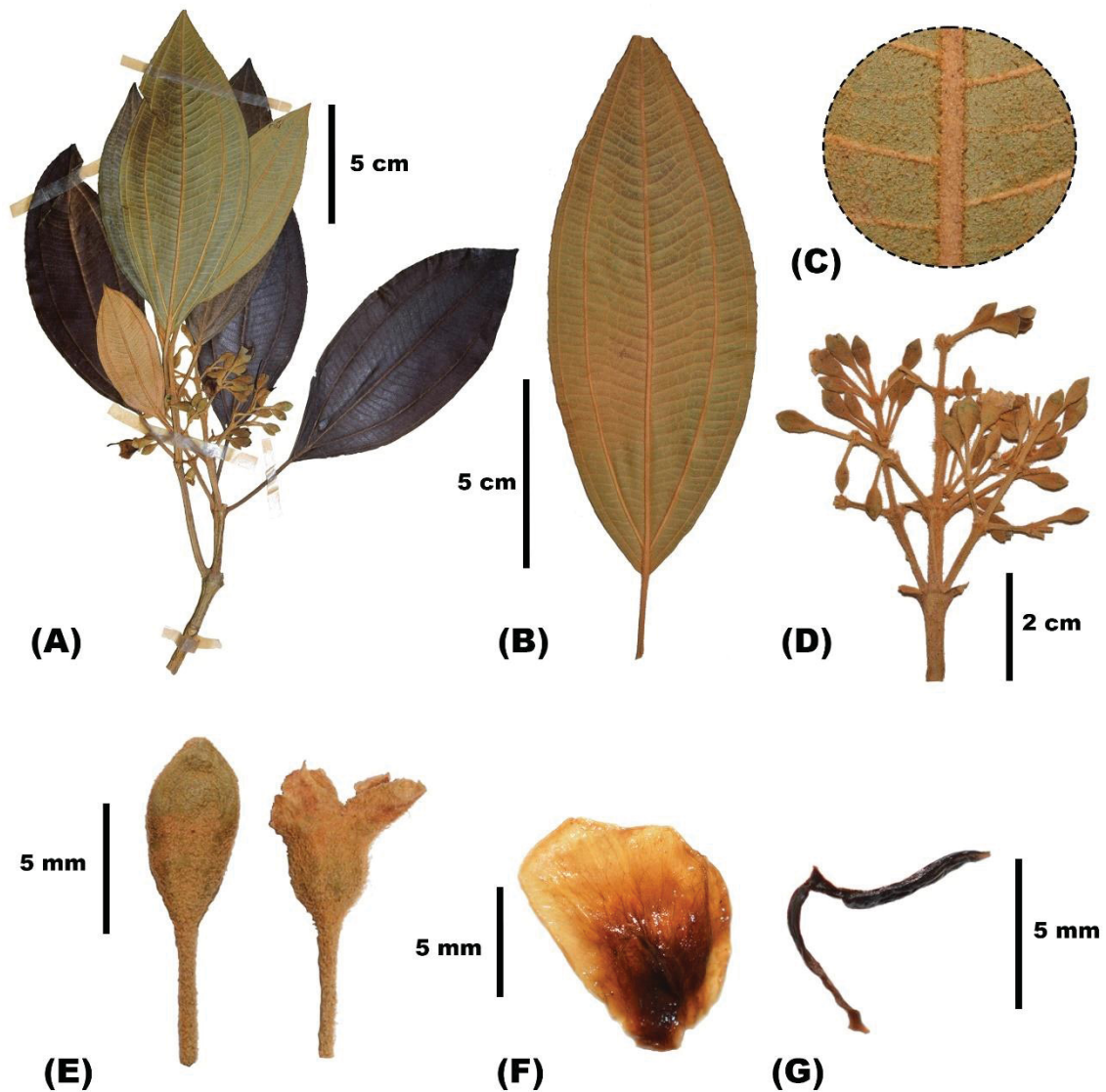


FIGURE 7. *Meriania acida*. **A.** Terminal fertile branch with inflorescence. **B.** Leaf blade, abaxial view. **C.** Detail of abaxial leaf surface. **D.** Inflorescence with flower buds. **E.** Flower bud (left) and calyx with irregular dehiscence (right). **F.** Petal. **G.** Stamen, lateral view. A-G from *A. Raimondi* 3695.

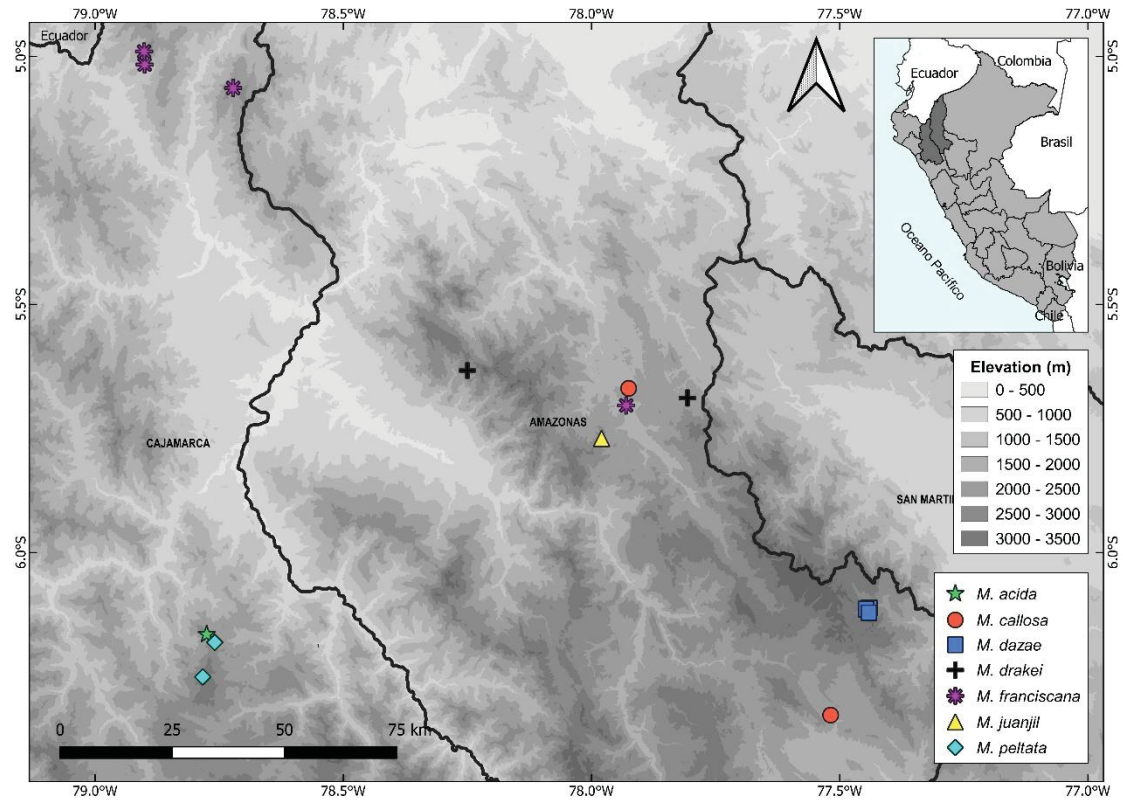


FIGURE 8. Distribution map of *M. acida*, *M. callosa*, *M. dazae*, *M. drakei*, *M. franciscana*, *M. juanjil* and *M. peltata*.

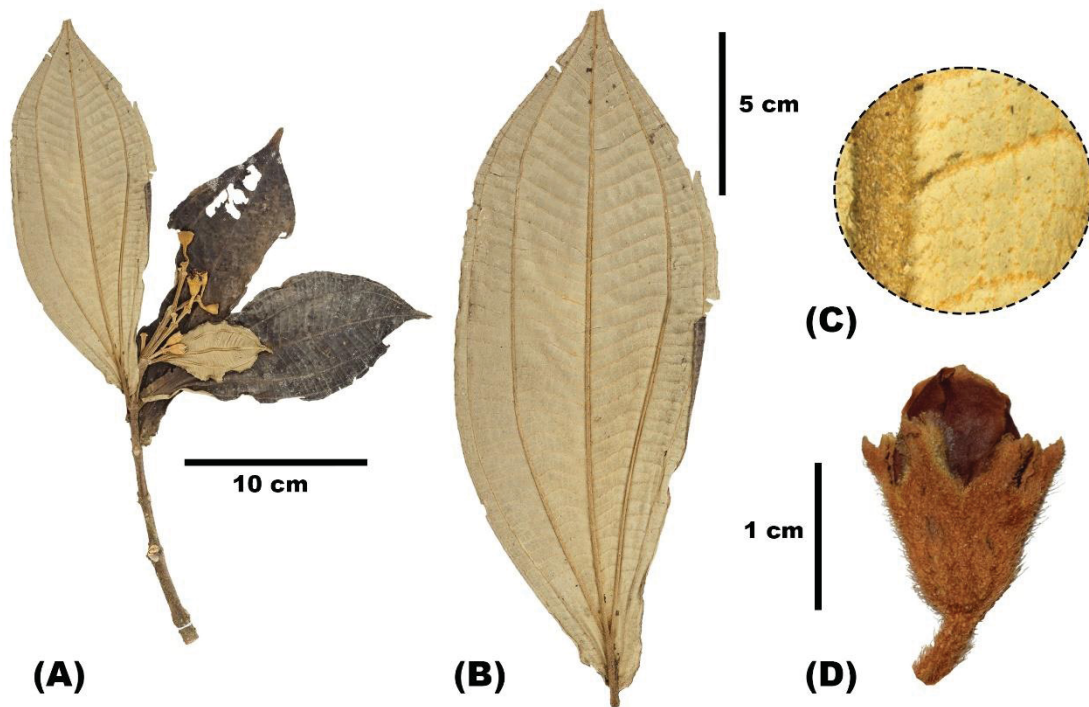


FIGURE 9. *Meriania amischophylla*. **A.** Terminal fertile branch with inflorescence. **B.** Leaf blade, abaxial view. **C.** Detail of abaxial surface. **D.** Flower bud. A-D from *J. Schunke 11374*.

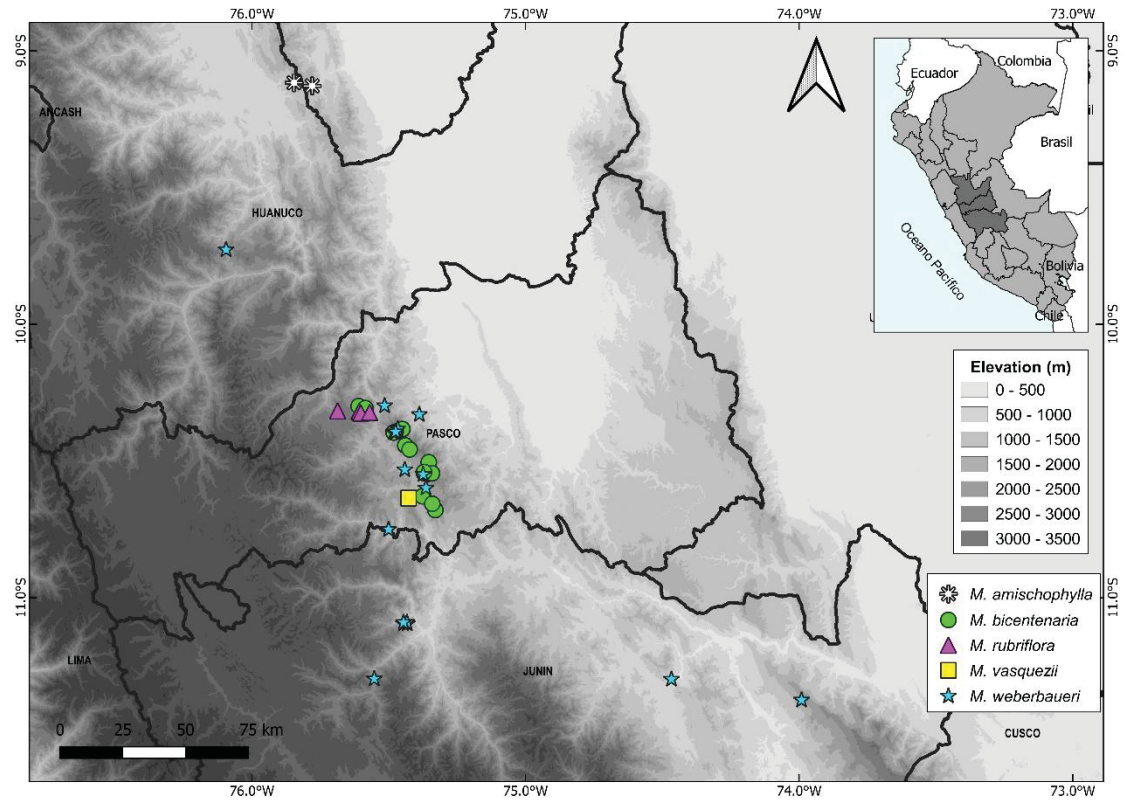


FIGURE 10. Distribution map of *M. amischophylla*, *M. bicentenaria*, *M. rubriflora*, *M. vasquezii* and *M. weberbaueri*.

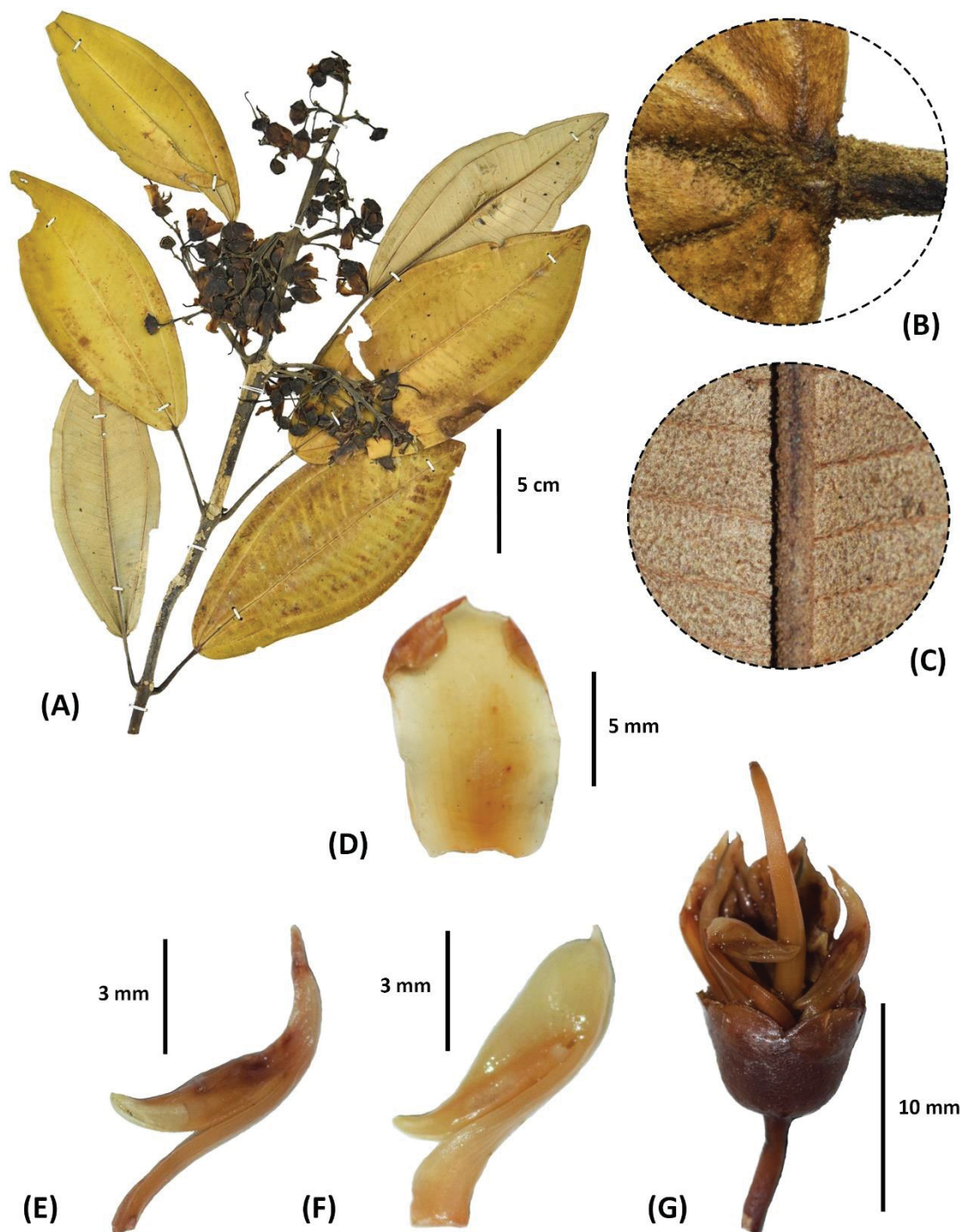


FIGURE 11. *Meriania bicentenaria*. **A.** Terminal fertile branch with inflorescence. **B.** Detail of the base of the leaf blade. **C.** Detail of the abaxial leaf surface. **D.** Petal. **E.** Antesepalous stamens, lateral view. **F.** Antepetalous stamen, lateral view. **G.** Flower with petals removed. A-C from A. Monteagudo *et al.* 6960; D-G from R. Villanueva-Espinoza 675. Reproduced with permission from Wildenowia (2021).

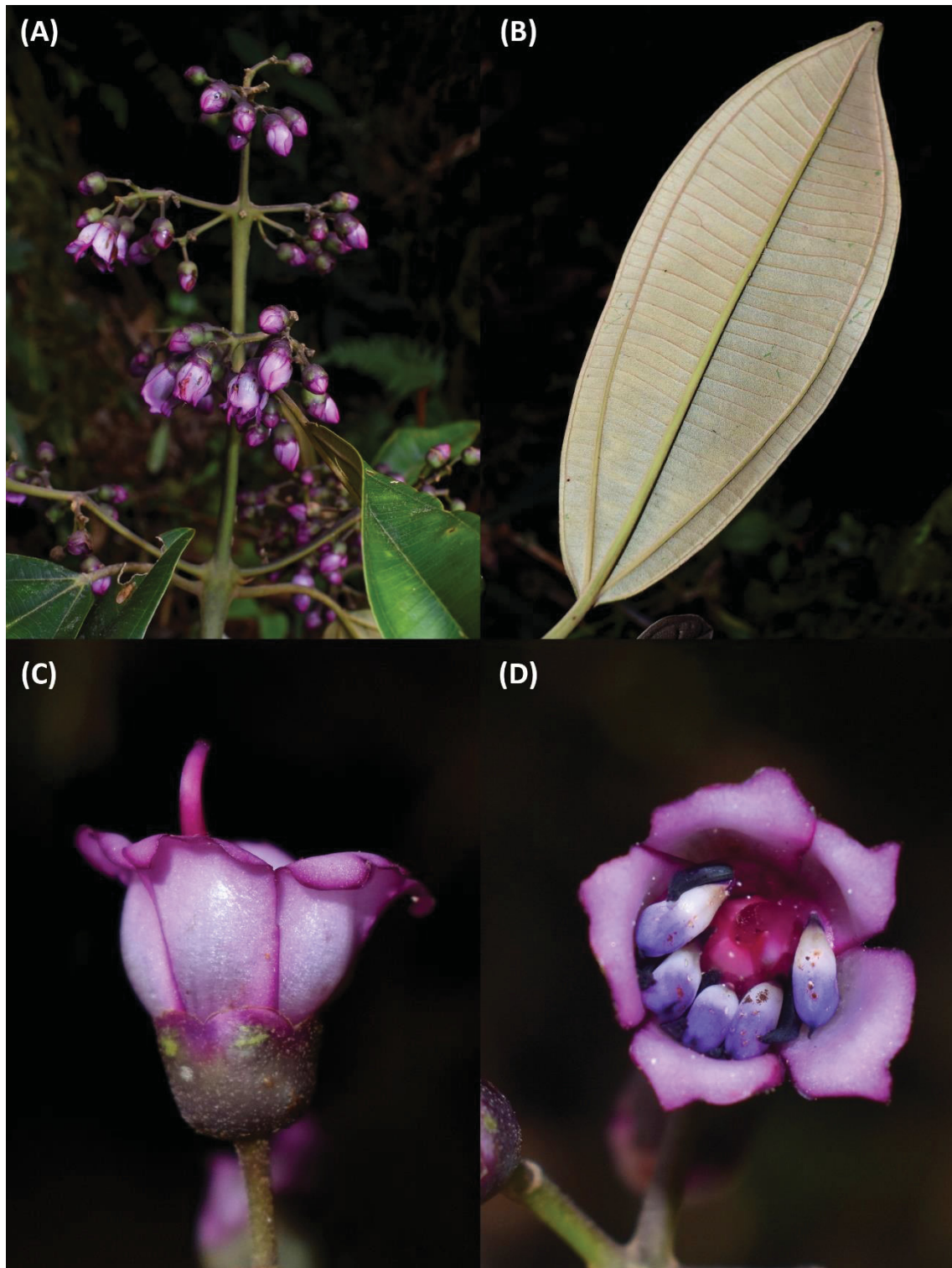


FIGURE 12. *Meriania bicentenaria*. **A.** Terminal fertile branch. **B.** Leaf blade, abaxial view. **C.** Flower at anthesis, lateral view. **D.** Flower at anthesis, apical view. From *R. Villanueva-Espinoza 675*. Photos by Rosa Villanueva-Espinoza.

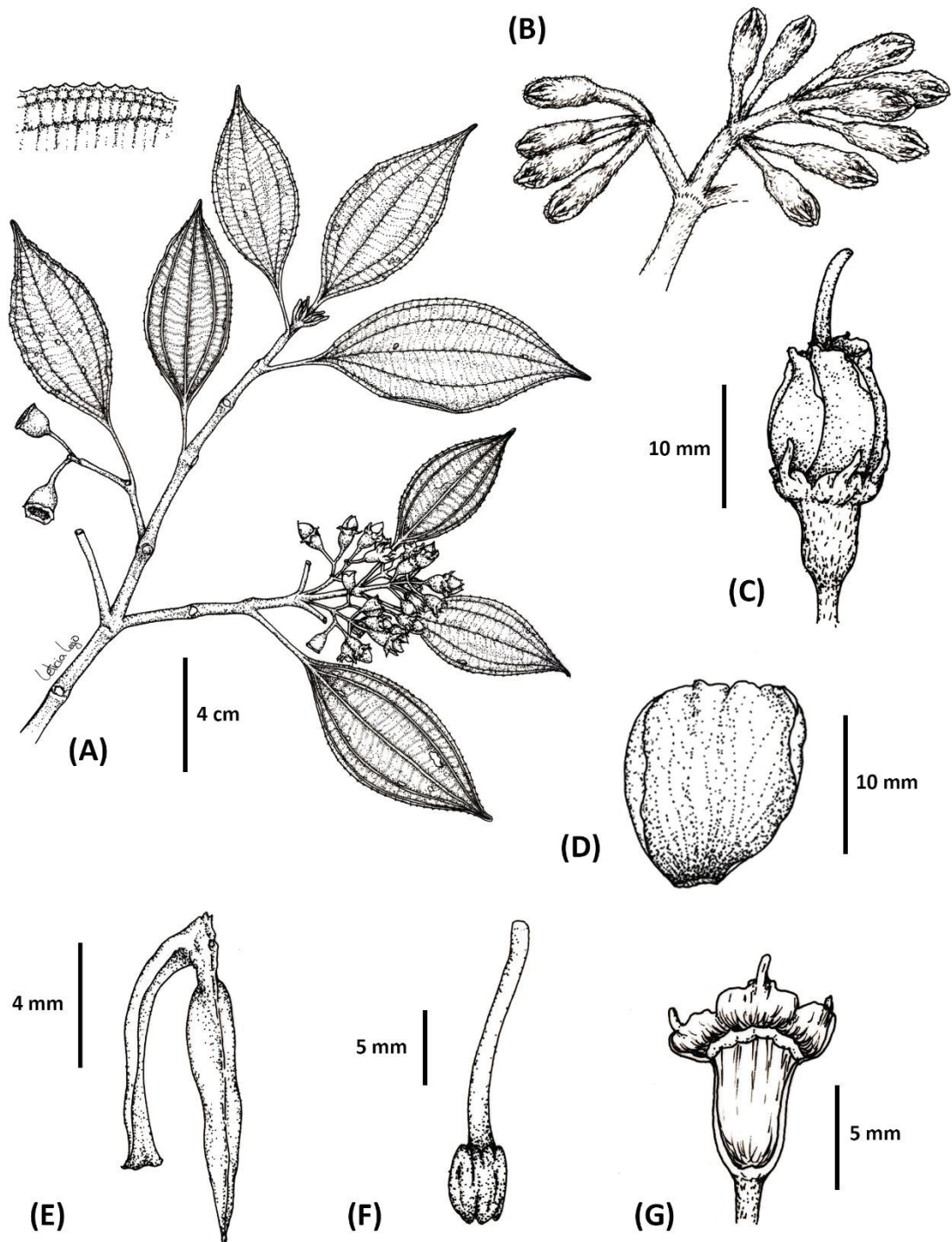


FIGURE 13. *Meriania bongarana*. **A.** Terminal fertile branch with inflorescence with detail of the margin leaf. **B.** Inflorescence branch. **C.** Flower at anthesis, lateral view. **D.** Petal. **E.** Stamen, lateral view. **F.** Ovary and style. **G.** Longitudinal section of the hypanthium and calyx. A-D from *R. Fernandez-Hilario et al. 1930*. Reproduced with permission from Wildenowia (2021).

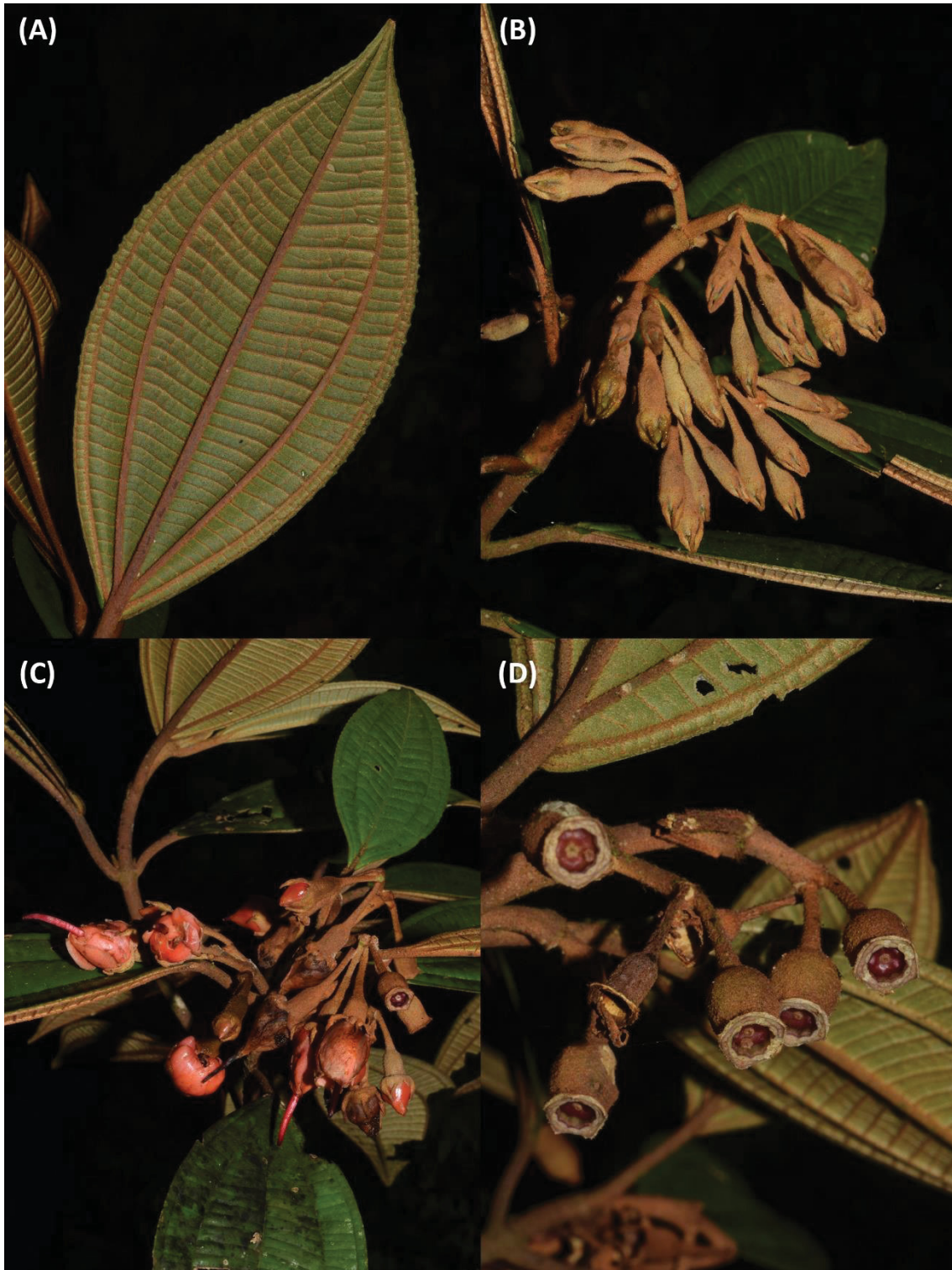


FIGURE 14. *Meriania bongarana*. **A.** Leaf blade, abaxial view. **B.** Inflorescence with flower buds. **C.** Terminal fertile branch with inflorescence. **D.** Fruits. A-D from *R. Fernandez-Hilario et al. 1930*. Photos by Robin Fernandez.

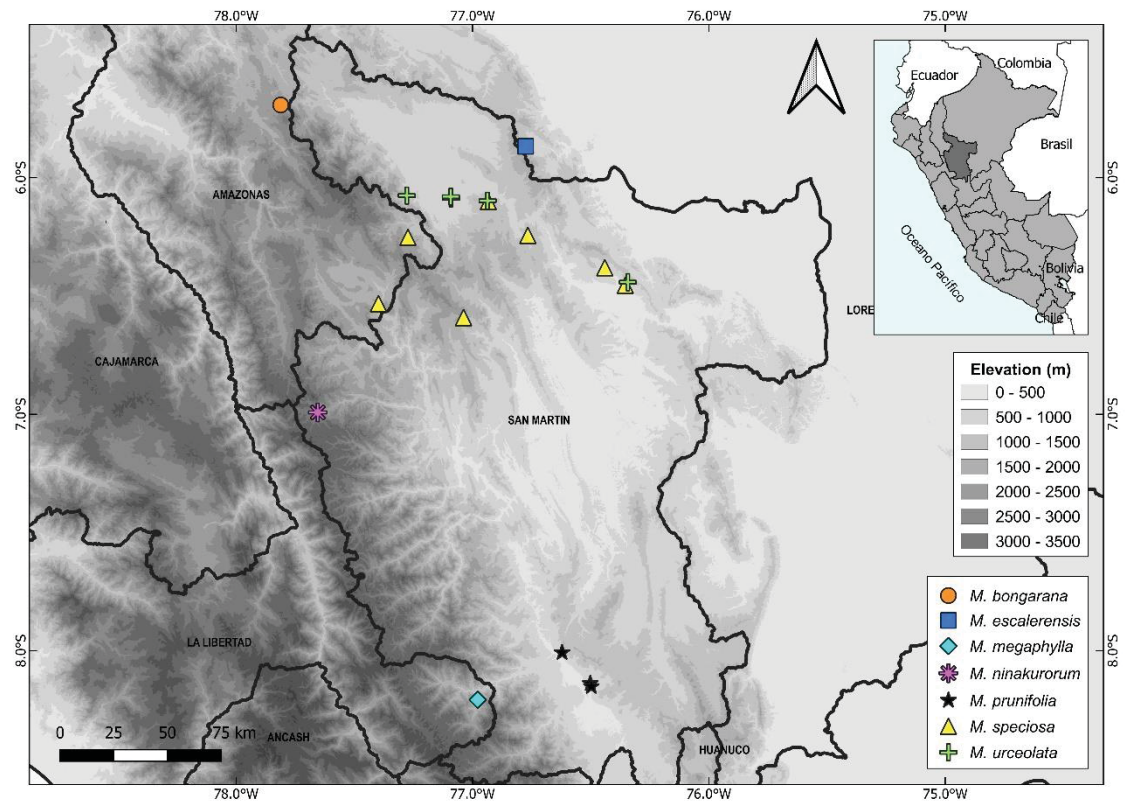


FIGURE 15. Distribution map of *M. bongarana*, *M. escalerensis*, *M. megaphylla*, *M. ninakurorum*, *M. prunifolia*, *M. speciosa* and *M. urceolata*.

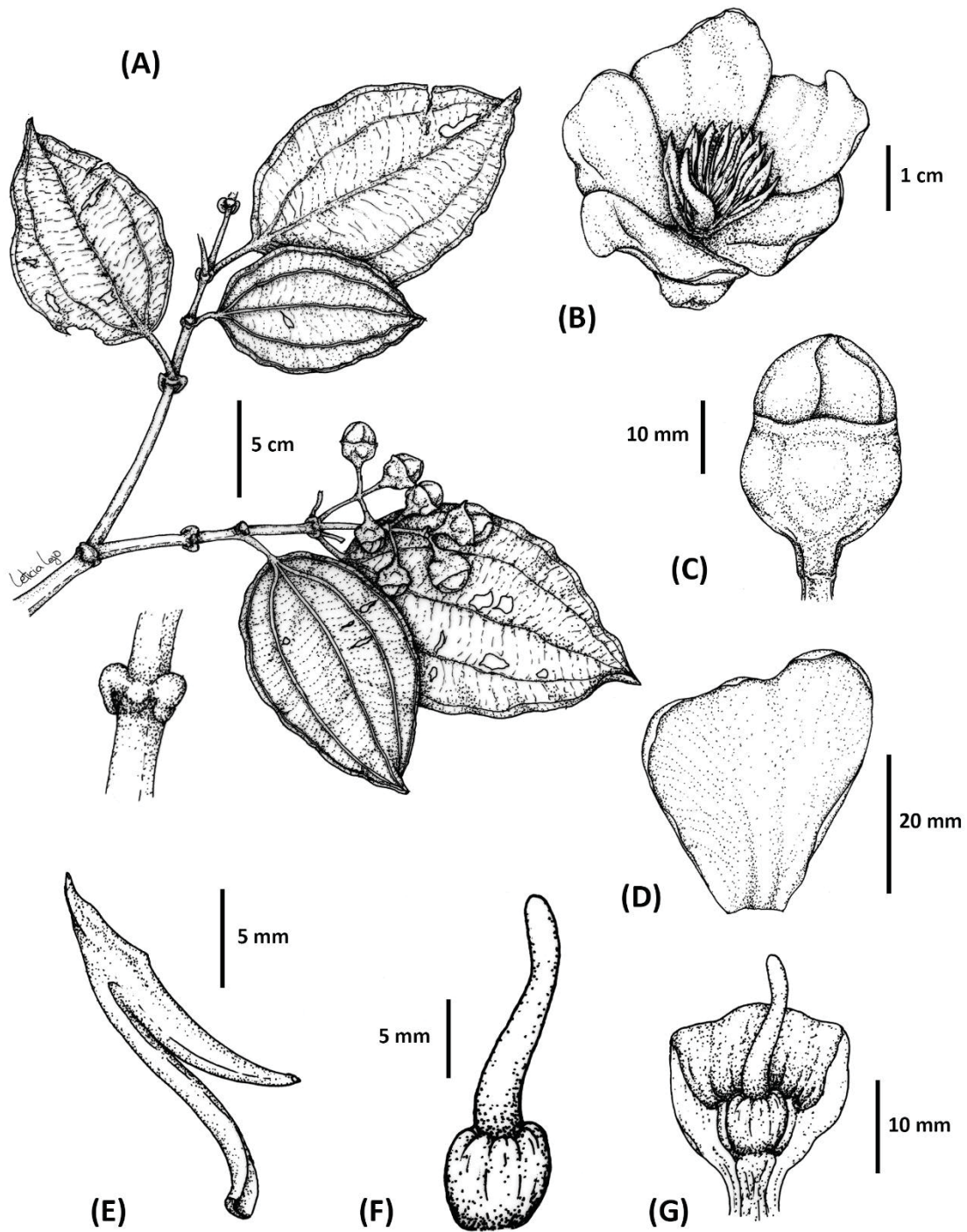


FIGURE 16. *Meriania callosa*. **A.** Terminal fertile branch with inflorescence with detail of the interpetiolar flap. **B.** Flower at anthesis, apical view. **C.** Flower bud. **D.** Petal. **E.** Stamen, lateral view. **F.** Ovary and style. **G.** Longitudinal section of the flower with the petals and stamens removed. A-G from R. *Fernandez-Hilario et al.* 2055. Reproduced with permission from Wildenowia (2021).

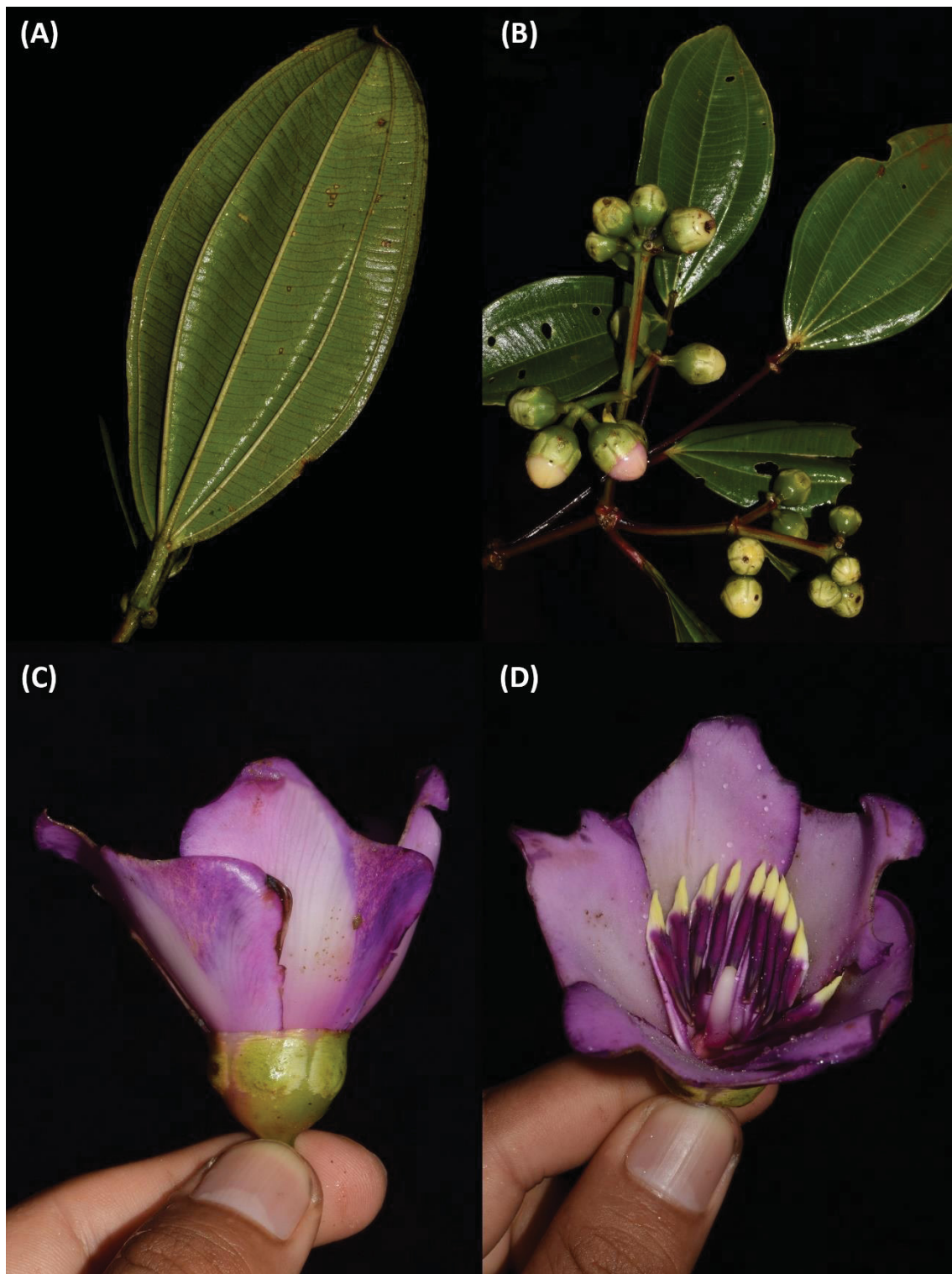


FIGURE 17. *Meriania callosa*. **A.** Leaf blade, abaxial view. **B.** Inflorescence with flower buds. **C.** Flower at anthesis, lateral view. **D.** Flower at anthesis, apical view. A-D from *R. Fernandez-Hilario et al. 2055*. Photos by Robin Fernandez.

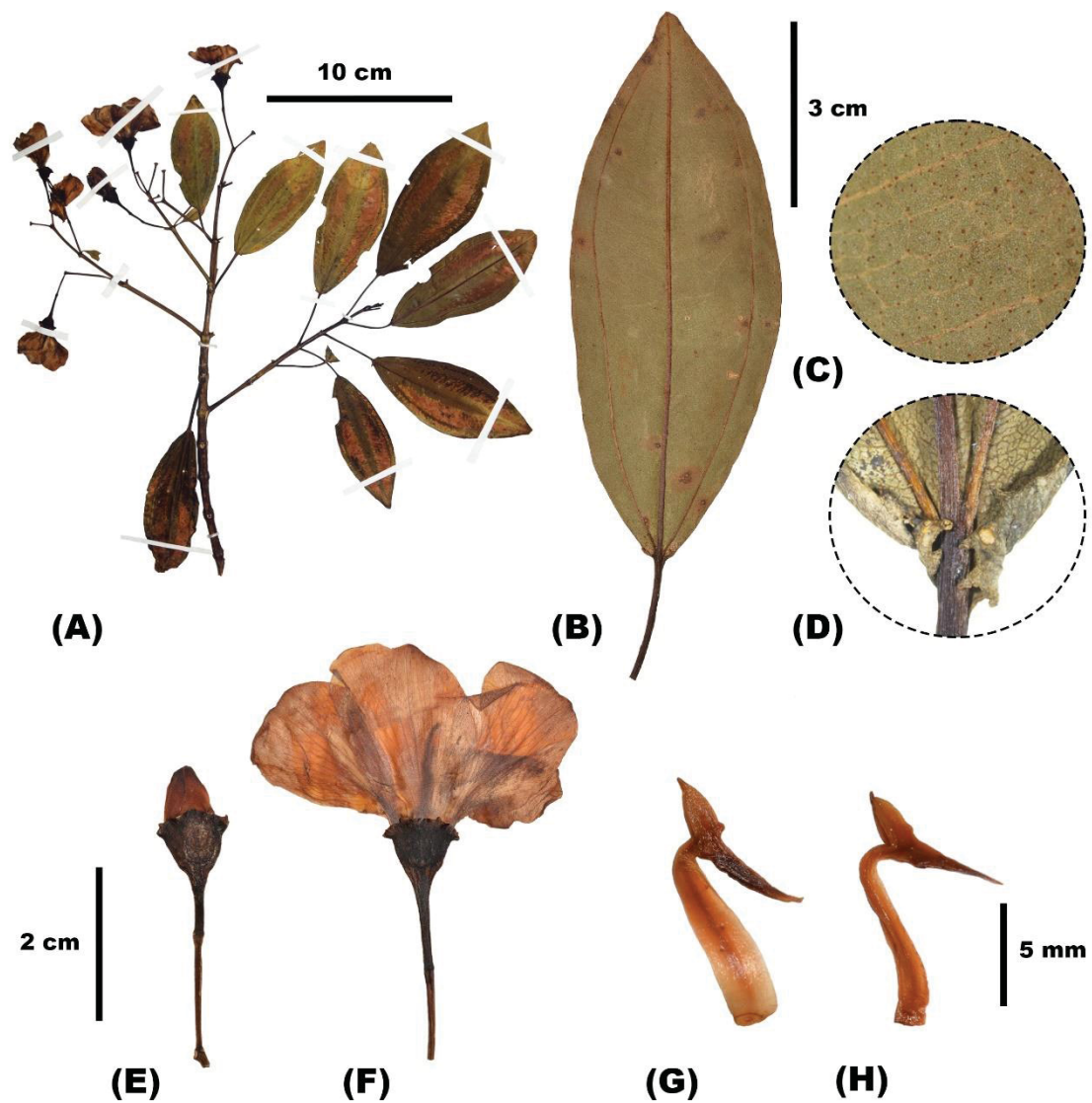


FIGURE 18. *Meriania cuzcoana*. **A.** Terminal fertile branch with inflorescence. **B.** Leaf blade, abaxial surface. **C.** Detail of abaxial leaf surface. **D.** Detail of the revolute leaf base, abaxial view. **E.** Flower bud. **F.** Flower at anthesis. **G-H.** Stamens, lateral view. A-C and E-H from *W. Farfán et al.* 976; D from *L. Valenzuela et al.* 6904.



FIGURE 19. *Meriania cuzcoana*. **A.** Leaf blade, abaxial view. **B.** Detail of the revolute base of the leaf blade. **C.** Flower at anthesis, apical view. **D.** Flower at anthesis, lateral view. From *F. A. Michelangeli et al. 1908*. Photos by Fabián A. Michelangeli.

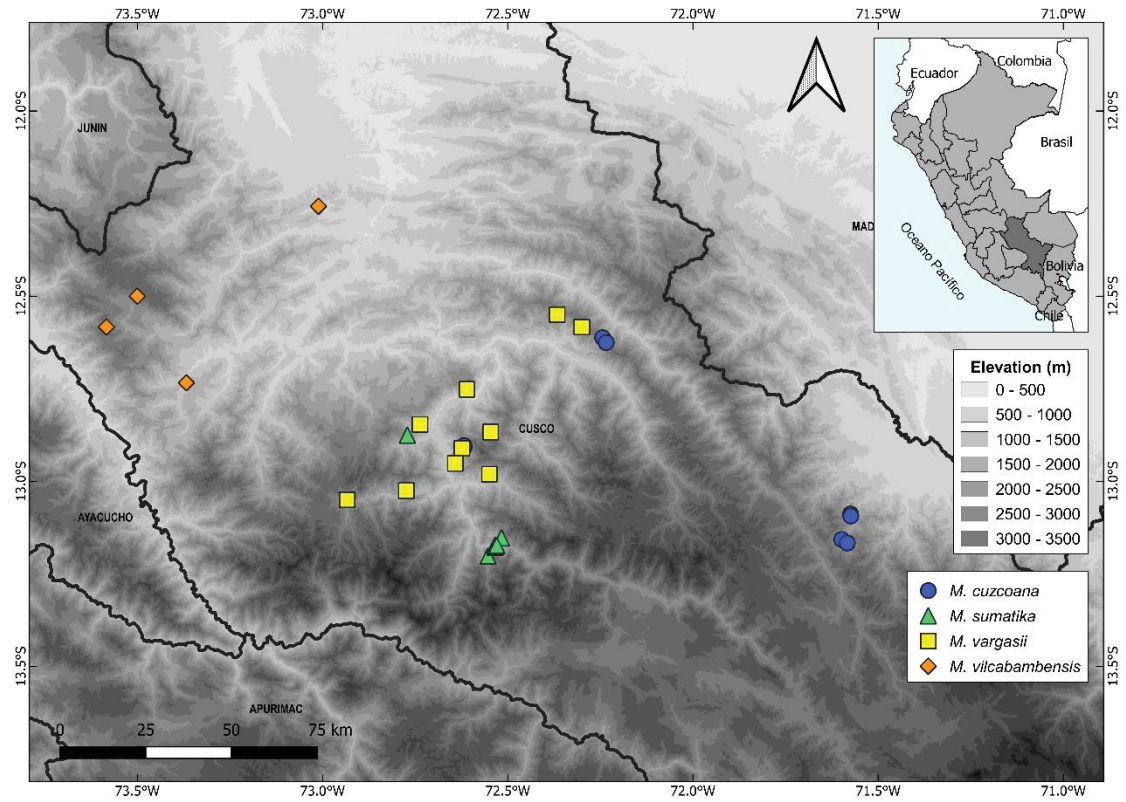


FIGURE 20. Distribution map of *M. cuzcoana*, *M. sumatika*, *M. vargasii* and *M. vilcabambensis*.

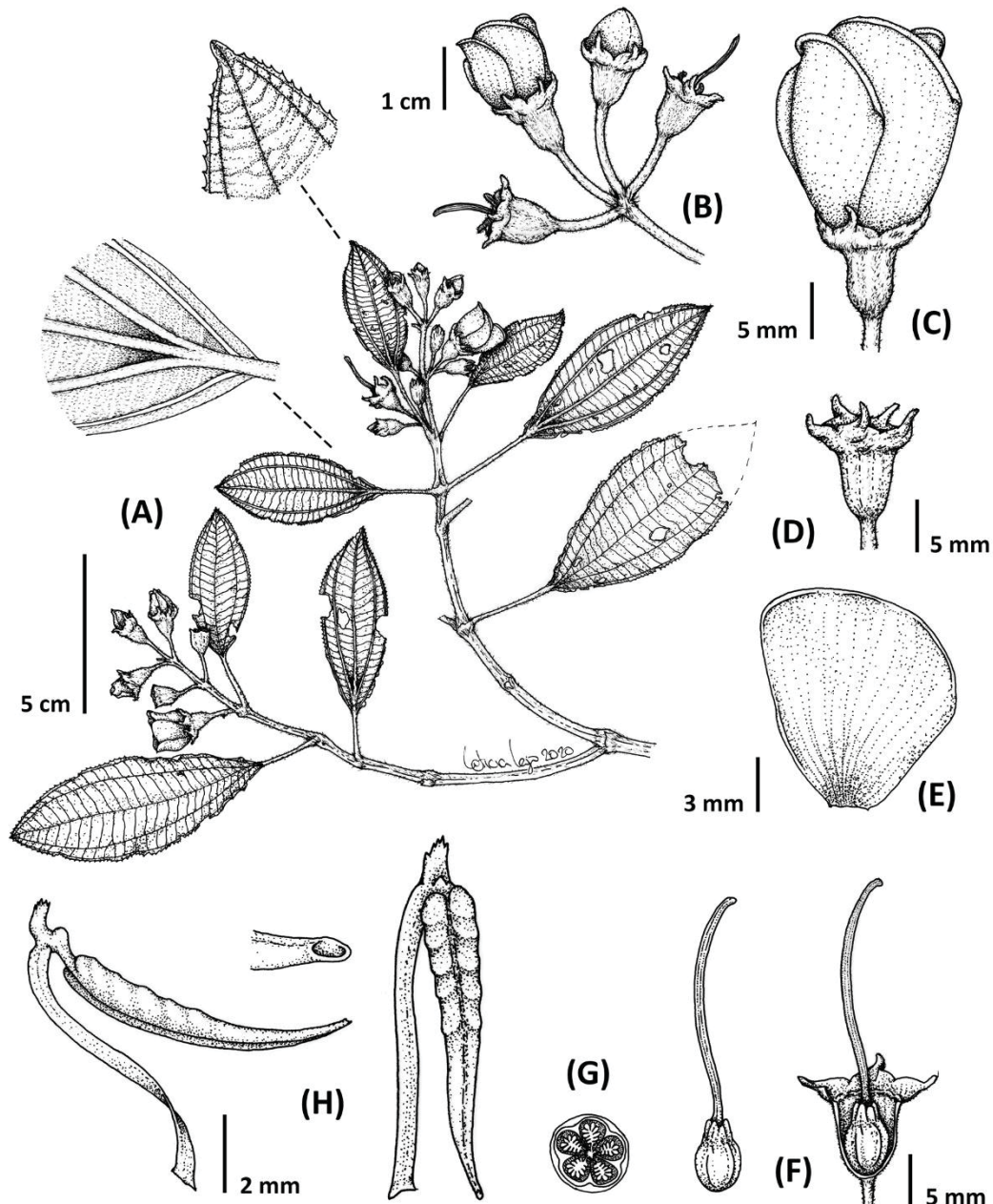


FIGURE 21. *Meriania dazae*. **A.** Terminal fertile branch with inflorescences, and details of apex of the leaves and domatia on abaxial surface. **B.** Inflorescence branch. **C.** Flower at anthesis. **D.** Hypanthium and calyx. **E.** Petal. **F.** Style and ovary (left) and longitudinal section of flower with petals and stamens removed (right). **G.** Transversal section of the ovary. **H.** Stamen in lateral view (left) and dorsal view (right), with detail of pore orientation. From *J.L. Marcelo et al. 6568*. Reproduced with permission from *Nordic Journal of Botany* e02969: 6, fig. 4 (2021).

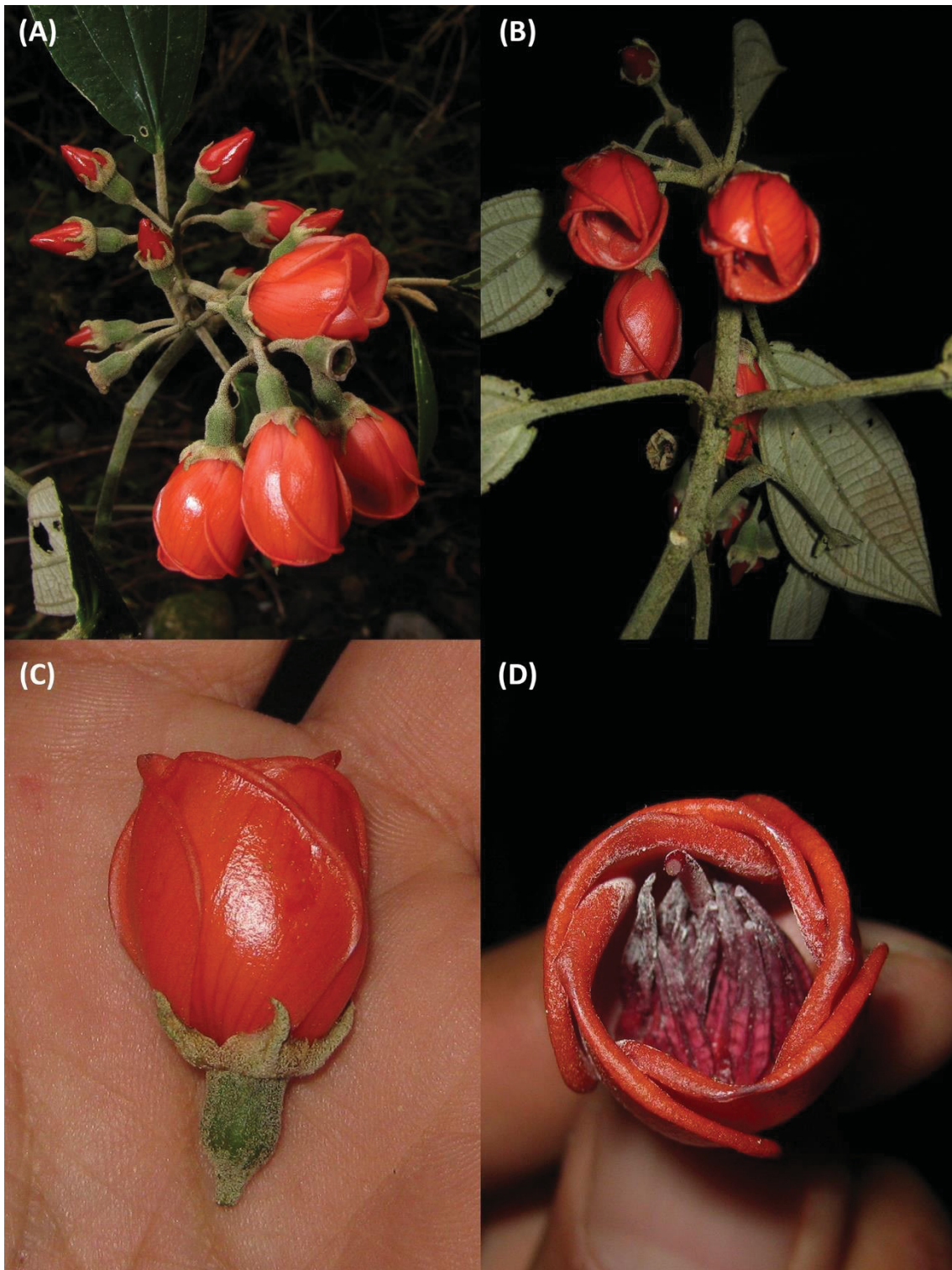


FIGURE 22. *Meriania dazae*. **A-B.** Terminal fertile branches with inflorescences. **C.** Flower at anthesis, lateral view. **D.** Flower at anthesis, apical view. A from *J.L. Marcelo et al.* 6568, B-D from *R. Fernandez-Hilaro et al.* 169. Photos by José L. Marcelo (A) and Robin Fernandez (B-D).

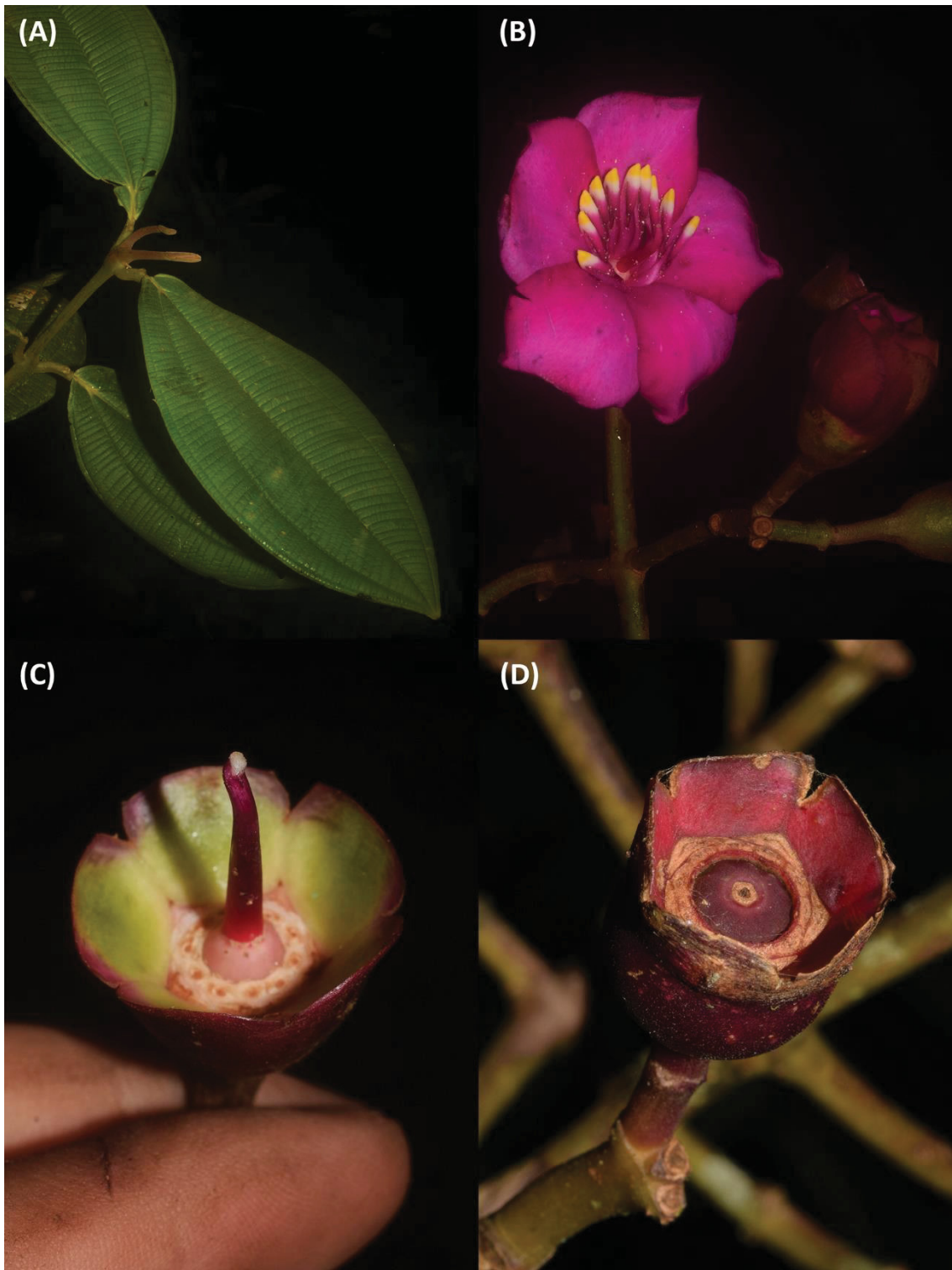


FIGURE 23. *Meriania drakei*. **A.** Terminal sterile branch. **B.** Inflorescence with one flower at anthesis. **C.** Flower, petals and stamens removed. **D.** Mature fruit. A-C from *R. Fernandez-Hilario et al. 1775*, D from *R. Fernandez-Hilario et al. 1937*. Photos by Robin Fernandez.

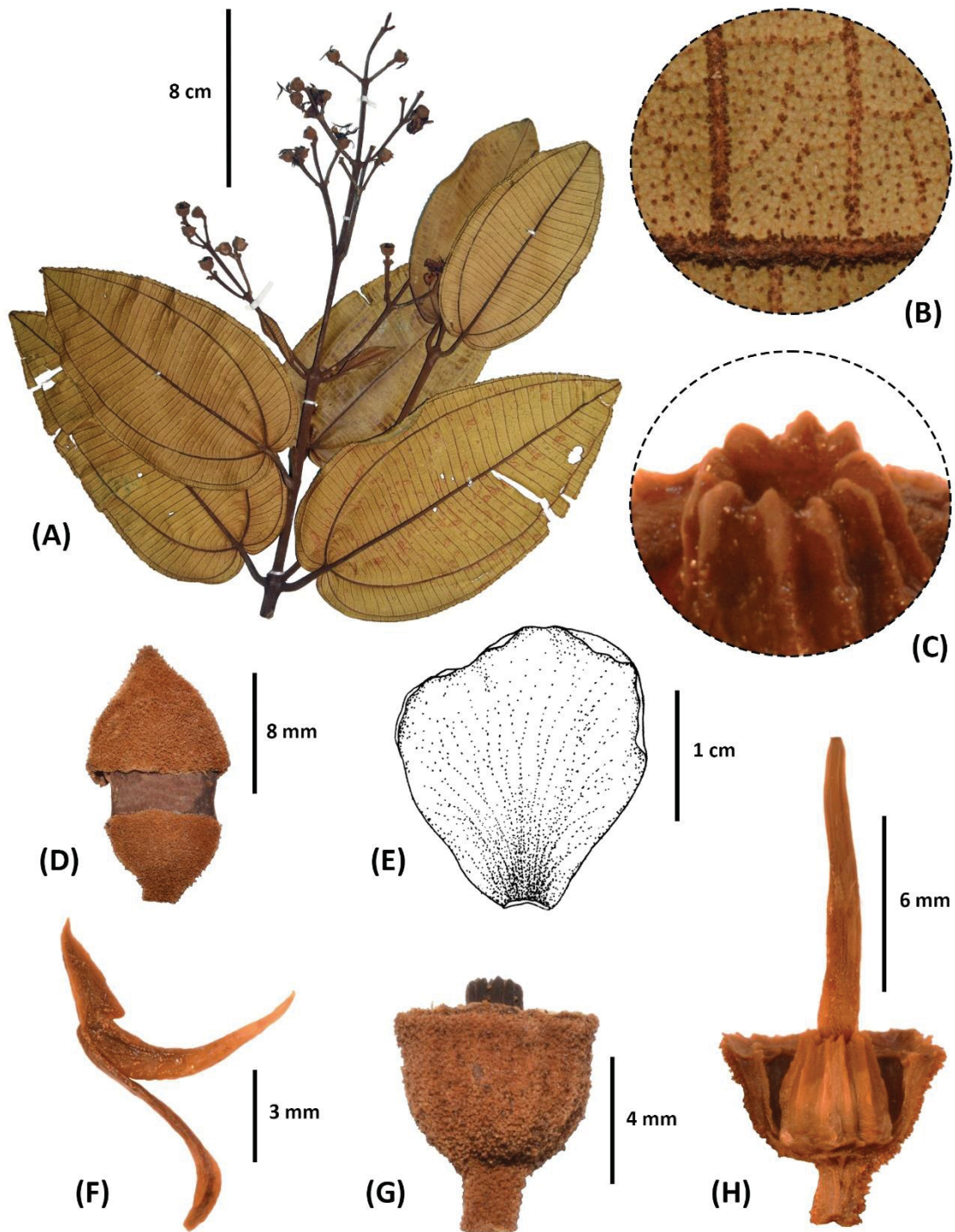


FIGURE 24. *Meriania escalerensis*. **A.** Terminal fertile branch with inflorescence. **B.** Detail of the abaxial leaf surface. **C.** Detail of the apex of the ovary. **D.** Flower bud, lateral view. **E.** Petal. **F.** Stamen, lateral view. **G.** Flower with petals, stamens and style removed. **H.** Longitudinal section of the flower with petals and stamens removed. A-H from *M. Ríos et al.* 3316. Reproduced with permission from Wildenowia (2021).

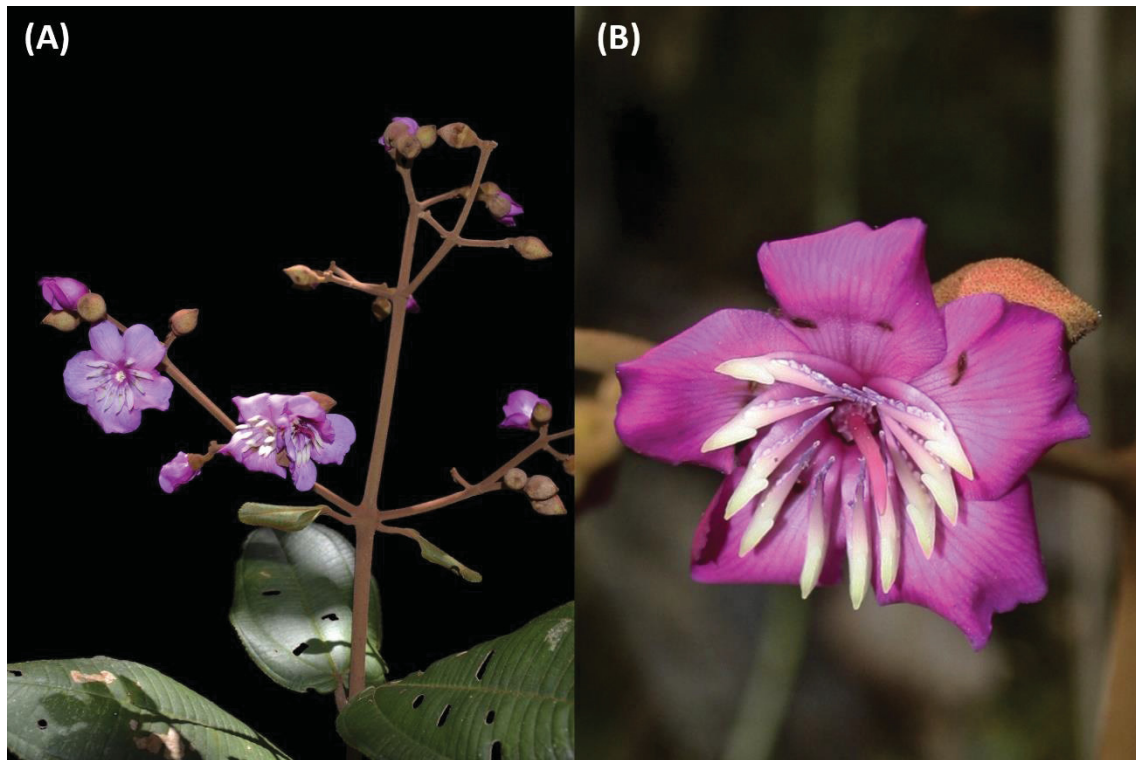


FIGURE 25. *Meriania escalerensis*. **A.** Terminal fertile branch with inflorescence. **B.** Flower at anthesis, apical view. A-B from *M. Ríos et al. 3316*. Photos by Luis Torres.

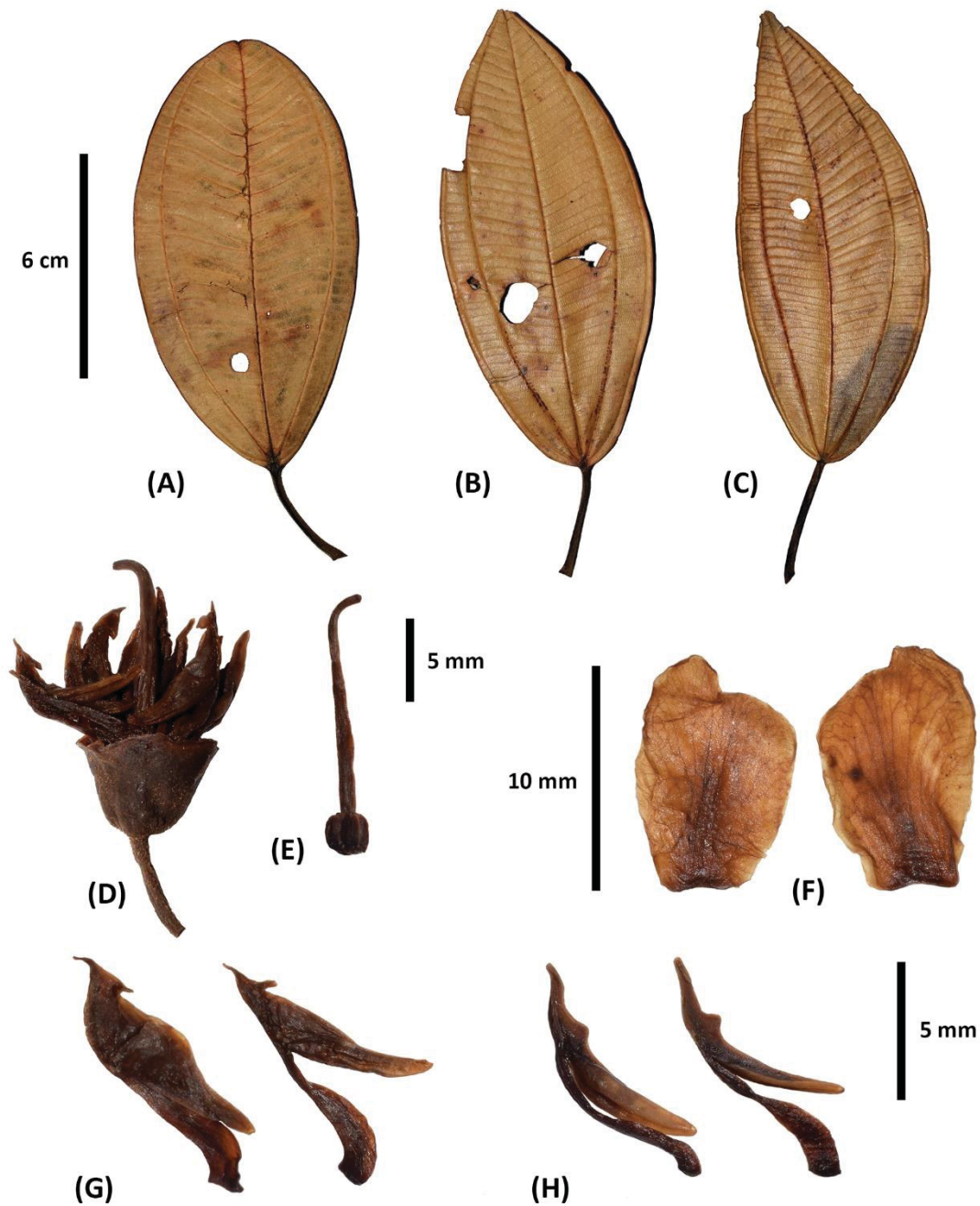


FIGURE 26. *Meriania franciscana*. **A-C.** Leaves, adaxial view. **D.** Flower with petals removed. **E.** Style and ovary. **F.** Petals. **G.** Antepetalous stamens, lateral view. **H.** Antesepalous stamens, lateral view. A and F from *J. Campos & S. Corrales 3393*, B-E and G-H from *C. Díaz & S. Fernández 10150*. Reproduced with permission from *Nordic Journal of Botany* e02969: 12, fig. 9 (2021).

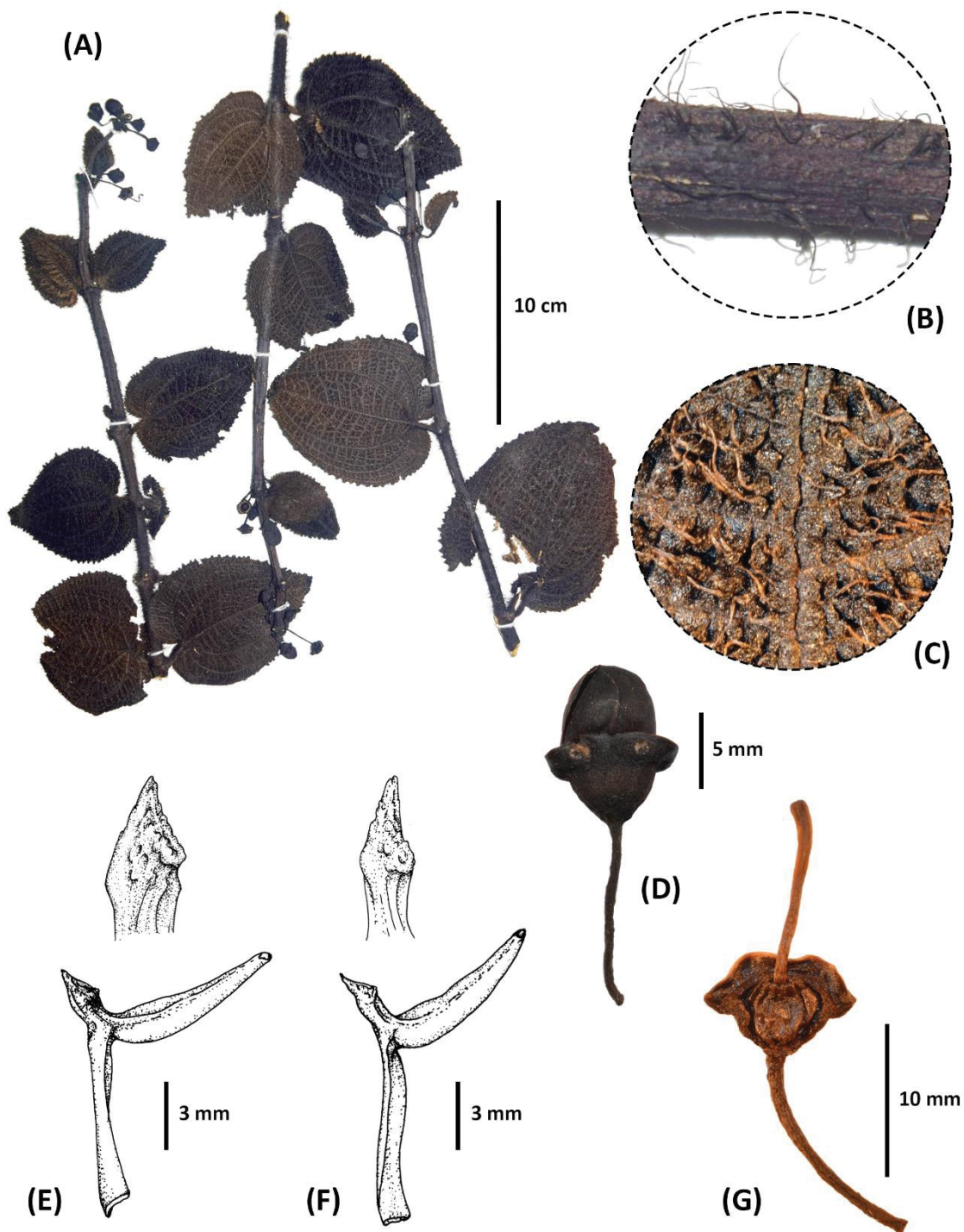


FIGURE 27. *Meriania hirsuta*. **A.** Terminal fertile branches with inflorescences. **B.** Detail of the hirsute internode. **C.** Detail of the adaxial leaf surface. **D.** Flower bud, lateral view. **E.** Antesepalous stamens, lateral view, with detail of the perpendicular dorso-basal appendage. **F.** Antepetalous stamens, lateral view, with detail of the perpendicular dorso-basal appendage. **G.** Longitudinal section of the flower with petals and stamens removed. A-G from *S. Baldeón & J. Campos 5373*. Reproduced with permission from Wildenowia (2021).

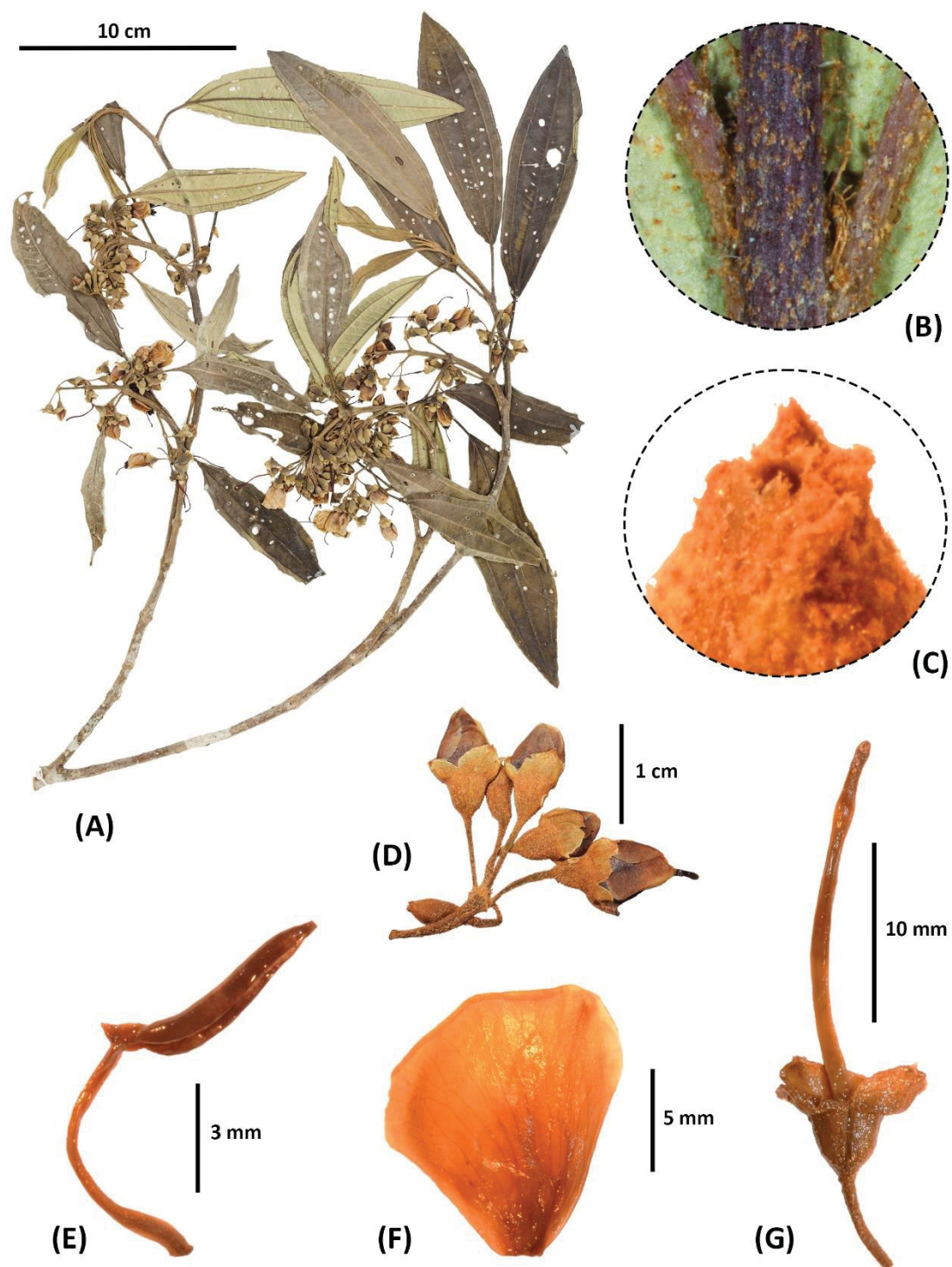


FIGURE 28. *Meriania juanjil*. **A.** Terminal fertile branch with inflorescences. **B.** Detail of the convergence of the midvein and secondary veins, abaxial view. **C.** Detail of the apex of the calyx. **D.** Inflorescence branch. **E.** Stamen, lateral view. **F.** Petal. **G.** Flower with petals and stamens removed. A-G from *J. Wurdack 1054*. Reproduced with permission from Wildenowia (2021).

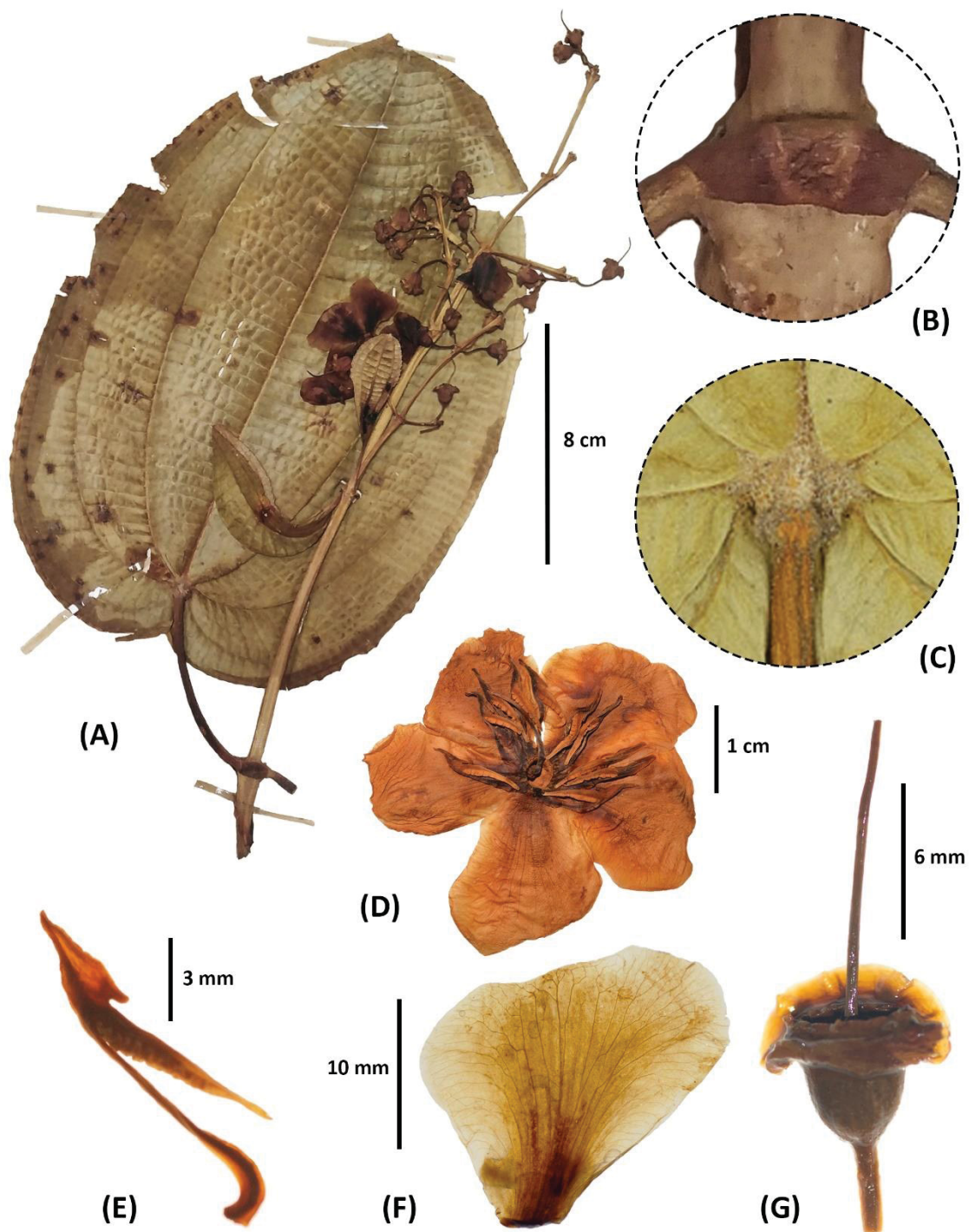


FIGURE 29. *Meriania megaphylla*. **A.** Terminal fertile branch with inflorescence. **B.** Detail of the interpetiolar flap. **C.** Detail of the base of the leaf blade. **D.** Flower at anthesis, apical view. **E.** Stamen, lateral view. **F.** Petal. **G.** Flower with petals and stamens removed. A-G from *A. Weberbauer 7048*. Reproduced with permission from Wildenowia (2021).



FIGURE 30. *Meriania microflora*. **A.** Terminal fertile branch with inflorescence and a detail of projections on the petiole. **B.** Inflorescence detail. **C.** Longitudinal section of the flower bud with petals removed. **D.** Antesepalous (right) and antepetalous (left) stamens in flower bud. **E.** Flower before anthesis. **F.** Flower at anthesis. **G.** Longitudinal section of the flower. **H.** Detail of antesepalous (left) and antepetalous (right) stamens in flower at anthesis. **I.** Longitudinal (right) and transversal (left) section of the ovary. From I. Huamantupa et al. 15552. Reproduced with permission from Phytotaxa 456: 89, fig. 1 (2020).

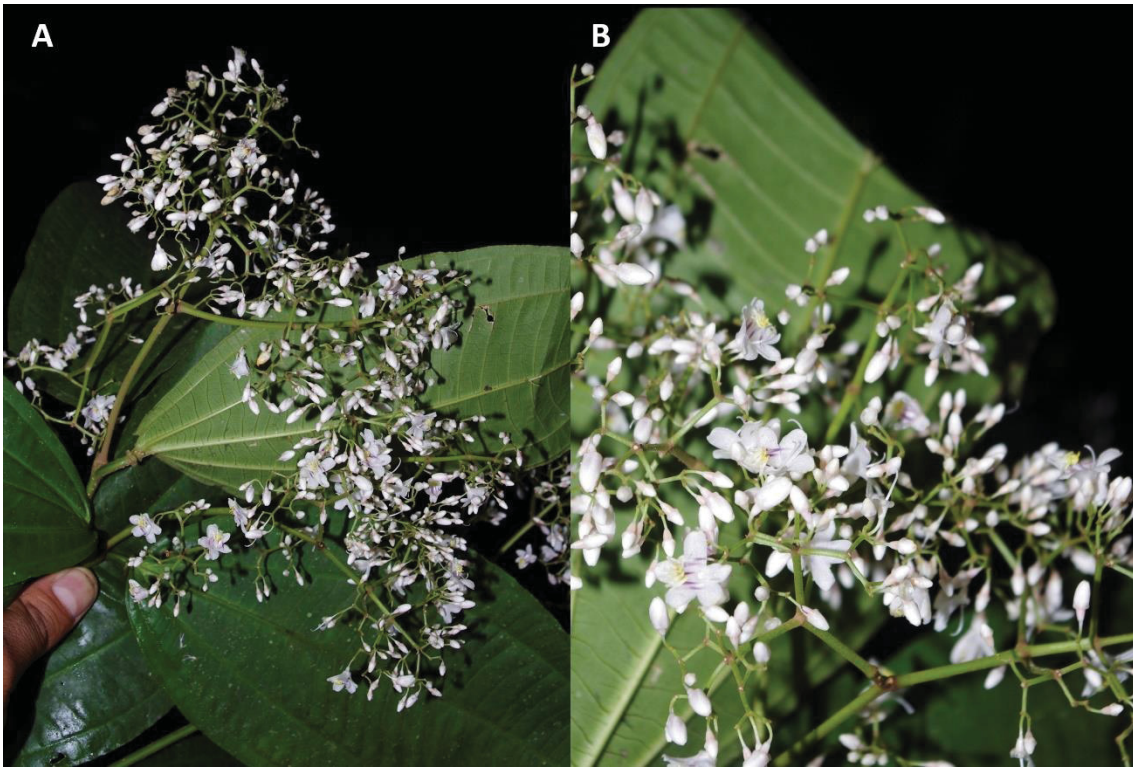


FIGURE 31. *Meriania microflora*. **A.** Terminal fertile branch. **B.** Detail of inflorescence. From *I. Huamantupa et al. 15552*. Photos by Isau Huamantupa.

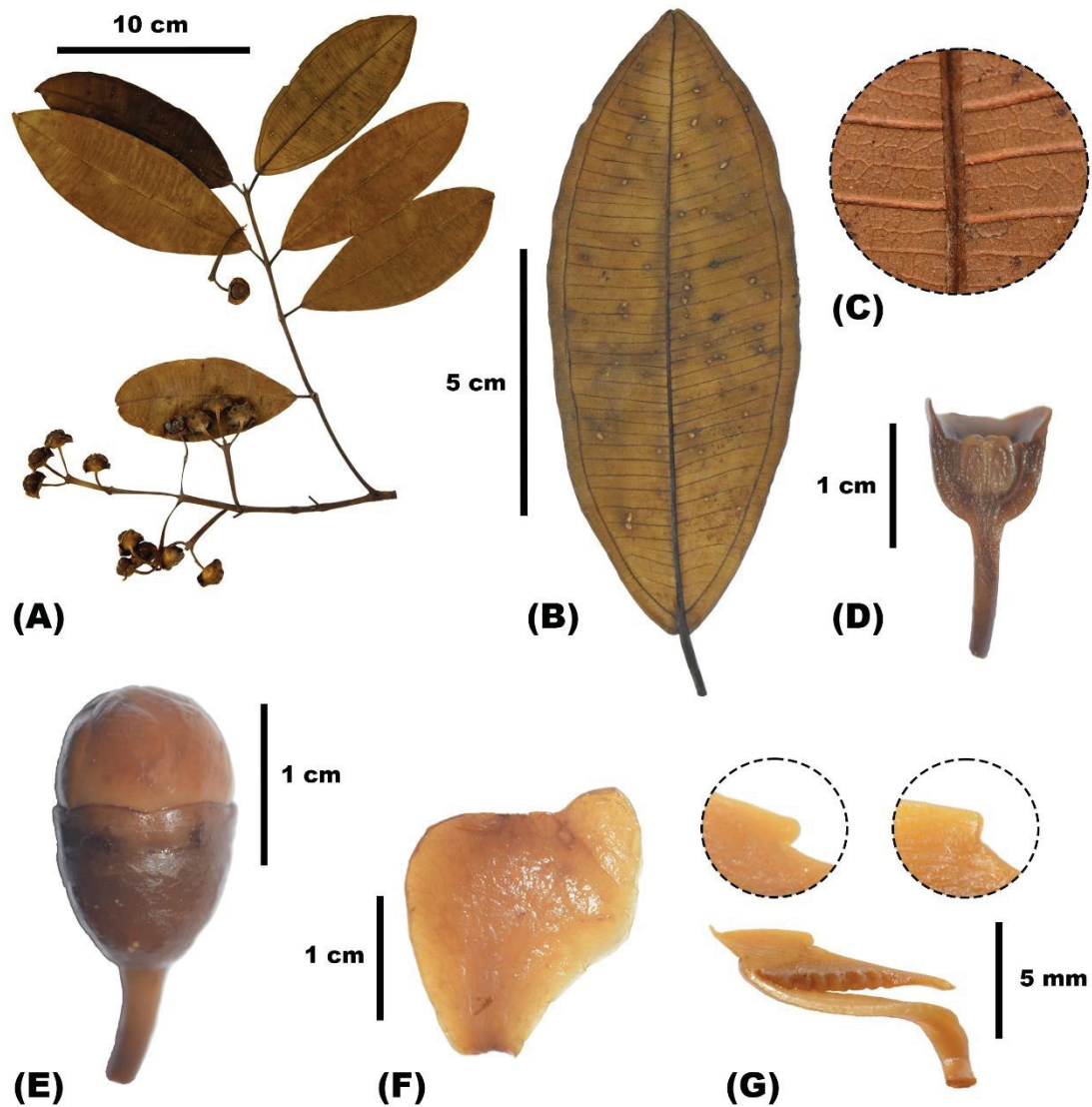


FIGURE 32. *Meriania neillii*. **A.** Terminal fertile branch with infructescence. **B.** Leaf blade, abaxial view. **C.** Detail of the abaxial leaf surface. **D.** Longitudinal section of the flower with petals, stamens and style removed. **E.** Flower bud. **F.** Petal. **G.** Stamen, lateral view, with details of dorsal appendages. A-C from *J. L. Marcelo-Peña & A. Castillo 1709*; D-G from *I. Revilla 3484*.

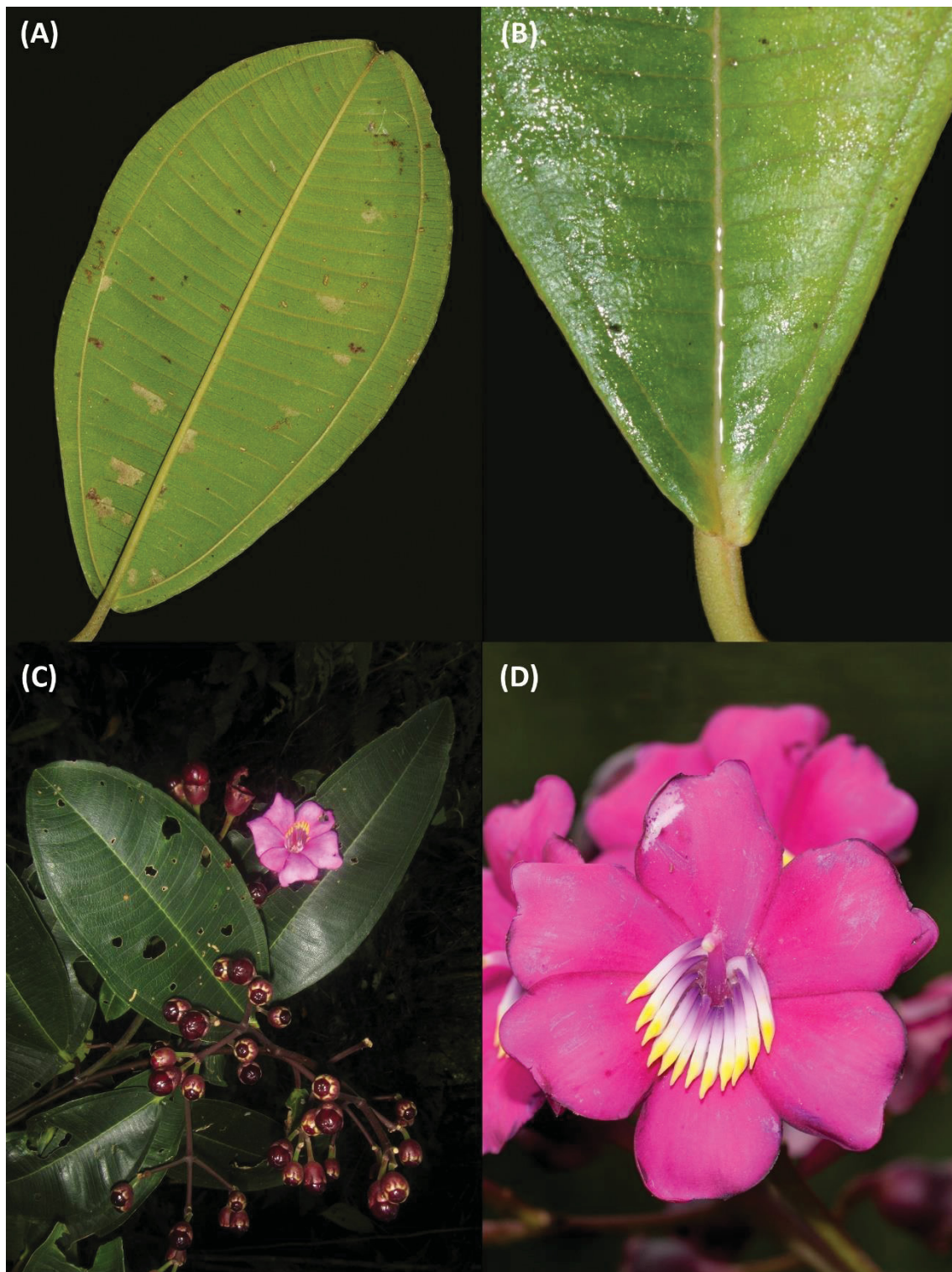


FIGURE 33. *Meriania neillii*. **A.** Leaf blade, abaxial view. **B.** Detail of the base of the leaf blade. **C.** Terminal fertile branch with inflorescence. **D.** Flower at anthesis, apical view. A from R. Fernandez-Hilario *et al.* 2034., B and D from F. A. Michelangeli *et al.* 1756, C from I. Revilla 3484. Photos by Robin Fernandez-Hilario (A), Fabián A. Michelangeli (B and D) and Italo Revilla (C).

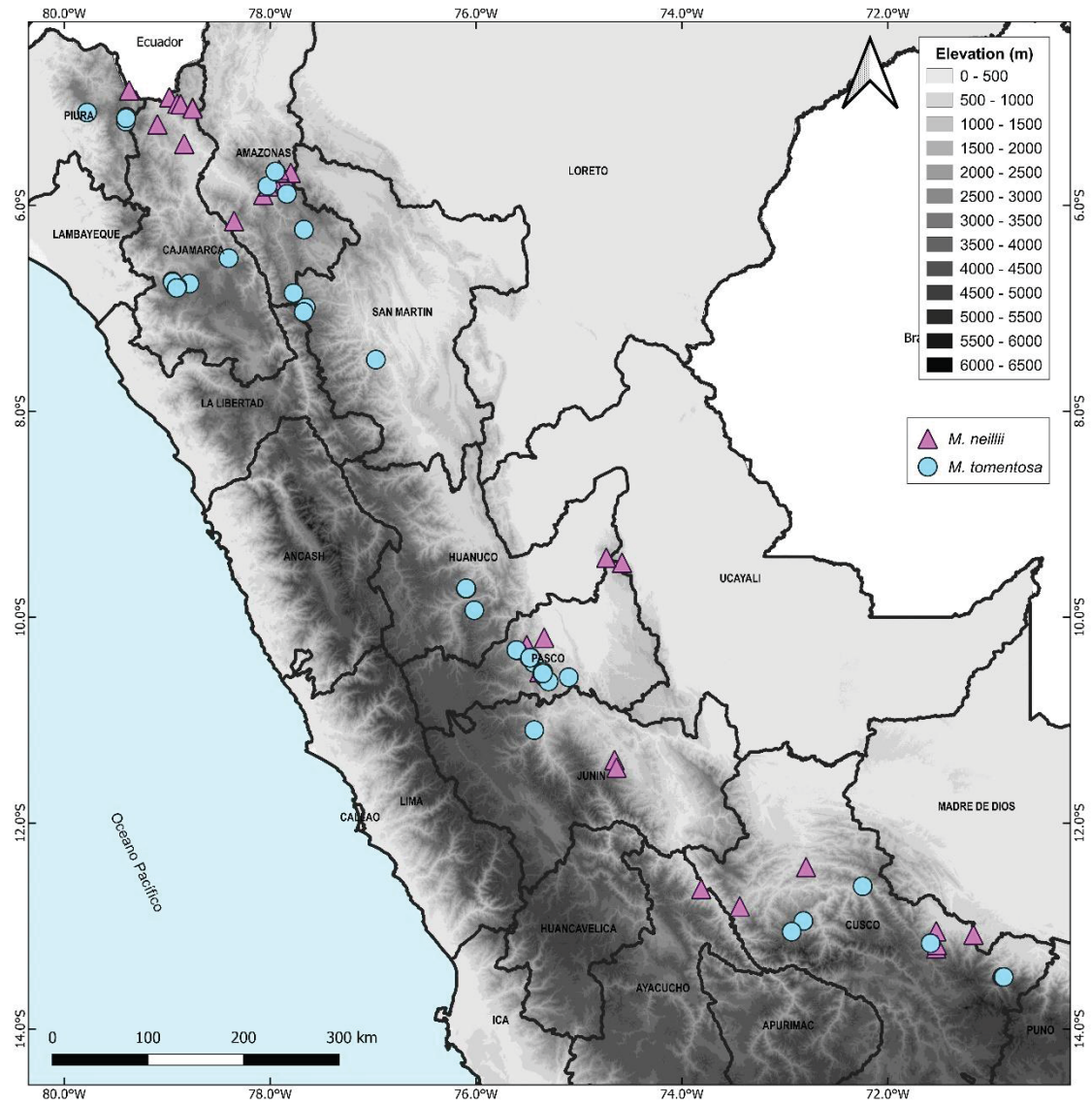


FIGURE 34. Distribution map of *M. neillii* and *M. tomentosa*.

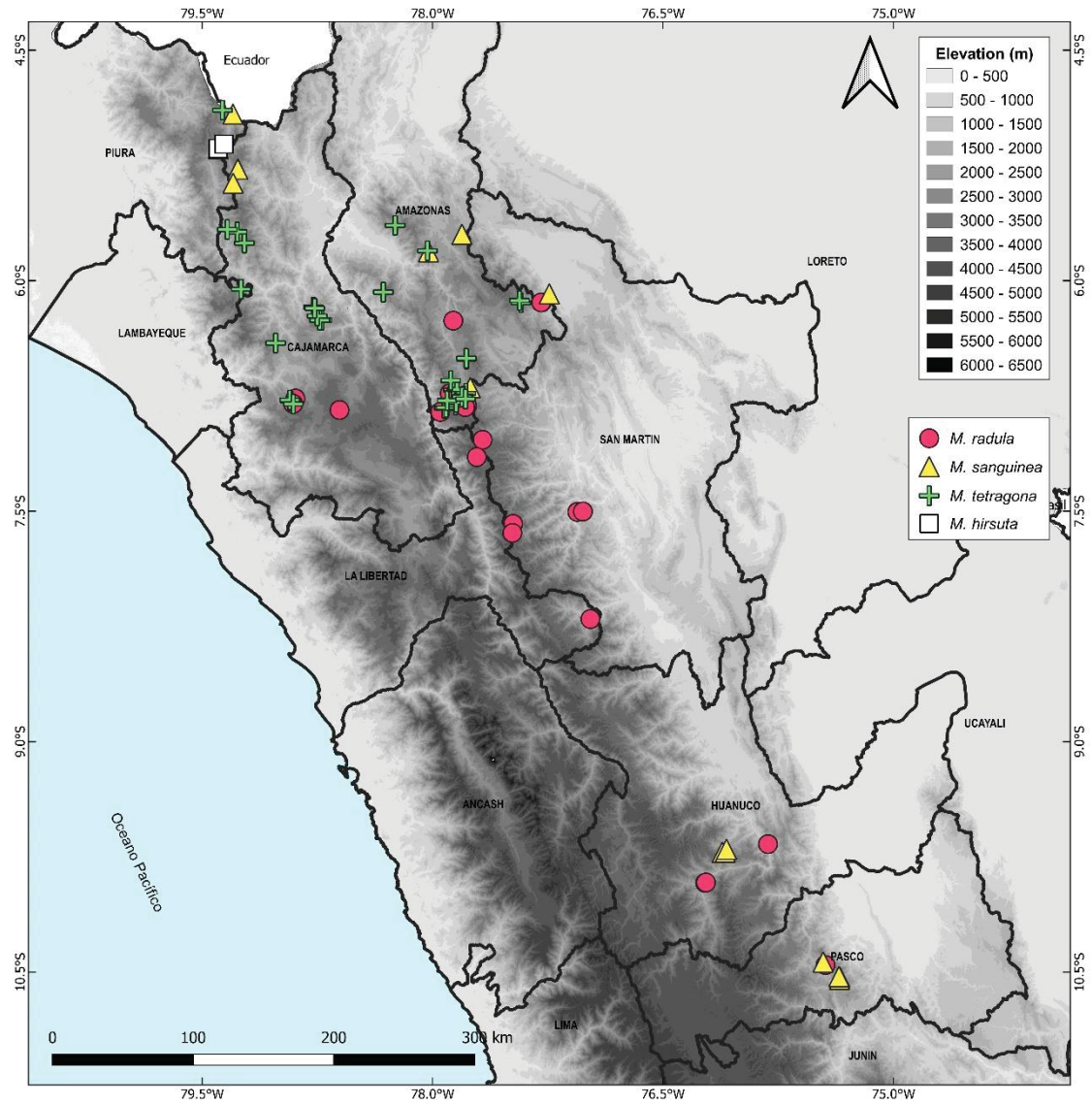


FIGURE 35. Distribution map of *M. radula*, *M. sanguinea*, *M. tetragona* and *M. hirsuta*.

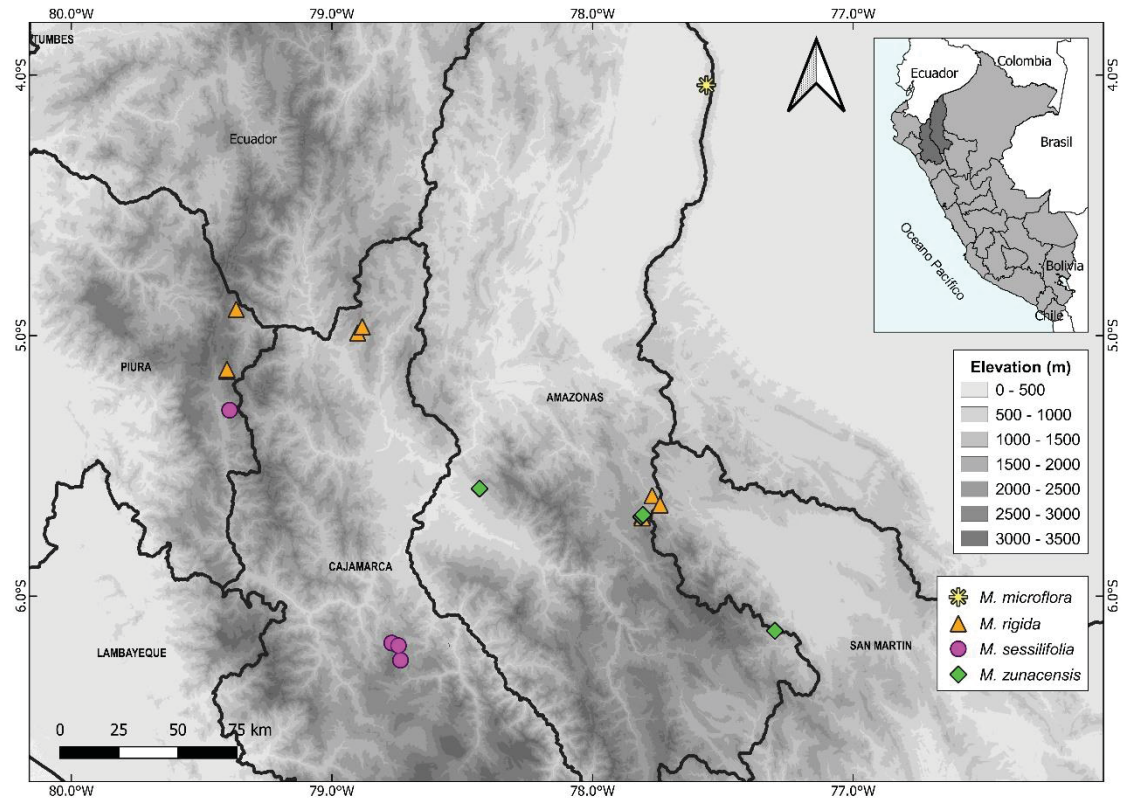


FIGURE 36. Distribution map of *M. microflora*, *M. rigida*, *M. sessilifolia* and *M. zunacensis*.

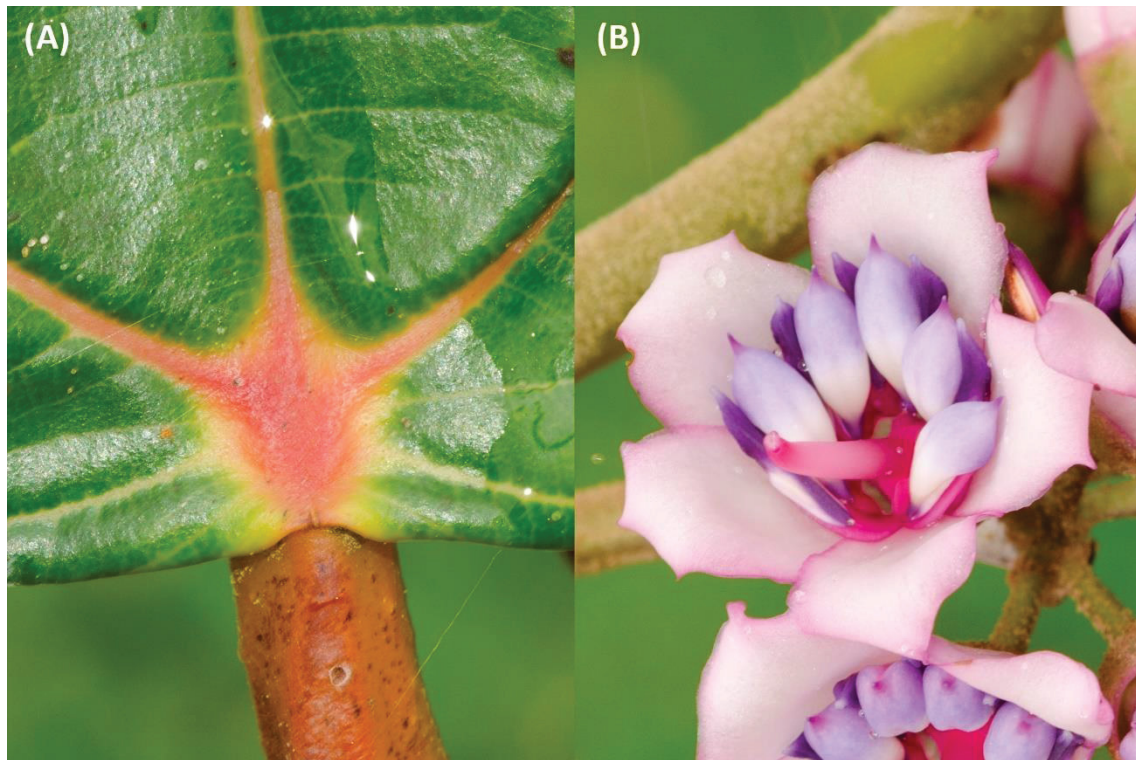


FIGURE 37. *Meriania ninakurorum*. **A.** Detail of the base (subpeltate) of the leaf blade. **B.** Flower at anthesis, apical view. A-B from *R.W. Bussmann et al. 17067*. Photos by Rainer W. Bussmann.

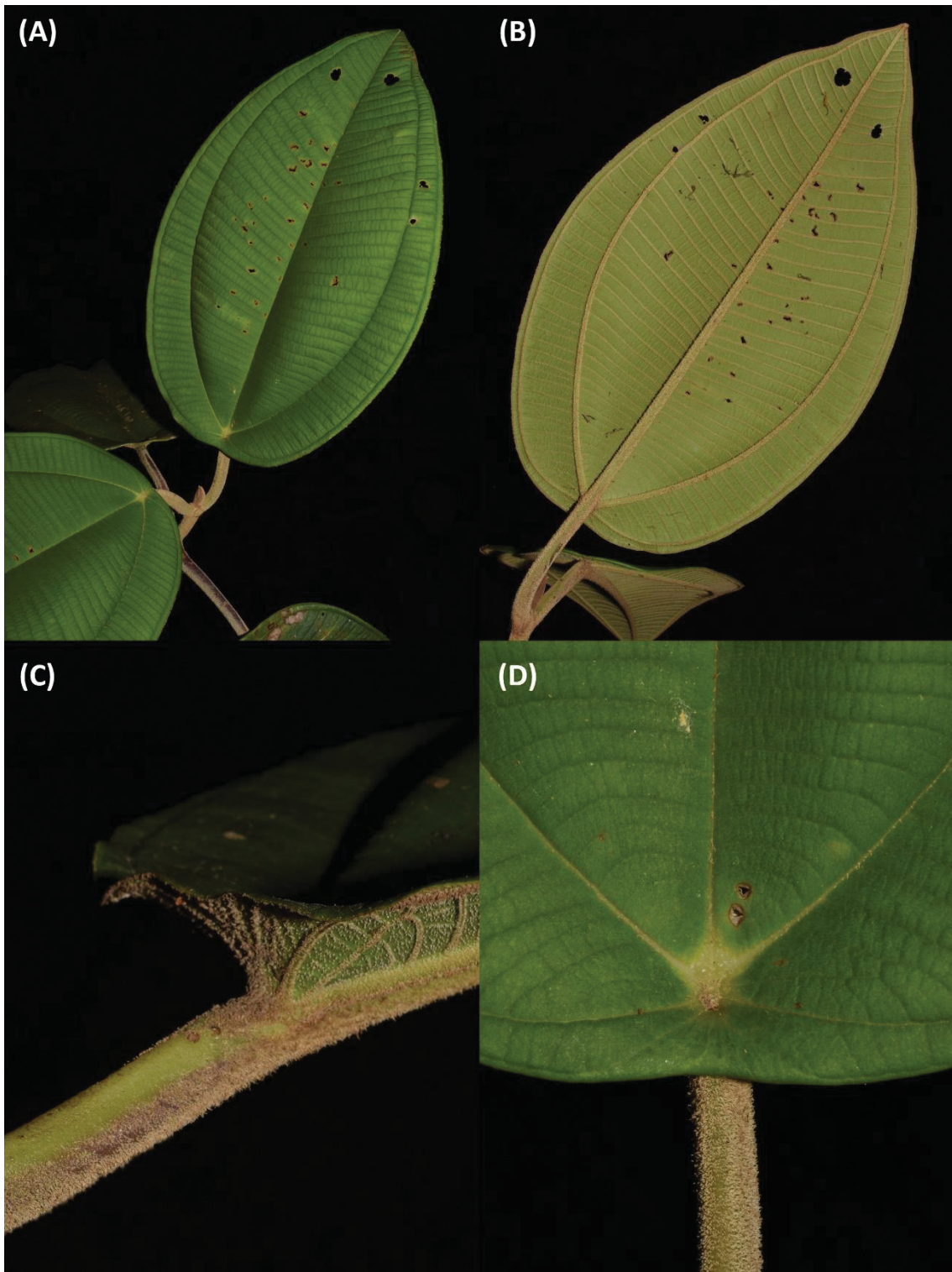


FIGURE 38. *Meriania peltata*. **A.** Terminal sterile branch. **B.** Leaf blade, abaxial view. **C-D.** Details of the bases (peltate) of leaf blades. A-D from *R. Fernandez-Hilario et al. 2093*. Photos by Robin Fernandez-Hilario.

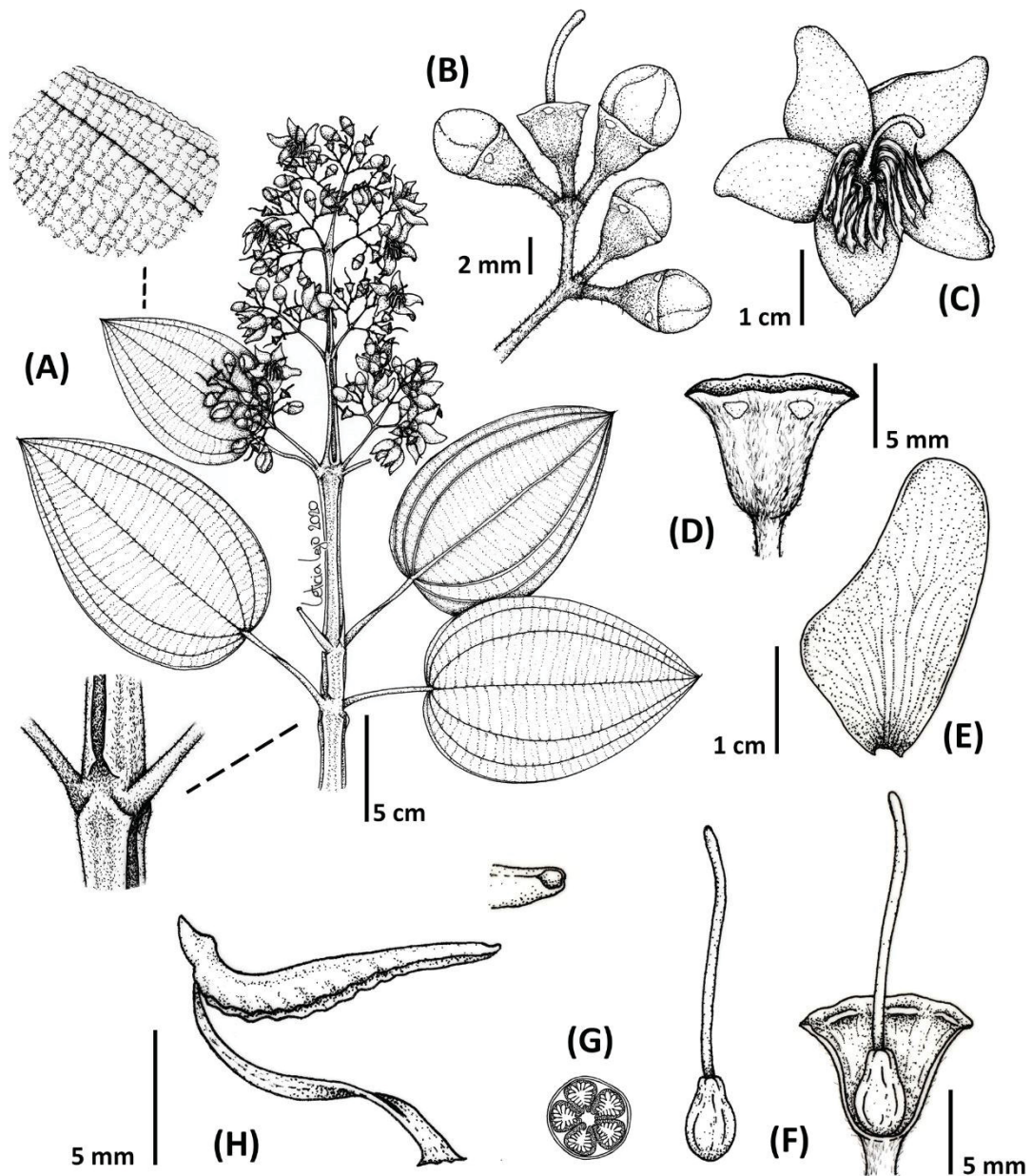


FIGURE 39. *Meriania penningtonii*. **A.** Terminal fertile branch with inflorescence, and details of bullate surface and winged internodes. **B.** Inflorescence branch. **C.** Flower at anthesis. **D.** Hypanthium and calyx. **E.** Petal. **F.** Style and ovary (left) and longitudinal section of flower with petals and stamens removed (right). **G.** Transversal section of the ovary. **H.** Stamen, lateral view, with detail of pore orientation. From *T.D. Pennington et al. 17639*. Reproduced with permission from *Nordic Journal of Botany* e02969: 3, fig. 1 (2021).

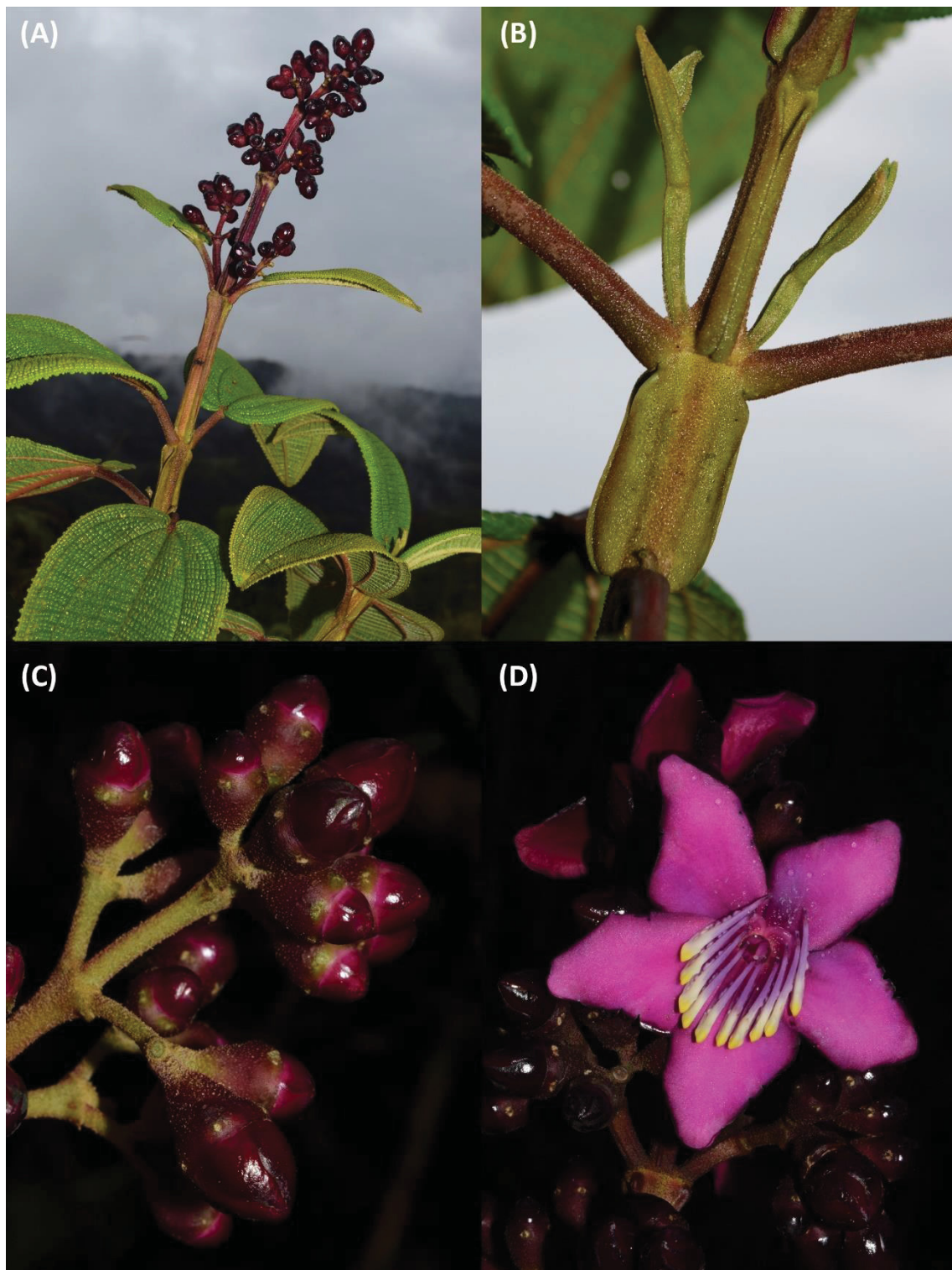


FIGURE 40. *Meriania penningtonii*. **A.** Terminal fertile branch with inflorescence. **B.** Winged internodes. **C.** Flower buds. **D.** Flower at anthesis, apical view. A-B from *R. Fernandez-Hilario et al. 2036*, C from *R. Fernandez-Hilario et al. 2026*, D from *R. Fernandez-Hilario et al. 2046*. Photos by Robin Fernandez.

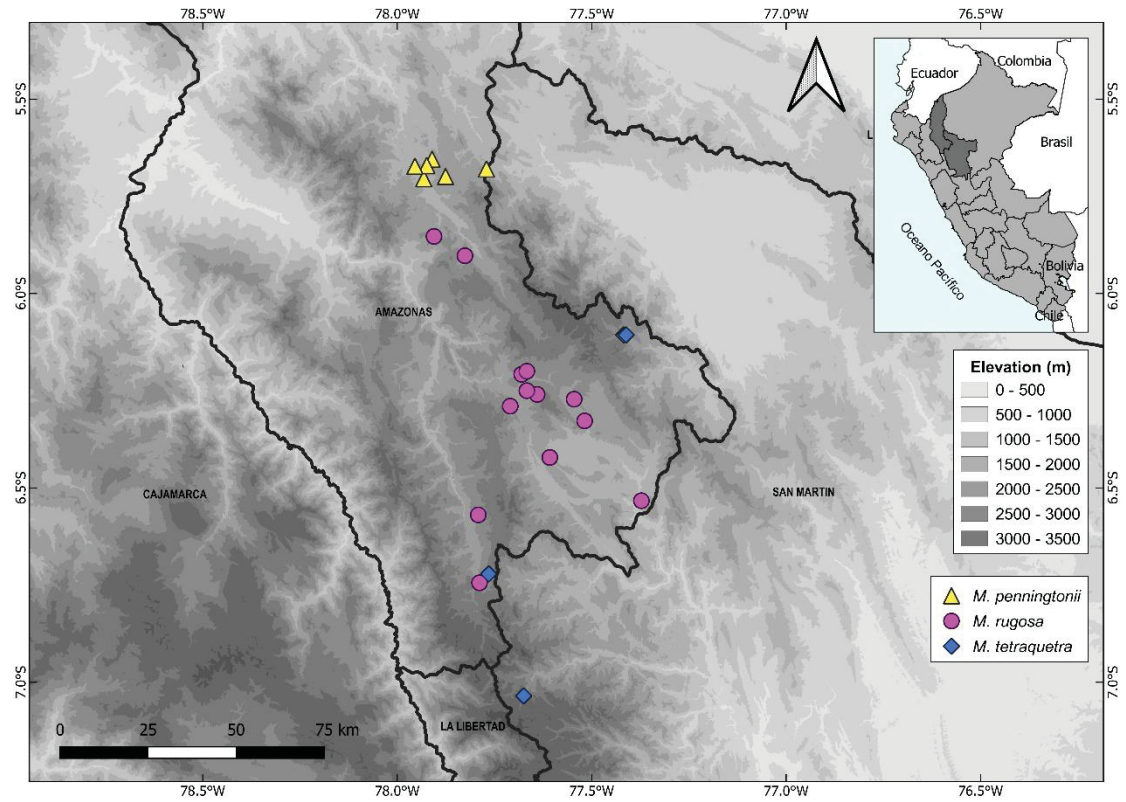


FIGURE 41. Distribution map of *M. penningtonii*, *M. rugosa* and *M. tetraquetra*.

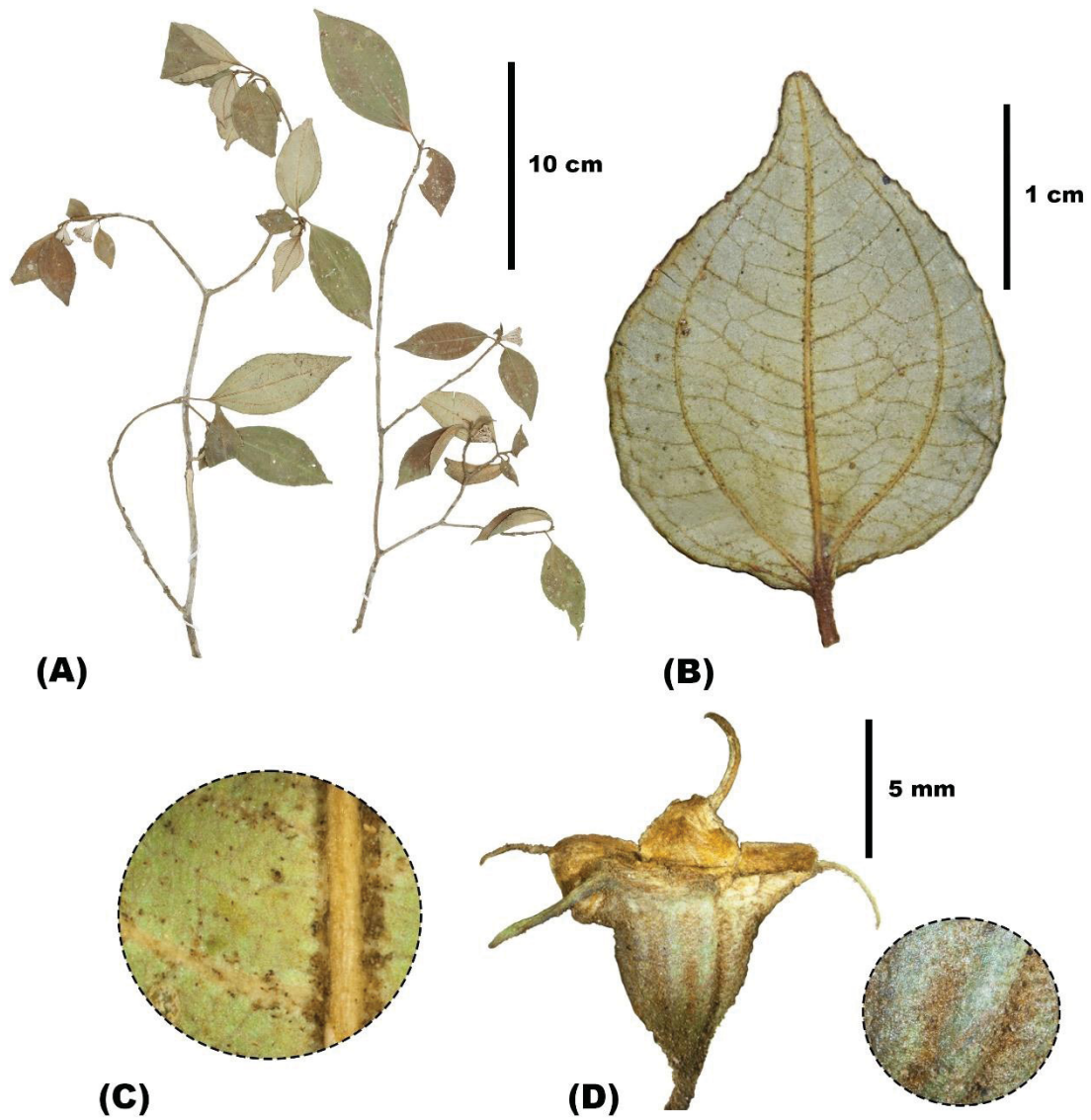


FIGURE 42. *Meriania prunifolia*. **A.** Terminal fertile branch with fruits. **B.** Leaf blade, abaxial view. **C.** Detail of the abaxial leaf surface. **D.** Fruit with detail of the surface (right). A and C from *J. Schunke 5667*; B from *A. Raimondi 1987*; D from *J. Schunke 11712*.

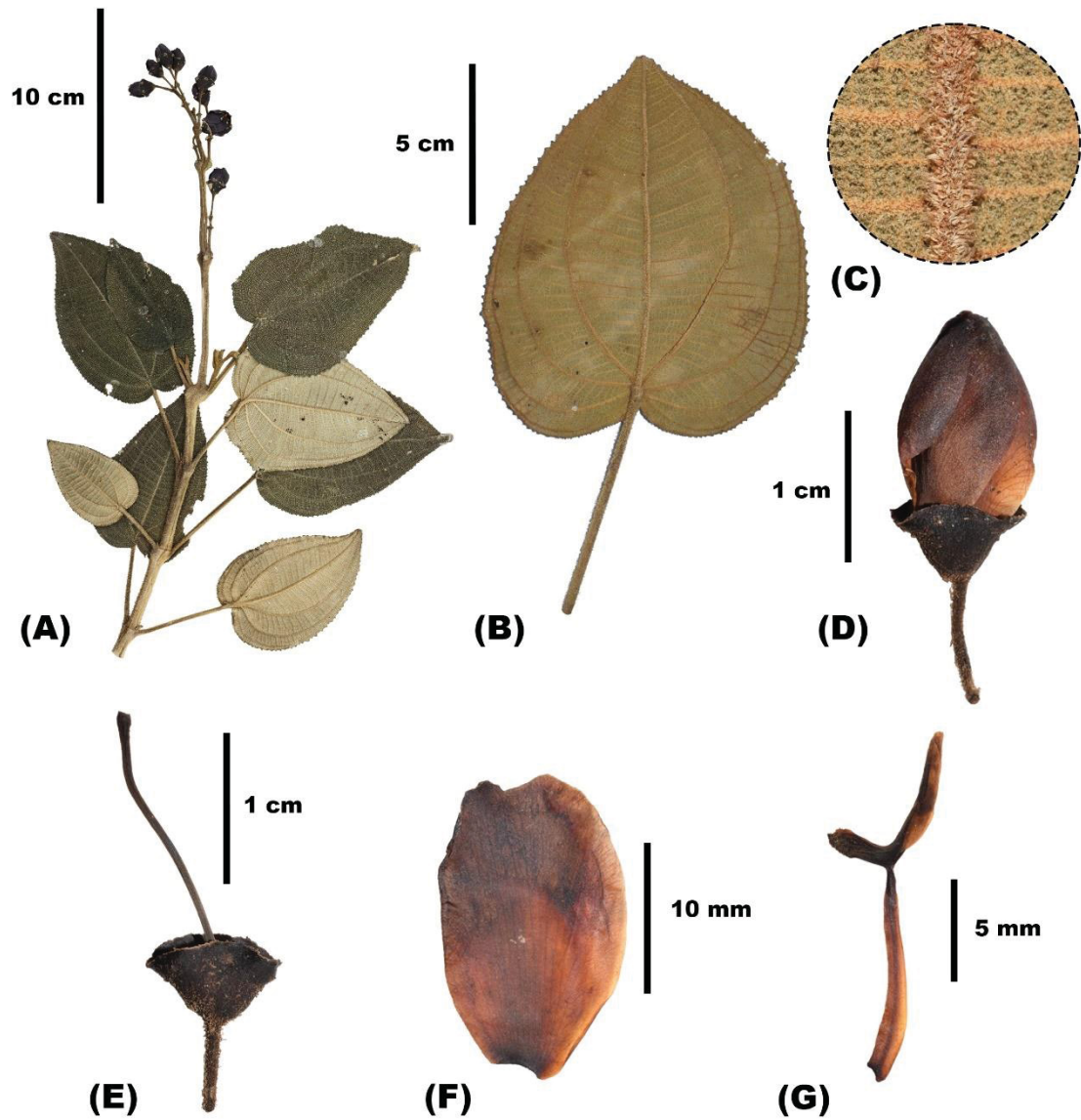


FIGURE 43. *Meriania radula*. **A.** Terminal fertile branch with inflorescence. **B.** Leaf blade, abaxial view. **C.** Detail of the abaxial surface. **D.** Flower bud. **E.** Flower with petals and stamens removed. **F.** Petal. **G.** Stamen, lateral view. **A** from *J. Wurdack 658*; **B-G** from *D. Paredes et al. 604*.

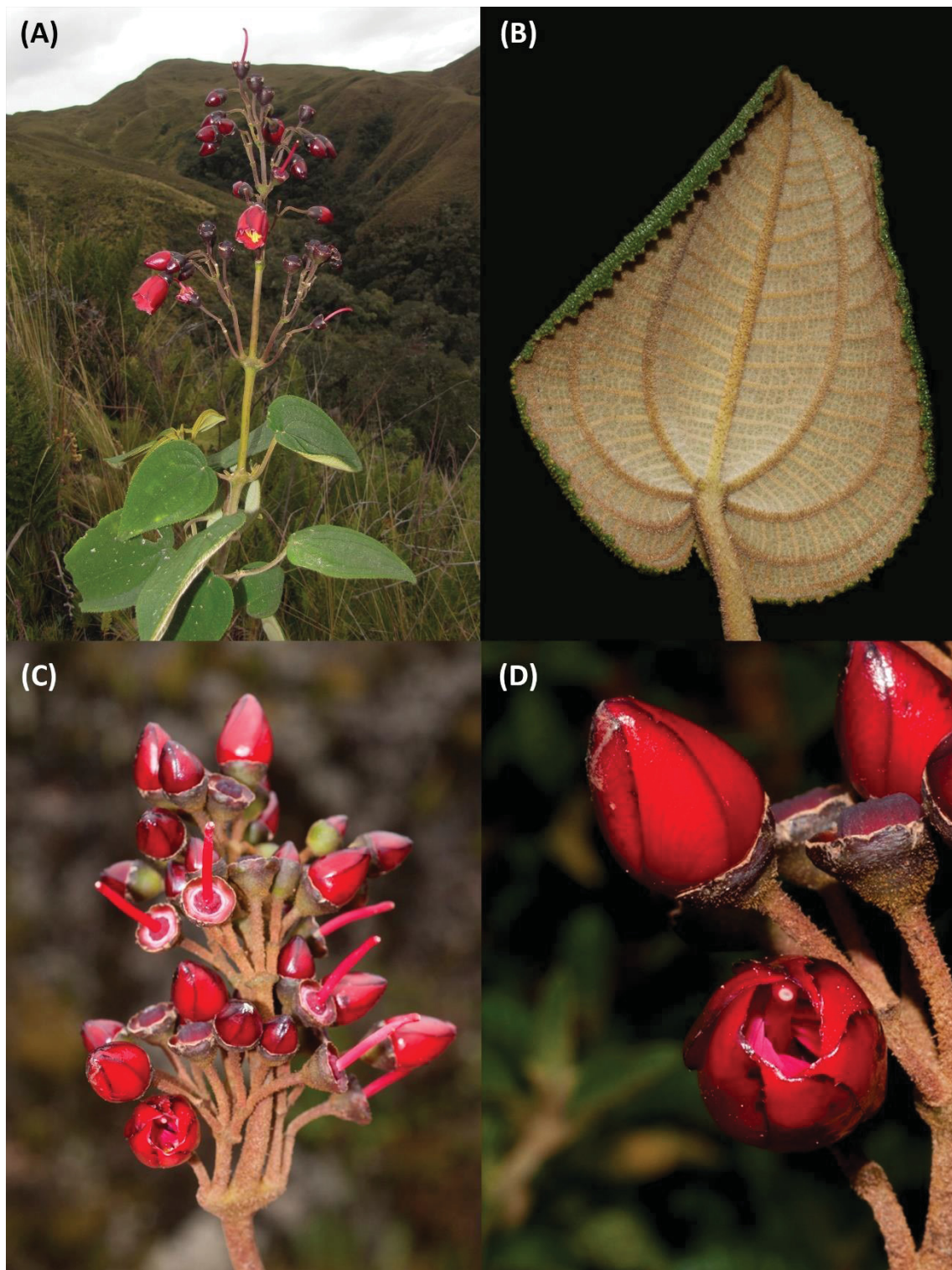


FIGURE 44. *Meriania radula*. **A.** Terminal fertile branch with inflorescence. **B.** Leaf blade, abaxial view. **C-D.** Detail of the inflorescences. A from *J.L. Marcelo-Peña s.n.*, B-D from *F.A. Michelangeli et al. 1732*. Photos by José Luis Marcelo-Peña (A) and Fabián A. Michelangeli (B-D).

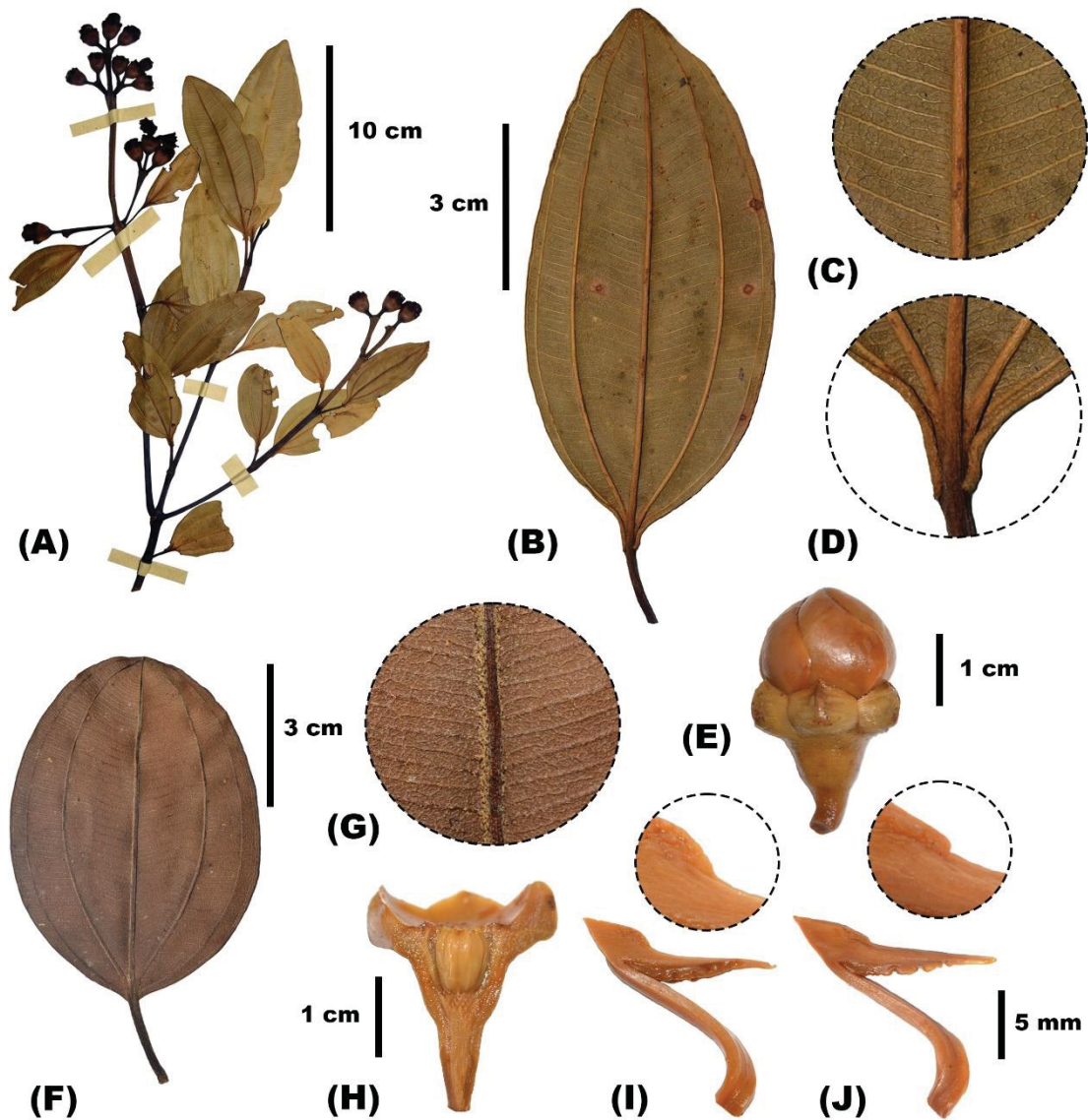


FIGURE 45. *Meriania rigida*. **A.** Terminal fertile branch with inflorescence. **B.** Leaf blade, abaxial view. **C.** Details of the abaxial surface. **D.** Detail of the revolute leaf base. **E.** Flower bud. **F.** Leaf blade, abaxial view. **G.** Details of the abaxial surface. **H.** Longitudinal section of the flower with petals, stamens and style removed. **I, J.** Stamens, lateral view, with details of the dorsal appendages. A-D from *C. Díaz & S. Fernández 10217*; E-J from *R. Fernandez-Hilario et al. 1931*.

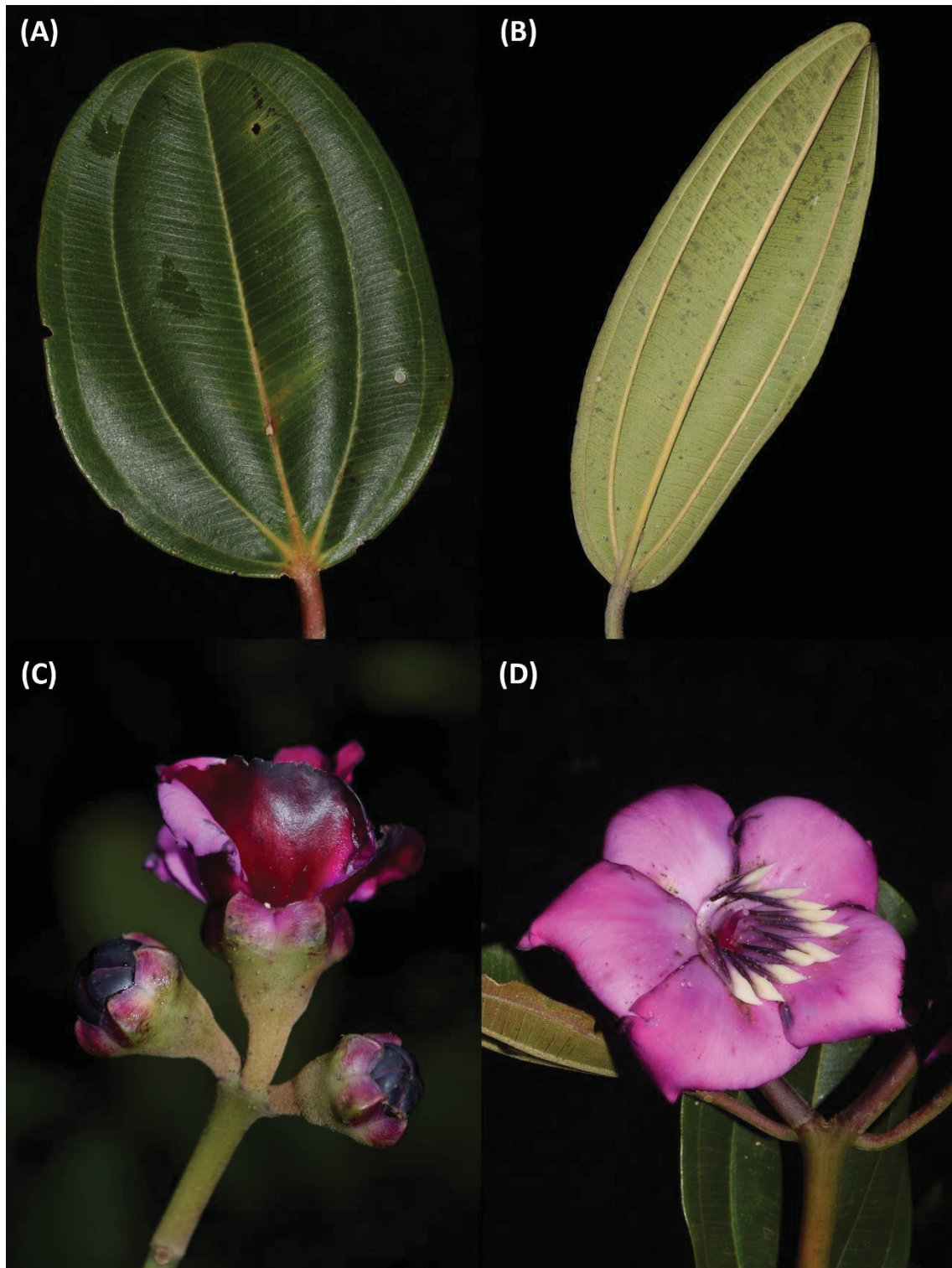


FIGURE 46. *Meriania rigida*. **A.** Leaf blade, adaxial view. **B.** Leaf blade, abaxial view. **C.** Detail of the inflorescence. **D.** Flower at anthesis, apical view. A, C and D from *R. Fernandez-Hilario et al. 1931*, B from *F.A. Michelangeli et al. 2635*. Photos by Robin Fernandez-Hilario (A, C and D) and Fabián A. Michelangeli (B).

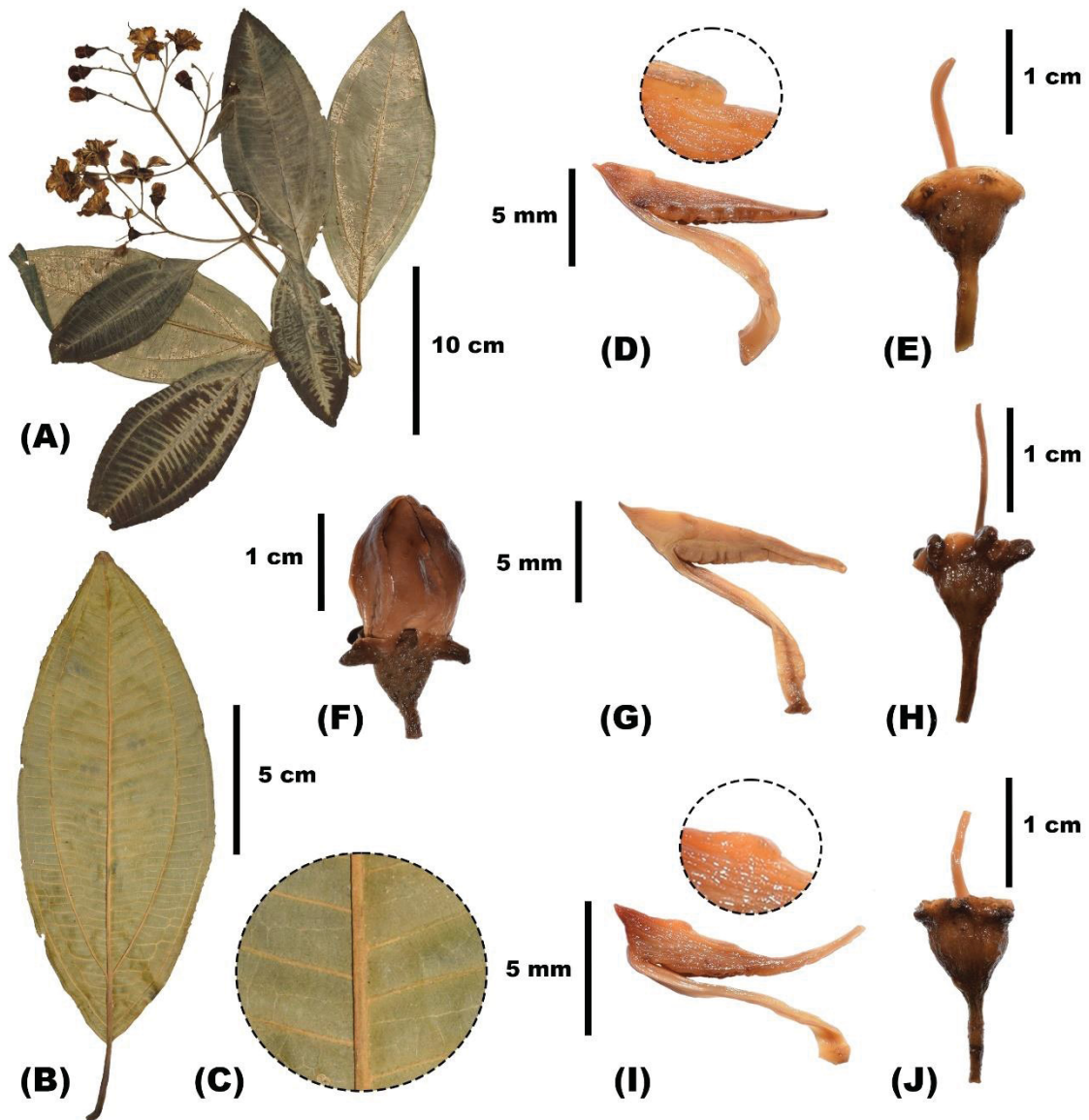


FIGURE 47. *Meriania rugosa*. **A.** Terminal fertile branch with inflorescence. **B.** Leaf blade, abaxial view. **C.** Detail of the abaxial leaf surface. **D.** Stamen, lateral view, with detail of the dorsal appendage (above). **E.** Flower with petals and stamens removed. **F.** Flower bud. **G.** Stamen, lateral view. **H.** Flower with petals and stamens removed. **I.** Stamen, lateral view, with detail of the dorsal appendage (above). **J.** Flower with petals and stamens removed. A-C and I-J from *F. A. Michelangeli et al. 1725*; D-E from *F. A. Michelangeli et al. 1704*; F-H from *H. van der Werff 17006*.

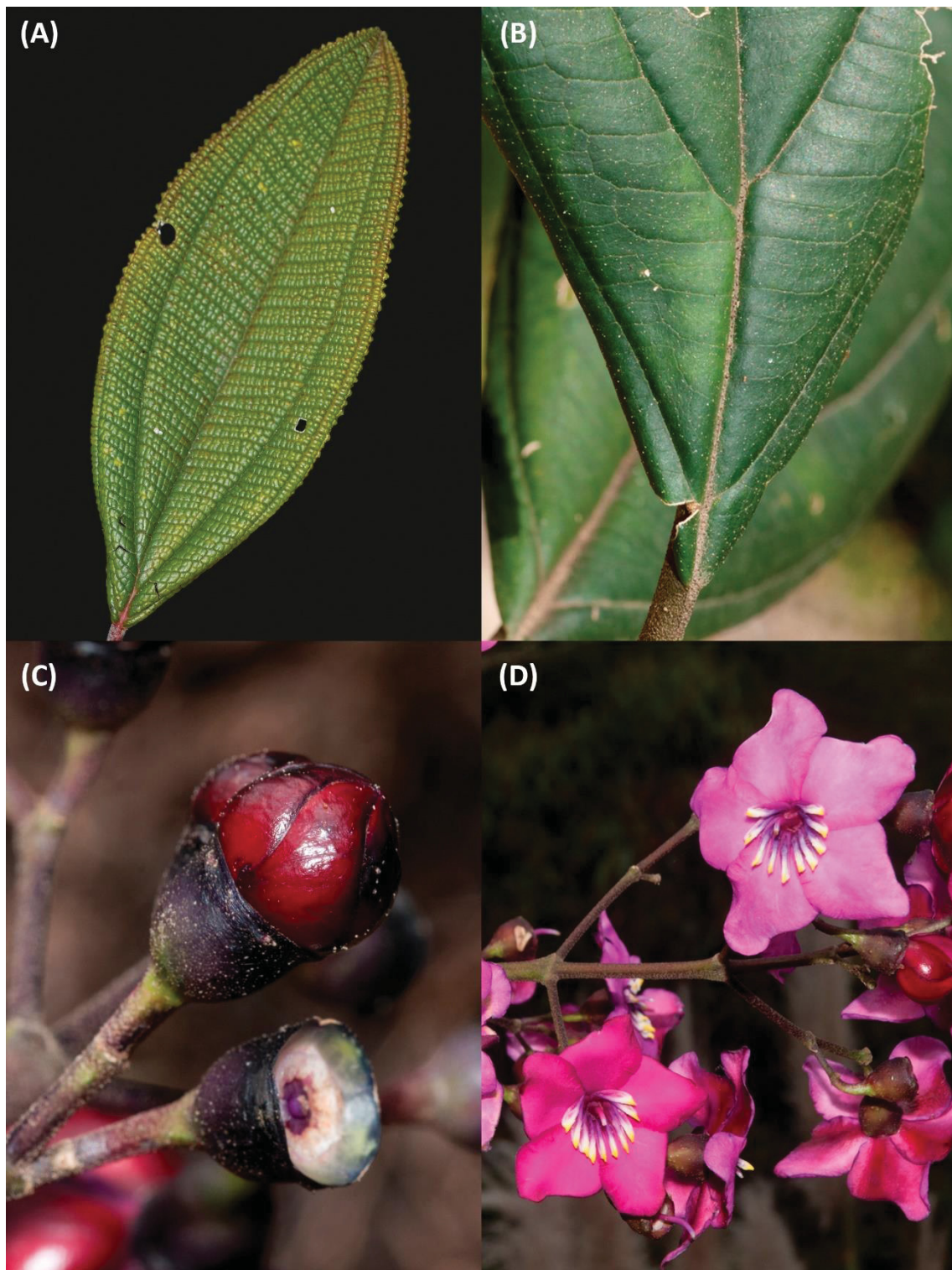


FIGURE 48. *Meriania rugosa*. **A.** Leaf blade, adaxial view. **B.** Detail of the base of the leaf blade. **C.** Detail of the inflorescence. **D.** Inflorescence with flowers at anthesis. A from *R.W. Bussmann et al. 16614*, B and D from *F.A. Michelangeli et al. 1725*, C from *F.A. Michelangeli et al. 1704*. Photos by Rainer W. Bussmann (A) and Fabián A. Michelangeli (B-D).

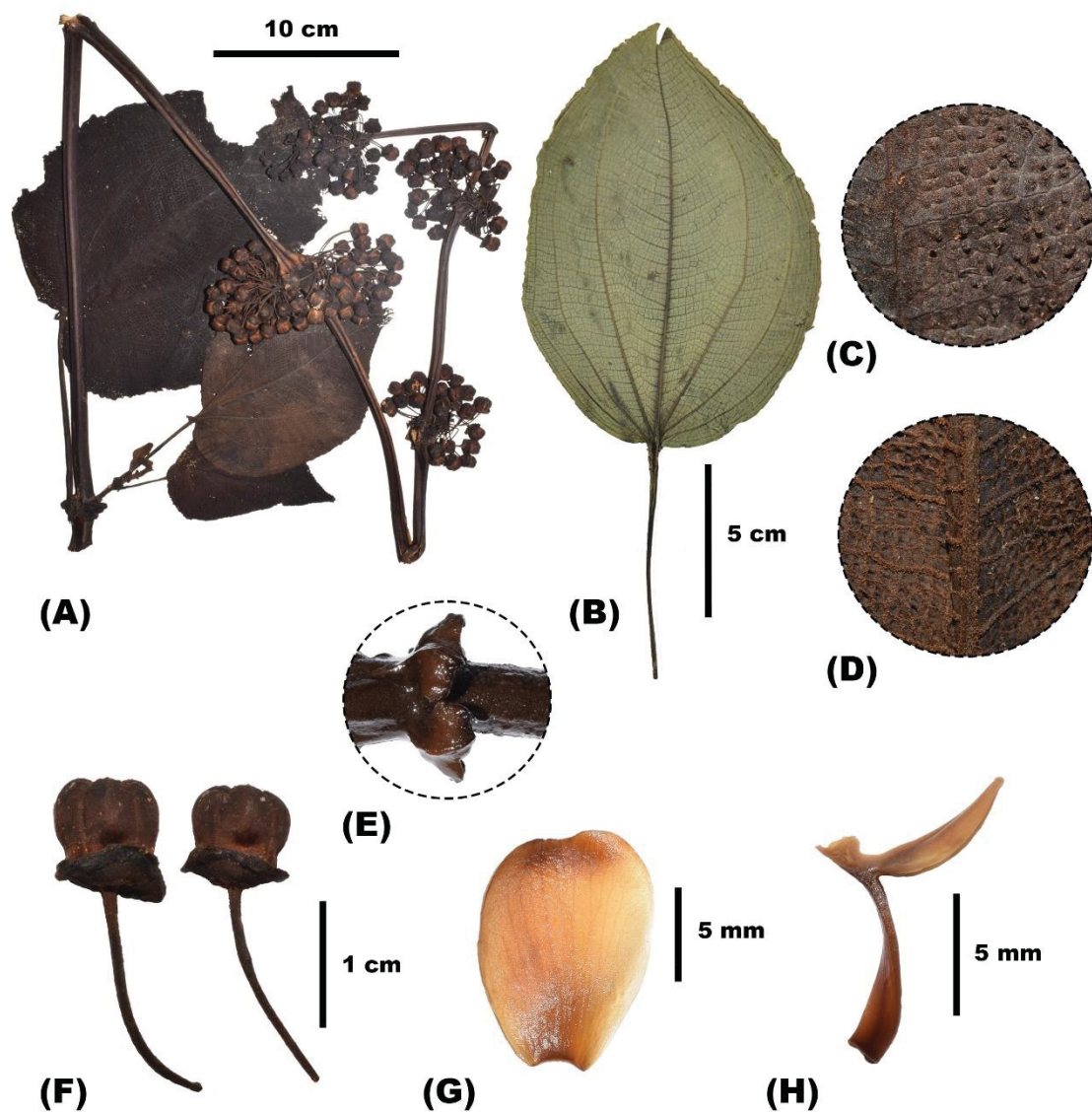


FIGURE 49. *Meriania sanguinea*. **A.** Terminal fertile branch with infructescence. **B.** Leaf blade, abaxial view. **C.** Detail of the adaxial leaf surface. **D.** Detail of the abaxial leaf surface. **E.** Detail of the abaxial projections of the petiole. **F.** Fruits. **G.** Petal. **H.** Stamen, lateral view. A, C-H. from *R. Fernandez-Hilario et al. 1896*; B from *L. Cárdenas & R. Francis 855*.

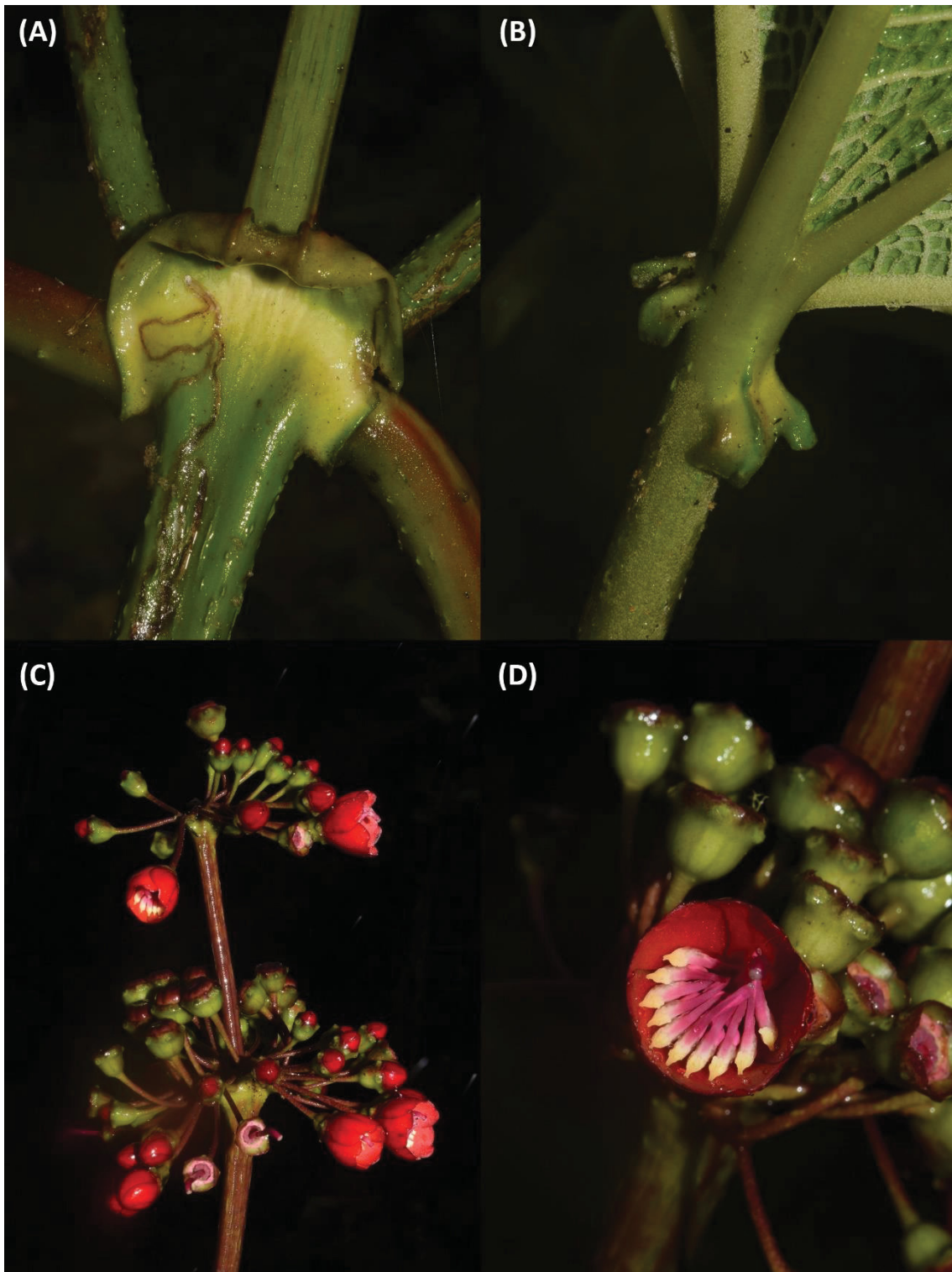


FIGURE 50. *Meriania sanguinea*. **A.** Interpetiolar flap. **B.** Abaxial projections on the apex of the petiole. **C.** Detail of the inflorescence. **D.** Flower at anthesis, apical view. A-D from R. Fernandez-Hilario *et al.* 1896. Photos by Robin Fernandez-Hilario.

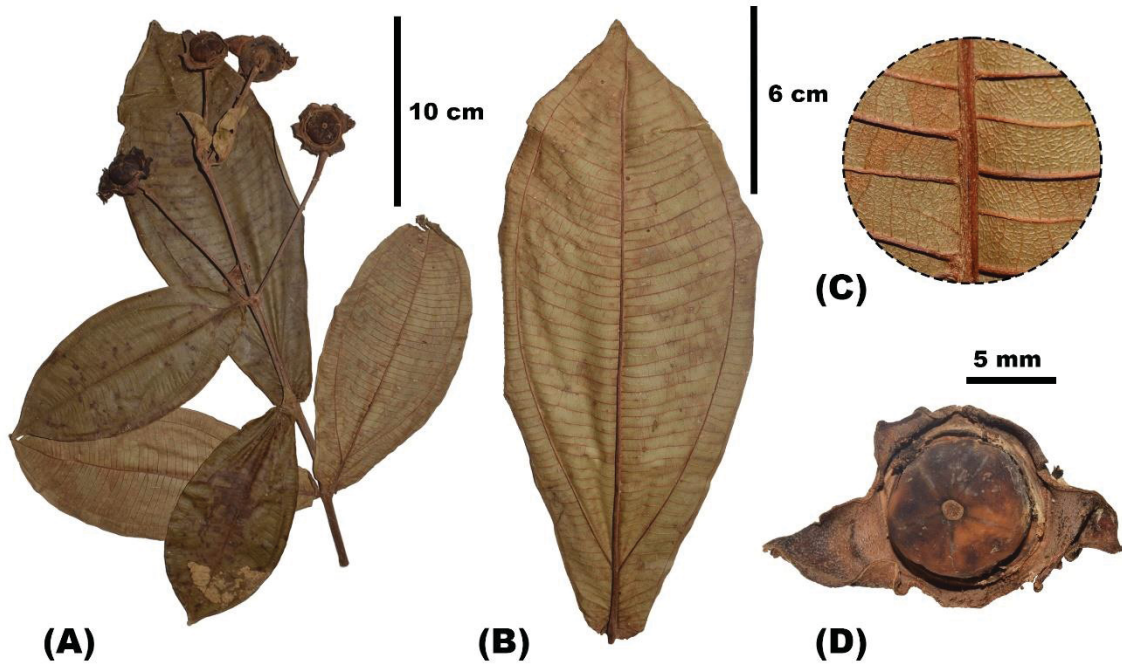


FIGURE 51. *Meriania sessilifolia*. **A.** Terminal fertile branch with infructescence. **B.** Leaf blade, abaxial view. **C.** Detail of the abaxial leaf surface. **D.** Fruit, apical view. A-D from R. *Fernandez-Hilario et al.* 2097.

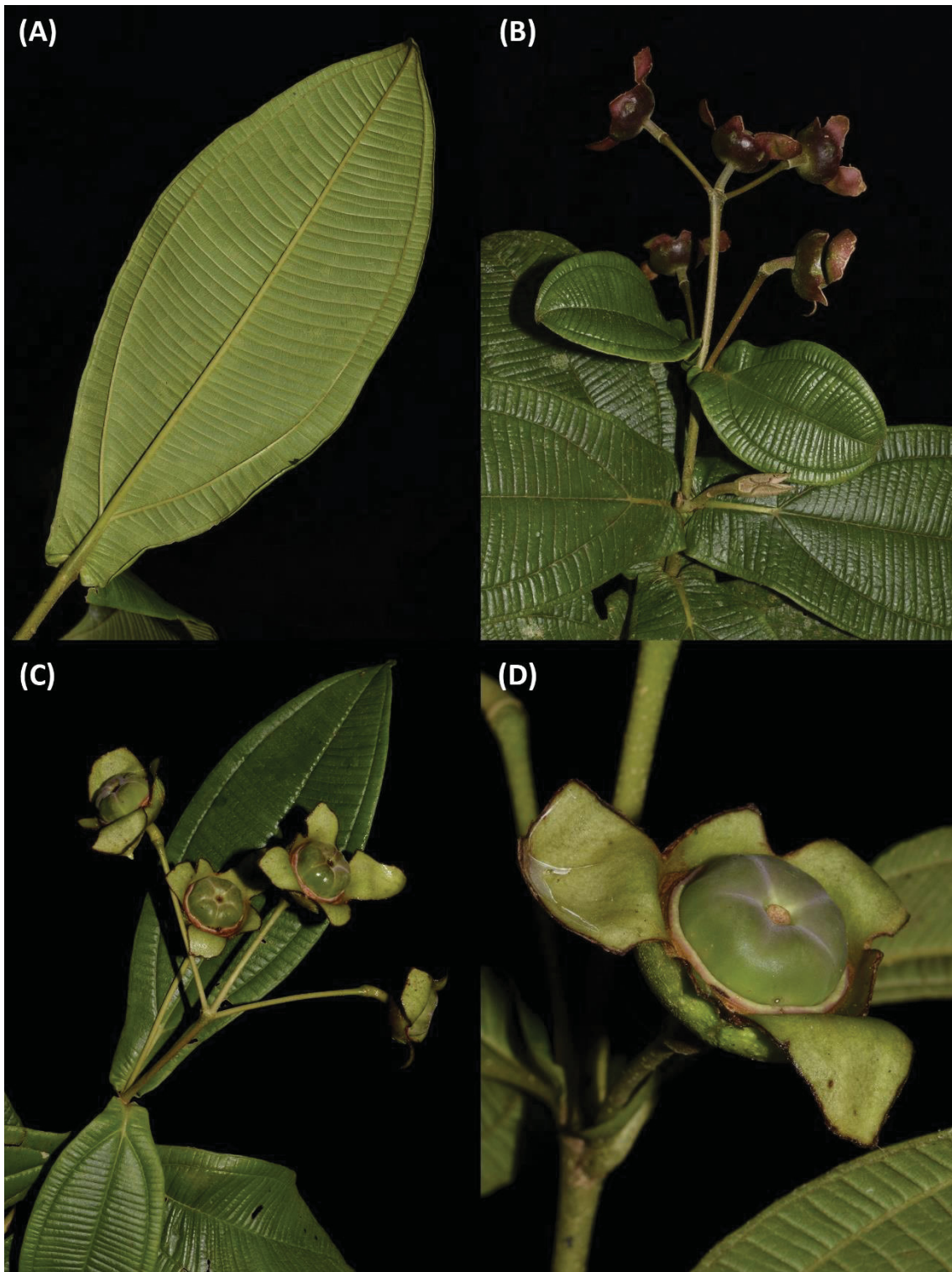


FIGURE 52. *Meriania sessilifolia*. **A.** Leaf blade, abaxial view. **B-C.** Terminal fertile branches with infructescences. **D.** Immature fruit, apical view. A-D from R. Fernandez-Hilario *et al.* 2097. Photos by Robin Fernandez-Hilario.

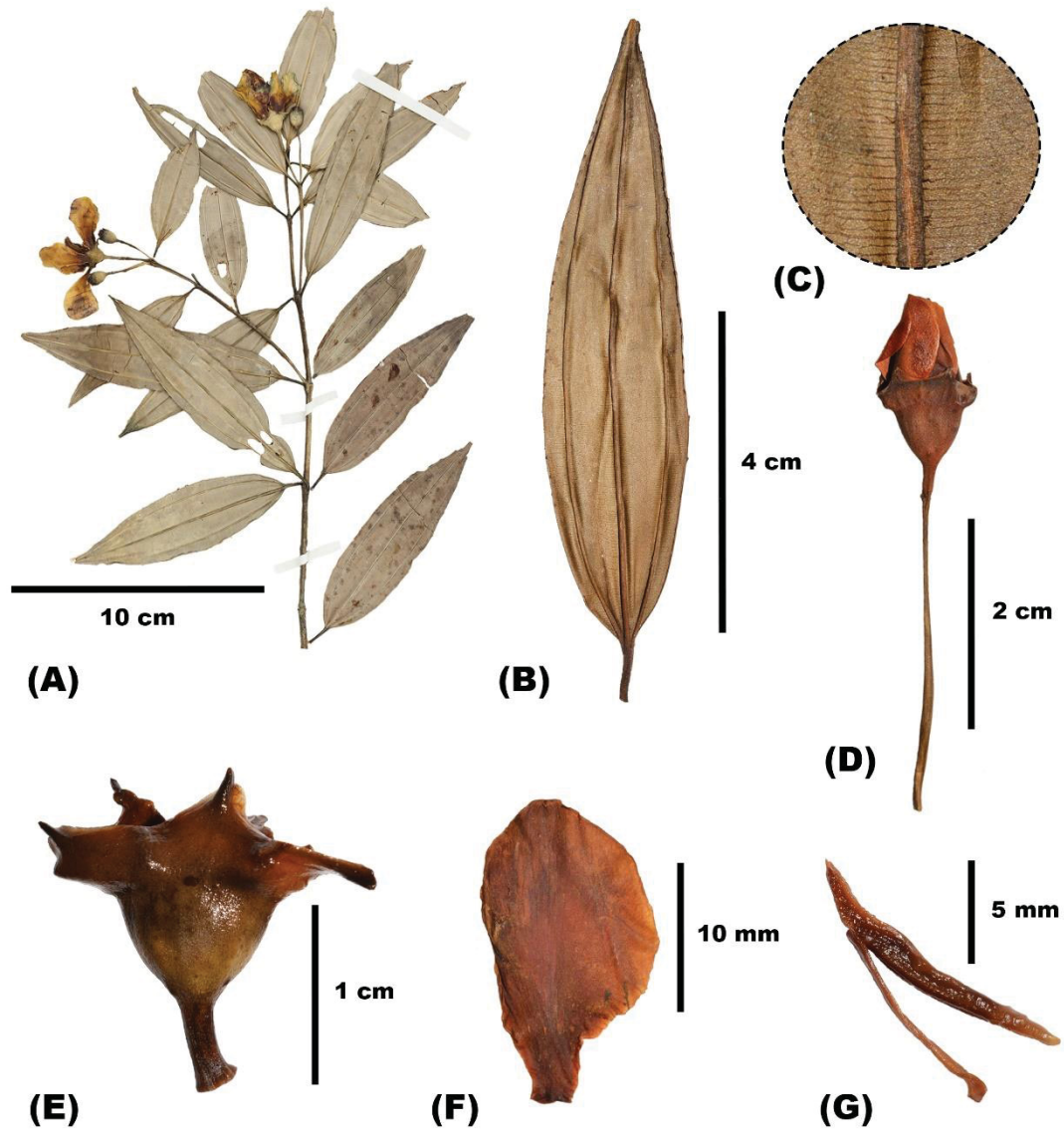


FIGURE 53. *Meriania speciosa*. **A.** Terminal fertile branch with inflorescences. **B.** Leaf blade, abaxial view. **C.** Detail of the abaxial surface. **D.** Flower bud. **E.** Flower with petals, stamens and style removed. **F.** Petal. **G.** Stamen, lateral view. A from *L. Williams 7010*; B-G from *V. Quipuscoa et al. 2036*.

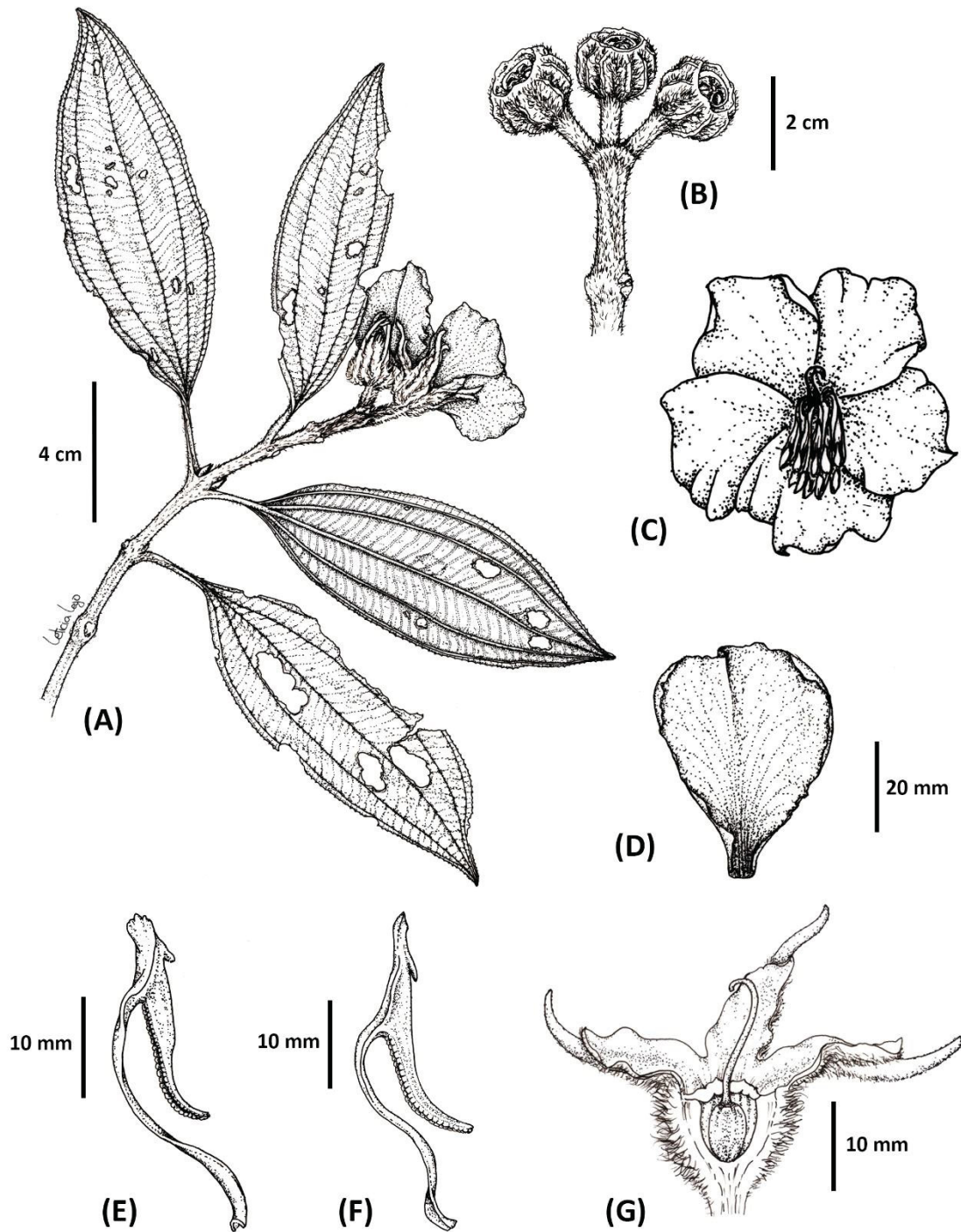


FIGURE 54. *Meriania sumatika*. **A.** Terminal fertile branch with inflorescence. **B.** Infructescence branch. **C.** Flower at anthesis, lateral view. **D.** Petal. **E.** Antepetalous stamen, lateral view. **F.** Antepetalous stamen, lateral view. **G.** Longitudinal section of the flower with petals and stamens removed. A from *W. Galiano et al. 6410*; B-G from *P. Nuñez & J. Arque 8369*. Reproduced with permission from Wildenowia (2021).

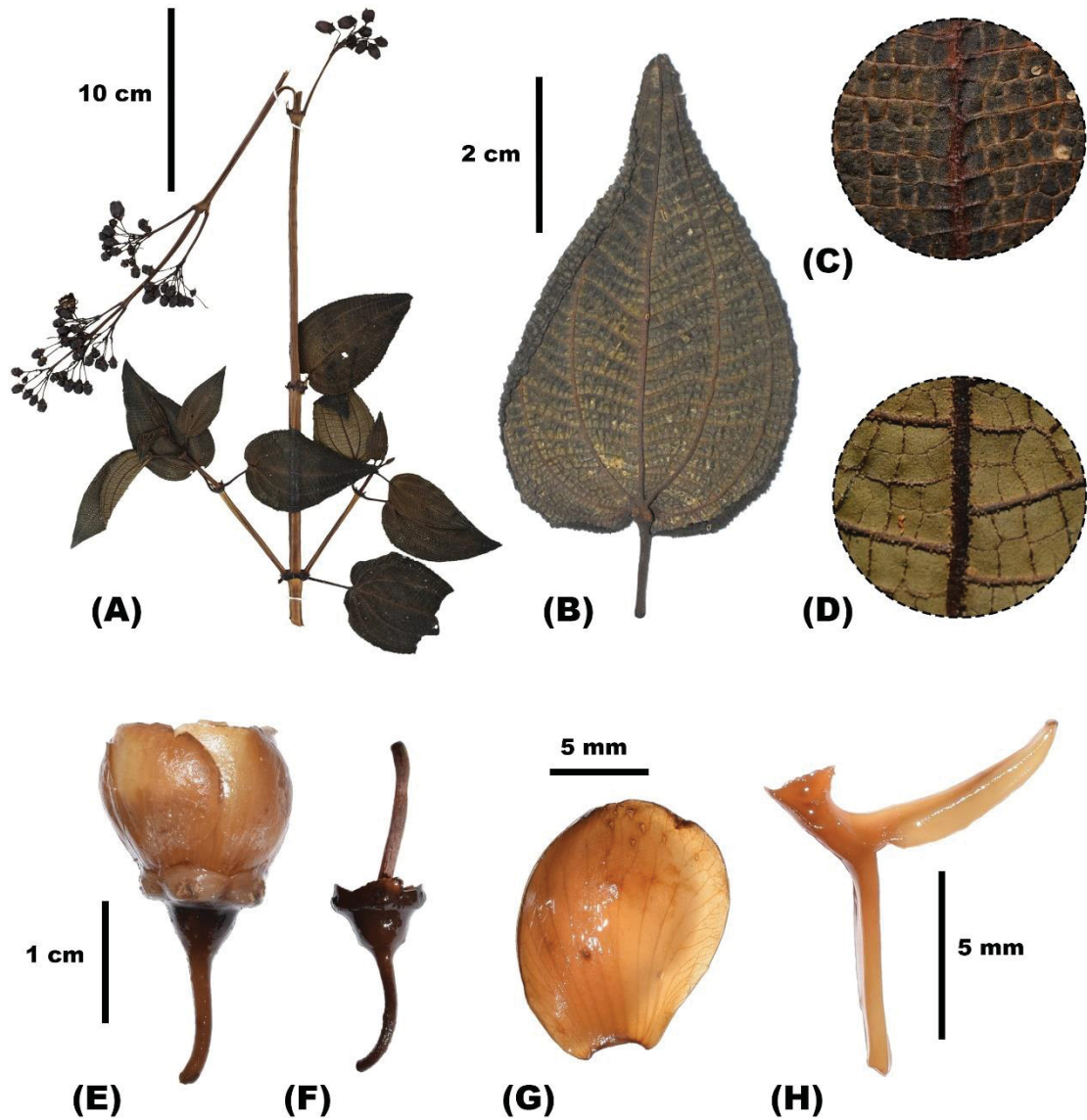


FIGURE 55. *Meriania tetragona*. **A.** Terminal fertile branch with inflorescence. **B.** Leaf blade, abaxial view. **C.** Detail of the adaxial leaf surface. **D.** Detail of the abaxial leaf surface. **E.** Flower at anthesis. **F.** Flower with petals and stamens removed. **G.** Petal. **H.** Stamen, lateral view. A from *J. Luteyn & E. Cotton 11379*; B from *T. Pennington et al. 17701*; C-H from *R. Fernandez-Hilario et al. 2092*.



FIGURE 56. *Meriania tetragona*. **A.** Terminal fertile branch with inflorescence. **B.** Interpetiolar flap. **C.** Abaxial projections on the apex of the petiole. **D.** Flowers at anthesis, apical view. A and D from *R. Fernandez-Hilario et al. 2092*, B and C from *R. Fernandez-Hilario et al. 1888*. Photos by Robin Fernandez-Hilario.

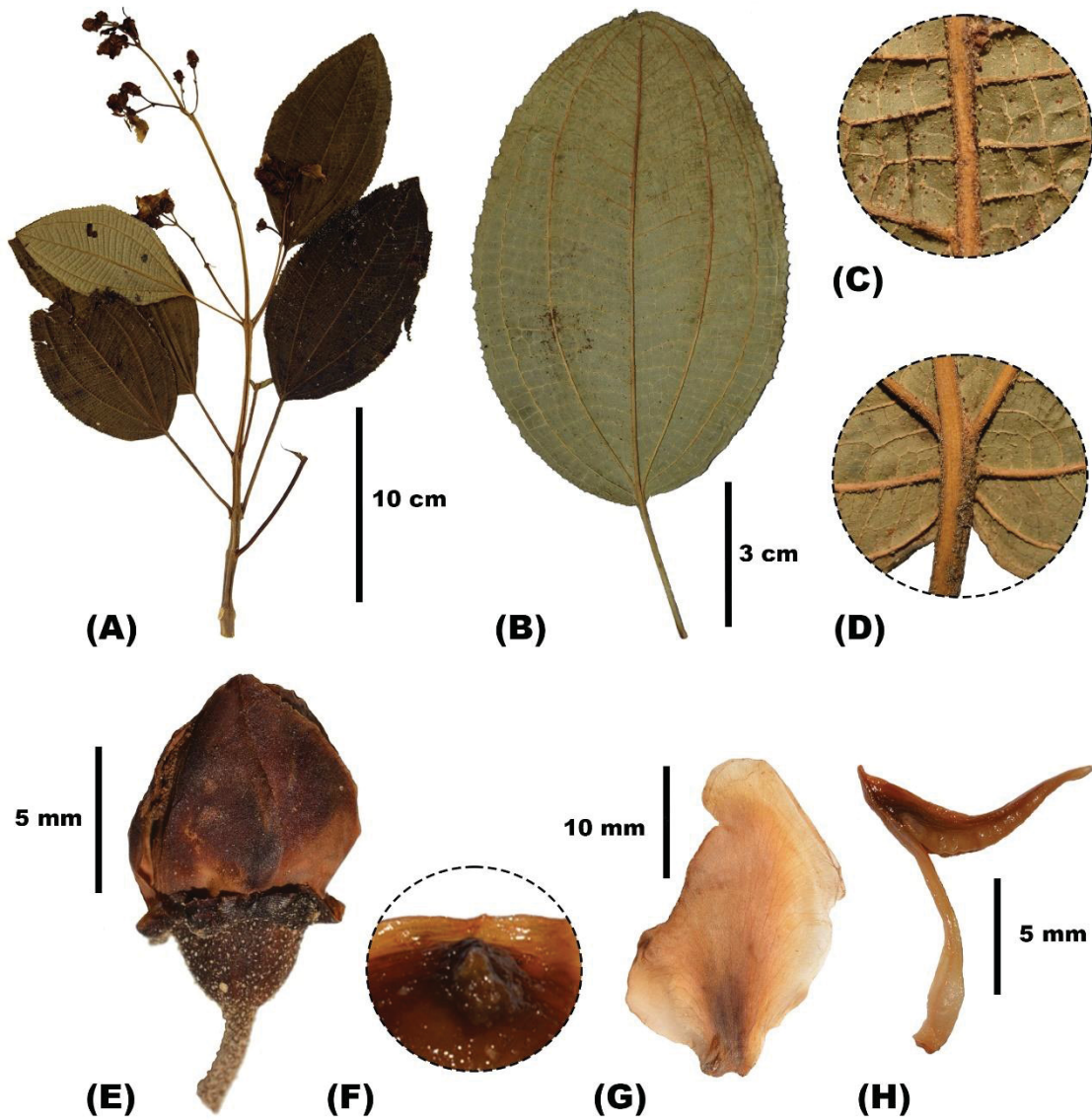


FIGURE 57. *Meriania tetraquetra*. **A.** Terminal fertile branch with inflorescence. **B.** Leaf blade, abaxial view. **C.** Detail of the abaxial leaf surface. **D.** Detail of the leaf base, abaxial view. **E.** Flower bud. **F.** Detail of the dorsal projection of the calyx. **G.** Petal. **H.** Stamen, lateral view. A from *J. L. Marcelo-Peña et al. 7103*; B-H from *R. Fernandez-Hilario et al. 251*.

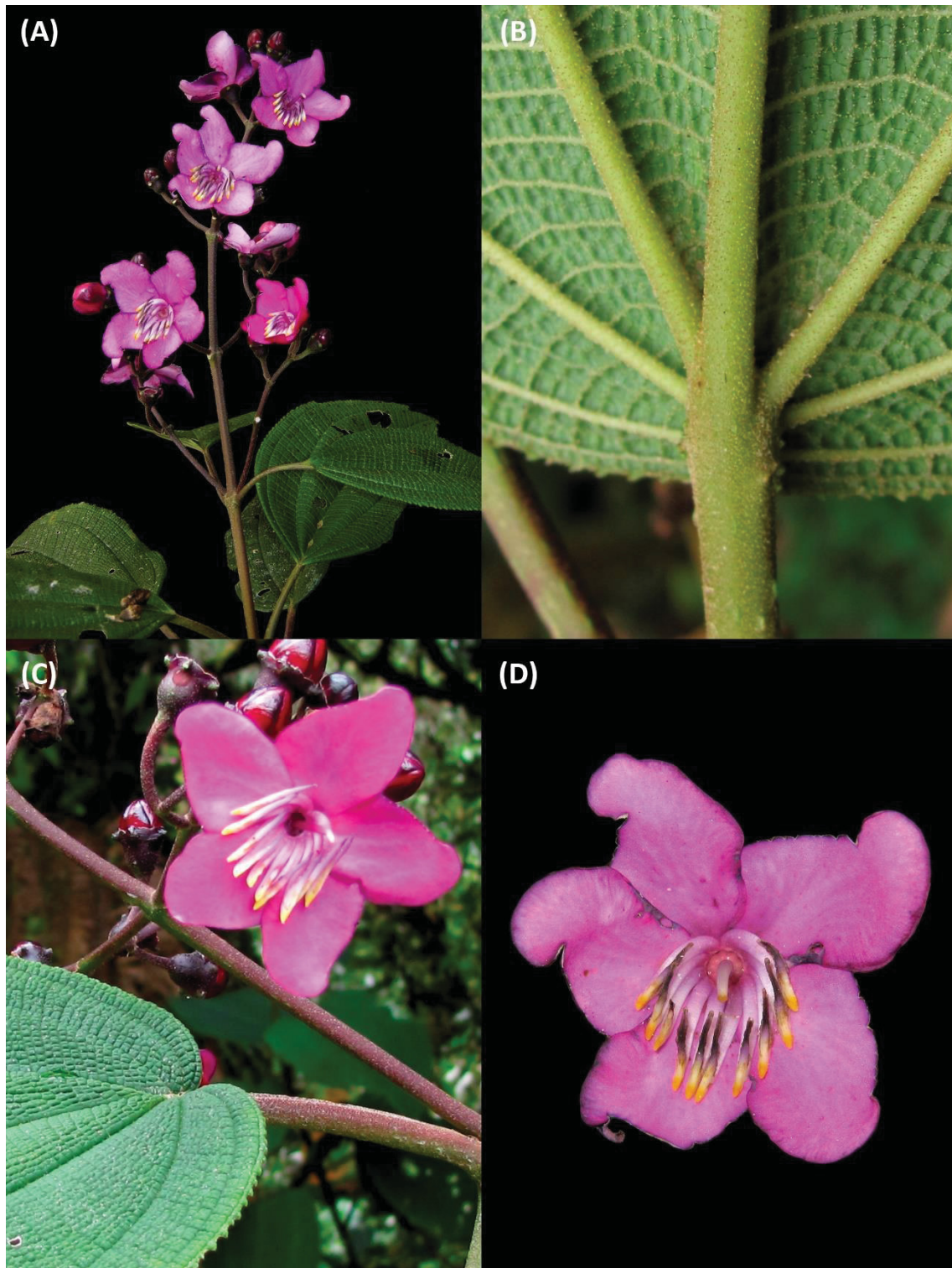


FIGURE 58. *Meriania tetraquetra*. **A.** Terminal fertile branch with inflorescence. **B.** Detail of the base of the leaf blade, abaxial view. **C.** Detail of the inflorescence. **D.** Flower at anthesis, apical view. A and D from *R. Fernandez-Hilario et al. 251*, B and C from *R.W. Bussmann et al. 17071*. Photos by Robin Fernandez-Hilario (A and D) and Rainer W. Bussmann (B and C).

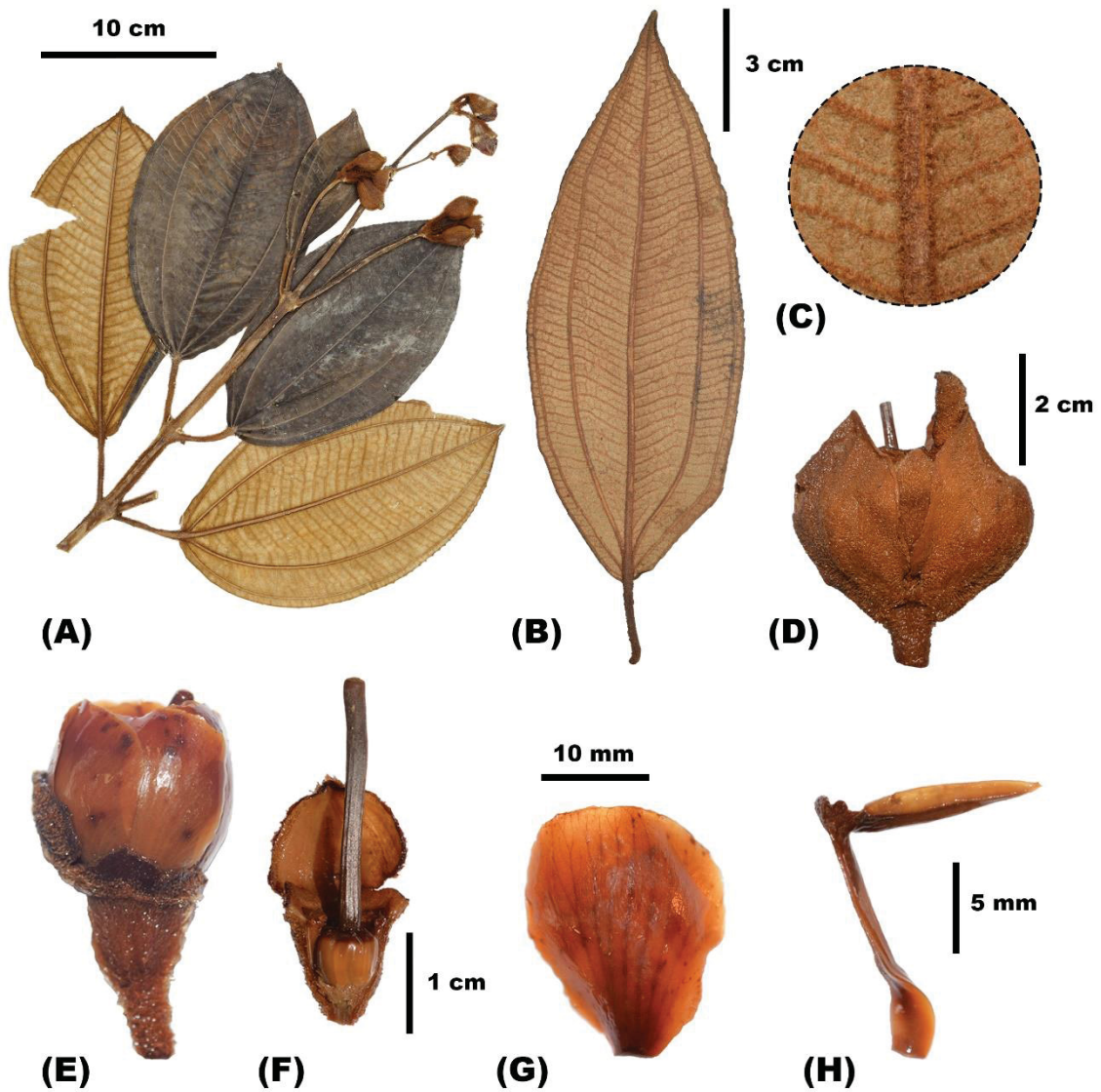


FIGURE 59. *Meriania tomentosa*. **A.** Terminal fertile branch with inflorescence. **B.** Leaf blade, abaxial view. **C.** Detail of the abaxial leaf surface. **D.** Bracteoles completely covering the flower buds. **E.** Flower at anthesis. **F.** Longitudinal section of the flower with petals and stamens removed. **G.** Petal. **H.** Stamen, lateral view. A from *B. Maguire & C. Maguire 44432*; B-H from *R. Fernandez-Hilario et al. 1905*.

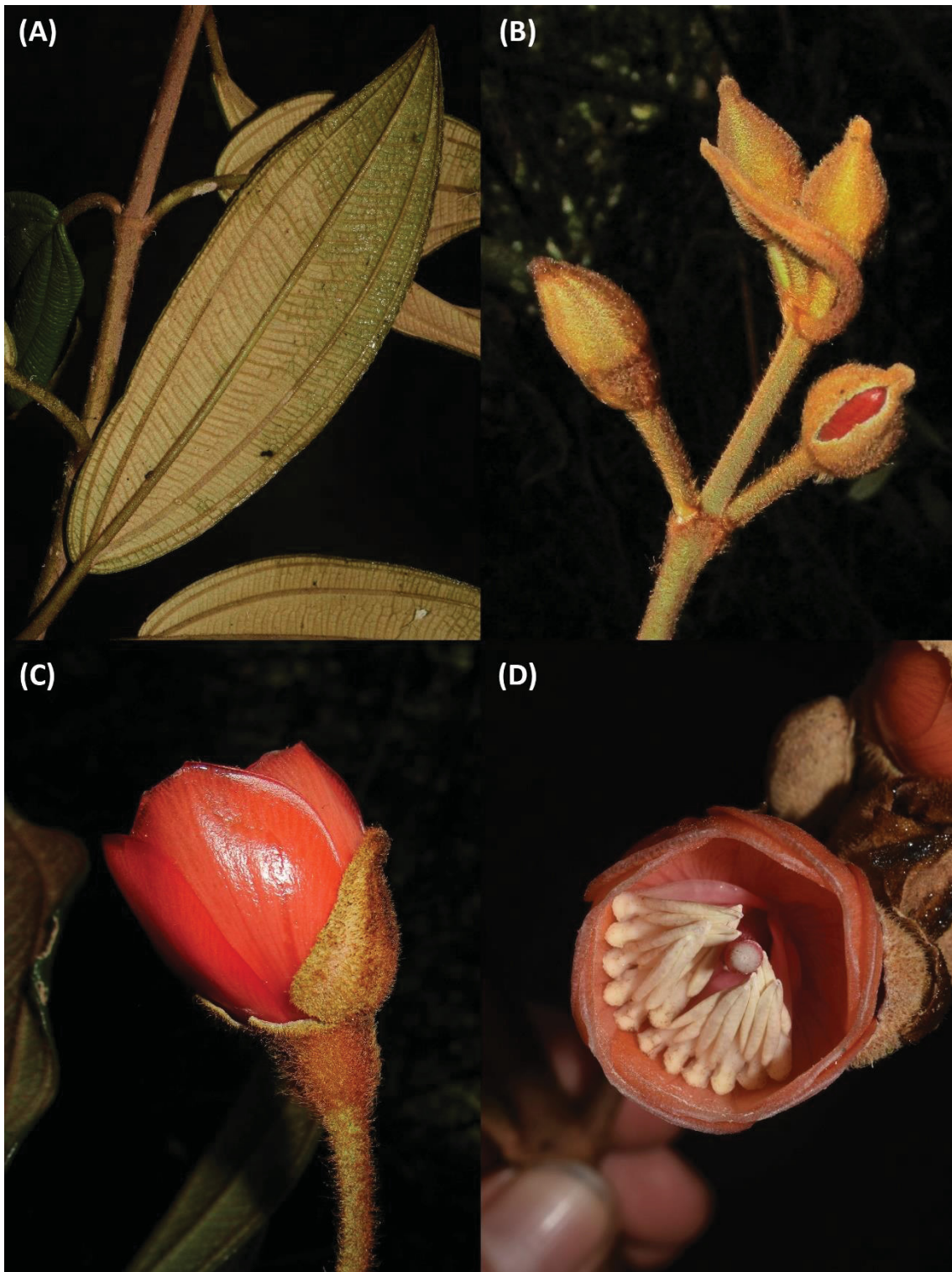


FIGURE 60. *Meriania tomentosa*. **A.** Leaf blade, abaxial view. **B.** Detail of the inflorescence with flower buds. **C.** Flower at anthesis, lateral view. **D.** Flower at anthesis, apical view. A and D from *R. Fernandez-Hilario et al. 1905*, B and C from *R. Villanueva-Espinoza 546*. Photos by Robin Fernandez-Hilario (A and D) and Rosa Villanueva-Espinoza (B and C).

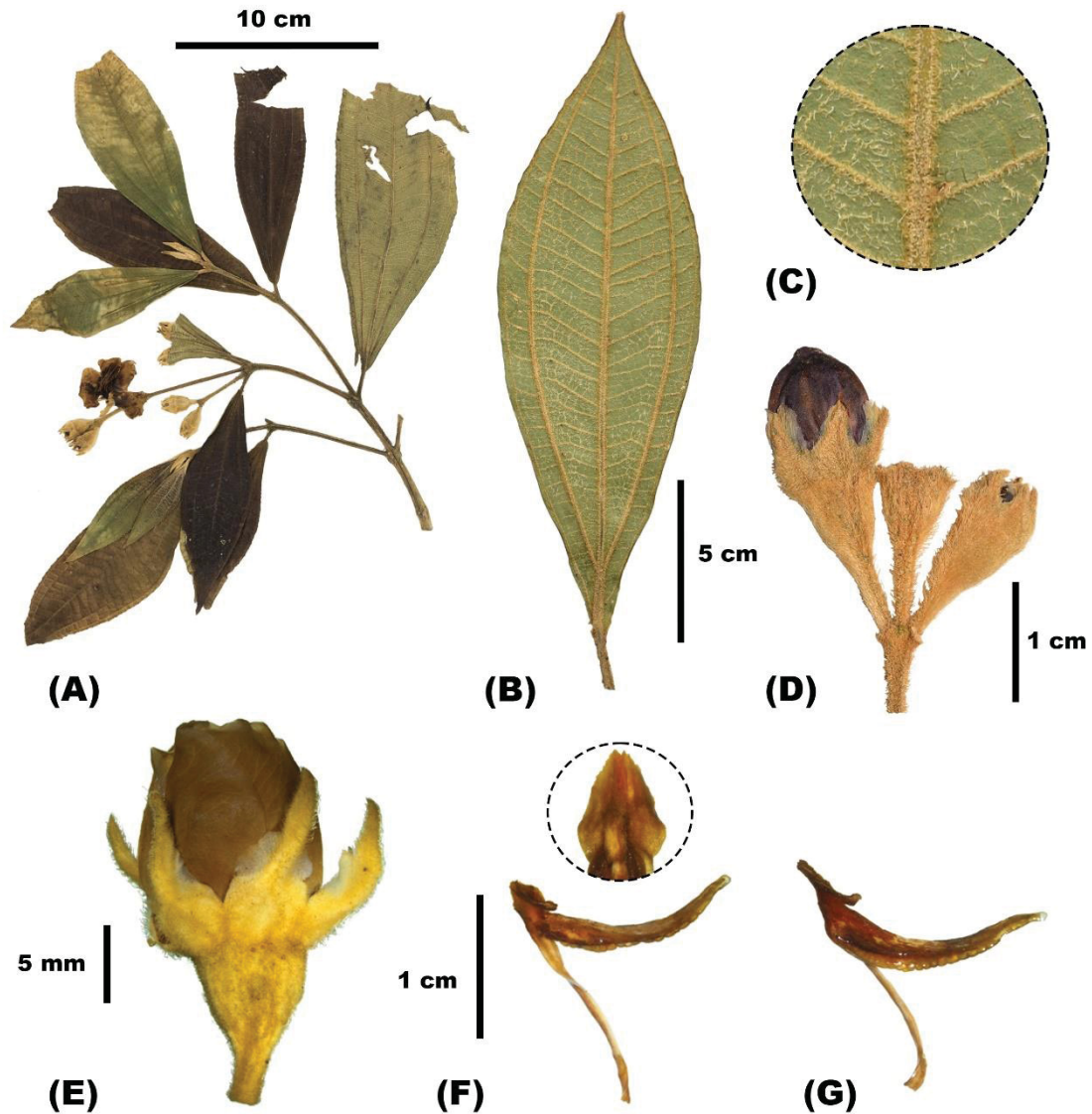


FIGURE 61. *Meriania vargasii*. **A.** Terminal fertile branch with inflorescence. **B.** Leaf blade, abaxial view. **C.** Detail of the abaxial leaf surface. **D.** Inflorescence branch. **E.** Flower bud. **F.** Antesepalous stamen, lateral view, with detail of the dorso-basal appendage, frontal view (above). **G.** Antepetalous stamen, lateral view. A from *G. Calatayud et al.* 2255; B-D from *C. Vargas* 10644; E from *L. Valenzuela et al.* 152; F-G from *W. Galiano et al.* 6156.

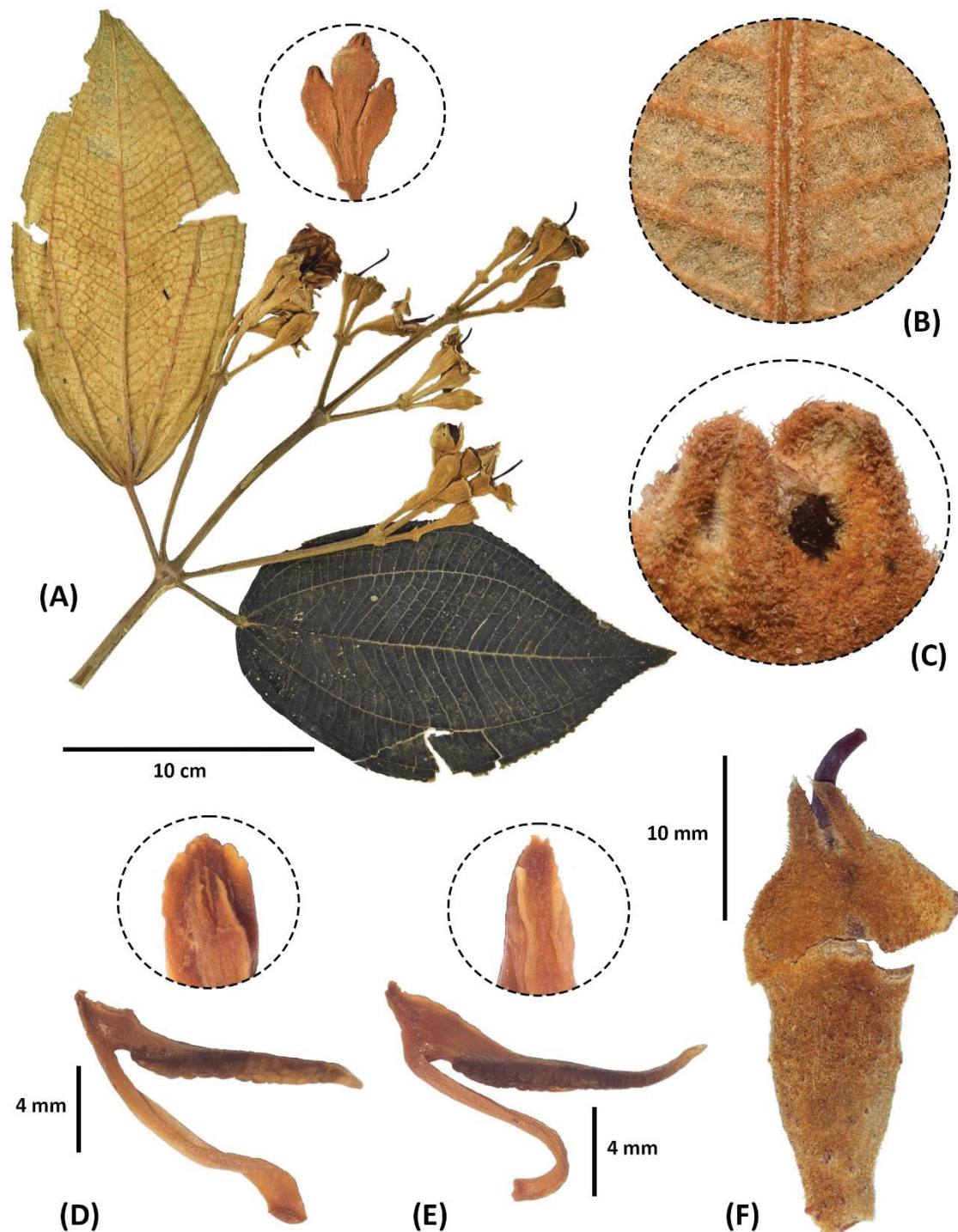


FIGURE 62. *Meriania vasquezii*. **A.** Terminal fertile branch with inflorescence and detail of the inflorescence branch. **B.** Detail of the abaxial leaf surface. **C.** Detail of the apex of the calyx. **D.** Antesepalous stamen, lateral view, with detail of the descending dorso-basal appendage. **E.** Antepetalous stamen, lateral view, with detail of the descending dorso-basal appendage. **F.** Flower with petals and stamens removed. A-F from *R. Vásquez et al. 45480*. Reproduced with permission from *Wildenowia* (2021).



FIGURE 63. *Meriania vasquezii*. **A.** Terminal fertile branch with inflorescence. **B.** Detail of the inflorescence. **C.** Flower at anthesis, apical view. **D.** Immature fruit. A-D from R. Vásquez et al. 45480. Photos by Rodolfo Vásquez.

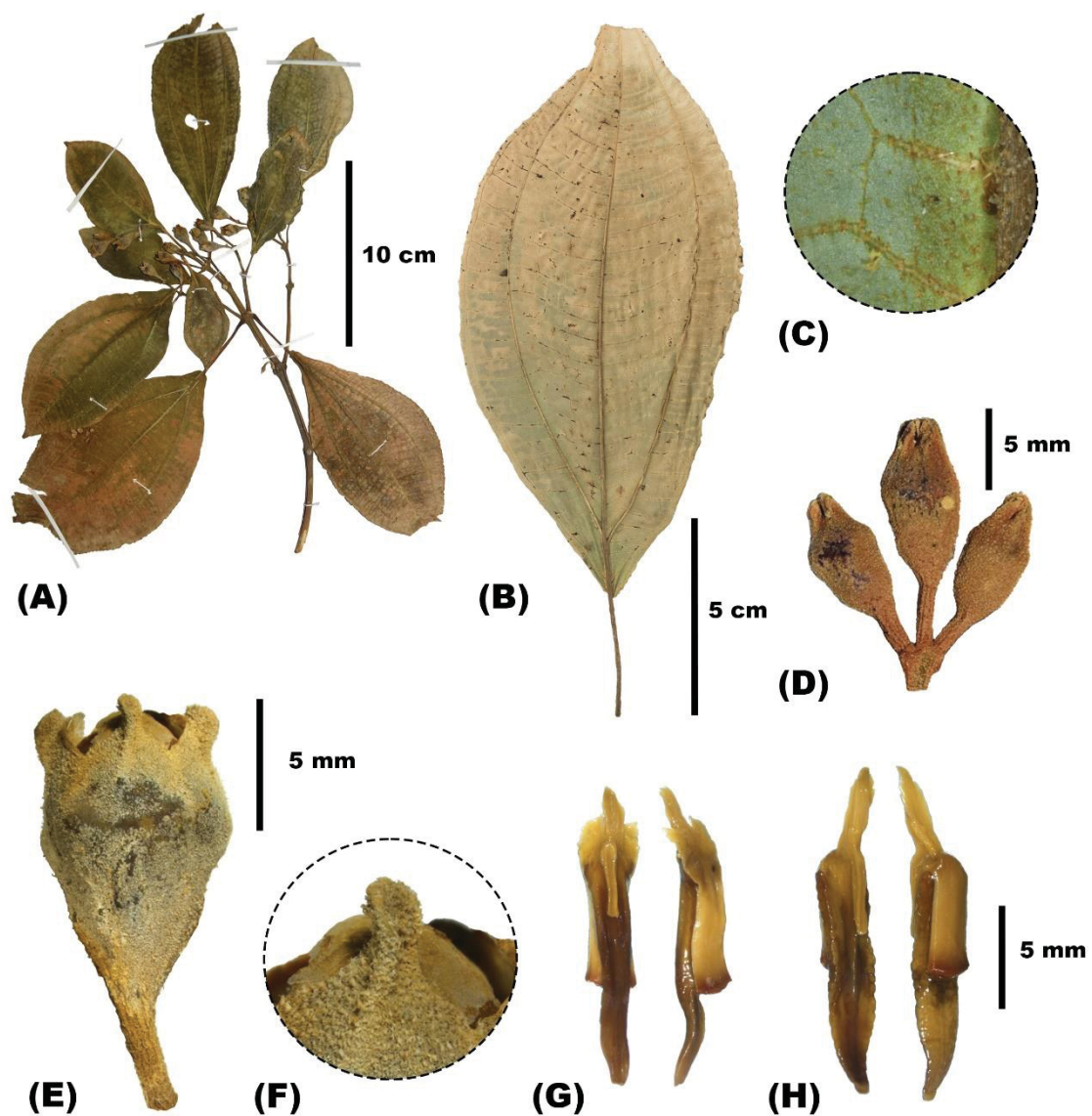


FIGURE 64. *Meriania vilcabambensis*. **A.** Terminal fertile branch with inflorescence. **B.** Leaf blade, abaxial view. **C.** Detail of the abaxial surface. **D.** Inflorescence branch. **E.** Flower bud. **F.** Detail of the dorsal appendage of the calyx. **G.** Antesepalous stamen, frontal (left) and posterior (right) view. **H.** Antepetalous stamen, frontal (left) and posterior (right) view. A-C and E-H from *L. Valenzuela 7494*; D from *S. Baldeón et al. 6719*.

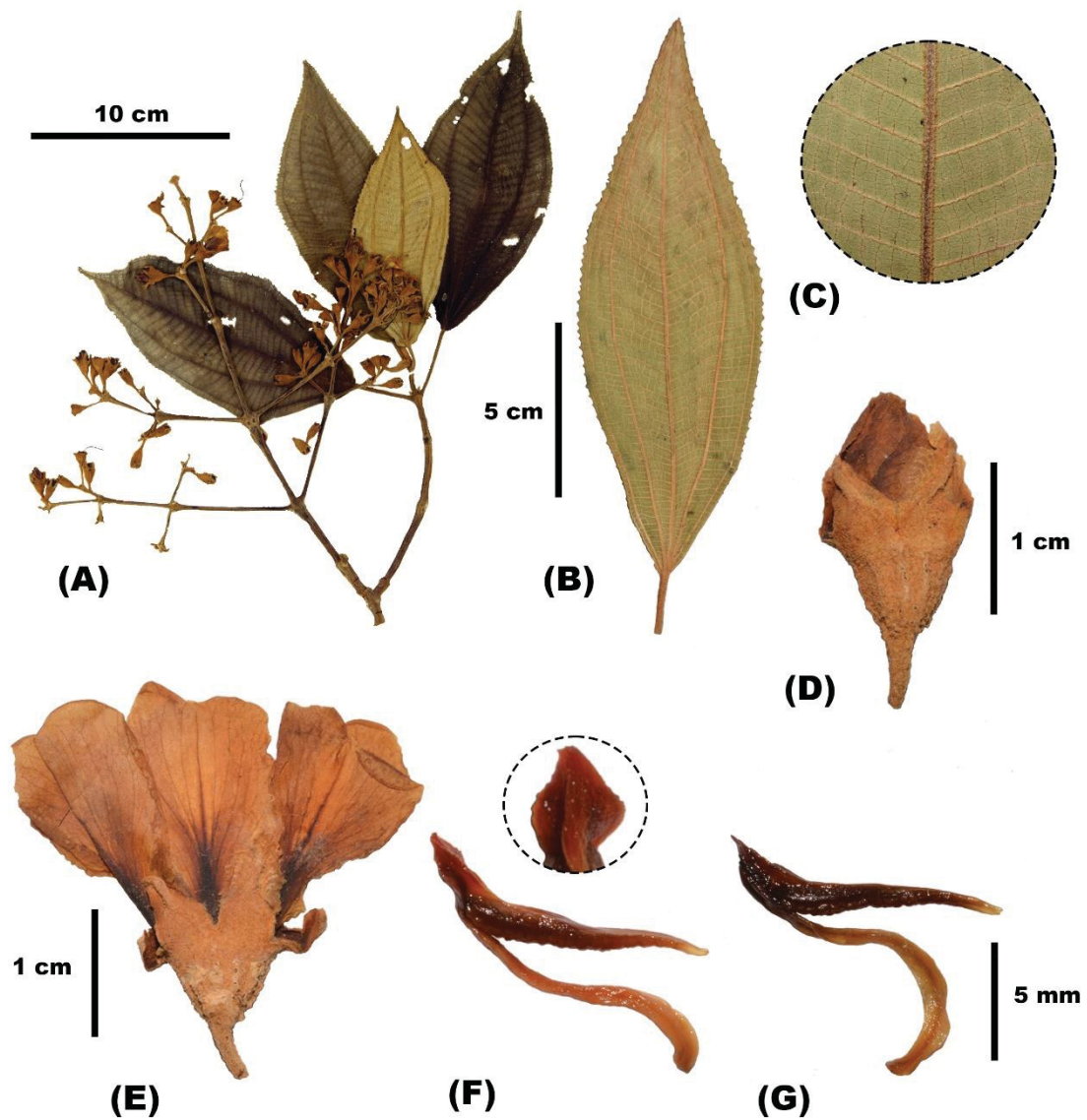


FIGURE 65. *Meriania weberbaueri*. **A.** Terminal fertile branch with inflorescence. **B.** Leaf blade, abaxial view. **C.** Detail of the abaxial leaf surface. **D.** Flower bud. **E.** Flower at anthesis. **F.** Antesepalous stamen, lateral view, with detail of the dorso-basal appendage, frontal view (above). **G.** Antepetalous stamen, lateral view. A from *A. Daza et al.* 2056; B-C and F-G from *S. Terreros & R. Villanueva-Espinoza* 191; D-E from *A. Weberbauer* 6659.

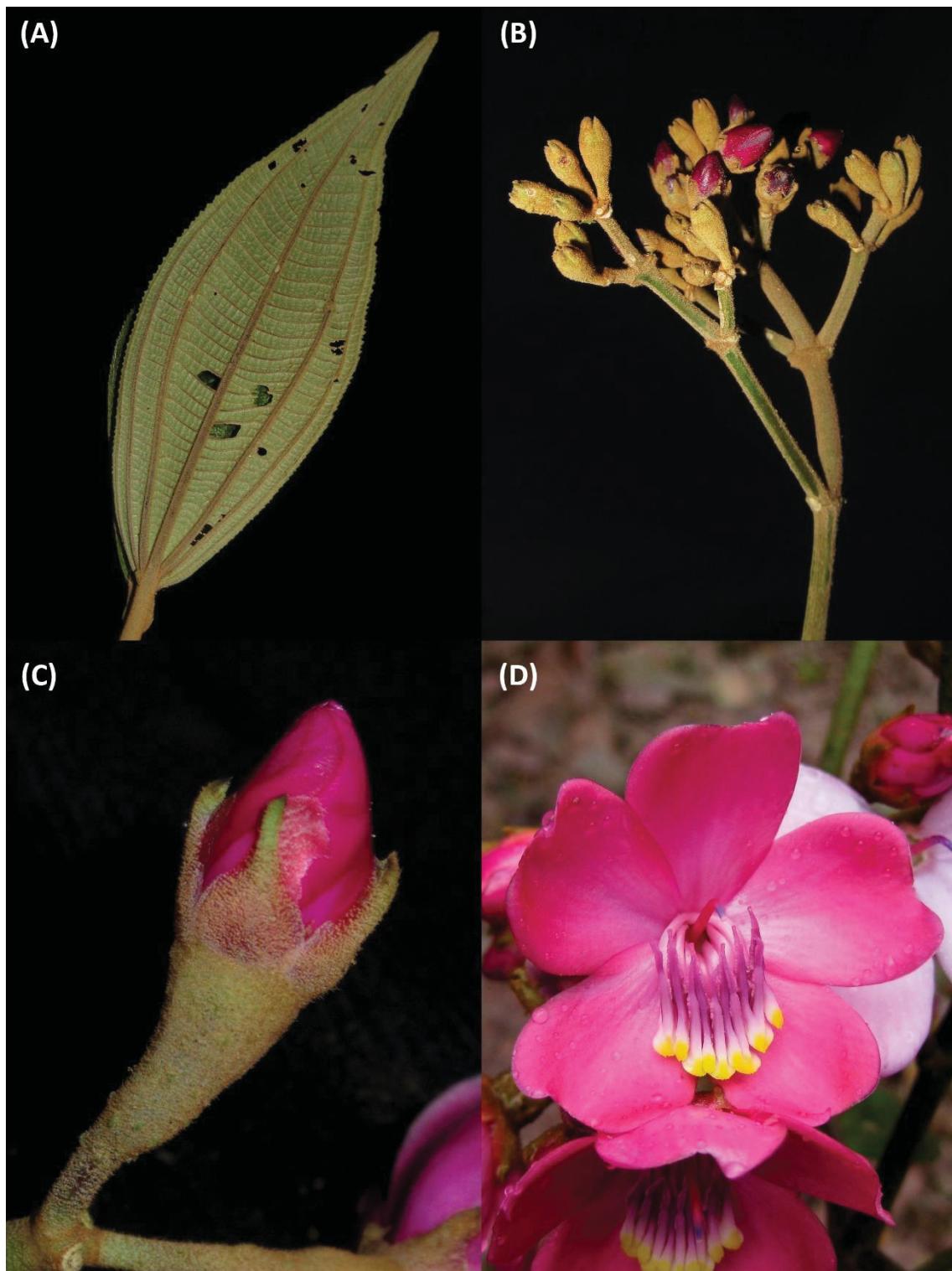


FIGURE 66. *Meriania weberbaueri*. **A.** Leaf blade, abaxial view. **B.** Inflorescence with flower buds. **C.** Flower bud, lateral view. **D.** Flower at anthesis, apical view. A-C from *S. Terreros & R. Villanueva-Espinoza 191*, D from *R. Vásquez et al. 35159*. Photos by Rosa Villanueva-Espinoza (A-C) and Rodolfo Vásquez (D).

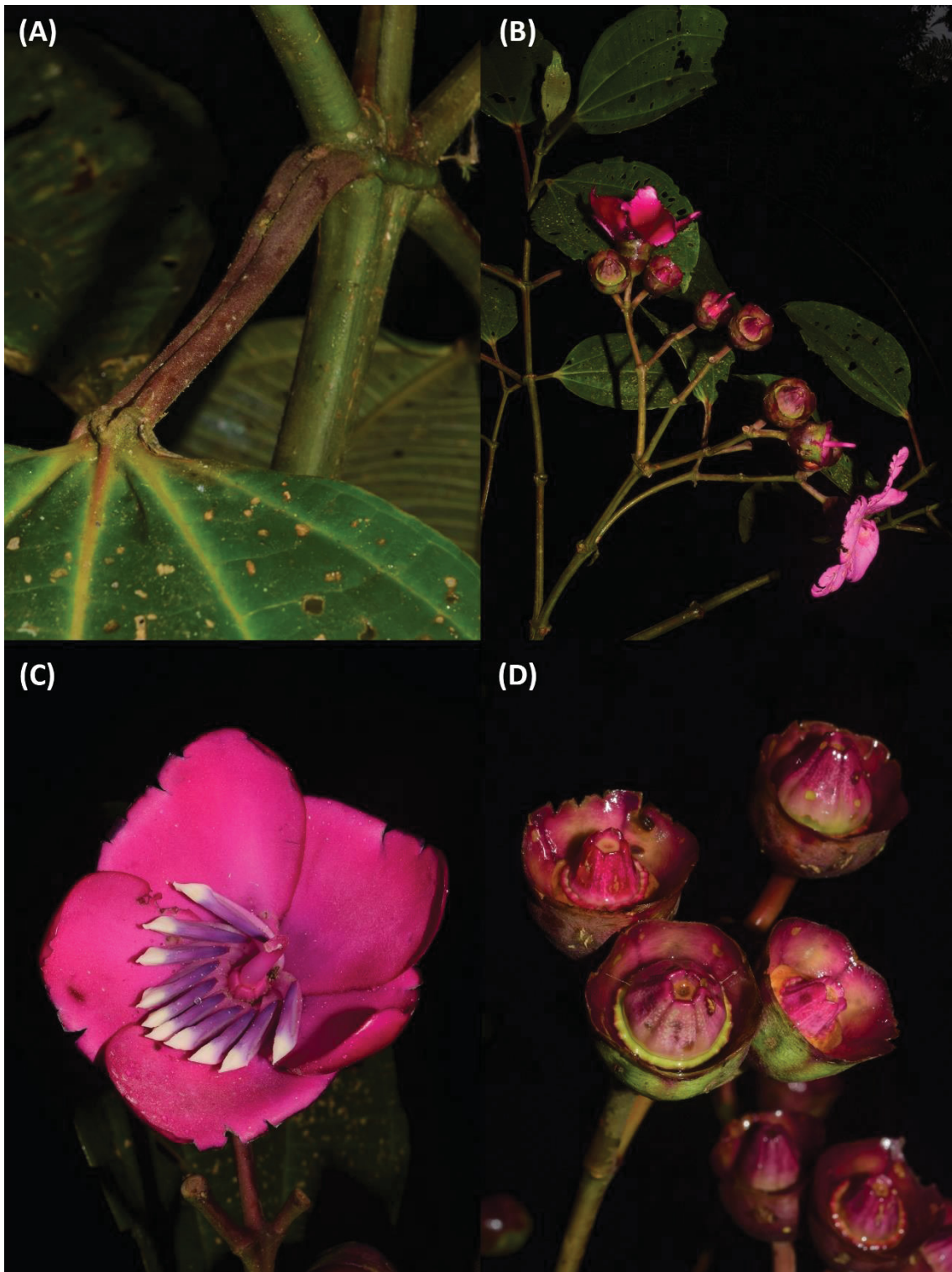


FIGURE 67. *Meriania zunacensis*. **A.** Node with interpetiolar flap and adaxial projection on the petiole apex. **B.** Terminal fertile branch with inflorescence. **C.** Flower at anthesis, apical view. **D.** Immature fruits. A-D from R. *Fernandez-Hilario et al.* 1920. Photos by Robin Fernandez.

7 CONSIDERAÇÕES FINAIS

Ao longo da análise e coleta dos espécimes de *Meriania* no Peru, foram identificadas doze novas espécies do gênero (*M. bicentenaria*, *M. bongarana*, *M. callosa*, *M. dazae*, *M. escalerensis*, *M. hirsuta*, *M. juanjil*, *M. megaphylla*, *M. microflora*, *M. penningtonii*, *M. sumatika* e *M. vasquezii*) e quatro novas ocorrências (*M. drakei*, *M. franciscana*, *M. peltata* e *M. zunacensis*) foram registradas para o Peru, sendo estas descritas e ilustradas nos três primeiros capítulos da dissertação. Com a inclusão desses táxons, *Meriania* passou a ter 36 espécies no Peru, quase duplicando a quantidade de espécies registradas no início deste estudo. Devido a estas descobertas Peru tornou-se o segundo país com a maior diversidade do gênero.

Embora o nosso estudo permitiu a descoberta de muitas espécies novas, ainda existem lacunas de informação sobre as espécies de *Meriania* no Peru. Isto deve-se principalmente ao difícil acesso às florestas de altitude nos Andes onde elas se encontram, e ao incremento do desmatamento pela pecuária e agricultura nessas regiões. Como se apresentou no capítulo quatro, há muitos espécimes que não puderam ser identificados ao nível de espécie, devido à ausência de flores ou material em bom estado. Muitos desses espécimes provavelmente sejam espécies novas, o que indicaria a grande diversidade do gênero e a necessidade de continuar com o trabalho de herbário e as expedições botânicas. Além disso, espécies como *M. rugosa* e *M. tomentosa* precisam de mais estudos aprofundados para determinar se são realmente espécies altamente variáveis ou se devem ser divididas em mais espécies.

Finalmente, esperamos que o tratamento taxonômico apresentado aqui inspire trabalhos futuros com diferentes abordagens. Principalmente porque a região andina tem uma grande diversidade, gêneros com poucos estudos, espécies ameaçadas e muitas espécies novas a serem descritas. Como este estudo demonstra no caso do gênero *Meriania*.

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