

Taxonomic and chorological novelties in *Blakea* (Melastomataceae: Pyxidanthae) from Peru with a list of species for the country

ROBIN FERNANDEZ-HILARIO^{1, 2, 9*}, LUIS PILLACA-HUACRE^{3, 10}, ROSA VILLANUEVA-ESPINOZA^{2, 4, 5, 11}, SEBASTIÁN RIVA-REGALADO^{6, 12}, ROCIO DEL PILAR ROJAS GONZÁLES^{7, 13}, RENATO GOLDENBERG^{1, 14} & FABIÁN A. MICHELANGELI^{8, 15}

¹ Programa de Pós-Graduação em Botânica, Universidade Federal do Paraná, Caixa Postal 19031, CEP 81531-970, Curitiba, PR, Brazil.

² División de Ecología Vegetal–CORBIDI, Calle Santa Rita 105 Of. 2, Urb. Huertos de San Antonio Monterrico, Surco, Lima, Perú.

³ Departamento de Ecología, Museo de Historia Natural, Universidad Nacional Mayor de San Marcos, Av. Arenales 1256, Jesús María, Lima, Perú.

⁴ Key Laboratory of Plant Resources Conservation and Sustainable Utilization, South China Botanical Garden, Chinese Academy of Sciences, Guangzhou 510650, China.

⁵ University of Chinese Academy of Sciences, Beijing 100049, China.

⁶ Laboratorio de Florística, Departamento de Dicotiledóneas, Museo de Historia Natural, Universidad Nacional Mayor de San Marcos, Av. Arenales 1256, Jesús María, Lima, Perú.

⁷ Herbario Selva Central Oxapampa-HOXA de la estación Biológica del Jardín Botánico de Missouri, Prolongación Bolognesi Mz. E-6, Oxapampa, Pasco, Perú.

⁸ The New York Botanical Garden, Bronx, NY 104458 USA.

⁹  rfernandez@corbidi.org;  <https://orcid.org/0000-0001-8234-9502>

¹⁰  luisbio08@gmail.com;  <https://orcid.org/0000-0002-5743-2352>

¹¹  rmvillanueva@corbidi.org;  <https://orcid.org/0000-0003-2989-8160>

¹²  sebastianrivar@gmail.com;  <https://orcid.org/0000-0001-9594-3631>

¹³  gesneria@yahoo.com;  <https://orcid.org/0000-0001-9494-1036>

¹⁴  renato.goldenberg@gmail.com;  <https://orcid.org/0000-0002-7047-6720>

¹⁵  fabian@nybg.org;  <https://orcid.org/0000-0001-7348-143X>

*Corresponding author:  rfernandez@corbidi.org

Abstract

Seven new Peruvian species of *Blakea* are described and illustrated here: *Blakea eden*, *Blakea quinta*, *Blakea wilderi* and *Blakea yumi* from the Department of Amazonas, *Blakea pavida* and *Blakea rojasiae* from the Departments of Amazonas and Cajamarca, and *Blakea leoniae* from the Departments of Amazonas and San Martín. Following IUCN criteria, we propose that most species should be considered as Endangered (EN) but for *B. pavida*, *B. quinta* and *B. yumi*, that should be recognized as Critically Endangered (CR) due to their restricted distributions and the intense ongoing human activity (agriculture and livestock) in their habitats. Additionally, we provide notes on the new records and species that have been published since Brako & Zarucchi's checklist of the Peruvian flora in 1993, including the lectotypifications of *Blakea brasiliensis*, *B. nareliana*, and *Topobea pittieri* (*B. henripittierii*). *Blakea gracilis* and *B. parvifolia* are suggested to be excluded from Peru. Based on this, we present a list of 33 *Blakea* species currently accepted for Peru, 14 of which are endemic.

Key words: Amazonas, Andean forests, Cajamarca, Myrtales, neotropics, new species, San Martín, systematics, *Topobea*

Introduction

Blakea P.Browne comprises 192 species of woody root climbers, shrubs, and trees that may be terrestrial, hemiepiphytic, or epiphytic, distributed from Mexico and the West Indies to Bolivia and Brazil (Penneys & Judd 2013a, 2013b; Michelangeli *et al.* 2020; Ulloa Ulloa *et al.* 2022). Along with *Chalybea* Naudin (7 species), it forms the Neotropical tribe Pyxidanthae (Penneys *et al.* 2022; Penneys & Almeda 2022), which can be recognized by the axillary inflorescences in distal nodes that are either simple or compound cymes (*Chalybea*), or solitary to fasciculate (*Blakea*), with perfect flowers, 6-merous, with isomorphic stamens, stamen connectives with blunt to caudiform dorso-basal appendages,

an inferior to superior ovary, fruit a berry, and seeds pyramidal to ovoid. *Blakea* is also characterized by its flowers subtended by two (three) pairs of persistent, decussate bracts, and anthers laterally compressed (Penneys & Judd 2013a, 2013b; Penneys & Almeda 2022).

In the last 30 years a considerable number of new species and new records have been published for Peruvian Melastomataceae (e.g.: Michelangeli & Goldenberg 2018; Paredes-Burneo *et al.* 2018; Fernandez-Hilario *et al.* 2022), almost all of them coming from the Andes. However, during the same period, only four new records (Vásquez *et al.* 2002; Torres *et al.* 2019; Tropicos 2022) and one new species of *Blakea* have been recorded for Peru (*Blakea nareliana* Bussmann [2013]). This is mainly due to three factors: (1) the difficulty of collecting *Blakea* specimens, because most of its species are epiphytic plants growing in high canopy forests, (2) the lack of taxonomic treatments for Peruvian *Blakea*, since the last work was published in 1941 by Macbride, and (3) the poor exploration and collection in some highly diverse areas such as the Andean forests. Before the present work there were 24 species of *Blakea* known from Peru, seven of them endemic (Brako & Zarucchi 1993; Vásquez *et al.* 2002; León 2006; Bussmann 2013; Torres *et al.* 2019; Tropicos 2022). The amount of endemic species is really low when compared to the diversity of other Andean countries such as Colombia (87 species with 49 endemics, Calderón-Sáenz & Mendoza-Cifuentes 2000; Valoyes-Cardozo & Morales-Puentes 2011; Mendoza-Cifuentes *et al.* 2021; Almeda *et al.* 2022; Urrea *et al.* 2023) and Ecuador (53 species with 32 endemics, Jørgensen & León-Yáñez 1999; Cotton & Matezki 2003; Ulloa Ulloa & Neill 2005; Penneys & Jost 2009; Neill & Ulloa Ulloa 2011; Fernández-Fernández *et al.* 2016).

Since 2017, botanical expeditions in the Departments of Amazonas and Cajamarca and the revision of herbarium material have been carried out as part of the study of Melastomataceae in the montane forests of the Peruvian Andes. After a detailed analysis, we found some specimens that correspond to seven new species of *Blakea*. In this article, we provide morphological descriptions along with comments on related species and diagnostic characters, conservation status and geographic distribution for each of these taxonomic novelties. Additionally, we include comments on the new records and species that have been published since Brako & Zarucchi's checklist of the Peruvian flora, and we present a list of *Blakea* species currently accepted for Peru.

Materials and methods

The descriptions were made through examination of herbarium specimens deposited in AMAZ, CPUN, CUZ, F, HAO, HOXA, HSP, HUT, KUELAP, MOLF, NY, UFV, UPCB, US and USM (herbarium acronyms follow Thiers 2023). Some of the examined specimens are indicated with the acronym UNC, which refers to the non-indexed herbarium of the 'Laboratorio de Dendrología' of the 'Universidad Nacional de Cajamarca' (Cajamarca, Peru). We also conducted several botanical expeditions to the Peruvian Andes between November 2017 and August 2023, mainly in the Departments of Amazonas and Cajamarca, to study the populations in the field, as well as to explore poorly collected areas or locate rare species. A complete set of collections was deposited at MOLF and duplicates, when available, sent to HOXA, KUELAP, NY and UPCB. Since the number of species cited along the paper is more than 30, full references are not provided for all of them (see <https://phytotaxa.mapress.com/pt/about/submissions>).

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. Indumentum terminology and trichome classification follow Beentje (2016) and Wurdack (1986), respectively. The description and measurement of flowers are based on material fixed in 50–70 % ethanol (*B. eden*, *B. leoniae*, *B. pavida*, *B. quinta*, *B. rojasiae*, *B. wilderi* and *B. yumi*) and rehydrated material (*B. pavida*). Information on the colours of vegetative and floral parts in the descriptions is derived from our own field observations and photographs, except where otherwise indicated. When we described the calyx, we use the term *dorsal projection* (see Basso-Alves *et al.* 2017) to refer to the distinct and opposite portion present in each sepal, which have been described in different ways in the Melastomataceae literature (e.g.: dorsal teeth, external teeth, external lobe, external projection). Measurements are presented in the order length × width, except when stated otherwise.

For scanning electron microscopy images of trichomes, leaf fragments from herbarium samples were mounted on aluminum stubs using double faced carbon adhesive and coated with gold-palladium in a DSK00V-0016 sputter coater (Denton, Moorestown, NJ, USA) at 15 mvolts for 4 min. Scanning electron microscopy was performed at the NYBG structural botany laboratories on a SU3500-VP (Hitachi, Tokyo, Japan) and images taken with the SE detector with accelerating voltages ranging from 5 to 15 kvolts and working distances ranging from 6 to 25 mm.

Comments on the distribution and morphological differences among Andean species of *Blakea* were made based on checklists and/or taxonomic treatments for Bolivia (Jørgensen *et al.* 2014), Colombia (Calderón-Sáenz & Mendoza-Cifuentes 2000; Valoyes-Cardozo & Morales-Puentes 2011; Mendoza-Cifuentes *et al.* 2021; Almeda *et al.* 2022; Urrea *et al.* 2023), Ecuador (Wurdack 1980; Jørgensen & León-Yáñez 1999), Peru (Macbride 1941; Brako & Zarucchi 1993), and Venezuela (Wurdack 1973; Hokche *et al.* 2008), examination of the protologues of recently described species (Cotton & Matezki 2003; Penneys & Jost 2009; Bussmann 2013; Fernández-Fernández *et al.* 2016; Urrea *et al.* 2023) and type specimens available through JSTOR Global Initiative portal (<https://plants.jstor.org>). Lectotypes designated here were chosen in correspondence with the rules of the International Code of Nomenclature (ICN; Turland *et al.* 2018). The distribution maps were made in software QGIS version 3.18.1 (QGIS Development Team 2022). Conservation status for each new species was suggested using IUCN criteria (2012, 2019), based on estimates of Extent of Occurrence (EOO) and Area of Occupancy (AOO), both calculated through GeoCat Geospatial Conservation Assessment Tool (<http://geocat.kew.org>) (Bachman *et al.* 2011).

Taxonomic treatment

New species

1. *Blakea eden* Rob.Fern., Michelang. & R.Goldenb., *sp. nov.* (Figures 1–2, 3A–B.)

Diagnosis:—A species differing from other congeners by the combination of hirsute indumentum, nodes with fimbriate interpetiolar flaps, outer floral bracts ca. 18×14 mm, inner floral bracts ca. 20×13 mm, spreading, deep pink corollas, stamens bent to one side of the flower at anthesis, stamen connectives with pyramidal appendages ca. 2 mm long, and ovaries with an apical conic collar.

Type:—PERU. Amazonas: Prov. Bongará, Dist. Yamborasbamba, Centro de Investigación de la ONG Neotropical Primate Conservation y bosque “El Toro” de la Comunidad Campesina de Yamborasbamba, 2000 m, $05^{\circ}39'17.05''\text{S}$, $77^{\circ}54'51.30''\text{W}$, 22–28 July 2018 (fl.), R. Fernandez-Hilario, W. Chuquitucto, G. Bravo & V. Fack 1433 (holotype: MOLF! [barcode 000154]; isotypes: HOXA! [accession no. 080655], MOLF! [barcode 000155], NY!, UPCB! [accession no. 99387]).

Epiphytic shrub; young branches and petioles hirsute with elongated eglandular trichomes, ferruginous, up to 1.5 mm long, moderate to dense on the young branches, sparse to dense on the petioles. **Young branches** obscurely quadrangular, 3–3.5 mm diam., lacking wings, nodes with fimbriate interpetiolar flaps, 2–3.5 mm long. **Leaves** opposite, isophyllous, rarely anisophyllous. **Petioles** terete, (1.7–) 2.2–3 cm long, without projections. **Leaf blades** coriaceous, (9.4–) 10.5–14.3 (–15.3) $\times$ (4.7–) 5.4–7.3 (–8.4) cm, elliptic to oblong, base obtuse to rounded, apex acuminate, margin finely serrulate on the distal half, discolorous; venation acrodromous and suprabasal, with one pair of secondaries (lateral) veins, diverging 3–5 mm from the base of the blade, and an additional pair of faint submarginal veins running up to the leaf apex, tertiary (transversal) veins 60–77 on each side of the primary, percurrent, the central tertiary veins 1–2.5 mm distant from each other, midvein and secondary veins impressed, tertiary veins visible and reticulation not visible on the adaxial surface, midvein and secondary veins salient, tertiary veins prominent and reticulation barely visible on the abaxial surface; adaxial surface flat, grey brown when dry, glabrous or with sparse to moderate elongated trichomes on the midvein, denser near the base, up to 1.5 mm long; abaxial surface olive green when dry, midvein, secondary and tertiary veins moderately to densely hirsute, with elongated trichomes up to 1.75 mm long. **Inflorescences** axillary, fasciculate in the distal branches, each fascicule with (1–) 3–4 flowers. **Peduncles** 1.1–2.4 cm long, terete, green, densely hirsute, with elongated trichomes up to 1.5 mm long. **Bracts** appressed to the hypanthium, green, persistent; outer pair subcoriaceous, free, equal, each bract ca. 18×14 mm, slightly obovate, apex rounded, margin entire, veins not visible, the adaxial surface densely hirsute, the abaxial surface moderately hirsute, with elongated trichomes up to 2.25 mm long; inner pair subcoriaceous, free, equal, each bract ca. 20×13 mm, obovate, apex rounded, margin entire, veins not visible, the adaxial and abaxial surfaces densely hirsute, with trichomes similar to the ones on the outer floral bracts. **Flowers** 6-merous, erect, with spreading corollas. **Hypanthium** ca. 7×8 mm, campanulate, outer surface green, densely hirsute, with trichomes similar to the those on the peduncles, inner surface green, glabrous; torus glabrous. **Calyx** opening regularly, obliquely spreading, outer surface green, densely hirsute, with trichomes similar to the those on the peduncles, inner surface light pink, glabrous; tube ca. 1.5 mm long; lobes ca. 3.5×6.5 –7 mm, almost rectangular-truncate, without dorsal projections. **Petals** 20–21 $\times$ 14–16 mm, 4.5–5 mm wide at base, slightly obovate, apex broadly obtuse, deep pink, glabrous. **Stamens** 12, isomorphic, all bent to one side of the flower and with

partially laterally coherent anthers at anthesis giving the flower a zygomorphic appearance; filaments ca. 4 mm long, whitish, adaxially keeled, glabrous; connectives rugose, cream, dorso-basally dilated ca. 2 mm above the filament insertion into a pyramidal appendage; anthers ca. 5 mm long, yellow to cream, oblong, laterally compressed, opening by two separated apical pores, thecae with a smooth surface. *Ovary* 6-locular, inferior, ca. 5.5 mm long, glabrous, with an apical conical collar ca. 1 mm high with 12 lobes, enveloping the base of the style; style ca. 14.5 mm long, pink, glabrous, straight; stigma punctiform and minutely papillate, ca. 0.75 mm wide, whitish. **Berries** and **seeds** not seen.

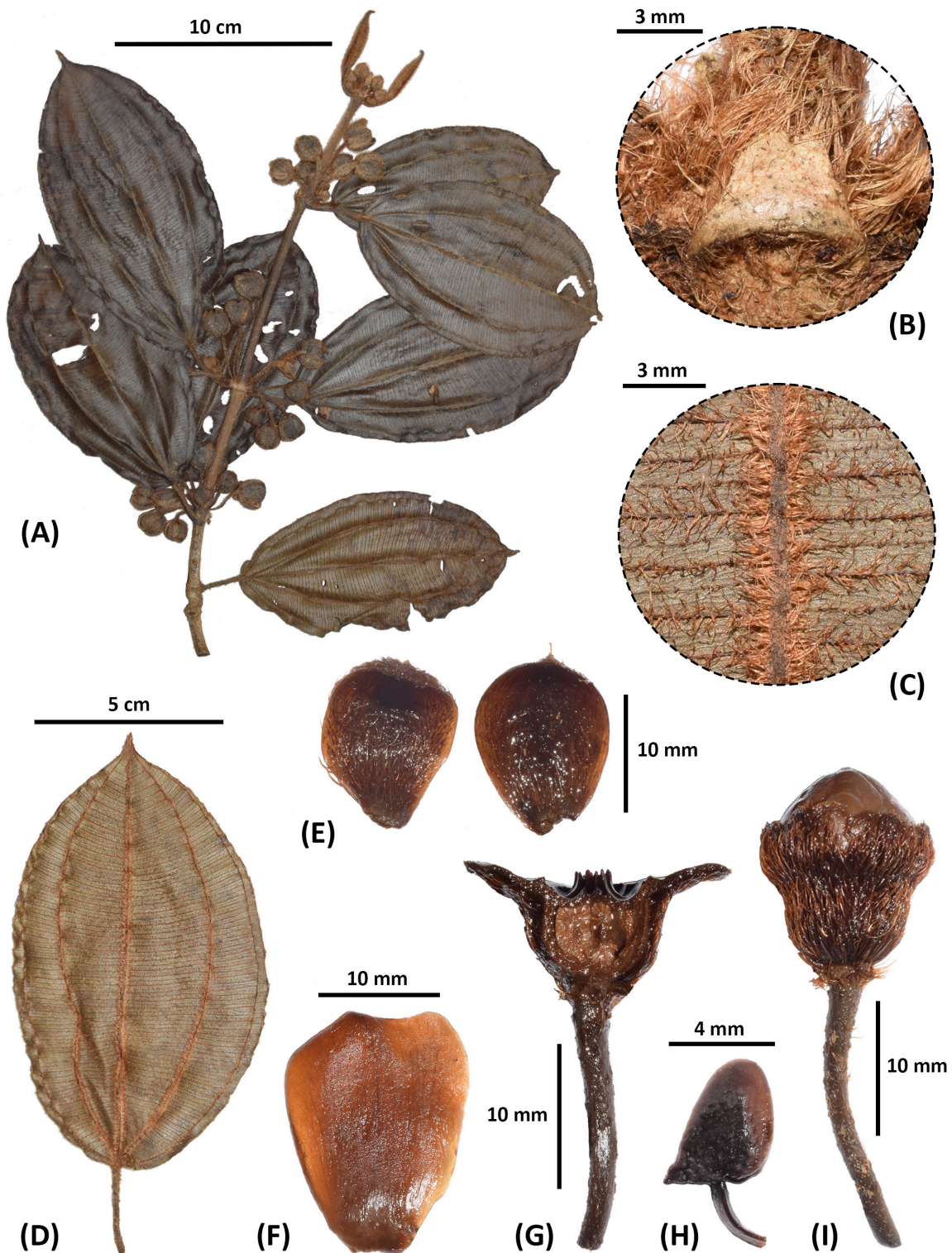


FIGURE 1. *Blakea eden*. A. Terminal fertile branch with flower buds. B. Detail of the node with an interpetiolar flap. C. Detail of the abaxial leaf surface. D. Leaf blade, abaxial view. E. Inner bract (left) and outer bract (right), adaxial surfaces. F. Petal. G. Longitudinal section of hypanthium, calyx, and ovary. H. Stamen, lateral view. I. Flower bud with bracts removed. Vouchers: A from R. Fernandez-Hilario *et al.* 2242, B–I from R. Fernandez-Hilario *et al.* 1433.



FIGURE 2. *Blakea eden*. A. Terminal fertile branch with flower buds. B. Detail of flower buds. C. Flower at anthesis. D. Immature fruits. Vouchers: A from *R. Fernandez-Hilario et al.* 1218, B–C from *R. Fernandez-Hilario et al.* 1433, D from *R. Fernandez-Hilario et al.* 1217. Photos by Robin Fernandez.

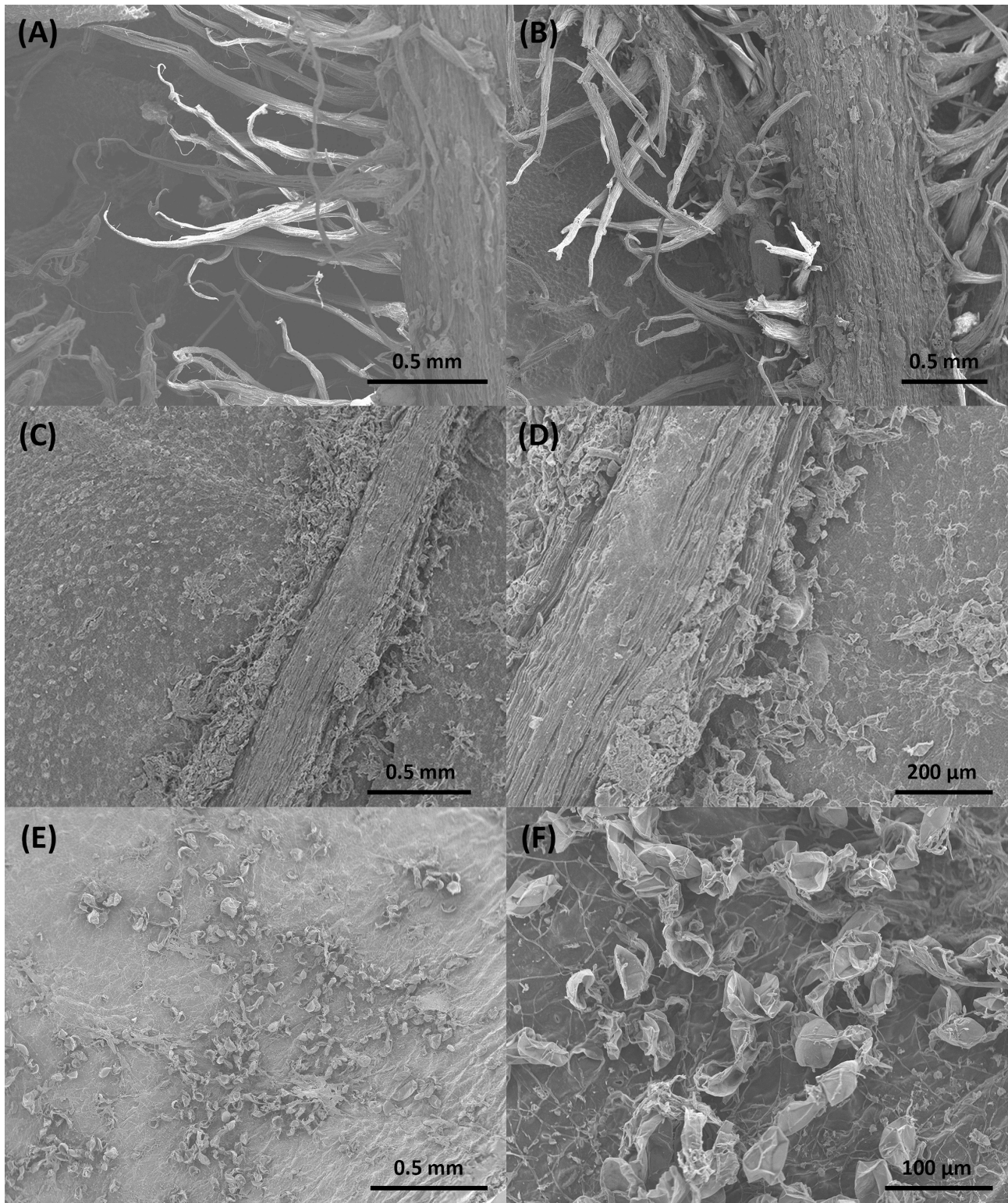


FIGURE 3. Scanning electron microphotographs of the indumentum of *Blakea eden*, *B. leoniae* and *B. pavida*. A–B. *Blakea eden*. A. Trichomes on the abaxial leaf surface. B. Detail of trichomes on the abaxial leaf surface. C–D. *Blakea leoniae*. C. Trichomes on the abaxial leaf surface. D. Detail of trichomes on the abaxial leaf surface. E–F. *Blakea pavida*. E. Trichomes on the abaxial leaf surface. F. Detail of trichomes on the abaxial leaf surface. Vouchers: A–B from *R. Fernandez-Hilario et al.* 2242, C–D from *R. Vásquez et al.* 27310, E–F from *R. Fernandez-Hilario et al.* 2078.

Distribution and habitat:—*Blakea eden* is endemic to high-elevation montane forests in the Department of Amazonas, between 2000–2150 m elev. (Fig. 4). Populations of this species occur in pristine forests and seldom in disturbed forests.

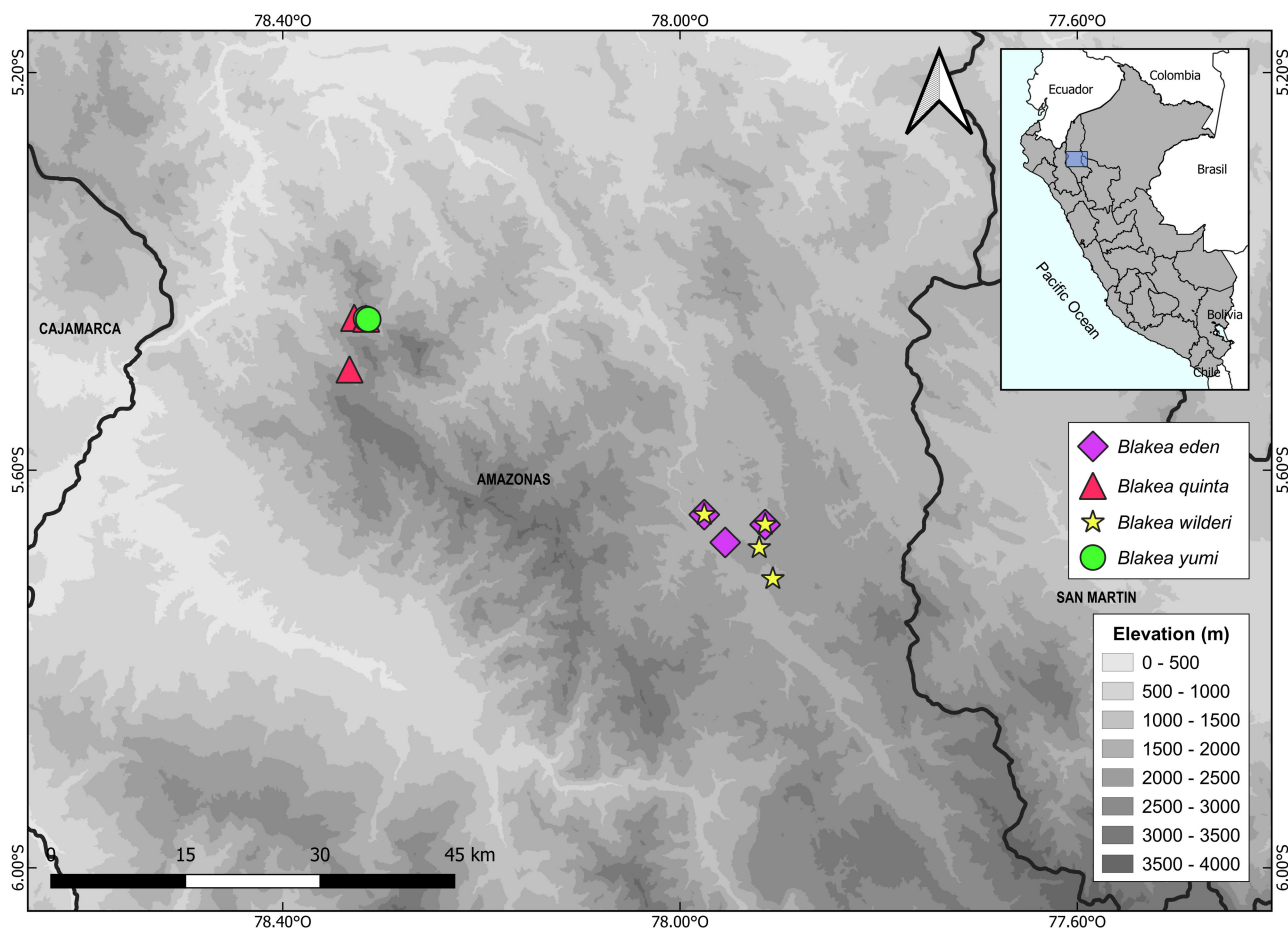


FIGURE 4. Distribution map of *Blakea eden*, *B. quinta*, *B. wilderi* and *B. yumi*.

Etymology:—The specific epithet refers to the Garden of Eden because the type locality is similar to this one, where in recent years several new species have been discovered including *Blakea leoniae*, *B. rojasiae* and *B. wilderi* (also described here). As the epithet is a noun in apposition, it retains its own termination irrespective of the gender of the generic name (see Turland *et al.* 2018: Art. 23.5).

Phenology:—Flowering occurs in July and November, and fruiting in November.

Conservation status:—*Blakea eden* is known from three localities, all outside protected areas and with strong anthropogenic activity nearby (agriculture and livestock). Following IUCN (2012, 2019) guidelines and based on an estimated area of occupancy of 12 km², we propose that this species is considered Endangered [EN (B2a+biii)].

Discussion:—*Blakea eden* is distinguished from other congeners by the combination of characters listed in the diagnosis. *Blakea eden* seems to be closely related with *B. pichinchensis* Wurdack (Ecuador) and *B. hispida* Markgraf (Colombia, Ecuador and Peru). However, *B. eden* differs from these species by the size of its bracts, which are wider than those of *B. hispida* [13–14 mm vs (5–) 8–10 mm] and longer than those of *B. pichinchensis* (18–20 mm vs. 10–12 mm). In addition, *B. eden* can be distinguished by the hypanthium length (ca. 7 mm vs. 3–4 mm in *B. hispida* and *B. pichinchensis*) and petal colour (completely deep pink vs. completely or predominately white).

Among the Peruvian species, *B. hirsuta* O.Berg ex Triana and *B. hirsutissima* (J.F.Macbr.) Wurdack are similar to *B. eden* because they have similar hirsute indumentum on branches and leaves. However, *B. eden* is easily distinguishable because it has nodes with interpetiolar flaps (vs. lacking flaps in the other two species). It can also be distinguished from *B. hirsuta* by its elliptic to oblong leaf blades (vs. obovate-oblong) and longer petioles (1.7–) 2.2–3 cm long (vs. 1–1.5 cm long). It can be distinguished from *B. hirsutissima* by its smaller leaf blades (9.4–) 10.5–14.3 (–15.3) × (4.7–) 5.4–7.3 (–8.4) cm (vs. 18.8–26.7 × 9.2–12.6 cm) with a larger number of tertiary (transversal) veins 60–77 (vs. 42–45).

Paratypes:—PERU. **Amazonas:** Prov. Bongará, Dist. Yambrasbamba, Centro de Investigación de la ONG Neotropical Primate Conservation y bosque “El Toro” de la Comunidad Campesina de Yambrasbamba, 2000 m, 05°39′17.05″S, 77°54′51.30″W, 27–30 November 2017 (fr.), R. Fernandez-Hilario *et al.* 1217 (MOLF!), same

locality and date, (fl.), 1218 (HOXA!, MOLF!), same locality, 26–29 November 2018 (fl.), *R. Fernandez-Hilario & W. Chuquitucto* 1738 (UPCB!), Ruta desde CP La Florida hacia finca de Don Ilario, 2150 m, 05°40'21.68"S; 77°57'16.02"W, 12 November 2020 (fl., fr.), *R. Fernandez-Hilario et al.* 2068 (HOXA!, NY!), Sector Los Monos, 1860 m, 05°38'41"S; 77°58'32"W, 28 August 2022 (fl. bud), *R. Fernandez-Hilario et al.* 2242 (KUELAP!, MOLF!, NY!).

2. *Blakea leoniae* Rob.Fern., Michelang. & R.Goldenb., *sp. nov.* (Figures 3C–D, 5–6.)

Diagnosis:—A species differing from other congeners by the combination of arachnoid ferruginous indumentum, nodes with obvious interpetiolar lines, outer floral bracts 14–20 × 16–22 mm, inner floral bracts 12.5–13.5 × 15–17.5 mm, spreading, pinkish white to white corollas, stamens bent to one side of the flower at anthesis, stamen connectives with pyramidal appendages 1.5 mm long, and ovaries without apical projections.

Type:—PERU. Amazonas: Prov. Bongará, Dist. Yambrasbamba, Centro de Investigación de la ONG Neotropical Primate Conservation y bosque “El Toro” de la Comunidad Campesina de Yambrasbamba, 2000 m, 05°39'17.05"S, 77°54'51.30"W, 27–30 November 2017 (fl.), *R. Fernandez-Hilario, W. Chuquitucto & L. Cangahuala* 1219 (holotype: MOLF! [barcode 000160]; isotypes: HOXA! [accession no. 080644], NY! [barcode 03228135], UPCB! [accession no. 99382]).

Epiphytic or rarely **terrestrial shrub**; young branches and petioles with arachnoid ferruginous indumentum, with elongated simple or branched trichomes, dense on terminal buds and glabrescent on young branches, moderate to dense on the petioles. **Young branches** quadrangular, 6–10 mm diam., lacking wings, nodes with obvious interpetiolar lines. **Leaves** opposite, isophyllous. **Petioles** semiterete, 2.5–3 cm long, without projections. **Leaf blades** coriaceous, 20–26.3 × 9.8–17 cm, elliptic to oblong, rarely slightly obovate, base acute to obtuse, apex acuminate, acumen 10–15 mm long, margin entire, discolorous; venation acrodromous and suprabasal, with one pair of secondaries (lateral) veins, diverging 4–7 mm from the base of the blade, and an additional pair of faint submarginal veins running up to the leaf apex, tertiary (transversal) veins 59–75 on each side of the primary, percurrent, the central tertiary veins 1.5–5 mm distant from each other, midvein, secondary and tertiary veins impressed, reticulation not visible on the adaxial surface, midvein and secondary veins salient, tertiary veins impressed to prominent and reticulation visible on the abaxial surface; adaxial surface flat, dark green olive when dry, glabrous; abaxial surface green olive when dry, with sparse arachnoid ferruginous indumentum, with elongated simple or branched trichomes, denser on the veins. **Inflorescences** axillary, fasciculate, in the distal branches, each fascicule with 4–8 flowers. **Peduncles** 4–8 mm long, quadrangular, green to reddish green, lenticellate, glabrous to with dense arachnoid indumentum, with trichomes similar to the ones on the petioles. **Bracts** appressed to the hypanthium, green to reddish green, persistent; outer pair coriaceous, fused basally for 3–4 mm, equal, each bract 14–20 × 16–22 mm, ovate, apex broadly obtuse to rounded, margin entire, 1-veined with one pair of lateral barely visible veins, lenticellate, adaxial surface glabrous, abaxial surface glabrescent or with sparse arachnoid indumentum, with trichomes similar to the ones on the peduncles; inner pair subcoriaceous, free, equal, each bract 12.5–13.5 × 15–17.5 mm, rounded-quadrangular, apex early disintegrating and producing 2–3 irregularly acute lobes (even in flower buds), margin entire, veins not visible, the adaxial and abaxial surfaces glabrous. **Flowers** (5–) 6-merous, erect, with spreading corollas. **Hypanthium** 9 × 11–12.5 mm, campanulate, green, both surfaces glabrous; torus with sparse arachnoid indumentum, with trichomes similar to the ones on the peduncles. **Calyx** opening regularly, erect, red on both surfaces, outer surface glabrous, inner surface with sparse arachnoid indumentum, with trichomes similar to the ones on the peduncles; tube 2.5–3 mm long; lobes 2.5–3 mm long, 5.5–6.5 mm wide at base, acute to broadly obtuse, with barely visible dorsal, vein-like projections. **Petals** 12–15 × 10–11 mm, 6.5–8.5 mm wide at base, ovate and slightly spatulate, apex acute, pinkish white to white, glabrous. **Stamens** (10–) 12, isomorphic, all bent to one side of the flower and with partially laterally coherent anthers at anthesis giving the flower a zygomorphic appearance; filaments 8–8.5 mm long, whitish, adaxially keeled, glabrous; connectives smooth, yellow, dorso-basally dilated ca. 1.5 mm above the filament insertion into a pyramidal appendage; anthers ca. 6 mm long, cream, oblong, laterally compressed, opening by two separated apical pores, thecae with a smooth surface. **Ovary** 6-locular, inferior, ca. 6 mm long, glabrous, without an apical conic collar; style 11–15 mm long, pink, glabrous, straight; stigma punctiform and minutely papillate, ca. 0.5 mm wide, whitish. **Berries** with persistent and appressed floral bracts; mature calyx red, mature hypanthium yellow; mature ovary 15–16 × 13–13.5 mm long. **Seeds** not seen.

Distribution and habitat:—*Blakea leoniae* is endemic to premontane forests and high-elevation montane forests in the Departments of Amazonas and San Martín, between 1000–2000 m elev. (Fig. 7). Populations of this species occur in pristine forests and remnant forest patches.

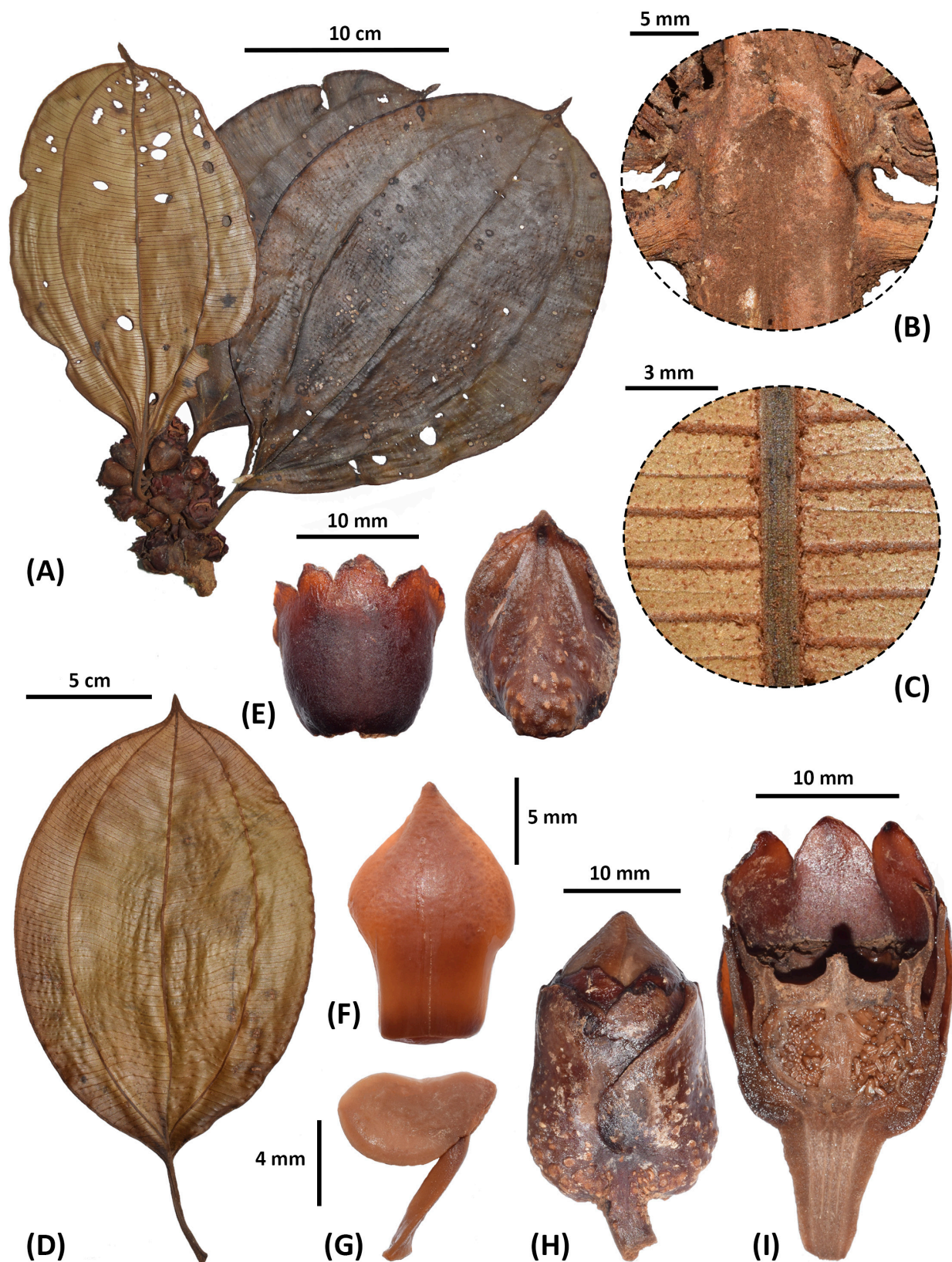


FIGURE 5. *Blakea leoniae*. A. Terminal fertile branch with immature fruits. B. Detail of the node with an interpetiolar line. C. Detail of the abaxial leaf surface. D. Leaf blade, abaxial view. E. Inner bract (left) and outer bract (right), abaxial surfaces. F. Petal. G. Stamen, lateral view. H. Flower bud. I. Longitudinal section of hypanthium, calyx, and ovary. Vouchers: A and C from *R. Fernandez-Hilario et al. 1659*, B from *R. Fernandez-Hilario et al. 1944*, D from *R. Fernandez-Hilario et al. 2414*, E–I from *R. Fernandez-Hilario et al. 1219*.

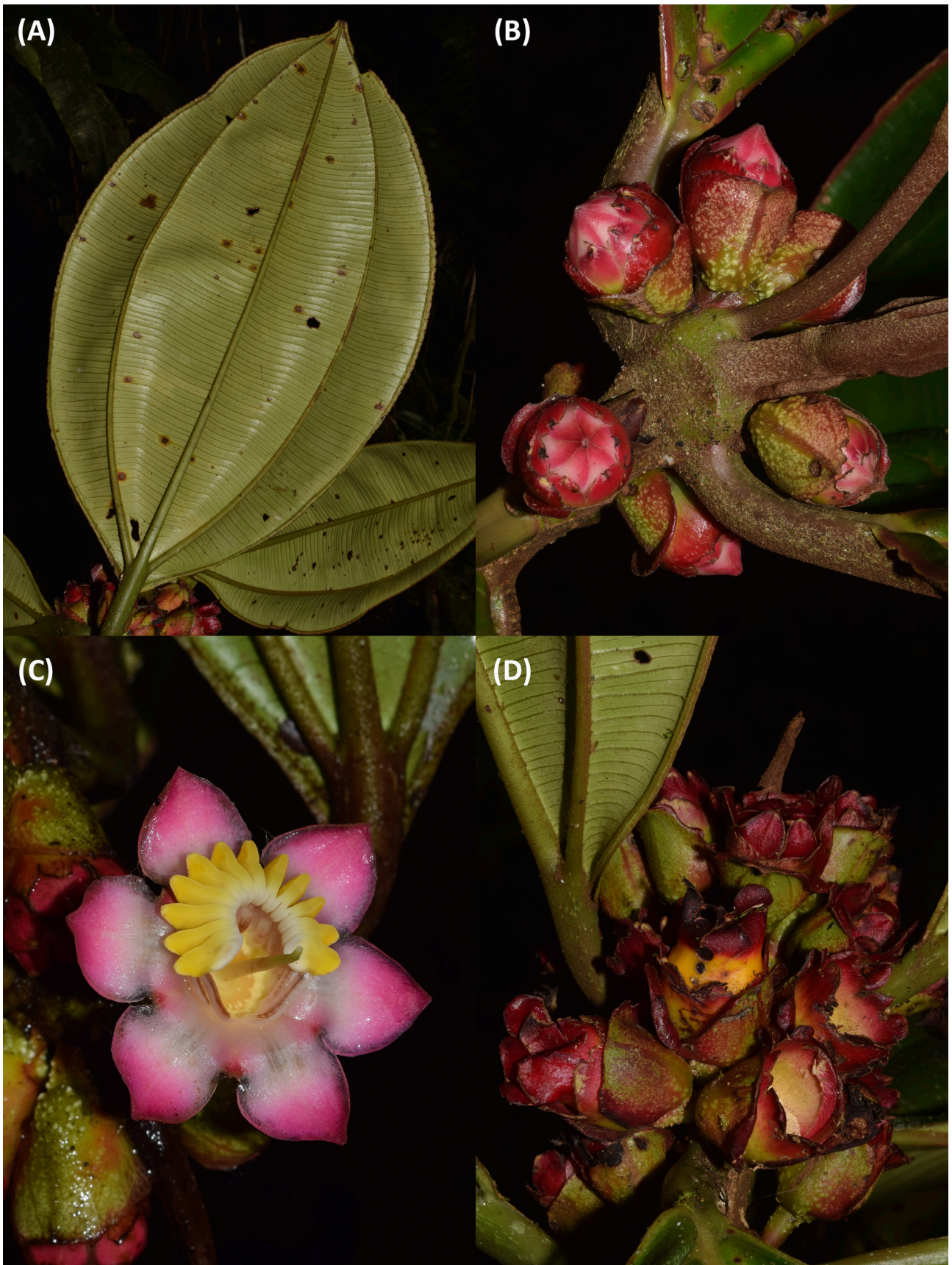


FIGURE 6. *Blakea leoniae*. A. Leaf blade, abaxial view. B. Detail of flower buds. C. Flower at anthesis. D. Mature fruits. Vouchers: A and D from R. Fernandez-Hilario *et al.* 1659, B–C from R. Fernandez-Hilario *et al.* 1219. Photos by Robin Fernandez.

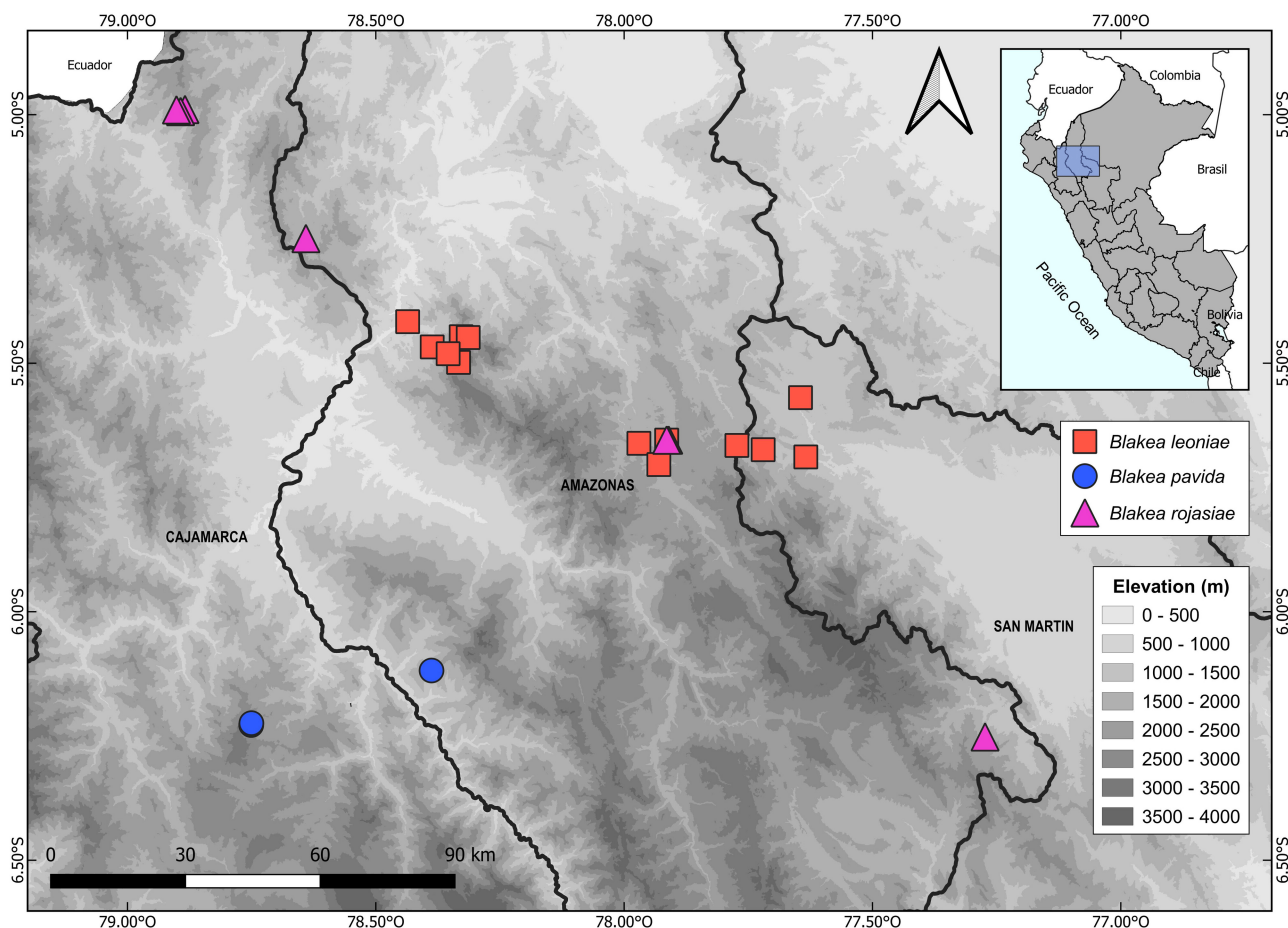


FIGURE 7. Distribution map of *Blakea leoniae*, *B. pavidia* and *B. rojasiae*.

Etymology:—It is an honor to dedicate this species to Blanca León, Peruvian pteridologist, who has contributed during the last 30 years to the training of Peruvian botanists (see León *et al.* 2018) and to the knowledge of the Neotropical pteridophyte flora, especially in the study of the genus *Campyloneurum* (see León 1993a, 1993b, 1995).

Phenology:—Flowering occurs in June, July, November and December, and fruiting in January, February, and November.

Conservation status:—*Blakea leoniae* is known from twelve localities, most of them with strong presence of anthropogenic activity (agriculture and livestock), and only three localities are within a protected area (‘Bosque de Protección Alto Mayo’ and ‘Reserva Comunal Chayu Nain’). Following IUCN (2012, 2019) guidelines and based on an estimated extent of occurrence of 1157 km², we propose that this species is considered Endangered [EN (B1biii+ci)].

Discussion:—*Blakea leoniae* is distinguished from other congeners by the combination of characters listed in the diagnosis. In the Peruvian Andean region there are two other species (*B. latifolia* D.Don and *B. sawadae* J.F.Macbride) that can be confused with *B. leoniae*. In sterile specimens, it is difficult to differentiate these three species due to the similarity of the size and indumentum of their leaves. *Blakea leoniae* can be differentiated from *B. latifolia* by its larger leaf blades 20–26.3 × 9.8–17 cm (vs. 10.4–14.6 × 4.5–7.5 cm), lenticellate outer floral bracts (vs. smooth, not lenticellate), and stamens bent to one side of the flower at anthesis (vs. encircling the style at anthesis). *Blakea leoniae* can be differentiated from *B. sawadae* by its outer floral bracts with glabrescent or with sparse trichomes on abaxial surface (vs. moderately furfuraceous), inner floral bracts with entire margins (vs. ciliate), and cream anthers (vs. purple).

Paratypes:—PERU. Amazonas: Prov. Bagua, Dist. Amarango, Camino hacia la catarata Numparket, Zona de amortiguamiento del Santuario Nacional Cordillera de Colán, 1458 m, 05°28′51.06″S; 78°21′15.52″W, 30 November 2022 (fl., fr.), I. Revilla & S. Terreros 3803 (HSP!, KUELAP!, MOLF!), Catarata Numparket, 2000 m, 05°24′59″S; 78°26′09″W, 13 December 2001 (fl.), R. Vásquez *et al.* 27310 (HUT!, NY!, USM!), Trocha Nueva Esperanza a la catarata, 1650 m, 05°29′54″S; 78°20′00″W, 15 December 2001 (fl.), R. Vásquez *et al.* 27356a (HUT!, NY!, USM!). Cerros de Nueva Esperanza, 1800 m, 05°28′02″S; 78°23′11″W, 20 December 2011 (fl.), R. Vásquez *et al.* 27517 (NY!,

USM!), Zona de Amortiguamiento de la Reserva Comunal Chayu Nain, inmediaciones del refugio Flor de la Viña—SERNANP, 1800 m, 05°26'48"S; 78°19'41"W, 12 November 2022 (fl.), *R. Fernandez-Hilario et al.* 2414 (HOXA!, MOLF!, NY!); Dist. Imaza, Reserva Comunal Chayu Nain, camino rumbo hacia el campamento Yumi Awai, 2010 m, 05°26'54"S; 78°18'50"W, 08–10 November 2022 (fl. bud), *R. Fernandez-Hilario et al.* 2388 (HOXA!, MOLF!, NY!). Prov. Bongará, Dist. Yambrasbamba, bosques aledaños al río Imaza, 1530 m, 05°39'40.22"S; 77°58'12.75"W, 11–12 January 2019 (fr.), *R. Fernandez-Hilario et al.* 1659 (HOXA!, MOLF!, UPCB!), Centro de Investigación de la ONG Neotropical Primate Conservation y bosque “El Toro” de la Comunidad Campesina de Yambrasbamba, 2000 m, 05°39'17.05"S; 77°54'51.30"W, 26–29 November 2018 (fl. bud), *R. Fernandez-Hilario & W. Chuquitucto* 1736 (HOXA!, NY!, UPCB!), Área de Conservación Abra Patricia, trocha abandonada cerca de la carretera, 1960 m, 05°39'55.66"S; 77°46'22.41"W, 22 February 2020 (fr.), *R. Fernandez-Hilario et al.* 1944 (MOLF!), Inmediaciones de CP Miraflores, 1980 m, 05°42'13.84"S; 77°55'48.17"W, 10 November 2020 (fr.), *R. Fernandez-Hilario et al.* 2040 (HOXA!, MOLF!). **San Martín:** Prov. Rioja, Dist. Nueva Cajamarca, cerca Poblado Miraflores, Bosque de Protección de Alto Mayo, 1150 m, 05°54'S; 77°23'W, 03 November 1996 (fr.), *I. Sánchez Vega & M. Dillon* 8456 (CPUN!, F!, US!); Dist. Pardo Miguel, Aguas Verdes (Perla del Mayo—Laguna Onarcocha), 1000 m, 05°38'S; 77°37'W, 19 June 1997 (fl.), *I. Sánchez Vega & M. Dillon* 8942 (F!), Caserío Jorge Chávez, km 398 de carretera marginal, 1400 m, 05°40'S; 77°43'W, 01 July 1999 (fl.), *I. Sánchez Vega et al.* 9957 (F!).

3. *Blakea pavid* Rob.Fern., Michelang. & R.Goldenb., *sp. nov.* (Figures 3E–F, 8–9)

Diagnosis:—A species differing from other congeners by the combination of large peduncles 7–9.8 cm long, solitary pendant flowers, revolute calyx lobes, campanulate, reddish-green corollas, obovate to reniform and slightly asymmetric petals 11–17 × 16–20 mm, stamen connectives lacking dorsal appendages, and large fruits (mature ovary 2.3–2.4 mm long).

Type:—PERU. Cajamarca: Prov. Cutervo, Dist. San Andrés de Cutervo, PN Cutervo, Sector Las Grutas, 2550 m, 06°13'40.33"S, 78°45'02.81"W, 25 November 2020 (fl.), *R. Fernandez-Hilario, L. Pillaca & F. Collante* 2078 (holotype: MOLF! [barcode 000161]; isotypes: HOXA! [accession no. 080679], NY! [barcode 03228137], UPCB! [accession no. 99419]).

Epiphytic shrub; young branches and petioles glabrous, rarely young branches (in *Díaz et al.* 4447) sparsely hirsute with elongated eglandular trichomes up to 1.5 mm long, terminal buds densely puberulent with elongated beige trichomes intermixed with dendritic beige trichomes up to ca. 0.5 mm long. **Young branches** rounded-quadrangular, 5–6.5 mm diam., lacking wings, nodes with barely visible interpetiolar lines. **Leaves** opposite, isophyllous, rarely anisophyllous. **Petioles** rounded-quadrangular, (1.3–) 2–3 (–4.6) cm long, without projections. **Leaf blades** subcoriaceous, 7.3–8.6 (–11.1) × 4.5–6.4 cm, elliptic, apex acuminate, sometimes short-acuminate, base obtuse, rarely acute, margin obscurely denticulate, discolorous; venation acrodromous and basal, with one pair of secondaries (lateral) veins and an additional pair of faint submarginal veins running up to the leaf apex, tertiary (transversal) veins 44–55 on each side of the primary, percurrent, the central tertiary veins 1.5–2.5 (–4) mm distant from each other, midvein, secondary and tertiary veins impressed, and reticulation not visible on the adaxial surface, midvein and secondary veins salient, tertiary veins impressed, and reticulation not visible on the abaxial surface; adaxial surface flat, dark green olive when dry, glabrous; abaxial surface green olive when dry, sparsely puberulent with short eglandular trichomes intermixed with dendritic beige trichomes up to 0.13 mm long. **Inflorescences** axillary, solitary, in the distal branches, very rarely with an additional peduncle growing between the outer and inner floral bracts, this up to 2.5 cm long, with the bracts and a single flower on its top, similar to the ones described below. **Peduncles** (2.8–) 7–9.8 cm long, quadrangular, greenish red, lenticellate, glabrous to sparsely puberulent with short simple to dendritic trichomes up to 0.13 mm long; **Bracts** basally appressed to the hypanthium and distally spreading, greenish red, persistent; outer pair subcoriaceous, free, equal, each bract 23–38 × 20–23.5 mm, foliaceous, ovate, apex obtuse to acute, margin entire to distally serrulate, 1-veined with one pair of lateral visible veins, and reticulation visible, the adaxial surface glabrous to sparsely puberulent with trichomes similar to the ones on the peduncles, the abaxial surface sparsely to moderately puberulent with similar trichomes; inner pair subcoriaceous, free, equal, each bract 16–21 × 17.5–24.5 mm, broadly ovate, apex obtuse, margin entire, 1-veined and reticulation visible, the adaxial sparsely puberulent with trichomes similar to the ones on the peduncles, the abaxial surface sparsely to moderately puberulent with similar trichomes. **Flowers** 6-merous, pendant, with campanulate corollas. **Hypanthium** 8.5–10.5 × 16–18 mm, campanulate, outer and inner surface green, glabrous; torus glabrous. **Calyx** opening regularly, with imbricate lobes, outer and inner surface greenish red, glabrous to sparsely puberulent with trichomes similar to the ones on the peduncles; tube 2–4.5 mm long; lobes 5.5–6.5 mm long, 14–14.5 mm wide at the middle, asymmetrically reniform, rarely oblong (in *Díaz et al.* 4447), revolute, without dorsal projections. **Petals** 11–17 × 16–20 mm, 6–7.5 mm wide at base, obovate to reniform and slightly asymmetric,

reddish green, glabrous. *Stamens* 12, isomorphic, position of stamens at anthesis not seen; filaments 6–9.5 mm long, light cream, keeled, glabrous; connectives smooth, cream, not dilated dorso-basally (without an appendage); anthers 5.5–6 mm long, laterally coherent in bud, cream, ovate, laterally compressed, opening by two separated apical pores, thecae with a smooth surface. *Ovary* 6-locular, inferior, 8–8.5 mm long, glabrous, without an apical conic collar; style 12–18.5 mm long, light cream, glabrous, straight; stigma punctiform and minutely papillate, ca. 1 mm wide, whitish. *Berries* with persistent and spreading floral bracts; mature calyx deep red, mature hypanthium red; mature ovary 2.3–2.4 mm long. *Seeds* not seen.

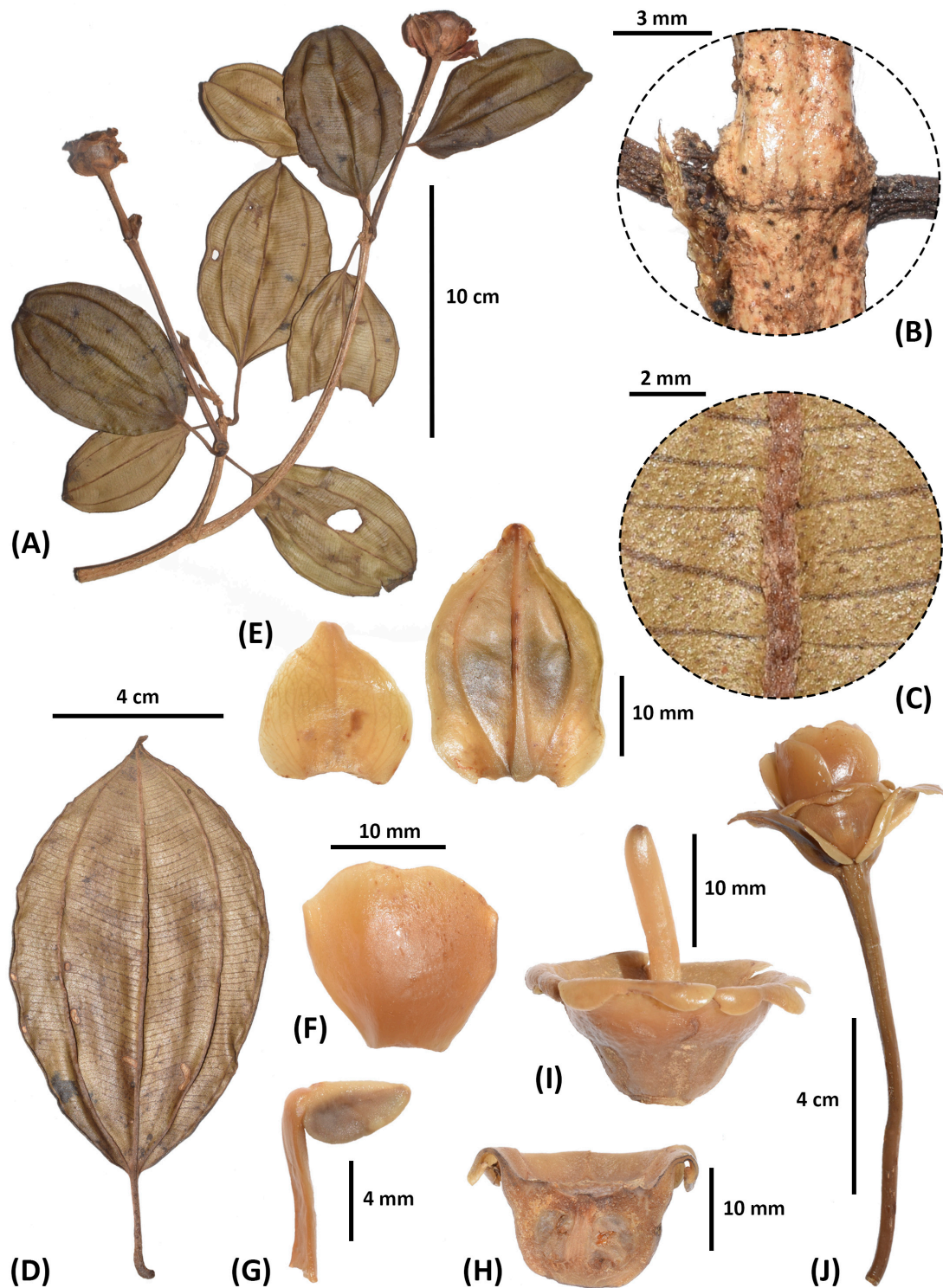


FIGURE 8. *Blakea pavida*. A. Terminal fertile branch with immature fruits. B. Detail of the node with an interpetiolar line. C. Detail of the abaxial leaf surface. D. Leaf blade, abaxial view. E. Inner bract (left) and outer bract (right), adaxial surfaces. F. Petal. G. Stamen, lateral view. H. Longitudinal section of hypanthium, calyx, and ovary. I. Flower with petals and stamens removed. J. Flower bud. Vouchers: A–J from R. Fernandez-Hilario et al. 2078.

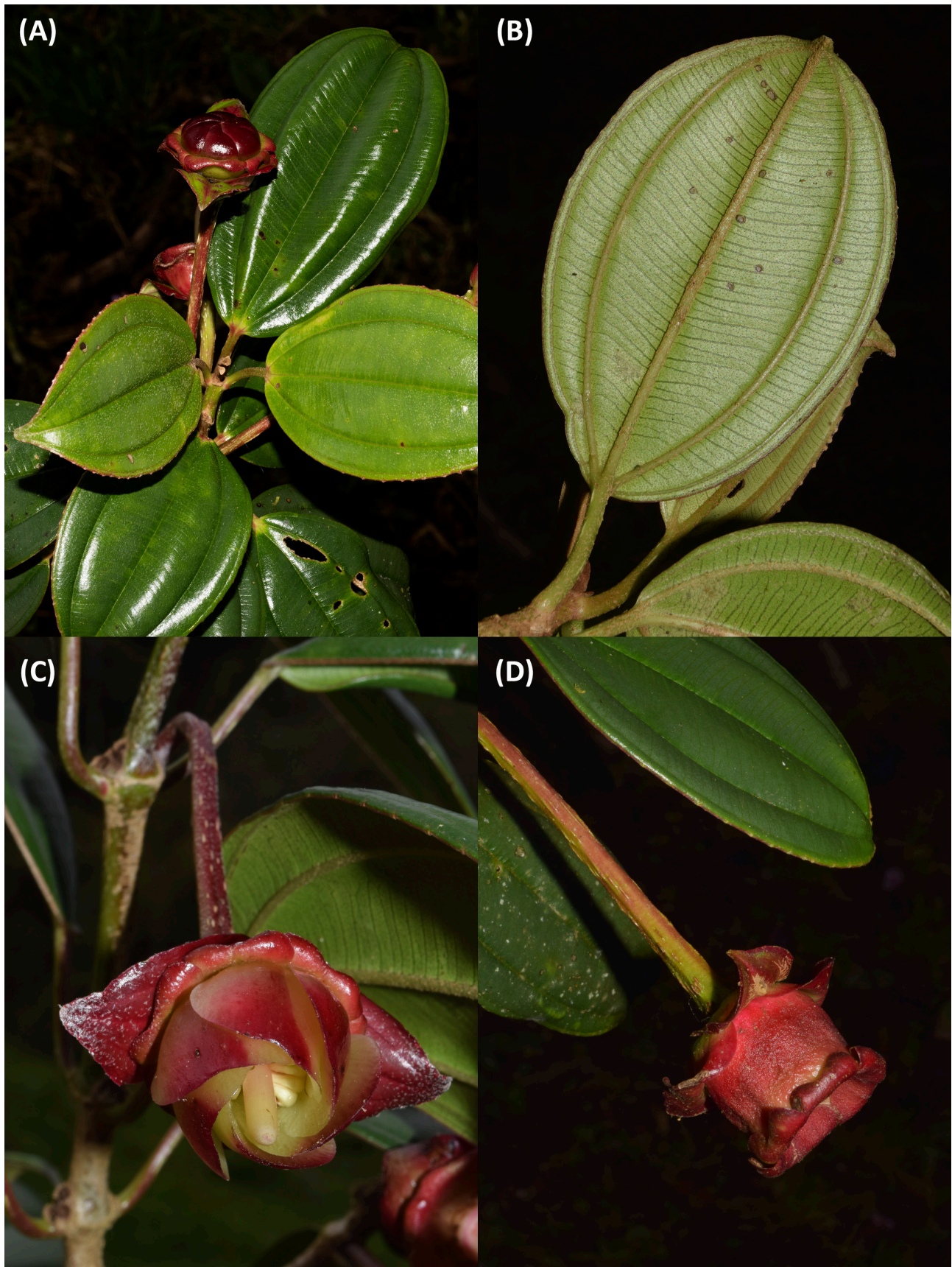


FIGURE 9. *Blakea pavida*. A. Terminal fertile branch with flower buds. B. Leaf blade, abaxial view. C. Flower at anthesis. D. Mature fruits. Vouchers: A from *F. Michelangeli et al.* 3195, B and D from *R. Fernandez-Hilario et al.* 2284, C from *R. Fernandez-Hilario et al.* 2078. Photos by Fabián A. Michelangeli (A) and Robin Fernandez (B–D).

Distribution and habitat:—*Blakea pavida* is endemic to high-elevation montane forests in the Department of Amazonas and Cajamarca, between 2000–2660 m elev. (Fig. 7). The populations of this species occur in remnant forest patches.

Etymology:—In June and July 2022, the first and last authors together with other colleagues (Juan Angulo, Agnes Dellinger, Sebastián Riva, Diego Páredes, Carrie Tribble & Léo-Paul Dagallier) undertook botanical expeditions in Peru, and during several moments of these trips, they feared that they would find only non-flowering Melastomataceae. Thus, the specific epithet comes from the Latin “pavidus” (= scared).

Phenology:—Flowering occurs in June and November, and fruiting in June.

Conservation status:—*Blakea pavida* is known from two localities. Although one of them is within a protected area (‘Parque Nacional de Cutervo’), in both localities there is a strong anthropogenic activity (agriculture and livestock). Following IUCN (2012, 2019) guidelines and based on an estimated area of occupancy of 8 km², we propose that this species is considered Critically Endangered [CR (B2a+biii)].

Discussion:—*Blakea pavida* is distinguished from other congeners by the combination of characters listed in the diagnosis. Other species of *Blakea* also have pendant flowers and campanulate green to reddish green corollas (magenta to pink in *B. fuchsioides* Almeda). This group was previously named as the “vertebrate pollination clade” by Penneys & Judd (2013a) and Michelangeli & Santamaría-Aguilar (2020), and it is composed by eight species: *B. austin-smithii* Standley (Costa Rica), *B. chlorantha* Almeda (Costa Rica), *B. fuchsioides* (Panama), *B. gregii* Almeda (Panama), *B. nareliana* (Peru), *B. penduliflora* Almeda (Costa Rica), *B. purpusii* Brandegee (Guatemala and Mexico) and *B. ricardoi* Michelangeli & D.Santamaría (Costa Rica). Almost all species occur in Mesoamerica, and they have peduncles shorter than 5.6 cm long, except 3.2–11.5 cm in *B. fuchsioides* (vs. longer than 7 cm in *B. pavida*). Only *B. nareliana* occurs in the Andes (Peru), from which *Blakea pavida* can be distinguished by its peduncles 7–9.8 cm long (vs. 21–32 cm long in *B. nareliana*), calyx lobes revolute (vs. erect), and ovate-reniform petals 11–12 mm long (vs. obovate, 20–25 mm long).

We include Díaz *et al.* 4447 (in fruit) in *B. pavida* with reservation since it has slightly hirsute young branches with elongated eglandular trichomes up to 1.5 mm long (vs. glabrous) and calyces with oblong lobes (vs. reniform). The other specimens of *B. pavida* (Prov. Cutervo, Department of Cajamarca) were collected 41 km away from Díaz *et al.* 4447 (Prov. Luya, Department of Amazonas), and all share the sizes and shapes of leaves, bracts, and peduncles.

Paratypes:—PERU. **Amazonas:** Prov. Luya, Parte alta de las montañas de Galeras, 2000–2500 m, 20 June 1991 (fr.), C. Díaz *et al.* 4447 (MOLF!, USM!). **Cajamarca:** Prov. Cutervo, Dist. San Andrés de Cutervo, PN Cutervo, Sector Las Grutas, 2550 m, 06°13'40.33"S; 78°45'02.81"W, 24 June 2022 (fr.), R. Fernandez-Hilario *et al.* 2284 (HOXA!, MOLF!), same locality and date, (fl. bud, fr.), F. A. Michelangeli *et al.* 3195 (NY!, USM!), Zona de Amortiguamiento del PN Cutervo, 2660 m, 06°13'27.37"S; 78°45'01.51"W, 20 June 2018 (fl.), S. Cruzado *et al.* 25 (UNC!).

4. *Blakea quinta* Rob.Fern., R. Villanueva & Pillaca, *sp. nov.* (Figures 10–11, 12A–B.)

Diagnosis:—A species differing from other congeners by the combination of alate petioles (5.5–8 mm wide at middle), membranaceous large leaf blades 18.6–26.4 × 10.4–14.7 cm, hypanthia ca. 6 × 7 mm, calyces with small triangular lobes (0.5–0.8 mm long), spreading, white corollas, oblong petals 10–10.8 × 6–6.5 mm, stamen connectives lacking dorsal appendages, and punctiform stigmas.

Type:—PERU. Amazonas: Prov. Bagua, Dist. Aramango, Zona de Amortiguamiento de la Reserva Comunal Chayu Nain, inmediaciones del refugio Flor de la Viña—SERNANP, 1800 m, 05°26'48"S; 78°19'41"W, 12 November 2022 (fl.), R. Fernandez-Hilario, L. Pillaca, C. Rojas, R. Vásquez & T. Wasun 2416 (holotype: MOLF! [barcode 000157]; isotypes: HOXA! [accession no. 081982], KUELAP!, NY! [barcode 03228141]).

Epiphytic shrub; young branches glabrous, petioles with arachnoid beige indumentum, with elongated eglandular trichomes, glabrous on the adaxial surface, glabrescent to moderate on the abaxial surface. **Young branches** obscurely quadrangular 6–8 mm diam., lacking wings, nodes with barely visible interpetiolar lines. **Leaves** opposite, isophyllous. **Petioles** alate, (2.5–) 3.3–4.5 cm long, 5.5–8 mm wide at middle. **Leaf blades** membranaceous, 18.6–26.4 × 10.4–14.7 cm, elliptic to oblong, base obtuse, rarely broadly obtuse, apex acuminate, margin entire, slightly discoloured; venation acrodromous and basal, with one pair of secondaries (lateral) veins and an additional pair of faint submarginal veins running up to the leaf apex, tertiary (transversal) veins 64–85 on each side of the primary, percurrent, the central tertiary veins (1.5–) 3–5 mm distant from each other, midvein, secondary and tertiary veins impressed, and reticulation not visible on the adaxial surface, midvein salient, secondary veins salient to prominent, tertiary veins impressed and reticulation not visible on the abaxial surface; adaxial surface flat, dark green olive when dry, glabrous; abaxial surface olive green when dry, with sparse to moderate arachnoid indumentum on the sides of the midvein and secondary veins,

glabrous to sparse on tertiary veins, denser at the convergence of the midvein and secondary veins. **Inflorescences** axillary, fasciculate, in the distal branches, each fascicule with 8–11 flowers. **Peduncles** 10.5–19 cm long, obscurely quadrangular, green, lenticellate, with moderate to dense arachnoid indumentum, with trichomes similar to the ones on the petioles. **Bracts** obliquely spreading to the hypanthium, green to reddish green, persistent; outer pair subcoriaceous, free, equal, each bract 11–12 × 7.5–8.5 mm, elliptic, apex obtuse, margin entire, 1-veined with three or four pair of lateral barely visible veins, the adaxial surface glabrous to with sparse arachnoid indumentum, the abaxial surface with sparse to moderate arachnoid indumentum; inner pair subcoriaceous, free, equal, each bract 10–10.5 × 6.5–7 mm, elliptic, apex broadly acute, margin entire, 1-veined with three pair of lateral barely visible veins, the adaxial surface glabrous to with sparse arachnoid indumentum, the abaxial surface with sparse to moderate arachnoid indumentum. **Flowers** 6-merous, erect, with spreading corollas. **Hypanthium** ca. 6 × 7 mm, campanulate, outer surface green, with moderate arachnoid indumentum, with trichomes similar to the ones on the peduncles, inner surface green, glabrous; torus glabrous. **Calyx** opening regularly, erect, outer surface red, glabrous or with sparse arachnoid indumentum, with trichomes similar to the ones on the peduncles, inner surface red, with sparse to moderate arachnoid indumentum, with trichomes similar to the ones on the peduncles; tube 1–1.3 mm long; lobes 0.5–0.8 mm long, ca. 0.7 mm wide at base, triangular, without dorsal projections. **Petals** 10–10.8 × 6–6.5 mm, 2.5–3 mm wide at base, oblong, apex rounded to broadly obtuse, white, glabrous. **Stamens** 12, isomorphic, all bent to one side of the flower and with partially laterally coherent anthers at anthesis giving the flower a zygomorphic appearance; filaments ca. 4 mm long, white, adaxially keeled, glabrous; connectives smooth, yellow, not dilated dorso-basally (without an appendage); anthers 3.3–3.5 mm long, yellow, elliptic, laterally compressed, opening by two separated apical to dorsally inclined pores, thecae with a smooth surface. **Ovary** 6-locular, inferior, ca. 4 mm long, glabrous, with an apical conical collar ca. 0.25 mm high with 12 little conspicuous lobes, enveloping the base of the style; style 8.3–10 mm long, whitish, glabrous, straight or incurved at apex and opposite to anthers at anthesis; stigma punctiform and minutely papillate, ca. 0.5 mm wide, whitish. **Berries** with persistent and spreading floral bracts; mature calyx red, mature hypanthium pink to red; mature ovary ca. 7 mm long. **Seeds** not seen.

Distribution and habitat:—*Blakea quinta* is endemic to high-elevation montane forests in the Department of Amazonas, between 1800–2160 m elev. (Fig. 4). Populations of this species occur in pristine forests and seldom in disturbed forests.

Etymology:—The specific epithet “quinta” comes from the Latin and is the ordinal adjective for five. This refers to the five presidents that Peru has had since the first author began his postgraduate studies with Melastomataceae in 2019, which reflects the serious political crisis of Peru in recent years.

Phenology:—Flowering occurs in November.

Conservation status:—*Blakea quinta* is known from three adjacent localities. One of them is within a protected area (‘Reserva Comunal Chayu Nain’) in pristine forests, but in the other localities there is anthropogenic activity (agriculture and livestock). Following IUCN (2012, 2019) guidelines and based on an estimated area of occupancy of 12 km², we propose that this species is considered Critically Endangered [CR (B2a+biii)].

Discussion:—*Blakea quinta* is distinguished from other congeners by the combination of characters listed in the diagnosis. The remarkable alate petioles of *B. quinta* are also present in other Andean species such as *B. platypoda* Gleason and *B. tetioici* (Wurdack) Penneys & Judd, both endemic to Colombia. Among these species, *B. quinta* can be differentiated from the former by its smaller bracts 10–12 × 6.5–8.5 mm (vs. 25–27 × 16–30 mm in *B. platypoda*), smaller petals 10–10.8 mm long (vs. 18–20 mm long), and yellow anthers (vs. light purple). Also, *B. quinta* differs from the latter by its elliptic anthers 3.3–3.5 mm long (vs. narrowly lanceolate anthers ca. 6.1 mm long in *B. tetioici*) with two separated pores (vs. two confluent pores, resulting in one single functional pore), and inferior ovaries (vs. superior). Some species within *B. subconnata* complex sensu Penneys & Judd (2013a) such as *B. involvens* Markgraf (Ecuador), *B. subconnata* O.Berg ex Triana (Colombia, Ecuador and Peru) and *B. subvaginata* Wurdack (Colombia and Ecuador) have alate petioles, but in those cases, they are clearly vaginate. In addition, these species have petals longer than 16 mm (vs. 10–10.8 mm long in *B. quinta*) and capitellate to capitate stigmas (vs. punctiform).

Blakea quinta seems to be closely related to *B. quadriflora* Gleason (Colombia, Ecuador and Peru) because of their similar flowers. In fact, the floral whorls of both (see Fig. 11C and Fig. 23B) seems to have no relevant differences in size or shape. However, *B. quinta* is easily distinguishable by its alate petiole (vs. not alate in *B. quadriflora*), leaf blades 18.6–26.4 × 10.4–14.7 cm [vs. (9.9–) 11–13 (–16.5) × (4–) 5.5–6.5 (–7.5) cm], and abaxial leaf surfaces with arachnoid indumentum on the sides of the midvein and secondary veins (vs. glabrous).

Paratypes:—PERU. **Amazonas:** Prov. Bagua, Dist. Aramango, Catarata Numparket, 2000 m, 05°29′55″S; 78°19′58″W, 13 December 2001 (fl.), *R. Vásquez et al.* 27284 (HUT!, NY!, USM!); Dist. Imaza, Reserva Comunal Chayu Nain, alrededores de campamento Yumi Atsawai, 2160 m, 05°26′51″S; 78°18′58″W, 04–07 November 2022

(fl.), *R. Fernandez-Hilario et al.* 2351 (HOXA!, MOLF!, NY!), same locality, 06–11 November 2022 (fl.), *R. Villanueva et al.* 475 (HOXA!, MOLF!).

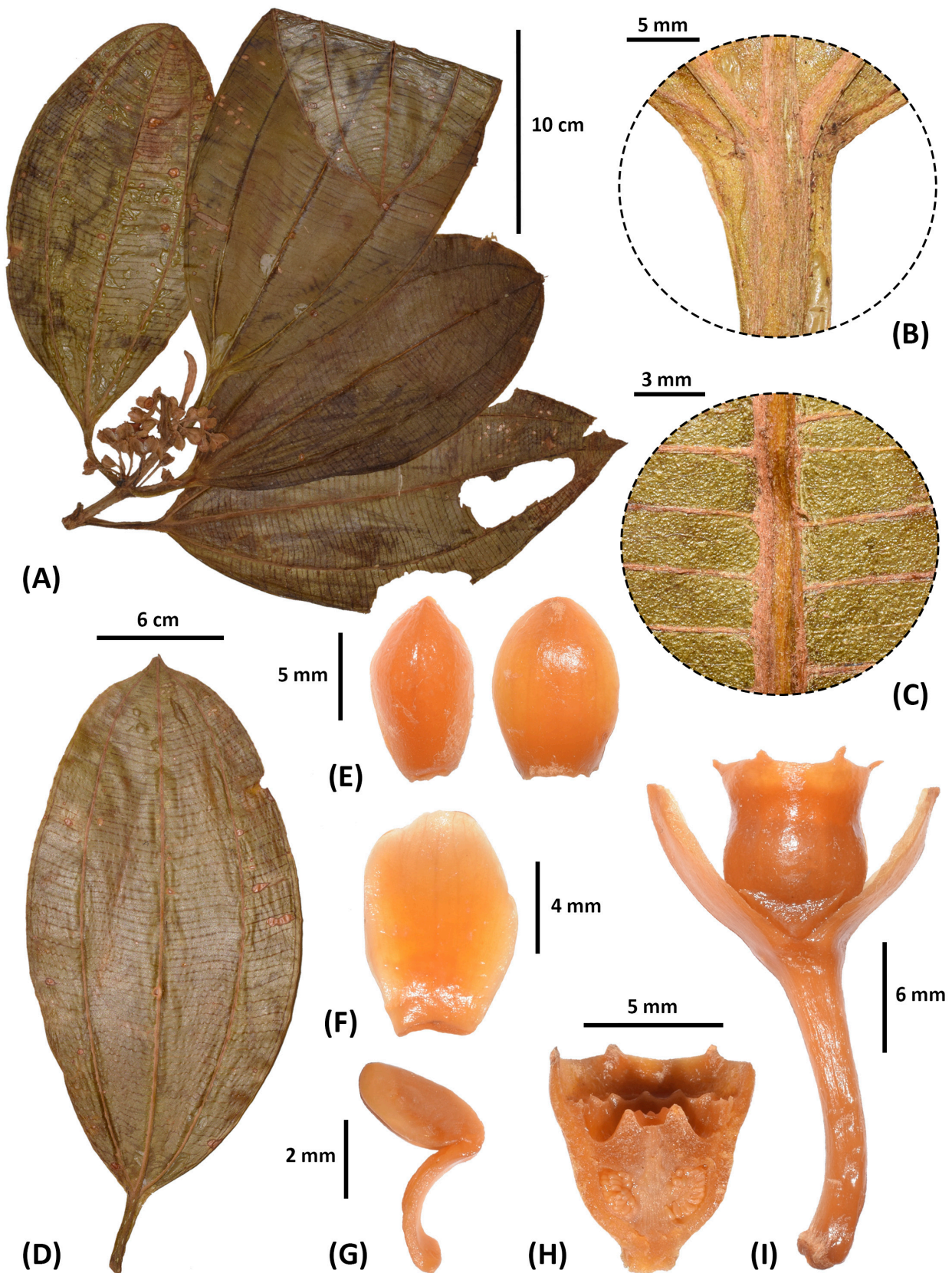


FIGURE 10. *Blakea quinta*. A. Terminal fertile branch with immature fruits. B. Detail of the alate petiole. C. Detail of the abaxial leaf surface. D. Leaf blade, abaxial view. E. Inner bract (left) and outer bract (right), abaxial surfaces. F. Petal. G. Stamen, lateral view. H. Longitudinal section of hypanthium, calyx, and ovary. I. Hypanthium, calyx, and outer bracts. Vouchers: A–D from *R. Fernandez-Hilario et al.* 2416, E–I from *R. Fernandez-Hilario et al.* 2351.



FIGURE 11. *Blakea quinta*. A. Terminal fertile branch with flowers and immature fruits. B. Flowers and immature fruits. C. Flower at anthesis. D. Mature fruits. Vouchers: A, C and D from R. Fernandez-Hilario et al. 2351, B from R. Fernandez-Hilario et al. 2416. Photos by Robin Fernandez.

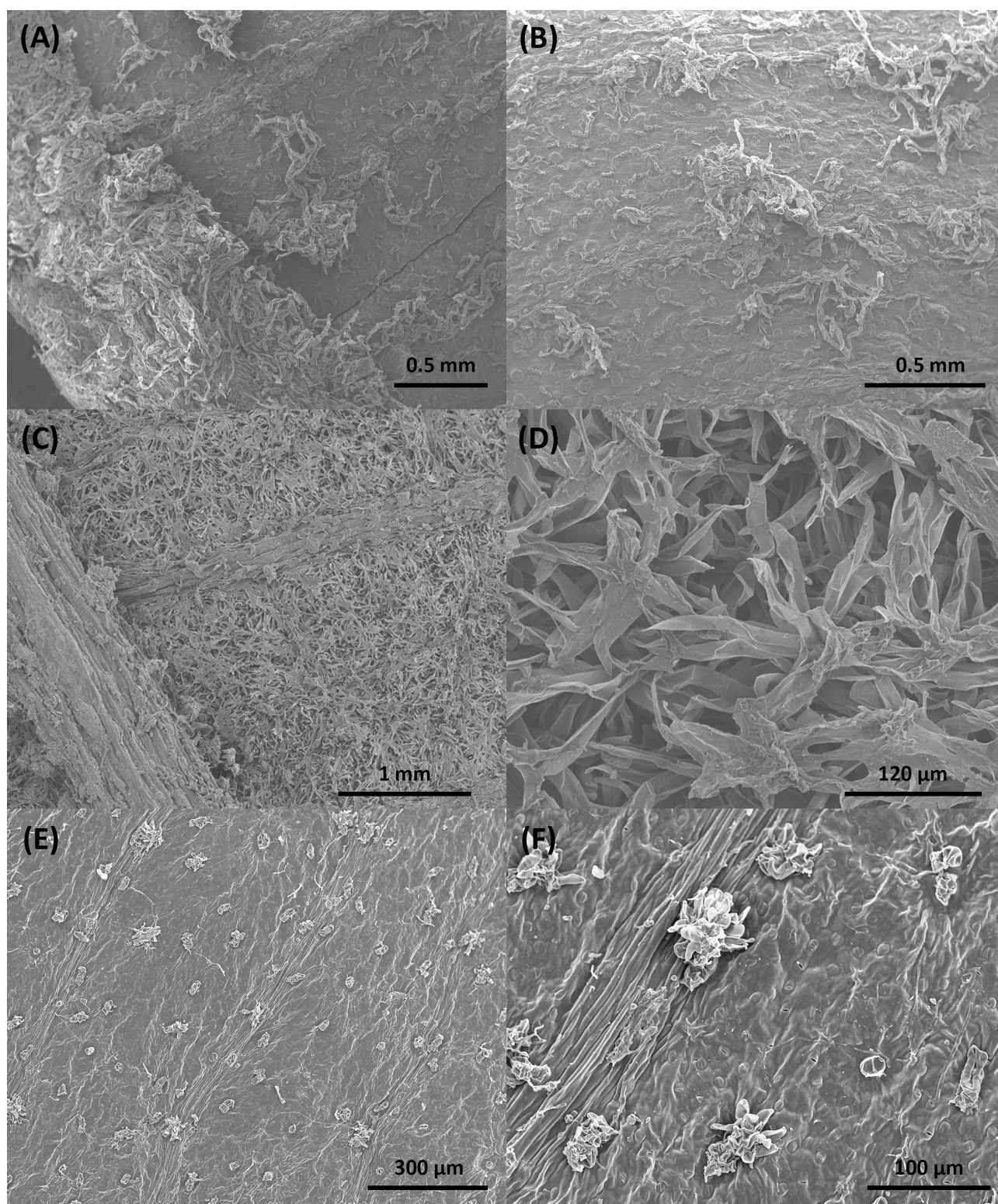


FIGURE 12. Scanning electron microphotographs of the indumentum of *Blakea quinta*, *B. rojasiae* and *B. yumi*. A–B. *Blakea quinta*. A. Trichomes on the abaxial leaf surface. B. Detail of trichomes on the abaxial leaf surface. C–D. *Blakea rojasiae*. C. Trichomes on the abaxial leaf surface. D. Detail of trichomes on the abaxial leaf surface. E–F. *Blakea yumi*. E. Trichomes on the abaxial leaf surface. F. Detail of trichomes on the abaxial leaf surface. Vouchers: A–B from R. Fernandez-Hilario *et al.* 2351, C–D from E. Rodríguez & M. Núñez 1921, E–F from R. Fernandez-Hilario *et al.* 2399.

5. *Blakea rojasiae* Rob.Fern., Michelang. & R.Goldenb., *sp. nov.* (Figures 12C–D, 13–14.)

Diagnosis:—A species differing from other congeners by the combination of stellate trichomes intermixed with dendritic trichomes

evenly covering the abaxial leaf surfaces, flat adaxial leaf surfaces, moderately barbate torus, rounded ciliate calyx lobes, spreading, light purple corollas, orbiculate-spatulate petals with ciliate margins in the middle, free anthers, and superior ovaries with an apical conic collar ca. 3 mm high.

Type:—PERU. Amazonas: Prov. Bongará, Dist. Yambrasbamba, Centro de Investigación de la ONG Neotropical Primate Conservation y bosque “El Toro” de la Comunidad Campesina de Yambrasbamba, 2000 m, 05°39′17.05″S, 77°54′51.30″W, 22–28 July 2018 (fl.), R. Fernandez-Hilario, W. Chuquitucto, G. Bravo & V. Fack 1429 (holotype: MOLF! [barcode 000158]; isotypes: HOXA! [accession no. 080654], NY! [barcode 03228136], UPCB! [accession no. 99386]).

Liana or epiphytic shrub; young branches and petioles pubescent with dendritic cream trichomes up to ca. 0.13 mm long, densely on terminal buds, glabrescent to moderately on young branches and petioles. **Young branches** terete, 5–7 mm diam., lacking wings, nodes without interpetiolar lines or flaps. **Leaves** opposite, isophyllous. **Petioles** terete, 2.5–3.3 cm long, without projections. **Leaf blades** coriaceous, 10.2–15.2 × (4–) 4.7–8.5 cm, elliptic to oblong, apex obtuse, rarely acute or slightly rounded, base obtuse to rounded, margin denticulate, discolorous; venation acrodromous and slightly suprabasal, with one pair of secondaries (lateral) veins, diverging 2–4 mm from the base of the blade, and an additional pair of faint submarginal veins running up to the leaf apex, tertiary (transversal) veins 42–53 on each side of the primary, percurrent, the central tertiary veins 2.5–5 mm distant from each other, midvein and secondary veins impressed, tertiary veins visible and reticulation not visible on the adaxial surface, midvein vein salient, secondary veins prominent, tertiary veins impressed and reticulation visible to barely visible on the abaxial surface; adaxial surface flat, greyish brown when dry, sometimes cream, glabrous or with sparse dendritic trichomes intermixed with elongated roughened trichomes on veins, denser on the base, up to 0.5 mm long; abaxial surface cream when dry, densely pubescent with stellate trichomes intermixed with dendritic trichomes, up to 0.25 mm long, evenly covering the entire surface. **Inflorescences** axillary, fasciculate, in the distal branches, each fascicule with 5–7 flowers. **Peduncles** 10.6–18.5 mm long, terete, green, lenticellate, densely pubescent, with trichomes similar to the ones on the petioles, evenly covering the entire surface. **Bracts** appressed to the hypanthium, green, persistent; outer pair coriaceous, free, equal, each bract 8.5–10 × 9.5–11.5 mm, ovate, apex acute, margin entire, veins barely visible on the adaxial surface, the adaxial densely pubescent, with trichomes similar to the ones on the peduncles, the abaxial surface glabrous; inner pair subcoriaceous, free, equal, each bract 8–9 × 7.5–10.5 mm, rounded, apex early disintegrated producing 3 irregularly acute lobes (even in flower buds), margin ciliate, veins barely visible on the adaxial surface, the adaxial surface glabrous to with sparse trichomes similar to the ones on the peduncles, abaxial surfaces glabrous. **Flowers** 6-merous, erect, with spreading corollas. **Hypanthium** 4.5–5 × 6.5–8 mm, campanulate, outer surface and inner surface green, glabrous; torus moderately barbate, with elongated slightly roughened trichomes, 3–3.5 mm long. **Calyx** opening regularly, erect, with quincuncial lobes, outer surface and inner surface green, glabrous; tube ca. 2.5 mm long; lobes 2.5–3 mm long, 5–5.5 mm wide at base, rounded, ciliate, without dorsal projections. **Petals** 12–12.5 × 8–8.5 mm, 2–2.5 mm wide at base, orbiculate-spatulate, apex rounded, light purple, white in the base, ciliate in the middle. **Stamens** 12, isomorphic, all bent to one side of the flower and with free anthers at anthesis giving the flower a zygomorphic appearance; filaments ca. 7 mm long, white, flat, glabrous; connectives smooth, yellow, dilated dorso-basally ca. 0.5 mm above the filament insertion into a blunt appendage; anthers 7–7.5 mm long, yellow, narrowly lanceolate, opening by two confluent (functionally one) dorsally inclined pores, thecae with a corrugated surface. **Ovary** 6-locular, superior, 3.5–4 × 4.5–5 mm, oblong and 12-costate, glabrous, with an apical conic collar ca. 3 mm high with 12 lobes, enveloping the base of the style; style ca. 10 mm long, colour unknown, glabrous, straight; stigma punctiform and minutely papillate, ca. 0.5 mm wide, colour unknown. **Berries** with persistent and appressed floral bracts; mature calyx green, mature hypanthium red in the proximal region and green in the distal region; mature ovary ca. 8 mm long. **Seeds** not seen.

Distribution and habitat:—*Blakea rojasiae* is endemic to high-elevation montane forests in the Departments of Amazonas and Cajamarca, 1700–2080 m elev. (Fig. 7). Populations of this species occur in pristine forests and remnant forest patches.

Etymology:—This species is named in honor of Rocio del Pilar Rojas, researcher at the ‘Estación Biológica del Jardín Botánico de Missouri’, who has made an important contribution to the knowledge of the flora of Peru and especially to the study of the Peruvian Gesneriaceae (see Rojas & Clark 2015; Rojas & Mora 2021; Rojas 2020, 2022).

Phenology:—Flowering occurs from May to September and in November, and fruiting in February, October, and November.

Conservation status:—*Blakea rojasiae* is known from four localities, some of them with anthropogenic activity (agriculture and livestock) and none within a protected area. Following IUCN (2012, 2019) guidelines and based on an

estimated extent of occurrence of 1690 km², we propose that this species is considered Endangered [EN (B1a+biii)].

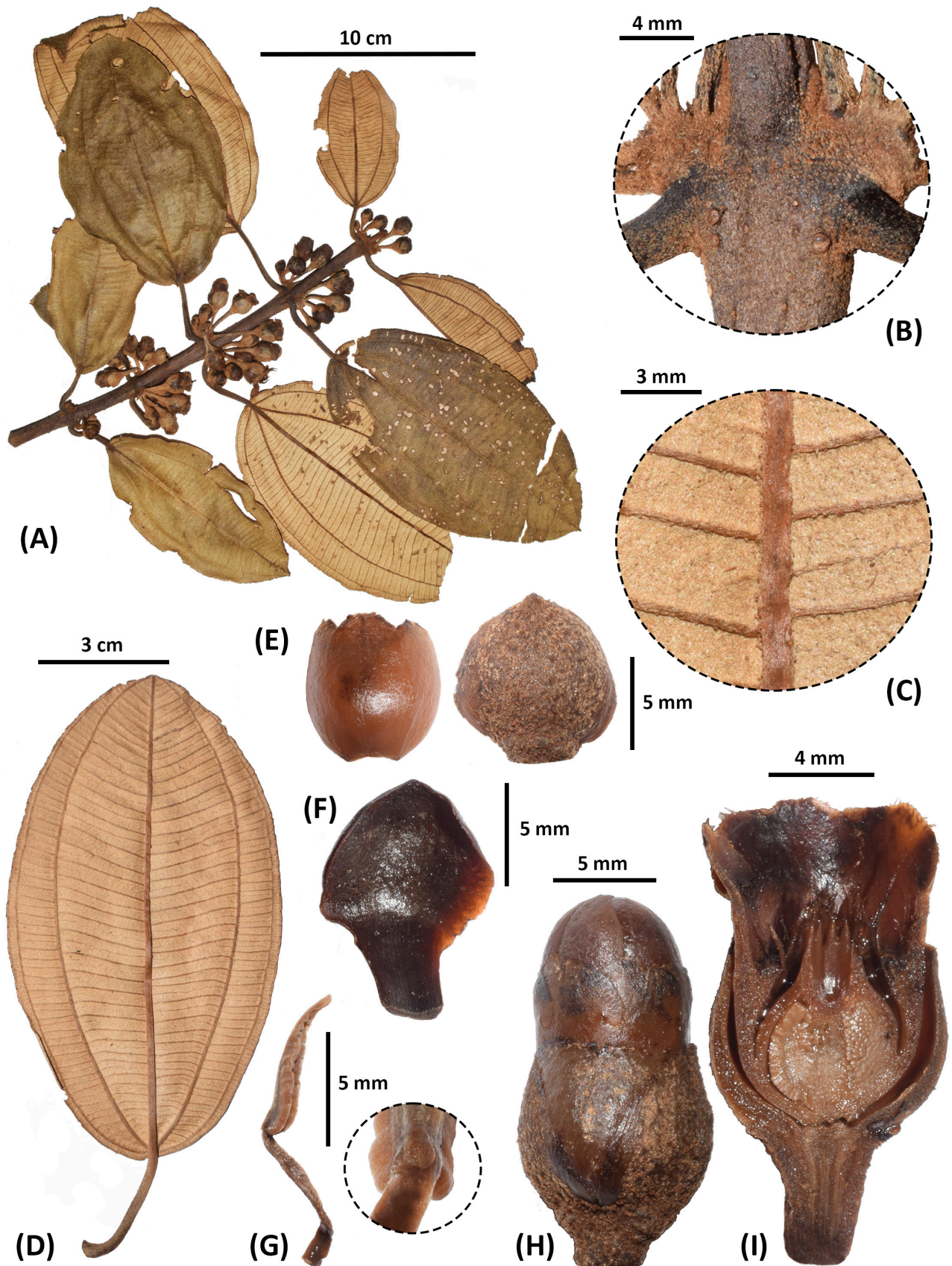


FIGURE 13. *Blakea rojasiae*. A. Terminal fertile branch with flower buds. B. Detail of the node. C. Detail of the abaxial leaf surface. D. Leaf blade, abaxial view. E. Inner bract (left) and outer bract (right), abaxial surfaces. F. Petal. G. Stamen, lateral view, with detail of the blunt, dorso-basal appendage (right). H. Flower bud. I. Longitudinal section of hypanthium, calyx, and ovary. Vouchers: A–B and E–I from *R. Fernandez-Hilario et al.* 1429, C–D from *T. Espinal* 86.



FIGURE 14. *Blakea rojasiae*. A. Terminal fertile branch with flower buds. B. Detail of flower buds. C. Flower at anthesis. D. Mature fruits. Vouchers: A from Fernandez-Hilario & W. Chuquitucto 2712, B and C from R. Fernandez-Hilario *et al.* 1429, D from R. Fernandez-Hilario & W. Chuquitucto 1733. Photos by Robin Fernandez.

Discussion:—*Blakea rojasiae* is distinguished from other congeners by the combination of characters listed in the diagnosis. *Blakea rojasiae* seems to be closely related with *Blakea verrucosa* (Wurdack) Penneys & Judd (Ecuador), because they share glabrous hypanthia, rounded calyx lobes with ciliate margins, and orbiculate-spatulate petals with ciliate margins in the middle portion. However, the former is distinguished by its flat adaxial leaf surfaces (vs. covered with conic verrucae), outer floral bracts ca. 10 mm long (vs. 5–5.5 mm long) with pubescent external surfaces (vs. setulose), and torus with trichomes 3–3.5 mm long (vs. 1–2 mm long).

We initially included the material cited as “other related specimens” (see below) within *B. rojasiae*, but after detailed morphological analysis we decided to exclude them from this new species. These specimens are almost impossible to differentiate from *B. rojasiae* in sterile specimens, as both have similar leaves with the cream indumentum covering the entire abaxial surface. The flowers are also similar, but *B. rojasiae* differs by its glabrous hypanthia and calyces (vs. moderately to densely pubescent), barbate torus (vs. glabrous), and ovaries with an apical collar (vs. lacking apical modifications). Moreover, *B. rojasiae* inhabits montane forests between 1700–2080 m elev., while the related specimens inhabit pre-montane forests and lowland forests between 320–820 m. These materials probably correspond to another undescribed species of *Blakea*; however, we require additional collections to confirm it.

Paratypes:—PERU. **Amazonas:** Prov. Bongará, Dist. Yambrasbamba, Bosque “El Toro” de la comunidad campesina de Yambrasbamba, 2088 m, 05°39'16.9"S; 77°54'36.9"W, 23 July 2015 (fl. bud), *S. Almeyda & C. Castillo 21* (MOLF!), same locality, 29 June 2016 (fl. bud), *T. Espinal 86* (MOLF!, UFV!), Centro de Investigación de la ONG Neotropical Primate Conservation y bosque “El Toro” de la Comunidad Campesina de Yambrasbamba, 2000 m, 05°39'17.05"S; 77°54'51.30"W, 22–28 July 2018 (fl. bud), *R. Fernandez-Hilario et al. 1427* (MOLF!, UCB!), same locality, 26–29 November 2018 (fr.), *R. Fernandez-Hilario & W. Chuquitucto 1733* (HOXA!, MOLF!, UCB!), same locality, 1900 m, 05°39'15"S; 77°54'46"W, 15 August 2023 (fl.), *R. Fernandez-Hilario & W. Chuquitucto 2712* (MOLF!, HOXA!, NY!). Prov. Rodríguez de Mendoza, Dist. Vista Alegre, entre Valle Encantado y Bosque Salas, 1100–1853 m, 06°15'07.1"S; 77°16'23.2"W, 30 May 2008 (fl.), *V. Quipuscoa et al. 4061* (HSP!, HUT!). **Cajamarca:** Prov. San Ignacio, Dist. Huarango, Nuevo Mundo, quebrada Santa Rosa, 1700 m, 05°10'05"S; 68°32'00"W, 10 November 1997 (fl., fr.), *J. Campos & S. Núñez 4590* (MOLF!, NY!, USM!), Nuevo Mundo, caserío Pisaguas, 1700–1800 m, 05°10'S; 78°32'W, 12 November 1997 (fl.), *E. Rodríguez & M. Núñez 1921* (MOLF!, NY!); Dist. San José de Lourdes, camino al Picorana, 2020 m, 04°59'22"S; 78°53'03"W, 23 February 2000 (fr.), *J. Campos et al. 6503* (MOLF!, NY!, USM!), Selva Andina, 1900 m, 04°59'37"S; 78°53'35"W, 06 May 2001 (fl. bud), *E. Vicuña 109* (HUT!, USM!), same locality and date, (st.), *121* (HUT!, USM!), same locality and date, (fl. bud), *136* (HUT!, USM!), Selva Andina, base del cerro Picorana, 25 August 1999 (fl.), *C. Díaz et al. 10749* (NY!, USM!), same locality, 1900–2010 m, 26 August 1999 (fl.), *C. Díaz et al. 10802* (NY!, USM!).

Other specimens related to *Blakea rojasiae* (see discussion):—PERU. **Amazonas:** Prov. Bagua, Dist. Imaza, Comunidad Aguaruna Putuim (anexo Yamayakat), 700–820 m, 23 September 1994 (fl.), *C. Díaz et al. 7214* (NY!), Comunidad Aguaruna de Putuim, 700–780 m, 04°55'S; 78°19'W, 14 June 1996 (fl.), *E. Rodríguez et al. 1036* (MOLF!, NY!, USM!), Comunidad de Kampaenza, ribera de la quebrada Shimutaz, 320 m, 04°55'S; 78°19'W, 25 September 1994 (fl.), *N. Jaramillo et al. 511* (HUT!, NY!, USM!), Tayu Mujaji, Comunidad de Wawas, 800 m, 05°15'25"S; 78°21'41"W, 23 October 1997 (fr.), *R. Rojas et al. 441* (NY!, USM!).

6. *Blakea wilderi* Rob.Fern., R.Villanueva & Pillaca, *sp. nov.* (Figures 15–16.)

Diagnosis:—A species differing from other congeners by the combination of glabrous leaf blades, large outer floral bracts (18–26 mm long) with a slightly auriculate base, calyptrate or subcalyptrate calyces with irregular dehiscence, spreading, deep pink corollas, stamens encircling the style, and stamen connectives with falcate appendages ca. 3 mm long.

Type:—PERU. Amazonas: Prov. Bongará, Dist. Yambrasbamba, Sector Los Monos, 1860 m, 05°38'41"S; 77°58'32"W, 28 August 2022 (fl.), *R. Fernandez-Hilario, W. Chuquitucto & K. Celis 2243* (holotype: MOLF! [barcode 000159]; isotypes: HOXA! [accession no. 083299], KUELAP!, NY! [barcode 03228139]).

Epiphytic shrub; young branches and petioles glabrous, terminal buds densely puberulent with roughened to dendritic trichomes up to ca. 0.13 mm long. **Young branches** rounded-quadrangular, 3–5 mm diam., lacking wings, nodes with fine interpetiolar lines. **Leaves** opposite, isophyllous to slightly anisophyllous. **Petioles** semiterete, 0.9–1.5 cm long, without projections. **Leaf blades** coriaceous, 7–9 (–11) × 4–5.5 (–6.9) cm, elliptic to broadly elliptic, rarely slightly obovate, apex acuminate, base obtuse, margin entire, discolorous; venation acrodromous and slightly suprabasal, with one pair of secondaries (lateral) veins, diverging 2–2.5 mm from the base of the blade, and an additional pair of faint submarginal veins running up to the leaf apex, tertiary (transversal) veins 140–192 on each side of the primary,

percurrent, the central tertiary veins 0.5–0.75 mm distant from each other, midvein and secondary veins impressed, tertiary veins visible and reticulation not visible on the adaxial surface, midvein salient, secondary veins impressed, tertiary veins visible and reticulation not visible on the abaxial surface; adaxial surface flat, dark brown when dry, glabrous; abaxial surface brown when dry, glabrous. **Inflorescences** axillary, solitary or geminate, in the distal branches. **Peduncles** 2.6–3.6 (–6.5) cm long, quadrangular, green, lenticellate, glabrous or moderately puberulent, with trichomes similar to the ones on the terminal buds. **Bracts** basally appressed to the hypanthium and distally spreading, green, persistent; outer pair subcoriaceous, free, equal, each bract 18–26 × 10–11 mm, foliaceous, lanceolate to ovate, apex acute, somewhat auriculate at the base, margin distally entire and basally sinuate, 1-veined with one pair of lateral visible veins, the adaxial surface glabrous, the abaxial surface glabrescent or with sparse trichomes similar to the ones on the peduncles; inner pair subcoriaceous, free, equal, 10–12 × 6 mm, elliptic to lanceolate, apex acute, margin entire, 1-veined with one pair of lateral visible veins, green, the adaxial and abaxial surfaces glabrous. **Flowers** 6-merous, erect, with spreading corollas. **Hypanthium** ca. 7 × 9 mm, campanulate, outer surface green, densely puberulent with stellate beige trichomes, inner surface green, glabrous; torus glabrous. **Calyx** opening irregularly, outer surface green, glabrescent or with sparse roughened to dendritic trichomes, inner surface green, moderately puberulent with similar trichomes; calyx lobes closely connate in bud, forming a calyptra or subcalyptra, 6–6.5 mm long, each with a small conic dorsal projection ca. 0.5 mm long (in subcalyptrate calyces) or with obsolete dorsal projections (in calyptrate calyces). **Petals** 13.5–16.5 × 14–16 mm, 5.5–6 mm wide at base, obovate and slightly asymmetric, pink to deep pink, glabrous. **Stamens** 12, isomorphic, encircling the exerted style and with partially laterally coherent anthers at anthesis giving the flower an actinomorphic appearance; filaments 3.5–4 mm long, whitish, keeled, glabrous; connectives smooth, cream, dilated dorso-basally ca. 3 mm above the filament insertion into a falcate appendage; anthers 3.5–4 mm long, cream, broadly oblong, laterally compressed, opening by two separated apical pores, thecae with a smooth surface. **Ovary** 6-locular, inferior, ca. 5.5 mm long, glabrous, with a conical apex ca. 3 mm high; style ca. 9 mm long, deep pink, with sparse minute enations, straight; stigma punctiform and minutely papillate, ca. 0.5 mm wide, whitish. **Berries** with persistent, basally appressed and distally spreading floral bracts; mature calyx green, mature hypanthium orange; mature ovary ca. 6 mm long. **Seeds** not seen.

Distribution and habitat:—*Blakea wilderi* is endemic to high-elevation montane forests in the Department of Amazonas, between 1860–2160 m elev. (Fig. 4). Populations of this species occur in pristine forests and remnant forest patches.

Etymology:—We dedicate with much gratitude this species to Wilder Chuquitucto, villager of the ‘Comunidad Campesina de Yambrasbamba’ (Dept. Amazonas). Since 2017 WC has supported our botanical expeditions in Amazonas, and his ability to find rare species has allowed the discovery of several new species, e.g.: *Blakea eden* (described here), *Magnolia enepeceana* Rob.Fernandez & Marcelo-Peña (Fernandez-Hilario *et al.* 2020), and *Meriania callosa* Rob. Fernandez, R. Goldenberg & Michelangeli (Fernandez-Hilario *et al.* 2022).

Phenology:—Flowering occurs in July and August, and fruiting in November.

Conservation status:—*Blakea wilderi* is known from three localities outside protected areas and with strong anthropogenic activity nearby (mainly livestock). Following IUCN (2012, 2019) guidelines and based on an estimated area of occupancy of 12 km², we propose that this species is considered Endangered [EN (B2a+biii)].

Discussion:—*Blakea wilderi* is distinguished from other congeners by the combination of characters listed in the diagnosis. Calyx lobes closely connate in bud, forming a calyptra or subcalyptra, are an uncommon character within species of *Blakea*, and only three Andean species exhibit it, *B. argentea* Gleason, *B. calyptrata* Gleason and *B. fissicalyx* Uribe, the three species endemic to Colombia. Nevertheless, *B. wilderi* is distinguished from them by its large outer floral bracts 18–26 mm long (vs. < 14 mm long in the others) and calyces glabrescent or with sparse trichomes (vs. densely tomentose evenly covering the entire surface in *B. calyptrata* and *B. fissicalyx*, moderately furfuraceous in *B. argentea*).

Peruvian *Blakea* species closely resembling *B. wilderi* are *B. brasiliensis* Cogniaux and *B. standleyana* J.F. Macbride. However, *B. wilderi* has calyptrate or subcalyptrate calyces with irregular dehiscence and petals 13.5–16.5 mm long, whereas *B. brasiliensis* and *B. standleyana* have lobed calyces with regular dehiscence and petals 24.5–28 mm long. Also, *B. wilderi* inhabits montane forests between 1860–2160 m while *B. brasiliensis* and *B. standleyana* inhabit lowland forests and premontane forests below 1200 m.

Paratypes:—PERU. **Amazonas:** Prov. Bongara, Dist. Yambrasbamba, Área de Conservación de la ONG Neotropical Primate Conservation y bosque “El Toro” de la Comunidad Campesina de Yambrasbamba, 2000 m, 05°39′17.05″S; 77°54′51.30″W, 22–28 July 2018 (fl.), R. Fernandez-Hilario *et al.* 1428 (MOLF!), same locality, 1900 m, 05°39′15″S; 77°54′46″W, 16 August 2023 (fl. bud), R. Fernandez-Hilario & W. Chuquitucto 2713 (HOXA!, MOLF!, NY!), same locality, 2150 m, 05°39′59″S; 77°54′33″W, 16 August 2023 (fl.), R. Fernandez-Hilario & W.

Chuquitucto 2721 (HOXA!, MOLF!, NY!), Ruta desde CP Santa Rosa hacia bosque El Toro, 2160 m, 05°40'41.13"S; 77°55'12.72"W, 11 November 2020 (fl. bud, fr.), *R. Fernandez-Hilario et al. 2059* (KUELAP!, MOLF!, NY!).

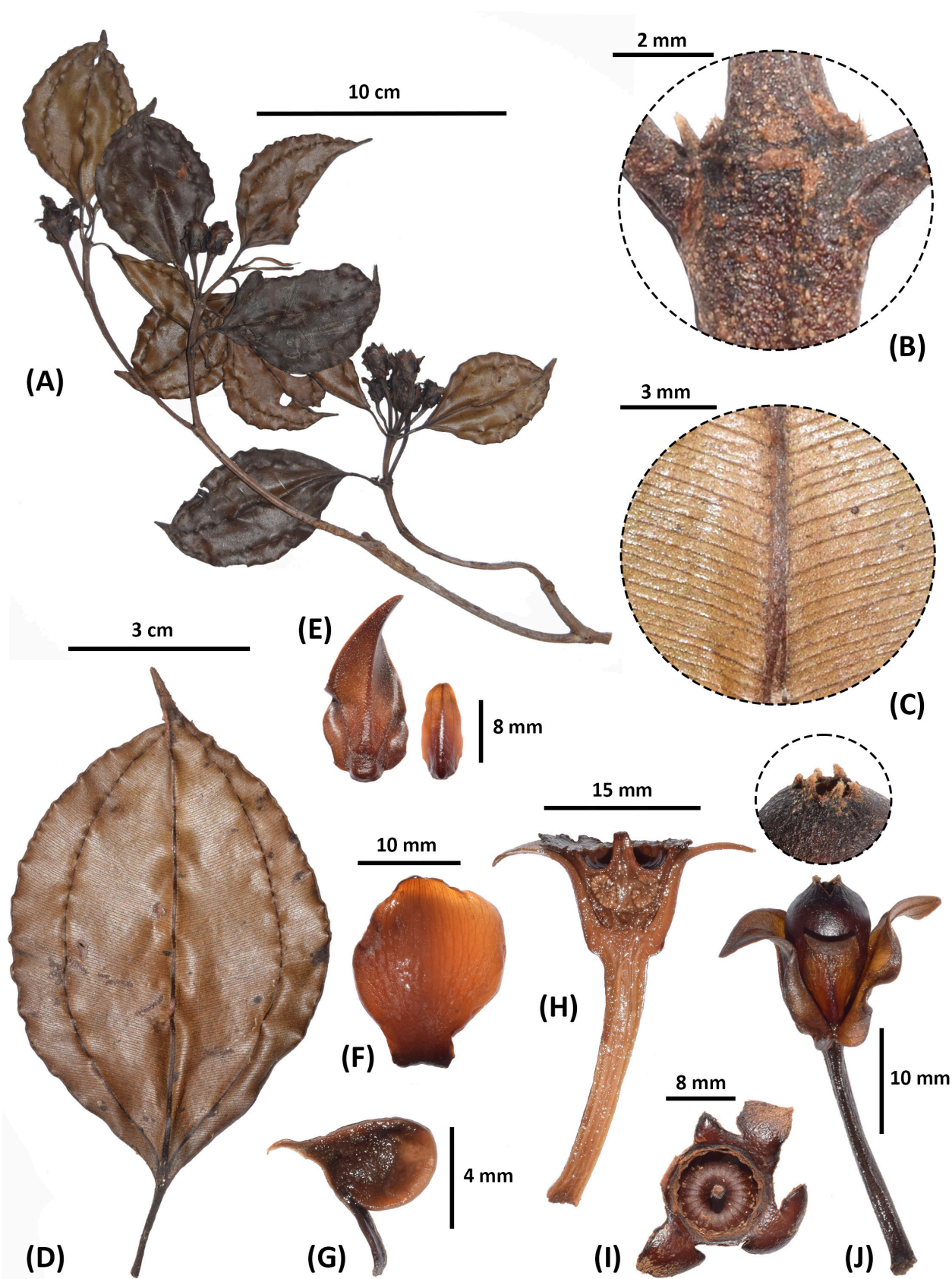


FIGURE 15. *Blakea wilderi*. A. Terminal fertile branch with flowers. B. Detail of the node with an interpetiolar line. C. Detail of the abaxial leaf surface. D. Leaf blade, abaxial view. E. Outer bract (left) and inner bract (right), abaxial surfaces. F. Petal. G. Stamen, lateral view. H. Longitudinal section of hypanthium, calyx, and ovary. I. Calyx with irregular dehiscence, apical view. J. Flower bud with detail of the apex of the subcalyprate calyx. Voucher: *R. Fernandez-Hilario et al. 2243*.



FIGURE 16. *Blakea wilderi*. A. Leaf blade, abaxial view. B. Calyptrate calyx with irregular dehiscence. C. Flower at anthesis. D. Mature fruits. Vouchers: A–C from R. Fernandez-Hilario *et al.* 2243, D from R. Fernandez-Hilario *et al.* 2059. Photos by Robin Fernandez.

7. *Blakea yumi* Rob.Fern., R.Villanueva & Pillaca, *sp. nov.* (Figures 12E–F, 17–18.)

Diagnosis:—A species differing from other congeners by the combination of small leaf blades (5.3–) 6–9.3 × (2.8–) 3.5–4.5 cm, floral bracts not exceeding hypanthium length, hypanthia 4–4.5 mm long, spreading calyces, spreading, white corollas, asymmetric obovate petals 10–11.5 × 8–10 mm, free anthers, stamen connectives with blunt appendages ca. 0.2 mm long, and prolonged below the thecae ca. 0.5 mm long, and superior ovaries.

Type:—PERU. Amazonas: Prov. Bagua, Dist. Imaza, Reserva Comunal Chayu Nain, alrededores de campamento Yumi Atsawai, 2160 m, 05°26'51"S; 78°18'58"W, 11 November 2022 (fl., fr.), R. Fernandez-Hilario, R. Villanueva, C. Rojas, R. Vásquez & T. Wasun 2399 (holotype: MOLF! [barcode 000156]; isotypes: HOXA! [accession no. 081983], KUELAP!, NY! [barcode 03228140]).

Epiphytic or **scandent shrub**; young branches and petioles pubescent with conic and roughened trichomes intermixed with elongated trichomes with a roughened base, ferruginous, up to ca. 0.3 mm long, glabrescent to densely on young branches, densely on petioles, leaf axils with elongated eglandular trichomes up to 1.75 mm long. **Young branches** terete, 3–4.5 mm diam., lacking wings, nodes without interpetiolar lines or flaps. **Leaves** opposite, isophyllous, sometimes slightly anisophyllous. **Petioles** terete, 9–17 mm long, without projections. **Leaf blades** coriaceous, (5.3–) 6–9.3 × (2.8–) 3.5–4.5 cm, elliptic to broadly elliptic, rarely slightly lanceolate, apex acuminate, base obtuse, margin entire, discolorous; venation acrodromous and basal, with one pair of secondaries (lateral) veins and an additional pair of faint submarginal veins running up to the leaf apex, tertiary (transversal) veins 96–110 on each side of the primary, percurrent, the central tertiary veins (0.25–) 0.5–1 mm distant from each other, midvein and secondary veins impressed, tertiary veins visible and reticulation not visible on the adaxial surface, midvein vein salient, secondary veins prominent, tertiary veins and reticulation visible on the abaxial surface; adaxial surface flat, brown when dry, glabrous or with sparse minute roughened to dendritic trichomes intermixed with elongated with a roughened base up to 1 mm long on midvein, denser on the base; abaxial surface light brown when dry, moderately to densely pubescent with minute roughened to dendritic trichomes intermixed with elongated with a roughened base up to 0.75 mm long on midvein and secondary veins, and with elongated curly trichomes with a roughened base up to 0.5 mm long on the surface. **Inflorescences** axillary, fasciculate, in the distal branches, each fascicule with (1–) 3 flowers. **Peduncles** 12.5–19 mm long, rounded-quadrangular, green, lenticellate, sparsely to densely pubescent, with trichomes similar to the ones on the petioles. **Bracts** appressed to the hypanthium, green, persistent; outer pair subcoriaceous, free, equal, each bract ca. 4 × 3.5 mm, orbicular to ovate, apex obtuse to rounded, margin entire, 1-veined with three pair of lateral barely visible veins, the adaxial surface with sparse to moderate trichomes on the apex, trichomes similar to the ones on the hypanthia, the abaxial surface sparsely to moderately pubescent, with trichomes similar to the ones on the hypanthia, denser on the apex; inner pair subcoriaceous, free, equal, each bract ca. 3.75 × 3–3.25 mm, orbicular to oblong, apex rounded, margin ciliate up to 0.3 mm long, veins not visible, the adaxial surface with moderate to dense elongated moderately roughened trichomes on the apex and margin, abaxial surfaces with sparse trichomes similar to the ones on adaxial surface, denser on the apex. **Flowers** 6-merous, erect, with spreading corollas. **Hypanthium** 4–4.5 × 4–5 mm, campanulate, outer surface green, with dense minute enations, inner surface green, glabrous; torus with minute enations. **Calyx** opening regularly, spreading, outer surface green, glabrous, inner surface green, with sparse to moderate minute enations; tube 2–2.5 mm long; lobes 0.5–0.75 mm long, 4–4.5 mm wide at base, rounded and acuminate, each with a small conic dorsal projection ca. 0.5 mm long. **Petals** 10–11.5 × 8–10 mm, 2–3 mm wide at base, asymmetric obovate, apex rounded, white, glabrous. **Stamens** 12, isomorphic, all bent to one side of the flower and with free anthers at anthesis giving the flower a zygomorphic appearance; filaments (3.2–) 4.5–5 mm long, greenish cream, flat, glabrous; connectives smooth, yellow, dilated dorso-basally ca. 0.2 mm above the filament insertion into a blunt appendage, prolonged below the thecae ca. 0.5 mm long; anthers (3.5–) 5–5.3 mm long, yellow, linear-oblong, opening by two dorsally inclined pores, thecae with a smooth surface. **Ovary** 6-locular, superior, basally fused with hypanthium, free portion 2.25–2.5 × 3 mm, oblong to slightly conical, glabrous, with an apical conic collar 0.25–0.5 mm high enveloping the base of the style; style 5.5–6.5 mm long, greenish cream, glabrous, incurved at apex and opposite to anthers at anthesis; stigma punctiform and minutely papillate, ca. 0.5 mm wide, whitish. **Berries** with persistent and appressed floral bracts; mature calyx red, mature hypanthium green; mature ovary 2.5–2.75 mm long, light green. **Seeds** not seen.

Distribution and habitat:—*Blakea yumi* is endemic to high-elevation montane forests in the Department of Amazonas, between 2010–2160 m elev. (Fig. 4). Populations of this species occur in pristine forests.

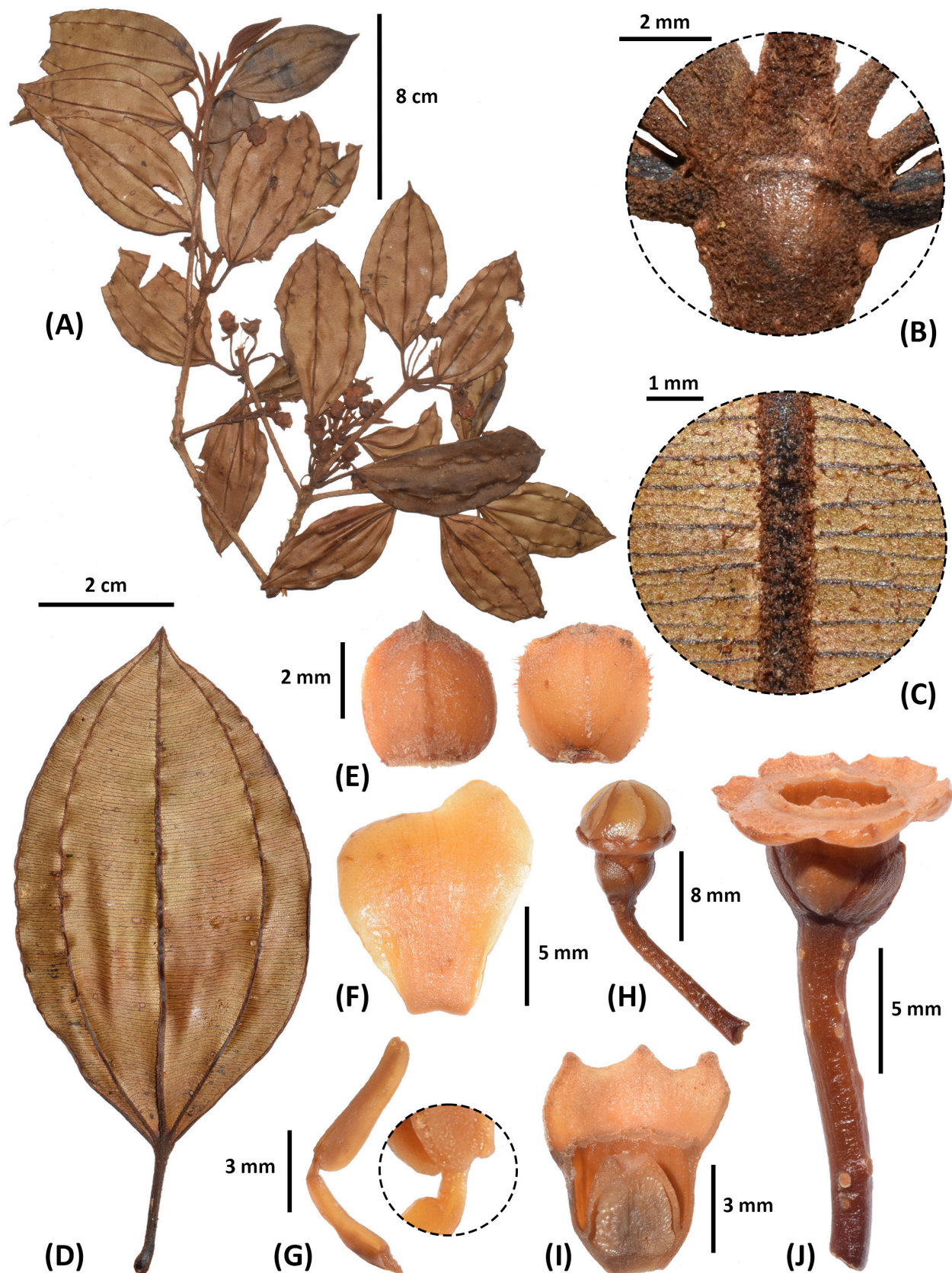


FIGURE 17. *Blakea yumi*. A. Terminal fertile branch with flowers. B. Detail of the node with an interpetiolar line. C. Detail of the abaxial leaf surface. D. Leaf blade, abaxial view. E. Outer bract (left) and inner bract (right), abaxial surfaces. F. Petal. G. Stamen, lateral view with detail of prolonged connective and blunt, dorso-basal appendage (right). H. Flower bud. I. Longitudinal section of hypanthium, calyx, and ovary. J. Hypanthium, calyx, and bracts. Vouchers: A–D from R. Fernandez-Hilario *et al.* 2403, E–J from R. Fernandez-Hilario *et al.* 2399.



FIGURE 18. *Blakea yumi*. A. Terminal fertile branch with flowers. B. Flower buds. C. Flower at anthesis. D. Mature fruits. Vouchers: A and C from *R. Fernandez-Hilario et al.* 2403, B and D from *R. Fernandez-Hilario et al.* 2399. Photos by Robin Fernandez.

Etymology:—The specific epithet comes from the Awajún “yumi” (= water), referring to the name of the camp “yumi atsawai” (= no water) because there were no nearby creeks in the type locality. Because the epithet is a noun in

apposition it retains its own termination irrespective of the gender of the generic name (see Turland *et al.* 2018: Art. 23.5).

Phenology:—Flowering and fruiting occurs in November.

Conservation status:—*Blakea yumi* is known from one locality within a protected area (‘Reserva Comunal Chayu Nain’). In this locality there is no anthropogenic activity, although it is adjacent to areas with agriculture and livestock. Following IUCN (2012, 2019) guidelines and based on an estimated area of occupancy of 4 km², we propose that this species is considered Critically Endangered [CR (B2a+biii)].

Discussion:—*Blakea yumi* is distinguished from other congeners by the combination of characters listed in the diagnosis. Among the Peruvian species, *B. yumi* is vegetatively similar to *B. mexiae* Gleason (Peru) and *B. spruceana* Cogniaux (Colombia, Ecuador and Peru). In fact, when we found the first infertile individuals of *B. yumi* we thought they were *B. mexiae* or *B. spruceana*. Nevertheless, *B. yumi* is clearly distinguished from these species by its peduncles 12.5–19 mm (vs. 20–30 mm long), bracts smaller than the hypanthium (vs. bracts exceeding the hypanthium), and superior ovaries (vs. inferior).

Blakea yumi most closely resembles *B. maguirei* (Wurdack) Penneys & Judd, endemic to Ecuador. They share ferruginous trichomes, bracts shorter than the hypanthium, spreading, white corollas, and free anthers bent to one side of the flower at anthesis, but both species can be distinguished by the spreading calyx lobes at anthesis (vs. erect), and larger petals 10–11.5 × 8–10 mm (vs. 8.6–8.9 × 4.8–5 mm).

Paratypes:—PERU. Amazonas: Prov. Bagua, Dist. Imaza, Reserva Comunal Chayu Nain, camino rumbo hacia el campamento Yumi Awai, 2010 m, 05°26′54″S; 78°18′50″W, 08–10 November 2022 (fl. bud), *R. Fernandez-Hilario et al.* 2394 (HOXA!, MOLFI!), Reserva Comunal Chayu Nain, alrededores de campamento Yumi Atsawai, 2160 m, 05°26′51″S; 78°18′58″W, 11 November 2022 (fl.), *R. Fernandez-Hilario et al.* 2403 (HOXA!, KUELAP!, MOLFI!, NY!).

Notes on new species and records of *Blakea* for Peru since 1993

The new records and new species published for Peru since the publication of the checklist of the Peruvian Melastomataceae by Brako & Zarucchi (1993) are discussed below.

1. *Blakea brasiliensis* Cogniaux, Fl. Bras. 14(4): 561. 1888. (Figure 19A–B.)

Type:—BRAZIL. Alto Amazonas: Prope Panumé ad Rio Uaupés, October 1852–January 1853, *R. Spruce* 2549 (lectotype, designated here: E! [barcode 00285789]; isolectotypes: BR! [barcode 0000005178964], G! [barcode 00328274], NY! [barcode 00221402], P! [barcode 01818666]).

Comments:—*Blakea brasiliensis* was recorded for Peru by Macbride (1941) based on the specimen *Tessmann* 4148 (B), which probably was destroyed. Later, Brako & Zarucchi (1993) cited *B. brasiliensis* in their checklist of Peruvian flora but as an “not reconfirmed species” because there was no specimen attributable to this species. *Blakea brasiliensis* occurs mainly in primary forests at 300–1200 m elev. from northern to southern Peru (Fig. 20) and is also recorded in Brazil and Colombia (Almeda *et al.* 2022; Brito 2023). It can be easily confused with *B. standleyana* (which has a wider distribution in northern Peru) because both species share foliaceous bracts, the outer pair much larger than the inner pair, lobed calyces with regular dehiscence, spreading, fuchsia to pink corollas, stamens encircling the style at anthesis, and ovaries with an apical cone. Macbride (1941) mentioned that the differences are slight between the two species, emphasizing the indumentum. However, this is not the strongest character to differentiate; both present furfuraceous to puberulent indumentum and are glabrescent when mature. There are two important characters to differentiate both species: *B. brasiliensis* has peduncles 1.5–2 cm long (vs. 2–7 cm long in *B. standleyana*) and an outer bract to inner bract ratio of 3 to 2 (vs. 4 to 1).

Nomenclatural notes:—Cogniaux (1888) cited specimen *Spruce* 2549 in the protologue with sheets (duplicates) housed in several herbaria. These sheets must be considered as syntypes conforming with Art. 9.6 of the ICN (Turland *et al.* 2018), and among them we chose as lectotype the sheet with the best-preserved flowers (E00285789).

Specimens examined:—PERU. Cusco: Prov. Quispicanchi, Dist. Camanti, Community of Vitobamba, 977–1106 m, 13°18′57.96″S; 70°49′4.8″W, 22 September 2010 (fl.), *J.D. Wells et al.* 286 (USM!). Pasco: Prov. Oxapampa, Dist. Palcazú, Rodal semillero de Mayro, 306 m, 09°55′11″S; 75°16′49″W, 27 May 2008 (fl.), *R. Vásquez et al.* 34352 (NY!, USM!), PN Yanachaga Chemillén, Estación Biológica Paujil, 410 m, 10°20′26″S; 75°15′11″W, 25 July 2007 (fl., fr.), *A. Monteagudo et al.* 14829 (NY!), PN Yanachaga Chemillén, Sector Paujil, 378 m, 10°20′10″S; 75°15′10″W, 12 September 2015 (fl.), *R. Vásquez et al.* 39952 (HOXA!, USM!). San Martín: Prov. Bellavista, Dist. Alto Biavo, PN

Cordillera Azul, Sector Las Palmas, 741 m, 07°35'44.5"S; 76°11'16.6"W, 19 September 2019 (fl. bud), *L. Valenzuela et al.* 36970 (HOXA!), PN Cordillera Azul, Sector Quebrada El Pescadero, 963 m, 08°10'48.9"S; 76°13'28.3"W, 09 September 2019 (fl. bud), *L. Valenzuela et al.* 37192 (HOXA!), same locality, 922 m, 08°10'31.8"S; 76°13'14"W, 20 November 2019 (fl.), *L. Valenzuela et al.* 37688 (HOXA!), same locality, 962 m, 08°10'41.5"S; 76°13'24.7"W, 13 November 2021 (fl., fr.), *L. Valenzuela et al.* 40564 (HOXA!); Prov. Tocache, Dist. Pólvora, PN Cordillera Azul, Sector Buenos Aires, 1075 m, 07°56'19.5"S; 76°36'06"W, 27 August 2017 (fl. bud), *L. Valenzuela et al.* 32641 (HOXA!, USM!), same locality, 1200 m, 07°55'58.8"S; 76°37'06.1"W, 07 September 2017 (fr.), *L. Valenzuela et al.* 33179 (HOXA!, USM!).



FIGURE 19. A–B. *Blakea brasiliensis*. A. Terminal fertile branch with flower. B. Fruits. C–D. *Blakea henripittieri*. C. Terminal fertile branch with flower and immature fruits. D. Flower at anthesis and mature fruits. Vouchers: A from *R. Vásquez et al.* 34352, B from *R. Vásquez et al.* 39952, C–D from *R. Rojas et al.* 11029. Photos by Rodolfo Vásquez (A–B) and Rocio Rojas (C–D).

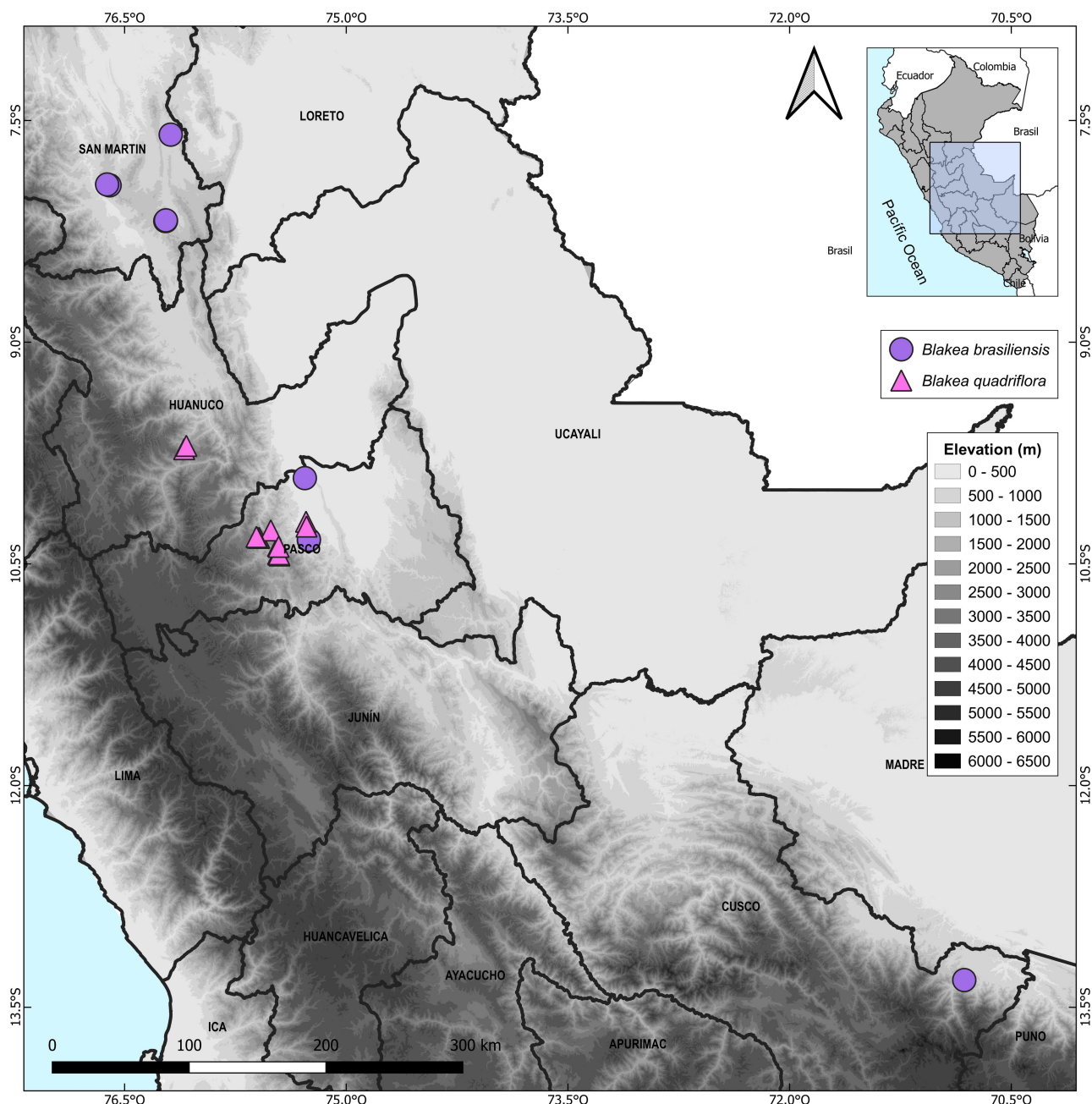


FIGURE 20. Distribution map of *Blakea brasiliensis* and *B. quadriflora* in Peru.

2. *Blakea campii* Wurdack, Mem. New York Bot. Gard. 16: 40. 1967.

Type:—ECUADOR. Prov. Chimborazo: cañón del Río Chanchan, 1500–2100 m, 29–31 May 1945 (fl.), *W. H. Camp* E-3535 (holotype US! [barcode 00123764]; isotypes COL! [barcode 000003176], F! [accession no. 1615142], G! [barcode 00353517], GH! [barcode 00071921], M! [barcode 0165352], MICH! [barcode 1111801], MO! [accession no. 1801310], MSC! [barcode 0091294], NY! [barcode 00221406], RB! [barcode 00541362], S! [accession no. 05–3814], SP! [barcode 001139], U! [barcode 0003960], USM! [accession no. 26608], VEM! [barcode 62148]).

Comments:—*Blakea campii* was recorded for northern Peru by Vásquez *et al.* (2002) and Vásquez & Rojas (2010), since it was previously considered endemic to Ecuador (Wurdack 1980; Jørgensen & León-Yáñez 1999). In Peru this species occurs in premontane forests at 350–1600 m elev. (Dept. Amazonas, Huánuco, Pasco and San Martín) (Fig. 21). The Peruvian specimens match the indumentum, leaf morphology and bracts with the typical population of *B. campii*. However, we place these specimens with reservation, because they have calyces with rounded and acuminate lobes ca. 3 mm long (vs. obscurely lobed up to 0.5 mm long). These specimens probably correspond to another undescribed *Blakea* species.

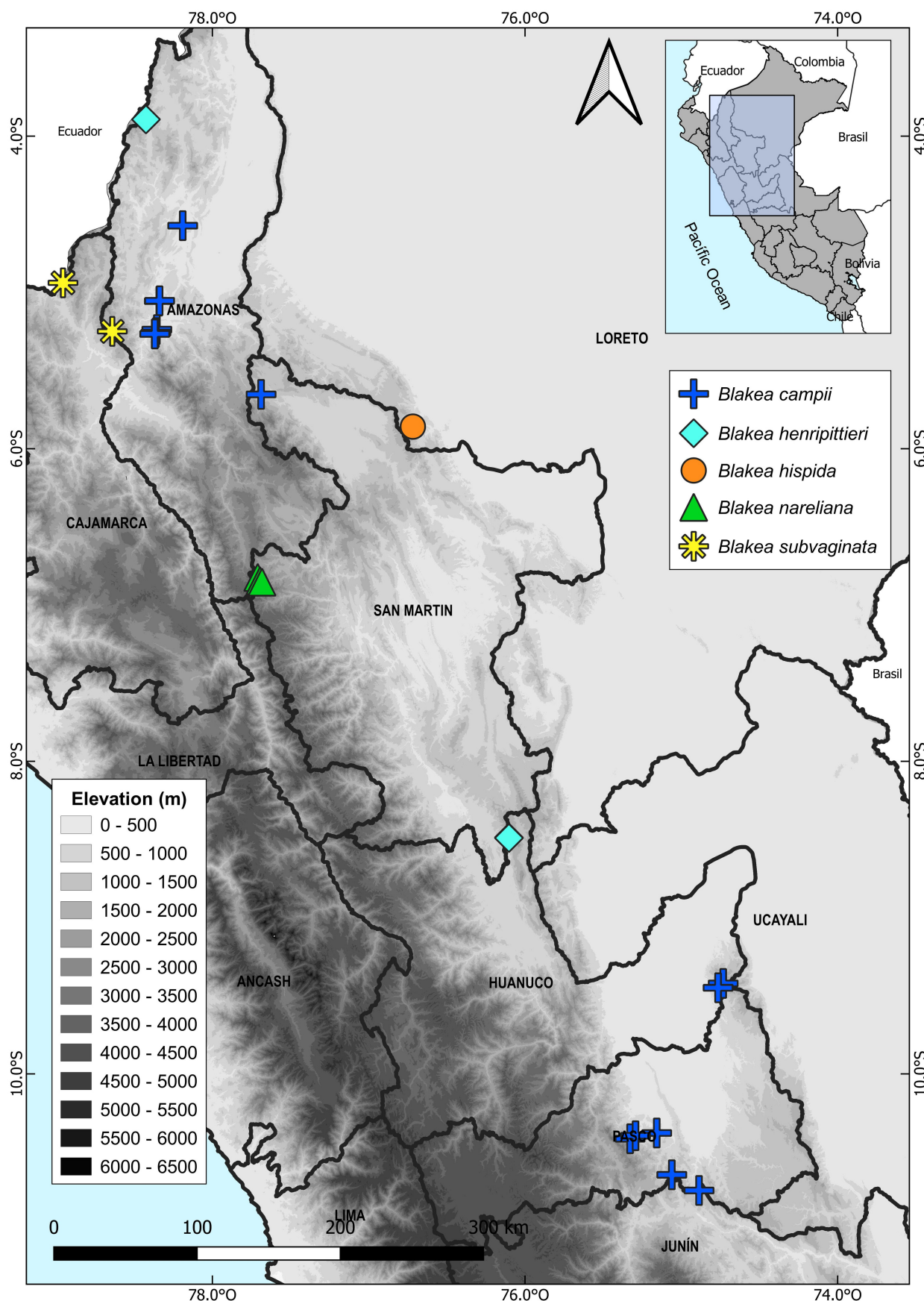


FIGURE 21. Distribution map of *Blakea campii*, *B. henripittieri*, *B. hispida*, *B. nareliana* and *B. subvaginata* in Peru.

Specimens examined:—PERU. **Amazonas:** Prov. Bagua, Dist. Imaza, Cerros de Putuim, 350 m, 05°03'20"S; 78°20'23"W, 15 June 1996 (fl. bud, fr.), *R. Vásquez et al.* 21176 (MOLF!, NY!, USM!), Chiriaco, lower slope of Cerro

Tayu, 900 m, 05°15'56"S; 78°22'07"W, 28 October 2012 (fl.), *H. van der Werff et al.* 24635 (HOXA!, USM!), same locality, 900–1000 m, 05°15'56"S; 78°22'07"W, 29 October 2012 (fr.), *H. van der Werff et al.* 24717 (HOXA!, NY!, USM!), Comunidad Aguaruna de Putuim (anexo Yamayakat), 700–820 m, 23 September 1994 (fl.), *C. Díaz et al.* 7221 (NY!), Comunidad Aguaruna de Wanás (km 92 carretera Bagua-Imacita), cerro Chinin, 600–700 m, 25 August 1996 (fl.), *C. Díaz et al.* 7938 (MOLF!, NY!, USM!), Tayu Mujaji, Comunidad Wawas, 1200 m, 05°15'56"S; 78°22'07"W, 21 October 1997 (fl.), *R. Rojas et al.* 354 (NY!), 355 (USM!), same locality, 800 m, 05°15'25"S; 78°21'41"W, 25 October 1997 (fl.), *R. Rojas et al.* 476 (NY!, USM!), same locality, 900 m, 05°15'56"S; 78°22'07"W, 23 October 1997 (fl. bud), *R. Vásquez et al.* 24656 (HUT!, MOLF!, NY!, USM!), same locality, 800 m, 05°15'56"S; 78°22'07"W, 16 February 2002 (fr.), *R. Vásquez et al.* 27577 (NY!, USM!), Upper slopes and Summit of Cerro Teyu, 1030 m, 05°15'56"S; 78°22'07"W, 22 March 2001 (fr.), *H. van der Werff et al.* 16340 (NY!). Prov. Condorcanqui, Dist. El Cenepa, Río Cenepa, Comunidad Tutinno, 750 m, 04°33'S; 78°10'W, 22 November 1993 (fr.), *R. Vásquez et al.* 18535 (HUT!, MOLF!, NY!, USM!). **Huánuco:** Prov. Puerto Inca, Dist. Yuyapichis, CCNN Tahuantinsuyo, 1605 m, 09°25'17.2"S; 74°43'56.4"W, 01 May 2014 (fl.), *L. Valenzuela et al.* 27426 (HOXA!). **Pasco:** Prov. Oxapampa, Dist. Palcazú, Bosque de Protección San Matías San Carlos, Sector Unión-Shimakii, 1350 m, 10°45'S; 74°55'W, 28 June 2003 (fl.), *A. Monteagudo & G. Ortiz* 5541 (HOXA!, NY!), PN Yanachaga Chemillén, Sector Catarata Rocío, 1316 m, 10°24'55"S; 75°19'41"W, 18 October 2013 (fl. bud), *R. Vásquez et al.* 38790 (HOXA!, USM!), PN Yanachaga Chemillén, Sector Paujil—Cerro San Luis, 900 m, 10°23'45"S; 75°17'35"W, 23 October 2020 (fl.), *R. Vásquez et al.* 44443 (HOXA!); Dist. Villa Rica, Bosque de Protección San Matías San Carlos, Sector Alto Ubiriki, 1600 m, 10°38'45"S; 75°03'40"W, 18 February 2017 (fr.), *L. Valenzuela et al.* 31459 (HOXA!, USM!), same locality, 1525–1625 m, 10°38'45"S; 75°03'40"W, 18 February 2017 (fr.), *S. Riva et al.* 49 (USM!), Reserva Comunal Yanesha, Sector Raya, 683–775 m, 10°22'42"S; 75°09'27"W—10°22'44"S; 75°09'30"W, 19 November 2010 (fr.), *L. Valenzuela et al.* 14729 (HOXA!). **San Martín:** Prov. Rioja, Dist. Pardo Miguel, Bosque de Protección Alto Mayo, on the way from Pte. El Afluente to La Esperanza, 1350 m, 17 July 2014 (fl. bud), *Y. Deng et al.* 1381 (USM!). **Ucayali:** Prov. Puerto Inca, Dist. Yuyapichis, El Sira, 1080 m, 09°26'56"S; 74°45'53"W, 02 February 2015 (fr.), *R. Tupayachi et al.* 15688 (HSP!), same locality, 1080 m, 09°26'58"S; 74°45'55"W, 03 February 2015 (fr.), *R. Tupayachi et al.* 15815 (HSP!).

3. *Blakea henripittieri* Penneys & Almeda, *Phytokeys* 20: 26. 2013. Replacing name for *Topobea pittieri* Cogniaux, *Monogr. Phan.* 7: 1088 1891, not *Blakea pittieri* Cogniaux, *Monogr. Phan.* 7: 1080. 1891. (Figure 19B–C.)

Type:—COSTA RICA. La Palma, 1550 m, 18 December 1888 (fl., fr.), *H. Pittier* 706 (lectotype, designated here: BR! [barcode 000005263929]; isoelectotypes: BR! [barcode 000005264223], CR!).

Comments:—Species previously known in cloud forests from Costa Rica to Ecuador at 500–2100 m elev. (Jørgensen & León-Yáñez 1999; Almeda 2001; Almeda *et al.* 2022), and only recorded for Peru in the Tropicos database (2022; based on *Beltrán & R. Foster* 801). In Peru this species occurs in montane forests at 1200–1600 m elev. (Dept. Amazonas and Huánuco) (Fig. 21). *Blakea henripittieri* is clearly distinguishable from other congeners by its abaxial leaf blades with pocket domatia at the convergence of the midvein and secondary veins, free bracts (1–2.5 mm long) much shorter than hypanthium and calyx, and small flowers with white petals 7–8.5 mm long.

Nomenclatural notes:—Cogniaux (1891) cited the specimen “(*Pittier in hb. Brux.*)” in the protologue of *Topobea pittieri*, and there are currently two sheets of this specimen in BR that were 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 sheet BR000005263929.

Specimens examined:—PERU. **Amazonas:** Prov. Condorcanqui, Dist. El Cenepa, Cordillera del Cóndor, Puesto de Vigilancia Alfonso Ugarte (PV3), cabeceras del Río Comainas, 1200 m, 03°53'35"S; 78°25'30"W, 15 July 1994 (fl. bud, fr.), *H. Beltrán & R. Foster* 801 (F!; USM!). **Huánuco:** Prov. Leoncio Prado, Dist. Pucayacu, PN Cordillera Azul, campamento “Jergón” hacia el campamento “Volante”, 1500–1600 m, 08°29'27.03"S; 76°06'10.52"W, 21 February 2022 (fl., fr.), *R. Rojas et al.* 11029 (HOXA!).

4. *Blakea hispida* Markgraf, *Notizbl. Bot. Gart. Berlin-Dahlem* 15: 381. 1941. (Figure 22A–B.)

Type:—ECUADOR. Prov. Pastaza, Mera, 1000 m, 22 August 1938, *H. Schultze-Rhonhof* 2724 (B, destroyed).

Comments:—*Blakea hispida* was recorded by Torres *et al.* (2019) based on the specimen *Ríos et al.* 3114 collected in the sub-Andean forests from northern Peru (Dept. Loreto) (Fig. 21). This species was previously known from Colombia and Ecuador (Wurdack 1980; Jørgensen & León-Yáñez 1999; Mendoza-Cifuentes *et al.* 2021). After examining the specimen, and supplemented by photographs in the field, we agree that the indumentum, leaf morphology, petal

and style colour, and sparsely glandular-puberulous style match with the ones in *B. hispida*. However, we place this specimen with reservation because its bracts are wider than those described by Wurdack (1980) [oblong to slightly obovate, ca. 15 mm vs. lanceolate to ovate, (5–) 8–10 mm]. Other Peruvian specimens (with flower buds or fruits) have similar indumentum, leaf blades and bracts, but a detailed analysis of the flowers is necessary to confirm whether they are the same form recorded by Torres *et al.* (2019).

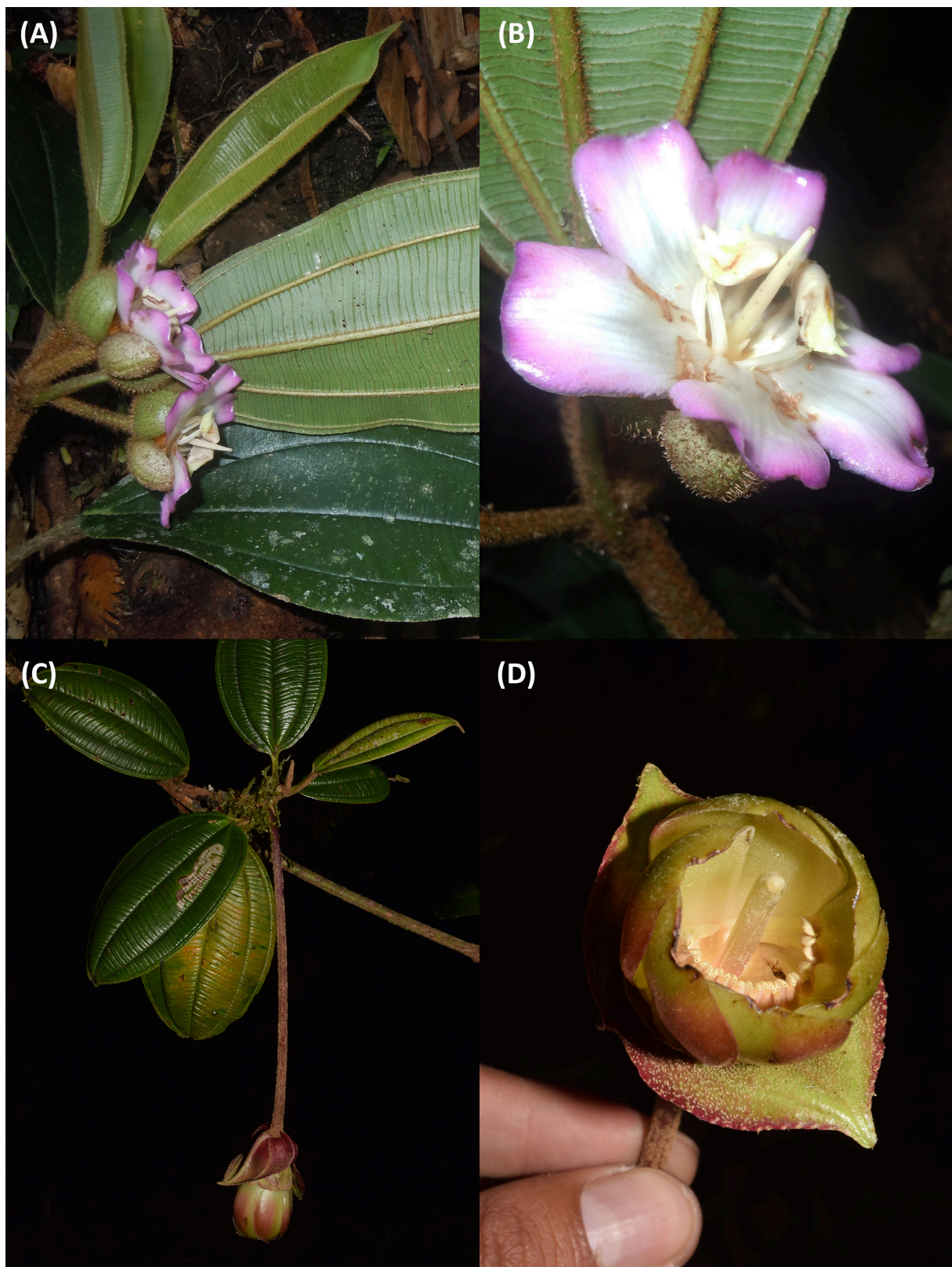


FIGURE 22. A–B. *Blakea hispida*. A. Terminal fertile branch with flowers. B. Flower at anthesis. C–D. *Blakea nareliana*. C. Terminal fertile branch with flower. D. Flower at anthesis. Vouchers: A–B from M. Ríos *et al.* 3134, C–D from R. Fernandez-Hilario *et al.* 2331. Photos by Marcos Ríos (A–B) and Robin Fernandez (C–D).

Specimen examined:—PERU. **Loreto:** Prov. Alto Amazonas, Dist. Balsapuerto, Cordillera Escalera, Campamento Base—Alto Cachiyacu, 510 m, 05°51'31"S; 76°43'03.4"W, 21 September 2013 (fl.), *M. Ríos et al.* 3134 (F!, USM!).

5. *Blakea nareliana* Bussman, *Revista Peru. Biol.* 20(2): 122. 2013. (Figure 22B–C.)

Type:—PERU. Dept. Amazonas [San Martín]: Prov. Chachapoyas [Mariscal Cáceres], Dist. Leymebamba [Huicungo], trail from La Esperanza to Laguna de Los Condores, 2900–3250 m, 06°49'24"S; 77°42'36"W, 30 June 2010 (fl., fr.), *A. Glenn, R. W. Bussmann, C. Vega & G. Chait* 524 (lectotype, designated here: NY! [barcode 02497170]; isoelectotypes: CAS! [barcode 474652], MO! [accession nos. 6606803, 6335758, 6335759]).

Comments:—*Blakea nareliana* is an endemic species known from a single locality in the montane forests at 2500–3250 m elev. from northern Peru (Dept. San Martín) (Fig. 21). This belongs to the species group named “vertebrate pollination clade” by Penneys & Judd (2013a) and Michelangeli & Santamaría-Aguilar (2020) (see comments below *B. pavida*). During our field work we observed hummingbirds visiting the flowers of *B. nareliana*. The species is clearly distinguishable from other congeners by its campanulate corollas with green to reddish green petals 20–25 mm long, and the largest peduncles for the genus, with 21–32 cm long.

Nomenclatural notes:—During the revision of Melastomataceae specimens in HAO herbarium we could not find the holotype of *B. nareliana*. According to Art. 9.3 and 9.12 of the ICN (Turland *et al.* 2018), we chose as lectotype the sheet housed in NY.

Specimens examined:—PERU. **San Martín:** Prov. Mariscal Cáceres, Dist. Huicungo, ACP Los Chilchos, alrededores de la Laguna de los Cóndores, 3000 m, 06°50'40"S; 77°41'42"W, 26–29 June 2022 (fr.), *R. Fernandez-Hilario et al.* 2331 (HOXA!, MOLF!), same locality and date, (fl.), 2342 (KUELAP!, MOLF!), same locality, 2500–2700 m, 06°51'12.06"S; 77°40'57.48"W, 16 August 1998 (fl. bud), *V. Quipuscoa et al.* 1267 (F!, HUT!).

6. *Blakea quadriflora* Gleason, *Bull. Torrey Bot. Club* 52: 459. 1925. (Figure 23A–B.)

Type:—ECUADOR. Prov. El Oro: between La Chorita and Portovelo, 1000–2000 m, 28 August 1923 (fl.), *A. S. Hitchcock* 21160 (holotype: NY! [barcode 00221433]; isotypes: GH! [barcode 00071926], US! [barcode 00123803]).

Comments:—This is a species widely collected in the montane forests of central Peru (Dpt. Huánuco and Pasco) (Fig. 20). Although many of the specimens cited here had been previously determined as *B. quadriflora* in different herbaria or in the Tropicos database (2022), this species has not been cited for Peru in any previous checklist or local floristic work. *Blakea quadriflora* is also recorded in Ecuador and Colombia (Wurdack 1980; Jørgensen & León-Yáñez 1999; Almeda *et al.* 2022), and it can be distinguished by its glabrous leaves and flowers, elliptic leaf blades (9.9–) 11–13 (–16.5) × (4–) 5.5–6.5 (–7.5), calyces with minute triangular lobes, and spreading corollas with white petals 7–9 mm long. *Blakea quadriflora* seems to be closely related with *B. quinta* by its similar flowers (see comments under the latter for differences).

Specimens examined:—PERU. **Huánuco:** Prov. Huánuco, ca. 46 km NE of Huánuco on road to Tingo María, 2600 m, 14 July 1981 (fl.), *M. Dillon* 2592 (F!, NY!, US!, USM!); Dist. Chinchao, San Pablo de Carpish y alrededores del Túnel, 2660 m, 09°42'05.58"S; 76°04'56.28"W, 17–18 January 2020 (fr.), *R. Fernandez-Hilario et al.* 1851 (KUELAP!, MOLF!). **Pasco:** Prov. Oxapampa, Dist. Huancabamba, camino al Abra Yanachaga, 2400–2700 m, 10°13'S; 75°16'W, 01 February 2005 (fl., fr.), *C. Arias et al.* 154 (HOXA!, NY!), PN Yanachaga Chemillén, Abra Yanachaga, 2900 m, 10°22'46"S; 75°27'43"W, 01 August 2003 (fl.), *R. Vásquez et al.* 28413 (HOXA!), PN Yanachaga Chemillén, alrededores de la Laguna San Daniel—Sector San Daniel, 2410 m, 10°25'56"S; 75°27'24"W, 10 September 2005 (fl.), *E. Ortiz* 931 (HOXA!, MOLF!), same locality, 2400 m, 10°15'S; 75°16'W, 11 August 2005 (fl., fr.), *A. Monteagudo et al.* 9213 (HOXA!, MOLF!, NY!), same locality, 2385 m, 10°25'55.3"S; 75°27'22.8"W, 21 July 2017 (fl.), *F. Michelangeli et al.* 2891 (HOXA!, NY!, USM!), same locality, 1221 m, 10°26'35"S; 75°27'07"W, 06 July 2004 (fl.), *J. Perea et al.* 1329 (HOXA!, NY!), same locality, 2346 m, 10°26'10"S; 75°27'16"W, 06 September 2006 (fl.), *L. Cárdenas* 800 (CUZ!, F!, HOXA!, MOLF!, USM!), same locality, 2363 m, 10°26'00"S; 75°27'41"W, 23 February 2008 (fr., fr.), *R. Vásquez et al.* 33584 (HOXA!, NY!, USM!), same locality, 2363 m, 10°26'13"S; 75°27'33"W, 27 February 2008 (fl.), *R. Vásquez et al.* 33745 (HOXA!, NY!, USM!), PN Yanachaga Chemillén, desde la trocha Erica hacia la laguna San Daniel, 2361 m, 10°26'05"S; 75°27'19"W, 20 April 2007 (fl.), *A. Monteagudo et al.* 13660 (HOXA!, NY!), Oso Playa Playa, camino al campamento, 2362 m, 10°19'27"S; 75°35'20"W, 15 October 2009 (fl.), *L. Valenzuela et al.* 13574 (HOXA!, MOLF!), PN Yanachaga Chemillén, parte alta de la trocha Tunqui-Cajonpata, sector Tunqui, 1950 m, 10°16'25"S; 75°30'39"W, 31 October 2007 (fl.), *A. Monteagudo et al.* 15756 (HOXA!, MOLF!, NY!, USM!), Sector Oso Playa, 2300–2500 m, 10°19'20"S; 75°36'06"W, 21 June 2006 (fl.), *L. Cárdenas* 420 (CUZ!,

F!, HOXA!, MOLF!, USM!), Sector Oso Playa, camino a la parcela Oso Playa, 2565 m, 10°19'05"S; 75°36'28"W, 25 June 2006 (fr.), *L. Cárdenas et al.* 470 (CUZ!), Trail to Summit of Cordillera Yanachaga vía Río San Daniel, 2400 m, 10°23'S; 75°27'W, 19 July 1984 (fl.), *D. Smith et al.* 7932 (AMAZ!, F!, US!, USM!).

7. *Blakea subvaginata* Wurdack, *Phytologia* 43: 347. 1979. (Figure 23C–D.)

Type:—ECUADOR. Prov. Tungurahua: Río Negro, shore of Río Pastaza, 1200 m, 12 November 1955 (fl.), *E. Asplund* 18393 (holotype: US! [barcode 00123809]; isotypes: NY! [barcode 00221443], S! [accession no. 05-3827]).



FIGURE 23. A–B. *Blakea quadriflora*. A. Terminal fertile branch with immature fruits. B. Flower at anthesis. C–D. *Blakea subvaginata*. C. Terminal fertile branch with flower. D. Flower at anthesis. Vouchers: A from *R. Fernandez-Hilario et al.* 1851, B from *R. Vásquez et al.* 33584, C–D from *R. Fernandez-Hilario et al.* 2102. Photos by Robin Fernandez (A, C and D) and Rodolfo Vásquez (B).

Comments:—Species previously known in Amazonian and montane forests from Colombia and Ecuador at 500–2070 m elev. (Wurdack 1980; Jørgensen & León-Yáñez 1999; Mendoza-Cifuentes *et al.* 2021). In northern Peru, this species occurs in montane forests at 1600–1630 m elev. (Dept. Cajamarca) (Fig. 21), and it is clearly distinguishable from other Peruvian congeners by its slightly vaginate petioles, appressed bracts exceeding the hypanthium and calyx length, large flowers with petals ca. 28 × 22 mm, and capitellate stigmas. The main difference between the Peruvian specimens and the typical form of *B. subvaginata* is the presence of pseudo campanulate corollas, which do not have overlapping petals as in other species with evident campanulate corollas (e.g.: *B. nareliana*, *B. pavida*). However, this feature may be not taxonomically significant; for example, we have observed Peruvian populations of *B. repens* (Ruiz & Pav.) D. Don with corolla forms between spreading and pseudo campanulate. The latter form does not necessarily correspond to an incomplete anthesis as we observed pollen liberation in both forms. Other differences between the Peruvian specimens of *B. subvaginata* and the typical form are the white petals (vs. pink to violet in the typical form), and ovaries without an apical cone (vs. cone 1.5–2 mm high). For these reasons, we place with reservation these specimens in *B. subvaginata*.

Specimens examined:—PERU. **Cajamarca:** Prov. San Ignacio, Dist. Huarango, Inmediaciones de CP Pisaguas, 1600 m, 05°14'56.93"S; 78°38'26.46"W, 30 November 2020 (fl.), *R. Fernandez-Hilario et al.* 2102 (CUZ!, HOXA!, MOLFI, UPCB!); Dist. San José de Lourdes, Estrella del Oriente, 1630 m, 04°57'S; 78°59'W, 02 September 1997 (fl.), *J. Campos & E. Rodríguez* 4332 (NY!, USM!).

Excluded taxa

1. *Blakea gracilis* Hemsley, Diagn. Pl. Nov. Mexic. 1: 13. 1878. Species cited by Brako & Zarucchi (1993) in their checklist of Peruvian flora based on *Ayala et al.* 2551 (AMAZ!, NY!). After a detailed analysis, we concluded that this specimen was misidentified and corresponds to *B. ovalis* (Ruiz & Pav.) D. Don. *Blakea gracilis* occurs from Nicaragua to Panama (Almeda 2000).
2. *Topobea parvifolia* (Gleason) Almeda, Proc. Calif. Acad. Sci. ser. 4, 46: 322. 1990. Basionym:—*Blakea parvifolia* Gleason, Phytologia 3: 357. 1950. Species cited by Ulloa Ulloa *et al.* (2004) as an addition to the Peruvian flora based on *Kayap* 793 (MO [image!]). However, this specimen has terminal panicles (vs. axillary solitary or fascicled flowers in *Blakea*) and corresponds to *Tococa tetramera* Wurdack [= *Miconia manserichensis* (Wurdack) Michelangeli], even though it was initially determined as *Tococa parviflora* Spruce by R. Liesner. Probably due to a typing confusion between *T. parviflora* and *T. parvifolia*, the latter was erroneously reported for Peru. *Topobea parvifolia* is endemic to Panama (Almeda 2001).

List of accepted *Blakea* species for Peru

The accepted species of *Blakea* are listed below, with the endemic ones indicated with (*). However, it is important to note that during the examination of herbarium specimens we have found several other specimens that would probably correspond to undescribed species or new records, which require a detailed analysis. The list we now provide should be taken as preliminary. Future works on the Peruvian *Blakea*, especially in central Peru (S. Riva, in prep.), will help us understand the diversity of the genus in this country.

1. *Blakea asplundii* (Wurdack) Penneys & Judd
2. *Blakea bracteata* Gleason
3. *Blakea brasiliensis* Cogn.
4. *Blakea campii* Wurdack
5. *Blakea ciliata* Markgraf
6. *Blakea eden* Rob. Fern., Michelang. & R. Goldenb. (*)
7. *Blakea henripittieri* Penneys & Almeda
8. *Blakea hirsuta* O. Berg ex Triana
9. *Blakea hirsutissima* (J.F. Macbr.) Wurdack
10. *Blakea hispida* Markgraf
11. *Blakea latifolia* (Ruiz & Pav.) D. Don
12. *Blakea leoniae* Rob. Fern., Michelang. & R. Goldenb. (*)
13. *Blakea mexiae* Gleason (*)
14. *Blakea multiflora* D. Don
15. *Blakea nareliana* Bussmann (*)
16. *Blakea ovalis* (Ruiz & Pav.) D. Don (*)
17. *Blakea paludosa* Gleason (*)
18. *Blakea pascoensis* (Wurdack) Penneys & Judd (*)

19. *Blakea pavid*a Rob.Fern., Michelang. & R.Goldenb. (*)
20. *Blakea portentosa* Wurdack
21. *Blakea quadriflora* Gleason
22. *Blakea quinta* Rob.Fern., R.Villanueva & Pillaca (*)
23. *Blakea repens* (Ruiz & Pav.) D.Don
24. *Blakea rojasiae* Rob.Fern., Michelang. & R.Goldenb. (*)
25. *Blakea rosea* (Ruiz & Pav.) D.Don
26. *Blakea rostrata* O.Berg ex Triana (*)
27. *Blakea sawadae* J.F.Macbr.
28. *Blakea spruceana* Cogn.
29. *Blakea standleyana* J.F.Macbr.
30. *Blakea subvaginata* Wurdack
31. *Blakea villosa* Cogniaux (*)
32. *Blakea wilderi* Rob.Fern., R.Villanueva & Pillaca (*)
33. *Blakea yumi* Rob.Fern., R.Villanueva & Pillaca (*)

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