

PASSIFLORA VERONESIAE (PASSIFLORACEAE),
A NEW SPECIES FROM THE ANDEAN-AMAZONIAN TRANSITION
OF SOUTHEASTERN ECUADOR AND NORTHERN PERU

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ABSTRACT

Passiflora veronesiae sp. nov. is described and illustrated as a new species from the Andean-Amazonian transition of southeastern Ecuador and northern Peru. The new species belongs to *Passiflora* subg. *Passiflora*, supersect. *Stipulata*, and is morphologically allied to species of ser. *Menispermifoliae*, especially *P. menispermifolia* and *P. deltoifolia*. It is distinguished by the combination of a dense golden hirsute indumentum, petioles bearing 7–9 cupiform glands distributed along its length, leaves that are entire to shallowly 3-lobed with lobation, when present, initiated above the middle of the blade, narrowly ovate lanceolate bracts, and pink to magenta perianth and corona elements. A taxonomic key to the most similar species is provided. Based on georeferenced records, a preliminary conservation assessment is proposed.

KEY WORDS: biodiversity, botany, IUCN, Passionflowers, tropics

RESUMEN

Passiflora veronesiae sp. nov. se describe e ilustra como una nueva especie de la transición andino-amazónica en el sureste de Ecuador y del norte de Perú. La nueva especie pertenece a *Passiflora* subg. *Passiflora*, supersect. *Stipulata*, y está morfológicamente emparentada con especies de la ser. *Menispermifoliae*, especialmente *P. menispermifolia* y *P. deltoifolia*. Se distingue por la combinación de un indumento denso, hispido y dorado; pecíolos con 7–9 glándulas cupuliformes distribuidas a lo largo de su longitud; hojas enteras a ligeramente trilobuladas, con la lobulación, cuando está presente, iniciándose por encima de la mitad de la lámina; brácteas estrechamente ovadas a lanceoladas; y segmentos del perianto y de la corona de color rosado a magenta. Se proporciona una clave taxonómica para las especies más similares. Con base en registros georreferenciados, se propone una evaluación preliminar de su estado de conservación.

INTRODUCTION

Passiflora L. (1753: 955), the largest genus within Passifloraceae, consists of more than 600 species, predominantly climbers or lianas, with a smaller number of shrubs and small trees. Recent taxonomic accounts place the genus at approximately 615 accepted species, although broader estimates in the literature range from

about 450 to 700 species depending on taxonomic circumscription and source (Yockteng & Nadot 2003; Cerqueira-Silva et al. 2014; Kuethe 2024; Tropicos 2025; GBIF 2025). The genus is widely distributed throughout the Neotropics and subtropics, with its greatest diversity occurring in the moist premontane forests of the northern Andes. Traditionally, *Passiflora* was divided into 21 subgenera (Killip 1938), but recent phylogenetic revisions have reduced this number to six, reflecting its remarkable morphological and ecological diversity but tied to distinct evolutionary lineages (Feuillet & MacDougal 2003; Cervi & Rodrigues 2010). Among these, *Passiflora* subgenus *Passiflora* includes over 200 species of herbaceous climbers and lianas characterized by considerable variation in leaf shape, large conspicuous and often colourful flowers, extrafloral nectary placement on the petioles, and flower morphology (Holm-Nielsen et al. 1988; Vanderplank 1996; Ulmer & MacDougal 2004). Flowers are adorned with complex corona structures of 2–12 series, and can range in size from 5 cm to 18 cm in diameter. Pollination strategies vary across species, primarily involving bees and wasps, though certain members exhibit adaptations to hummingbird and bat pollination (Knapp et al. 1984; Kay 2001; Ulmer & MacDougal 2004; Aquino & Amela-García 2019).

Ecuador, one of the world's 17 megadiverse countries (as recognized by Conservation International, 1998), provides ideal conditions for *Passiflora* diversification due to its complex geography and rich mosaic of climates and ecosystems (Iturralde-Pólit et al. 2017; Carpio 2018; Fischer & Miranda 2021; Kuethe et al. 2025). The Andean-Amazonian transition forests in particular support a high concentration of endemic taxa within Passifloraceae, with many of these of these species, such as *Passiflora ligularis* Juss. (1805:113) and *P. tarminiana* Coppens & V.E. Barney (2001:9) [and related species], valued both ecologically and economically for their edible, medicinal, and ornamental qualities (d'Eeckenbrugge et al. 2001; Ulmer & MacDougal 2004). Ecuador hosts between 130 and 140 *Passiflora* species (Tropicos 2025; GBIF 2025), with numerous endemics continually being discovered through integrative taxonomic methods that combine molecular analysis and morphological studies (d'Eeckenbrugge et al. 2001; Viana et al. 2010; Castro et al. 2018). Similarly, a series of targeted fieldwork led by the authorial team has resulted in several recent discoveries, including studies on species complexes or species with little or no accurate data derived from their type locality (Holm-Nielsen et al. 1988; Jørgensen 2003; Kuethe et al. 2024, 2025). During this endeavor, a new species here named *Passiflora veronesiae* sp. nov. was segregated from the wider *Passiflora menispermifolia* Kunth (1817:137) complex, a species originally typified from Peru yet known best for its wide distribution across Central and South America (Tropicos 2025). A targeted expedition to the type location in Peru helped type location helped to understand the diagnostic characteristics and limits of *P. menispermifolia*, identifying a set of maintainable differences that allowed for the Ecuadorean material to be elevated to its own taxonomic entity.

The description of *Passiflora veronesiae* sp. nov. further underscores Ecuador's continuing expansion of documented biodiversity, particularly within the highly threatened Andean-Amazon transitional biomes. Accelerating deforestation, mining, and associated infrastructure development are rapidly transforming these habitats, highlighting the urgent need for improved understanding of habitat structure, species composition, and ecological connectivity before additional taxa are lost.

MATERIALS AND METHODS

Field collection and ecological studies were conducted between December 2022 and August 2025, with three flowering plants observed in June 2024 and June 2025 enabling the dissection and description of the flowers. Analysis of the comparative species was based on observations by the authorial team between June 2020 and September 2025 (presented in this paper), with the type locality and specimens (F s.n. von Humboldt & Bonpland) of *Passiflora menispermifolia* visited in north-central Peru (with accessions sighted nearby Jaén and Bagua, Cajamarca and Amazonas departments) in early August 2025 to confirm the identifications (Kuethe et al. pers. obsv. 2025, see Fig. 2). Detailed photographs were taken from all three flowering accessions *in situ* and used in this manuscript to document and illustrate the morphology of the species (see Fig. 1). Herbarium material stored at K, HUTPL, HOXA, GUAY, and QCA (acronyms follow Thiers 2025, continuously updated) have been evaluated physically, with digitized specimens from herbaria NY, F, US, COL and MO studied

through online repositories in support of this manuscript. Literature studies, including the original manuscript for *P. menispermifolia* (*Nova Genera et Species Plantarum* 2, Kunth 1817), Flora of Ecuador (Holm-Nielsen et al. 1988), related species manuscripts (i.e., Holm-Nielsen & Lawesson 1987; Jørgensen & MacDougal 1997; Jørgensen 2003; Kuethe et al. 2024, 2025) and general compendiums addressing the species of *Passiflora* including *P. menispermifolia* and its variations across Latin America (i.e., Vanderplank 1996; Ulmer & MacDougal 2004) were consulted, as well as the type specimens and manuscripts for *P. crassifolia* (Killip 1930), *P. deltoifolia* (Holm-Nielsen & Lawesson 1987) and *P. albopurpurea* (Chávez-Corcuera et al. 2026). Additional digitized collections of herbarium specimens obtained from GBIF (www.gbif.org) and georeferenced observations of living plants on iNaturalist (www.inaturalist.org) were reviewed in evaluating geographic distribution. Geographic coordinates were recorded using the UTM Geo Map program, and the species distribution map was created using QGIS software (QGIS version 3.36.3). The conservation analysis was based on both field collections, herbarium records and additional iNaturalist (www.inaturalist.org) sightings and modelled through the RBG Kew GeoCAT software (Bachmann et al. 2011).

TAXONOMY

Passiflora veronesiae Kuethe, Garzón, & Tello-Hidalgo, **sp. nov.** (**Fig. 1**). TYPE: ECUADOR: Azuay, Sevilla de Oro, Amaluza–Campamento Guarumales, 02°34′48.6″S, 78°30′23.7″W, 1481 m, 13 Jun 2025, *H. Garzón 305* (HOLOTYPE: HUTPL15397; ISOTYPE: HUTPL).

Diagnosis.—*Passiflora veronesiae* sp. nov. differs from *Passiflora deltoifolia* by its denser vestiture, larger stipules, more numerous and differently positioned petiolar glands, ovate rather than deltoid leaves, and pink to pink-purple corona. It is further distinguished from *P. menispermifolia* by its yellowish indumentum, serrate-glandular stipules, narrowly ovate to lanceolate bracts, and pinkish-magenta to pinkish-purple corona.

Description.—Robust climbing vine, 5–7 m long or longer, densely hirsute throughout, covered in yellowish to golden-brown trichomes 1–1.5 mm long. Stem terete, 4.5 cm diameter at base, 2.5–3 mm diameter in branches. Stipules reniform, 24–30 × 8–10 mm, aristate terminating in a long mucro 14–18 mm long, coarsely glandular serrate, hirsute. Petioles up to 3.5 cm long, caniculate, bearing 7–9 cupiform glands, 1.2–1.4 mm long, 1.1–1.2 mm wide, glands scattered across the length of the petiole, often somewhat alternately arranged. Leaves 12–17 × 7–9 cm, entire to shallowly three-lobed, ovate in general outline, lobation shallow, initiated at above half the length of the blade with an oblique sinus 100–110 degrees, lobation 1.6–1.8 cm deep, blade rounded at base, acute to acuminate at apex, occasionally minutely mucronate at primary vein terminus, margins glandular serrated, most so in lower half, lesser in upper half, serration with 5–7 mm distance between teeth; foliar texture coriaceous to chartaceous, densely hirsute with stiff yellowish trichomes. Peduncles 4.0–5.5 cm long, borne solitary, hirsute. Bracts three, borne about 7–8 mm below the base of the flower, narrowly ovate to lanceolate, 27–29 × 6–7 mm, with two semiopposite glands present within the basal third, otherwise the margins are smooth, hirsute. Flowers deep pink to purple-pink, with concolorous corona, 6.2–6.5 cm diameter at anthesis, faintly fragrant giving a sweet scent. Hypanthium campanulate, 9–10 mm in diameter, 7–8 mm in depth, deep green and sparingly hirsute outside. Sepals linear oblong to lanceolate, 23–25 × 6–7 mm, deep pink to purplish pink adaxially, greenish pink abaxially, obtuse, dorsally corniculate just below apex with a hooked awn 3–4 mm long, sparingly hirsute abaxially. Petals subequal to sepals, lanceolate, 27–28 × 5–6 mm, pink, thinly membranous. Corona arranged in 7–8 series, filiform; the two outermost series 23–25 mm long, radiate, pinkish-magenta in basal third turning pinkish-purple with light-pinkish tips; the succeeding 4–5 series 2–3 mm long, erect, pinkish-magenta; the innermost 1–2 series progressively longer, 4–5 mm, pinkish-magenta at base turning pale-pinkish for upper third, erect though slightly inclined towards androgynophore. Operculum membranous at the lower half, filamentous above, 7–8 mm long, pinkish becoming white. Limen membranous, 1–2 mm high, whitish-pink. Androgynophore 9–11 mm tall, green to greenish-white with very pale purple speckles in the lower half. Ovary ellipsoid, glabrous to pruinose, 6 × 3 mm. [Immature] fruit ovoid, 4.0–4.5 × 2.6–2.8 cm, green, glabrous; mesocarp white. Mature seed not seen.

Phenology.—This species has been observed with both flowers and immature fruit during the June–July

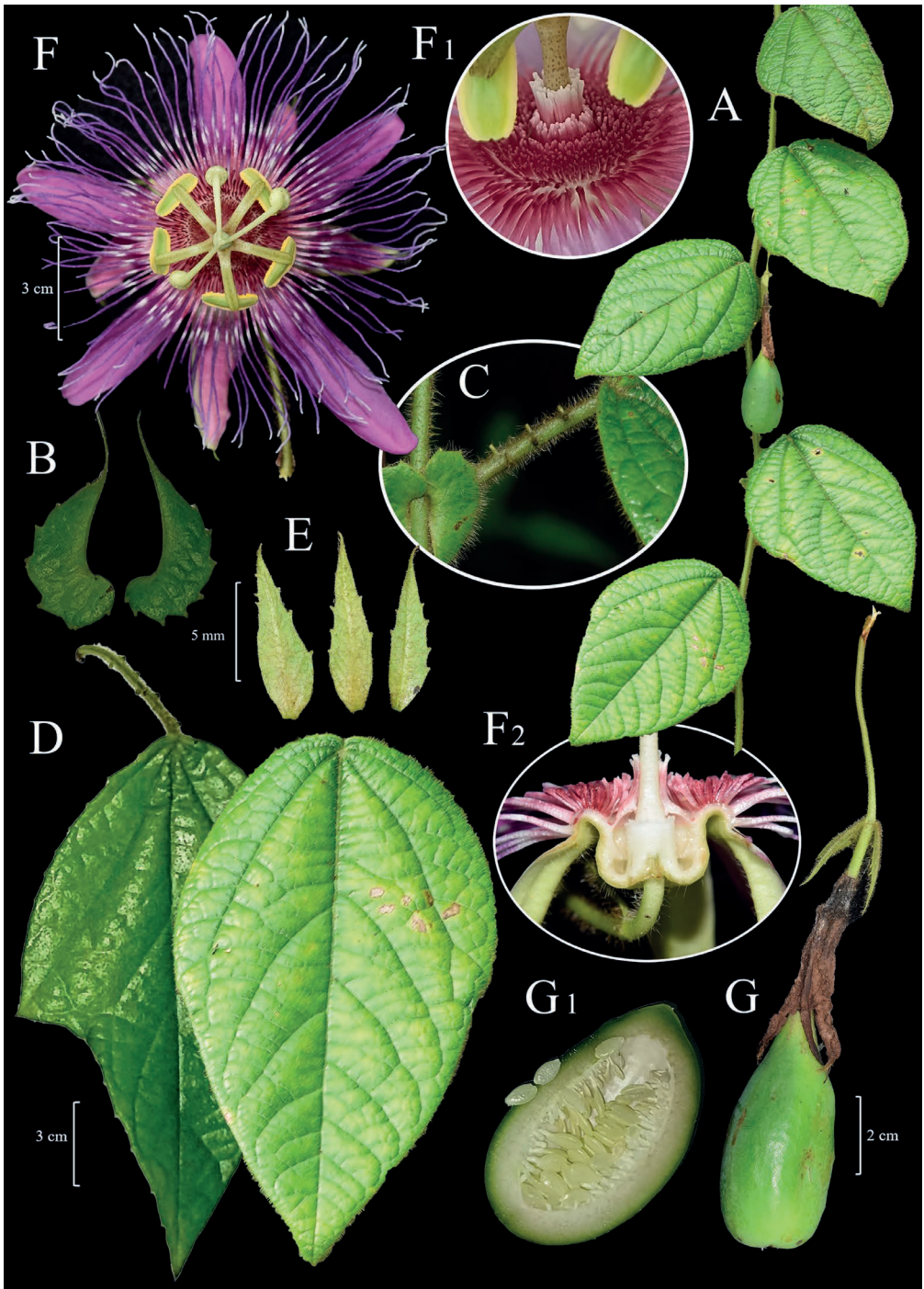


FIG. 1. *Passiflora veronesiae* sp. nov. A. Habit of a fruiting plant. B. Detail of the stipules. C. Detail of the petiolar nectaries and indument. D. Portion of the leaves showing the variation between unlobed and obliquely 3-lobed morphology. E. Detail of the bracts. F. Anterior view of the flower; F₁. Inner details of the corona filaments and operculum insertion; F₂. longitudinal section of the flower. G. Fruit at an immature stage with; G₁. one longitudinally sectioned to show pulp and immature seeds. Plate made using photos by the authorial team.

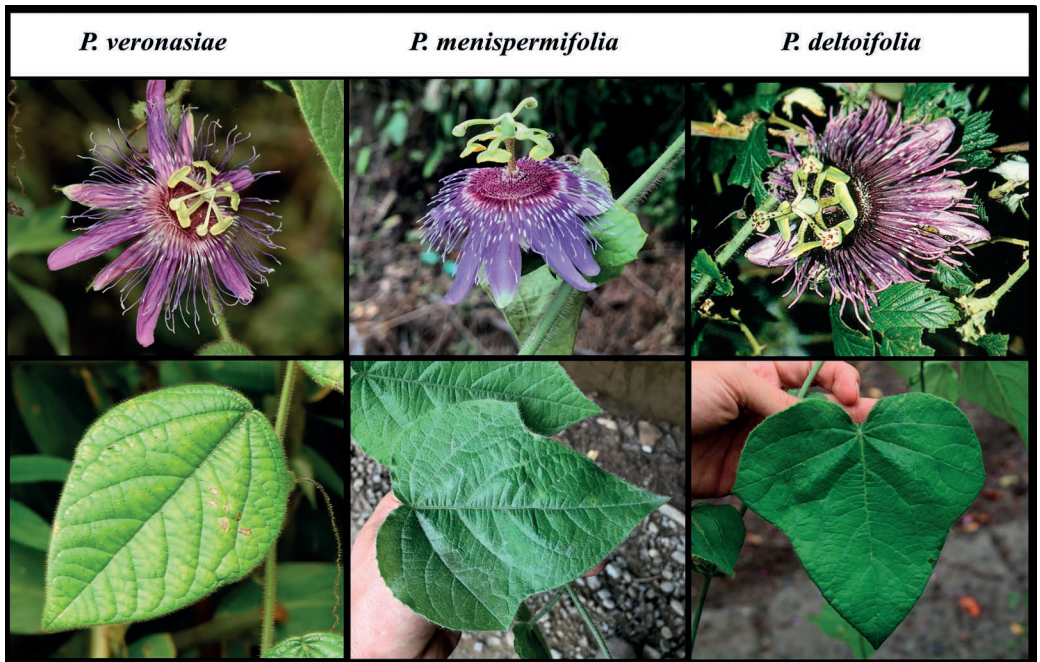


FIG. 2. Comparative display between *Passiflora veronasiae*, *P. menispermifolia* and *P. deltoifolia*. Photo courtesy by Henry Garzon, J.R. Kuethe, and Michael Schwerdtfeger.

collections, which corresponds to the wet season in its native Ecuador. In northern Peru, it was observed carrying mature fruit in August.

Etymology.—This species is dedicated to Manuela Veronesi, whose generosity and philanthropic contributions were essential for investigation and conservation projects across the Morona Santiago Province.

Distribution and Habitat.—*Passiflora veronasiae* sp. nov. occurs in the Amazon–Andean transitional cloud forests of southern Ecuador and northern Peru, from Morona Santiago and Zamora-Chinchipe provinces in Ecuador, to the Amazonas Department of Peru. It inhabits lower premontane cloud and wet forests between 700 and 1550 m elevation, with notable populations sighted around Macas, San Juan Bosco, Limón Indanza, the foothills of the Cordillera del Cóndor and along the Aramango–Chiriaco Road at the southern end of the Cordillera del Cóndor. The species grows in evergreen, shaded forests with 20–35 m canopy height on steep slopes (5–87°), where it is found as a tall, robust vine reaching [near] canopy height, best seen near forest clearings, road sections and along interandean rivers. The habitat is predominantly composed of inceptisols and perhumid andosols with loamy to clay-loam textures. The forest componentry is rich in Lauraceae, Rubiaceae, and Melastomataceae, with stratified layers that include herbaceous and epiphytic plants such as *Anthurium*, *Cyclanthus*, *Philodendron*, and *Rhodospatha*. Though its large size makes sighting the species difficult, *Passiflora veronasiae* sp. nov. appears to be relatively scarce within its habitat.

Conservation status.—From the 10 observations identified in the field and through herbarium studies or iNaturalist observations, *Passiflora veronasiae* sp. nov. is shown to have a distribution stretching an extent of occurrence (EOO) of 18,500–19,000 km² and an area of occupancy (AOO) of around 50–55 km². This would scale the species EN–VU (endangered to vulnerable) in accordance with the IUCN criteria B1 and B2. Though population sites appear to be scattered, criteria B2a or B2ciii could not adequately be triggered due to much of the intermediate regions being inaccessible, and populations are likely to be more continuous than what could be practically surveyed. Local tensions within the region due to mining activities, expansion of

agriculture (namely cattle farming), and/or commercial exploitation could trigger IUCN criteria D2, and the proximity of sighted populations nearby encroaching urban areas would satisfy criterion C2a_{ii}. For these reasons, we maintain the classification of VU for *Passiflora veronesiae*.

DISCUSSION

The new species belongs to *Passiflora* subgen. *Passiflora*, supersect. *Stipulata* Feuillet & MacDougal (2003:38), ser. *Menispermifoliae* Killip ex Cervi (1997:84), for it being pubescent to hirsute throughout; with conspicuous semi-ovate to subreniform stipules; petioles with two or more stipitate petiolar glands placed invariably along the length of the stalk; foliaceous bracts inserted 5 mm below the base of the flower; and a coronal structure containing three or more series of filaments (Cervi 1997; Feuillet & MacDougal 2003). Within this series, this species bears its nearest resemblance to the namesake *Passiflora menispermifolia*, featuring large [obscurely] three-lobed leaves and petioles with 2–4 pairs of nectaries and coarsely serrated stipules. Regardless, field observations have shown a noticeable difference in mature [flowering] sized plants, making *P. veronesiae* sp.nov. appear the larger sister-species of *P. menispermifolia* aside from other fertile differences.

Passiflora veronesiae sp. nov. is closely related to *Passiflora menispermifolia* and to a lesser extent *P. deltoifolia* Holm-Nielsen & Lawesson (1987:501) but differs markedly in the extent of its vestiture and its reproductive anatomy. While all three species are hirsute to pubescent vines, *P. veronesiae* is immediately recognizable by its dense, golden-hirsute indumentum that covers both sides of the foliage, contrasting with the sparsely puberulent to pubescent stems of *P. deltoifolia* and the uniformly hispid hirsute and grayish indumentum of *P. menispermifolia* focused primarily on the abaxial side of the leaf. The leaves of *P. veronesiae* tend to be ovate to only shallowly 3-lobed with very oblique sinuses, whereas *P. deltoifolia* has intermediate 3-lobed deltoid blades; and *P. menispermifolia* distinctly 3-lobed leaves divided near the middle of the blade. The petioles in *P. veronesiae* bear a greater number of cupiform glands (7–9) that are scattered along the length, unlike the 2–4 short-stipitate glands confined to the petiole apex in *P. menispermifolia* or the four alternate glands of *P. deltoifolia*. Florally, *P. veronesiae* is distinguished by the distinctly pink to magenta corolla, whereas both allied species exhibit violet to deep purple flowers. Additionally, the corona of *P. veronesiae* is organized in 7–8 series with gradually diminishing filament length toward the center, differing from the fewer (5–7) series with broad inner filaments in *P. deltoifolia* and the dense, short inner series of *P. menispermifolia* of which the operculum is markedly raised around the androgynophore (Shrestha et al. 2021; Aliaga et al. 2024).

In addition to the morphological differences, the habitat and distribution between these species is marginally different. *Passiflora veronesiae* sp. nov. appears to be present across a relatively restricted distribution covering the lower premontane cloud forest to sub-Andean wet forest south of the Cordillera del Cóndor (Chávez Corcuera 2021; Kuethe et al. 2025), which is similar in general habitat characteristics as *P. deltoifolia* found only further north from Sumaco up to Baeza in Napo and Sucumbios provinces (Fig. 3). The type locality for *Passiflora menispermifolia*, in some greater contrast, is shown to be relatively dry sub-Andean riverine forest, with other Ecuadorean accessions featuring mostly coastal and seasonally-dry forest. In Colombia, Central America and far northern Ecuador, accessions of *P. menispermifolia* have been reported in similarly wet forest, but at generally lower elevations placing it below the cloud forest biome.

DICHOTOMOUS KEY TO THE RELATED SPECIES OF THE MENISPERMIFOLIA GROUP

1. Flowers pink to magenta or pink-purple _____ 2
2. Flowers pink to magenta; plant densely golden-hirsute throughout; leaves ovate to shallowly 3-lobed with very oblique sinuses; petiole with 7–9 glands scattered along its length _____ **Passiflora veronesiae**
2. Flowers pink, not magenta; plant uniformly hirsute; leaves distinctly 3-lobed; petiole with 2–3 glands near the middle _____ **Passiflora rosacea**
1. Flowers white, light purple, bluish purple, or deep purple.
3. Flowers white _____ 4
4. Leaves 3-lobed in an extremely hastate shape, lateral lobes nearly at right angles to the median lobe; flowers sweetly scented, white, 5.5–6.5 cm across; corona filiform in 4 series, white throughout _____ **Passiflora asprantha**
4. Leaves unlobed or only slightly lobed, lanceolate to ovate-lanceolate; flowers white with purple banding in the corona _____ **Passiflora albopurpurea**
3. Flowers light purple to deep purple _____ 5

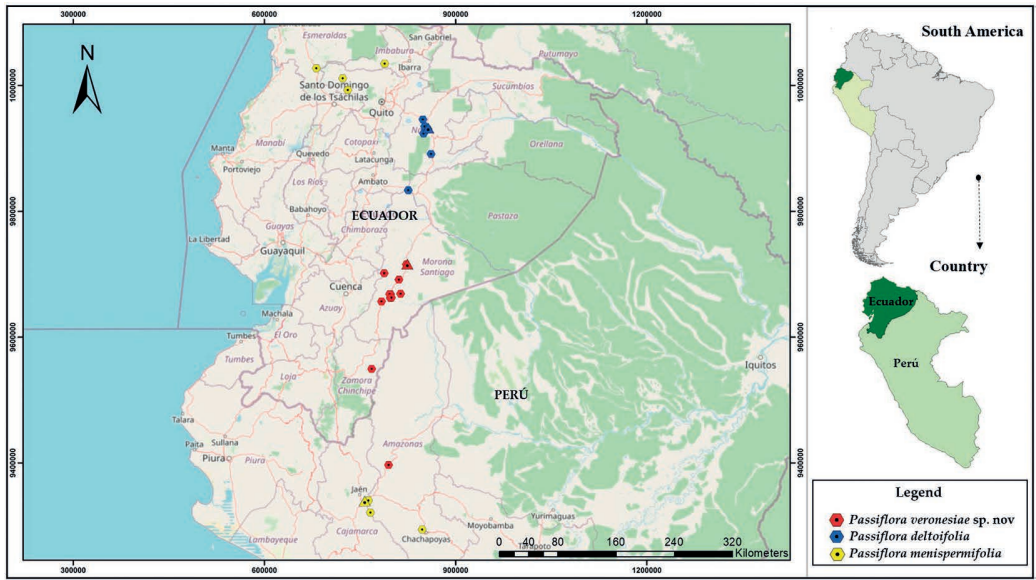


Fig. 3. Distribution between *Passiflora veronesiae* sp. nov., *Passiflora deltoifolia*, *Passiflora menispermifolia* in Ecuador and Northern Peru. Triangles with the same color correspond to the Type populations.

- 5. Leaves unlobed or only obscurely lobed; thick-coriaceous, glabrous above and villous beneath; petiole with 4–6 glands along its length; flowers large, 7–8 cm across; corona in 4 series _____ **Passiflora crassifolia**
- 5. Leaves distinctly 3-lobed _____ 6
- 6. Petiole with glands at both apex and middle; leaves membranous, villous above and tomentose beneath; flowers 5–6 cm wide, light purple to bluish purple; corona in 4 or 5 series _____ **Passiflora gardneri**
- 6. Petiole glands not arranged as above _____ 7
- 7. Leaves deeply 3-lobed, divided near the middle; indumentum mainly on the abaxial surface; petiole with 2–4 pairs of glands near apex; corona with dense, short inner filaments and raised operculum _____ **Passiflora menispermifolia**
- 7. Leaves 3-lobed but deltoid or hastate rather than deeply divided; petiole with different gland arrangement _____ 8
- 8. Leaves deltoid, intermediate in form; indumentum sparsely puberulent; petiole with 4 alternate glands; corona with 5–8 series and broader inner filaments _____ **Passiflora deltoifolia**
- 8. Leaves 3-lobed to the middle, lateral lobes ovate-lanceolate; petiole with 2–3 stipitate glands near the middle; corona filaments filiform in several series _____ **Passiflora nephrodes**

CONCLUSIONS

The new species was found in areas where extensive mining and mineral extraction is apparent, and it is important to note the imminent threat extractive activities are having on the Andean-Amazon transitional forests and its biodiversity of southeast Ecuador. While agricultural expansion was previously considered to be the primary cause of deforestation; mining activities, both legal and illegal, have brought about a new level of environmental destruction with heavy machinery that results in total loss of habitat where this novel species, and other species recently published (including families Orchidaceae, Ericaceae, Gesneriaceae: Clark 2025; Cornejo et al. 2025; Jiménez et al. 2025a, 2025b, 2025c, 2025d) have been identified. Access roads with no environmental considerations are indiscriminately being forged through pristine forests to streams and rivers, where they are dredged for gold, accompanied with large pools for settling the mineral, mixed with toxic mercury that leach in other adjacent waterways (Fig. 4). Similarly, the type locality for *Passiflora veronesiae* sp. nov. was taken within the grounds of a hydroelectric facility, developments of which alter waterways and pose potential risks to biodiversity for the ecosystems downstream.

As shown in Figure 4, the use of heavy machinery for mining removes all topsoil, making recuperation

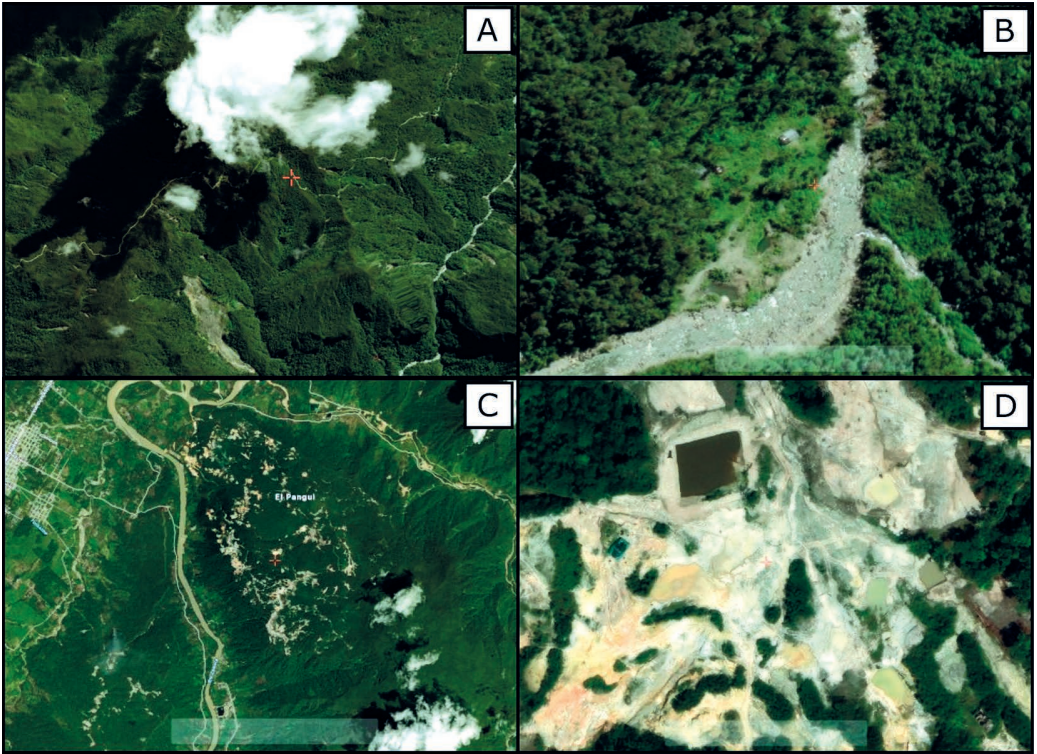


FIG. 4. **A.** Satellite image of an illegal access road to an illegal mining site within a Municipal Ecological Reserve, Gualaquiza County, Morona Santiago, Ecuador. **B.** Illegal mining site within an Ecological Reserve. Notice the pools adjacent to the rivers, used to purify gold deposits with mercury (Hg). **C.** Illegal mining in the biodiverse rich tepuye Shagmi Cordillera, Pangui county, Zamora Chinchipe, Ecuador. **D.** Satellite image of illegal mining camp in Shagmi Cordillera.

of habitat impossible through natural regeneration or proactive reforestation management plans, which are applicable to poorly managed agriculture lands (Shrestha & Lal 2011; Strohmayer 1999). In addition, access roads are tethered to illegal wood extraction activities, and hunting and trafficking of wildlife among others, having further environmental consequences (Laurance et al. 2009; Peres & Palacios 2007; Goosem 2002). Private conservation initiatives in the Ecuadorian Amazon are showing positive results (Stolton et al. 2014), allowing not only for the discovery and safekeep of many new and threatened species found within these land-exploitative activities, but also highlight the importance of continued habitat preservation and conservation efforts to prevent further ecological decline. Yet, funding for large scale projects for purchasing land, education of sustainable land use and the implementation of responsible production practices linked with further investigation remain of great essence.

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