

## A NEW SPECIES OF *CATASETUM* (CYMBIDIEAE: CATASETINAE) FROM THE COLOMBIAN AMAZONIA

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**ABSTRACT.** A new species, *Catasetum caquetense* from the Caquetá department of the Colombian Amazonia, is described and illustrated. *Catasetum caquetense* is morphologically distinct from similar species such as *C. tuberculatum* in its rectangular, entire, denticulate, prominent apiculate basal callus surrounded by inconspicuous crown-shaped protrusions with an extra callus towards the apex that partially narrows towards the midlip. Information about its distribution, ecology, habitat, and taxonomic comments on morphologically similar species is also provided. With this addition, the genus comprises eight species in the department of Caquetá.

**RESUMEN.** Se describe e ilustra una nueva especie, *Catasetum caquetense* del departamento del Caquetá amazónica colombiana. *Catasetum caquetense* difiere de especies morfológicamente similares como *C. tuberculatum* por el callo basal rectangular, entero, denticulado, prominentemente apiculado, rodeado de protuberancias inconspicuas en forma de corona con un callo extra hacia el ápice que se estrecha parcialmente hacia el labelo. Además, se proporciona información sobre su distribución, ecología, hábitat y comentarios taxonómicos sobre especies morfológicamente similares. Con esta adición, el género comprende ocho especies en el departamento del Caquetá.

**KEYWORDS / PALABRAS CLAVE:** Amazonia, Amazonía, *Catasetum caquetense*, *Catasetum tuberculatum*, orchid, orquídea, Caquetá

**Introduction.** The subtribe Catasetinae Lindl. includes eight genera (*Catasetum* Rich. ex Kunth., *Clowesia* Lindl., *Cyanaeorchis* Barb.Rodr., *Cynoches* Lindl., *Dressleria* Dodson, *Galeandra* Lindl., *Grobya* Lindl., and *Mormodes* Lindl.) (Chase *et al.* 2015), and is well represented in Colombia, except for *Cyanaeorchis* and *Grobya*. The neotropical genus *Catasetum* comprises 169 species and 28 natural hybrids (Milet-Pinheiro & Gerlach 2017, Romero-González 2009, POWO 2023). It is characterized by its unisexual flowers exhibiting sexual dimorphism (Holst 1999, Romero & Jenny 1993, Romero-González 2012, Milet-Pinheiro & Gerlach 2017, Van der Pijl & Dodson 1969). Among the genera in Catasetinae, *Catasetum* is notably species-rich, representing over 40 species in the Colombian orchid flora (Bonilla-Morales *et al.* 2016a). This count has grown with several recent additions (Bonilla-Morales *et al.* 2017).

In Colombia, *Catasetum* is widely distributed. It is most abundant in the Andean, Amazon, and Orinoquía regions (Betancur *et al.* 2015, Ortiz & Uribe 2019). The most significant species concentration occurs in forests of the eastern and central mountain ranges, ranging from above sea level to 1200 m in elevation. However, it is worth noting that certain Colombian regions, such as the Amazon (particularly departments like Vaupés) and areas in the Andes (like Norte de Santander), as well as the Atlantic region (departments including Atlántico, Córdoba, Sucre, Guajira, and Cesar), have sparse collections of *Catasetum* species (Bonilla-Morales *et al.* 2016a).

During our field studies in the Department of Caquetá, Colombia, we discovered a unique *Catasetum* specimen. After exhaustive comparison with representative species of *Catasetum* from Colombia and its neighboring countries, we found that this specimen did

not correspond to any previously described species. Consequently, we propose this Colombian entity as a new species, accompanied by comprehensive color photographs and comparison with morphologically similar species.

**Material and methods.** The plant material of the new species was collected during botanical exploration in June 2020 at one of the Universidad de la Amazonia campuses located in Florencia, Caquetá. This region serves as a transition between the Andean and Amazonian ecosystems. The plant was found as a single individual, but it was not in a fertile state. Consequently, it was transferred to a greenhouse to await flowering, which occurred in October. The flowers of the new species were then collected and preserved in FAA solution (5:5:50:40 Formaldehyde, Glacial Acetic Acid, 95% ETOH, and distilled Wat) (Díaz 2019).

Herbarium specimens of *Catasetum* from COL, JAUM, JBB, LLANOS, HPUJ, COAH, and HUAZ (acronyms according to Thiers 2021) were carefully examined. In addition, digital images of other specimens and type collections housed at AMES, F were reviewed through the JSTOR portal (<https://plants.jstor.org/>) and GBIF (<https://www.gbif.org/>). A stereoscope (Leica EZ4) was used to examine each available *Catasetum* flowering specimen. A map was plotted using the DIVA-GIS 7.5 software to visualize the distribution of specimens. In cases where specimen coordinates were not available, they were inferred using Gazetteers and Google Earth Pro 7.3.6.9345 (64-bit) (Hijmans *et al.* 2001).

#### TAXONOMIC TREATMENT

*Catasetum caquetense* R.A. Calderón-Álvarez & M. Bonilla, *sp. nov.* (Fig. 1).

**TYPE:** COLOMBIA. Caquetá: Municipality of Florencia, tropical humid forest -campus Universidad de la Amazonia, 1°36'29.86" N 75°36'22.36" W, 273 m, 3 June 2020, R.A. Calderón-Álvarez 244 (holotype: HPUJ030774; isotype: HPUJ030775).

**DIAGNOSIS:** *Catasetum caquetense* is morphologically similar to *C. tuberculatum* Dodson; however, it differs by the rectangular lip (*vs.* elliptical), with smooth

to somewhat denticulate edges (*vs.* entire), the abaxial surface not entirely tuberculate (*vs.* fully tuberculate lip on the abaxial surface), and a prominent apiculate basal callus (*vs.* slightly prominent), which is encircled by minor crown-shaped protrusions, with an extra callus towards the apex that partially narrows towards the saccate mid-lip, a characteristic absent in *C. tuberculatum*.

Epiphytic *herb*, caespitose, 15–25 cm long. *Roots* 1–2 mm thick, terete, whitish. *Pseudobulbs* *ca.* 13 × 5 cm, heteroblastic, caespitose, terete, ellipsoid-fusiform, up to 6 internodes, green. *Leaves* *ca.* 25 × 4 cm, oblong-lanceolate, distichous, plicate, flat, nerves sunken adaxially and prominent abaxially, green, slightly discolor, deciduous. *Inflorescence* basal, 30 cm, racemose, 1–2 by pseudobulb, up to 12 staminate flowers; peduncle up to 24.0 × 0.5 cm, terete, greenish; peduncle bracts up to 1.2 × 1.0 cm, clasping, lanceolate, acute, pale green; rachis up to 20 × 0.1–0.3 cm, terete, pale green; floral bracts up to 3.0 × 0.9 cm, lanceolate-ovate, acute, pale green. *Staminate flowers* are fragrant, ovary and pedicel up to 4.00 × 0.15 cm, terete, brown-reddish; *dorsal sepals* up to 3.6 × 0.7 cm, oblong-elliptical, base cuneate, margin entire, apex acute, concave, brown-reddish; *lateral sepals* up to 3.0 × 0.7 cm, elliptical, base cuneate, margin entire, apex acute, convex, brown-reddish; *petals* up to 3.2 × 0.9 cm, elliptical, convex, superimposed on the dorsal margins of the dorsal sepal in natural position, base acute, margin entire, apex acute, brown-reddish; lip 20 mm long × 10 mm wide × 5 mm deep, fleshy, sacciform, elliptical, denticulate margin, basal calli, greenish yellow. *Staminal column* 1.6 × 0.4 cm, trigonous, apex apiculate *ca.* 7 mm, brown; antennae 2, *ca.* 5 mm length, parallel, equal, filiform, pale brown. Anther *ca.* 10 × 3 mm, apiculate, opercular, unilocular, green-yellowish; viscidium 0.8 × 0.8 mm, rounded, whitish; stipe *ca.* 3.0 × 1.0–1.5 mm, oblanceolate, white-brownish; pollinia 2, *ca.* 3.5 × 1.8 mm, obovate, flattened, yellow. *Pistillate flowers* not observed. *Fruit* and *seeds* not seen.

**DISTRIBUTION AND ECOLOGY:** A single collection of *C. caquetense* has been identified in the Department of Caquetá, specifically in the municipality of Florencia, Amazon region, between 270–280 m of elevation (Fig. 2). *Catasetum caquetense* was found growing as an epiphyte on a tree of *Zygia longifo-*

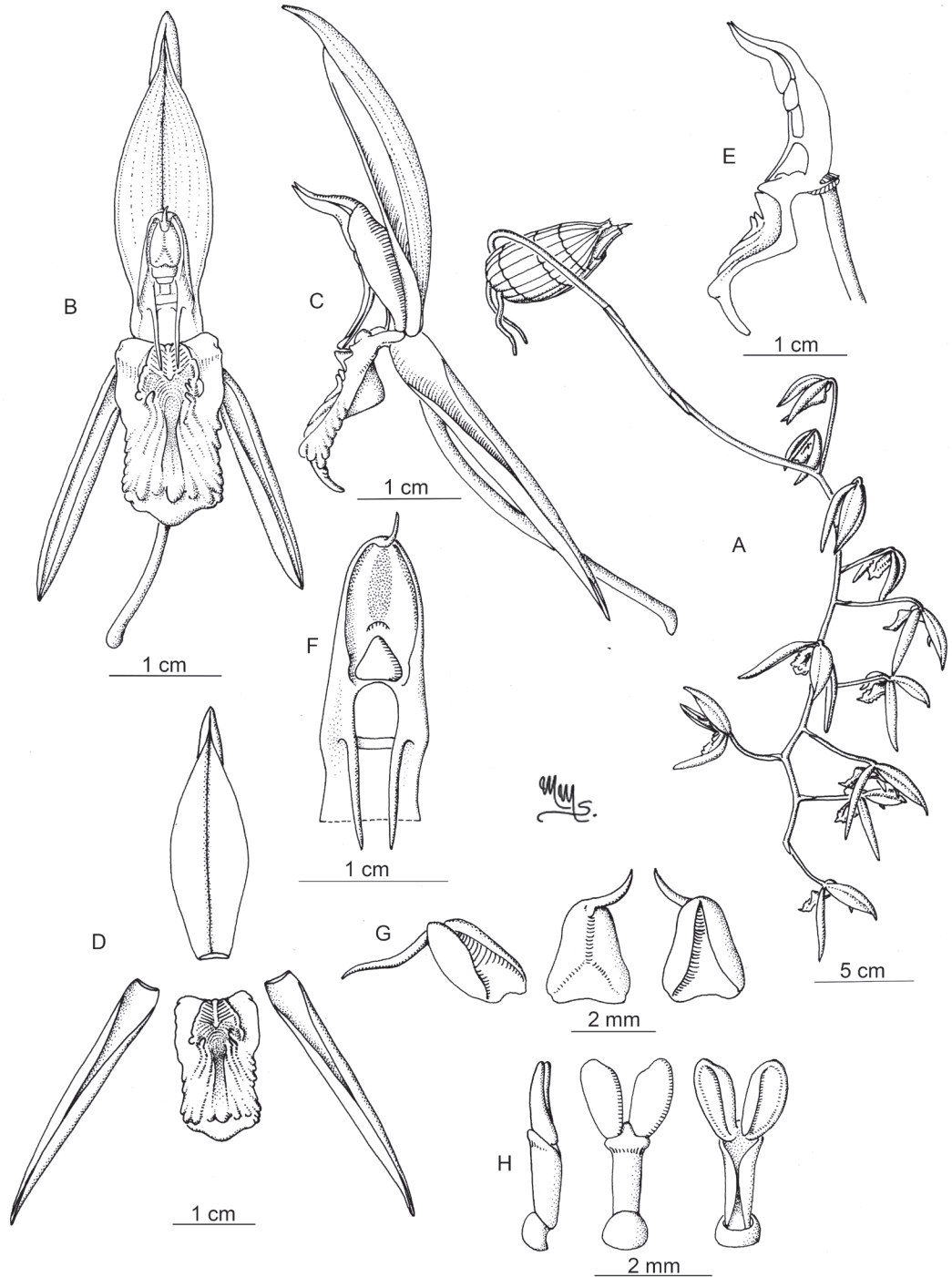


FIGURE 1. *Catasetum caquetense* R.A.Calderón-Álvarez & M.Bonilla. **A**. General view of the plant habit without leaves, the inflorescence with male flowers. **B**. Male flower. **C**. Male flower side view. **D**. Perianth. **E**. Column with labellum longitudinally sectioned. **F**. Column without anther cap, frontal view. **G**. Anther cap in frontal, lateral, and dorsal views. **H**. Pollinarium, two views. Illustration by Marcela Morales-S. based on the holotype and isotype.

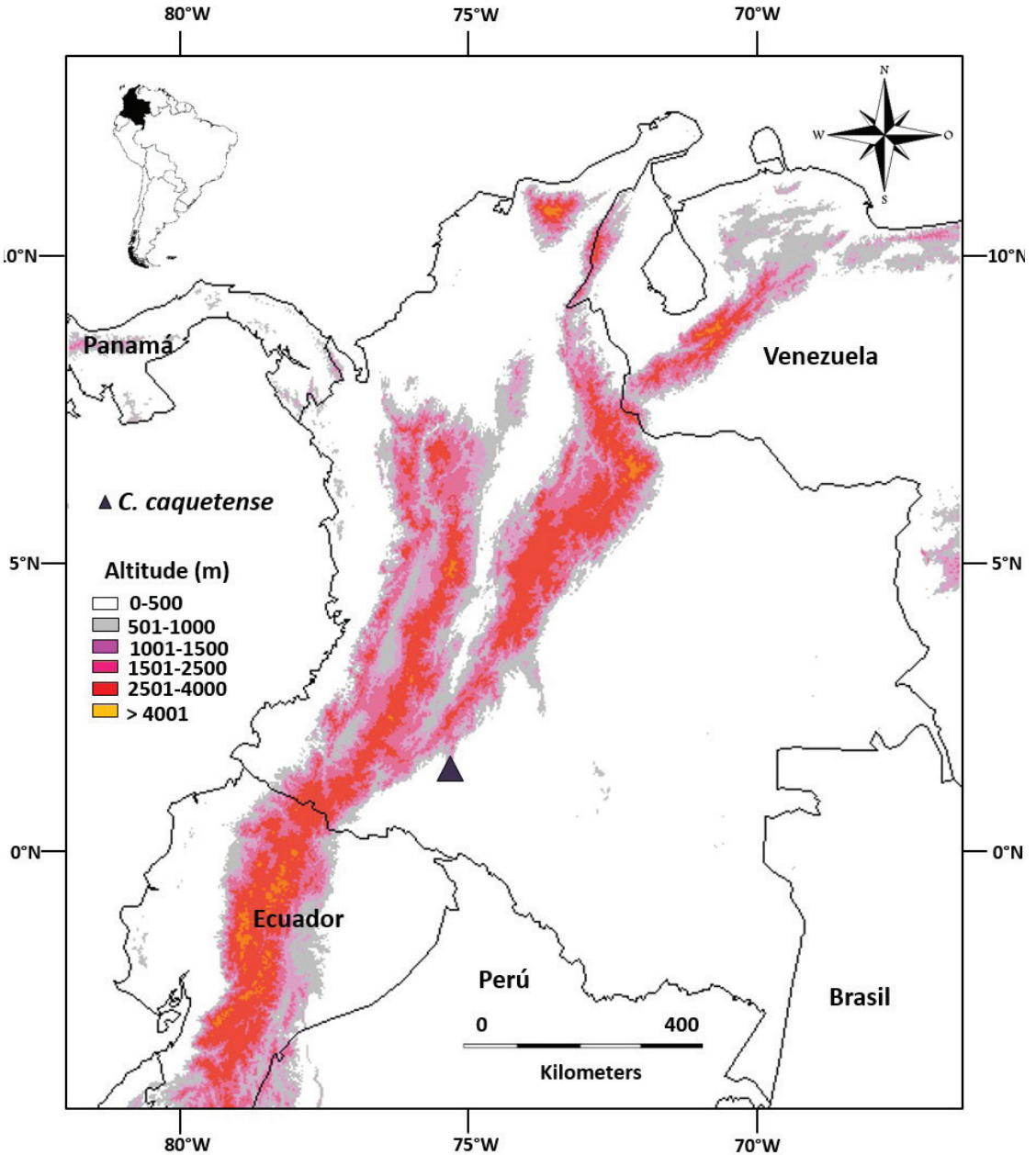


FIGURE 2. Distribution of *C. caquetense* R.A. Calderón-Álvarez & M. Bonilla in Caquetá Department. Map created by M. Bonilla.

*lia* (Humb. & Bonpl. ex Willd.) Britton & Rose. It grows in shade in the humid forest, similar to *C. tuberculatum*. Tree ferns, bromeliads, and various tree species from the Fabaceae family characterize the surrounding vegetation in this area.

PHENOLOGY: *Catsetum caquetense* is known to flower in October under cultivation.

ETYMOLOGY: The specific epithet “caquetense” refers to the Caquetá Department in Colombia, which

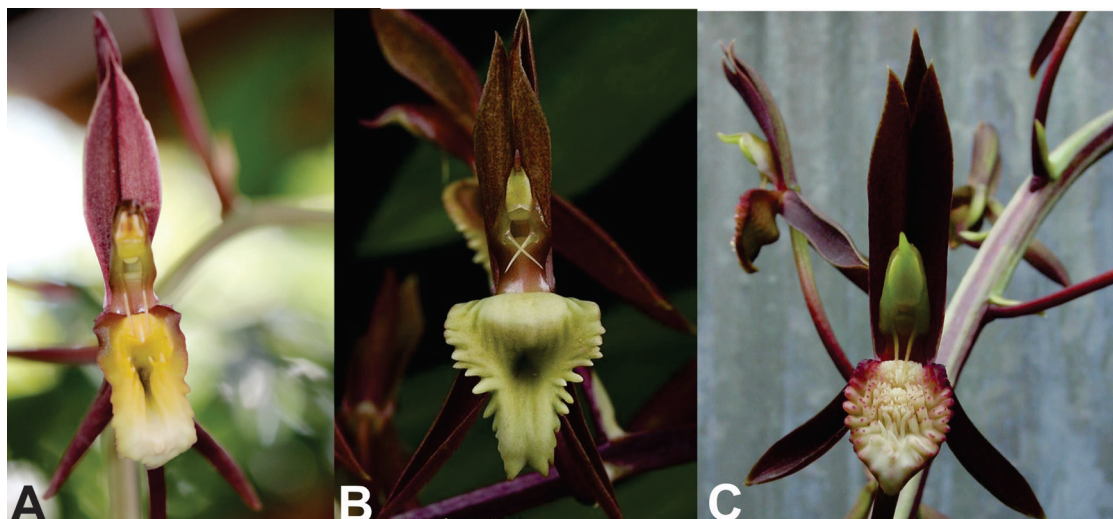


FIGURE 3. Comparison of morphologically similar species of *Catasetum*. **A.** *C. caquetense* R.A.Calderón-Álvarez & M.Bonilla, **B.** *C. juruenense* Hoehne. **C.** *C. tuberculatum* Dodson. Photograph by R.A.Calderón-Álvarez (A), Juan Fernández (B), and M.Bonilla (C).

is the geographical location where the species was discovered.

**Discussion.** *Catasetum caquetense* is morphologically similar to the *C. tuberculatum* and *C. juruenense* Hoehne. Distinguishing features of *Catasetum caquetense* include a lip with two calli on the abaxial surface, one at the base and another one that gives prominence and apiculation to the apex; therefore, the lip is not fully tuberculated.

*Catasetum caquetense* and *C. tuberculatum* exhibit parallel antennae, whereas *C. juruenense* has convergent and short antennae (Mauad *et al.* 2022). In addition, the lip of *C. caquetense* and *C. juruenense* are rectangular, in contrast to the elliptical lip of *C. tuberculatum*. Moreover, *C. caquetense* forms a crown-like structure with its basal callus, nearly closing with filiform prominences. In contrast, *C. tuberculatum* possesses rough to completely filiform or tuberculate basal calli and *C. juruenense* is slightly roughened (Fig. 3B–C).

*Catasetum caquetense* has a prominent callus and non-tuberculate edges at the base. Additionally, the antennae of *C. juruenense* are short and convergent, reaching the middle of the staminal column, while those of *C. caquetense* are of the same size and reach the base of the lip. While *C. tuberculatum* is distributed from Colombia to Peru, *C. juruenense* is endemic

to Brazil (Betancur *et al.* 2015, Bonilla-Morales *et al.* 2016a, Romero-González 2009, Ortiz & Uribe 2019). In addition, these three species (*C. caquetense*, *C. juruenense*, and *C. tuberculatum*) are distributed in the Amazonian Forest life zone, although *C. tuberculatum* extends to the Andean-Amazonian piedmont area.

Currently recognized species in the Department of Caquetá from Colombia include *C. discolor* (Lindl.) Lindl., *C. ochraceum* Lindl., *C. roseo-album* (Hook.) Lindl., *C. tabulare* Lindl., *C. tuberculatum* Dodson, *C. villegasii* G.F.Carr (Arias *et al.* 2023), the latter being considered endemic. Also present in the department of Caquetá are *C. caquetense* R.A.Calderón-Álvarez & M.Bonilla and *C. collare* Cogn. (Table 1). However, *C. villegasii* is similar to *Catasetum moorei* C.Schweinf., which is known from Ecuador, Peru, and Brazil (Romero-González & Gerlach 2008). Given its distribution in neighboring countries, it is highly likely that *C. moorei* is also found in Colombia.

*Catasetum collare*, while extensively documented in the broader Amazon region, is scarcely recorded in the Colombian Amazonia. The specimens from this region show subtle variations in the lip, suggesting the possibility of intraspecific variation. Such variations could broaden our understanding of the current species circumscription (Bonilla Morales *et al.* 2016a,b, Romero-González 2009) (Fig. 4).

TABLE 1. List of the *Catasetum* species in the Caquetá Department, Colombia. Municipalities are abbreviated using the first two letters of their name. If a name of a municipality consists of two words, the abbreviation takes the first letter from each word. Life zones are abbreviated as A (Amazonia) and ALP (Andean low piedmont). The municipalities are abbreviated as CAR (Cartagena del Chairá), FLO (Florencia), SOL (Solano), no loc (no locality).

Species	Municipalities	Elevation (m)	Life zone	Reference
<i>C. caquetense</i> R.A.Calderón-Álvarez & M.Bonilla	FLO	200–300	A	R.A.Calderón-Álvarez 244 (HPUJ)
<i>C. collare</i> Cogn.	FLO	500–700	ALP	M.Bonilla (Field record)
	CAR	200–250	A	R.A.Calderón-Álvarez (Field record)
<i>C. discolor</i> (Lindl.) Lindl.	FLO	400	A	J. Idrobo 9001 (COL)
	SOL	200–300	A	Arbelaez 238 (HUA), Arevalo 311 (COL)
<i>C. ochraceum</i> Lindl.	SOL	200–300	A	M. González 2710 (COL)
<i>C. tuberculatum</i> Dodson	FLO	300–600	A, ALP	M.Bonilla (Field record); Aguilar 253 (COAH)
<i>C. tabulare</i> Lindl.	FLO	500–700	A, ALP	Perdomo 430 (CUCV)
<i>C. roseo-album</i> (Hook.) Lindl.	SOL	200–300	A	Barbosa 7716 (FMB)
<i>C. villegasii</i> G.F.Carr	no loc	400–600	A	Carr (2008)



FIGURE 4. *Catasetum collare* Cogn. Photo by M.Bonilla.

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