



A new species of *Catasetum* (Orchidaceae, Catasetinae) for the Brazilian Amazon

Amauri Herbert Krahl^{1*}, Guy R. Chiron², Patrick de Castro Cantuária³
& João Batista Fernandes da Silva⁴

¹ Programa de Pós-Graduação em Botânica, Departamento de Botânica, Instituto Nacional de Pesquisas da Amazônia, Av. André Araújo, 2936, 69.060-001, Manaus, Amazonas, Brazil.

² Université de Lyon 1, Herbiers, F-69622, Villeurbanne Cedex, France.

³ Instituto de Pesquisas Científicas e Tecnológicas do Estado do Amapá, Laboratório de Taxonomia Vegetal, Rodovia Juscelino Kubitschek, Km 10, Postal Code 68.903-419, Macapá, Brazil.

⁴ Mineração Rio do Norte, Rua Rio Jarí s/n°, 68.275-000, Porto Trombetas, Oriximiná, Pará, Brazil.

*Corresponding author: amaurikrahl@hotmail.com

Abstract

A new taxon belonging to the *Catasetum cristatum* alliance, from the Brazilian Amazon and, more precisely, from the state of Pará, is proposed. A complete description is given, together with drawing and photograph plates and data on habitat, distribution and phenology. The new entity is compared with its closest relatives, both occurring in the same area, *Catasetum barbatum* and the recently described *Catasetum saracataquerense*.

Résumé

Un nouveau taxon du groupe *Catasetum cristatum*, originaire d'Amazonie brésilienne et plus précisément de l'état du Pará, est proposé. Une description morphologique détaillée en est donnée, accompagnée d'une planche de dessins, de photographies et d'informations relatives à l'habitat, la distribution géographique et la phénologie. L'espèce est comparée à

deux espèces proches, toutes deux présentes dans la même zone, *Catasetum barbatum* et le récemment décrit *Catasetum saracataquerense*.

Resumo

É proposto um novo táxon para Amazônia Brasileira do grupo de *Catasetum cristatum*, mais especificamente para o Estado do Pará. É fornecida uma descrição detalhada do novo táxon, bem como uma prancha fotográfica e informações referentes ao habitat, distribuição e fenologia. É feita também uma comparação com as espécies relacionadas, as duas presentes na mesma região, sendo elas, *Catasetum barbatum* e *Catasetum saracataquerense*, espécie recentemente descrita.

Keywords: Amazon basin, biodiversity, epiphyte, orchid, taxonomy.

Mots clés : Bassin amazonien, biodiversité, épiphyte, orchidée, taxinomie.

Palavras-chave: Bacia amazônica, biodiversidade, epífita, orquídea, taxonomia.

Introduction

The subtribe *Catasetinae* Lindley (1843a: sub t. 22) comprises eight genera (Chase *et al.*, 2015), five of them being present only in the Neotropical area, more precisely from southern Florida to northern Argentina and southern Brazil (Romero & Carnevali, 2009; Batista *et al.*, 2014). According to Dodson (1975) these five genera are *Catasetum* Richard ex Kunth (1822: 330), *Clowesia* Lindley (1843b: Misc. 25-26), *Cynoches* Lindley (1832: 154), *Dressleria* Dodson (1975: 131) and *Mormodes* Lindley (1836: 446) and form a coherent group sharing the same pollination syndrome and a few vegetative features (Romero & Carnevali, 2009).

Among the genera belonging to the subtribe *Catasetinae*, *Catasetum* stands out as it is the largest in species number and widely distributed within the Neotropical area, from Mexico to southern Brazil and Argentina (Romero & Jenny, 1993; Romero & Carnevali, 2009). The genus comprises about 170 species and tens of natural hybrids (Pridgeon *et al.*, 2009). However, the World Checklist of Selected Plant Families (WCSP) (Govaerts *et al.*, 2021) lists about 192 species and 29 natural hybrids so far (20/06/2021).

The species are practically indistinguishable through the vegetative features as they share most of them, pseudobulbs fusiform, elliptic, oval or

conical, leaves plicate and deciduous, usually elliptic, the base forming a sheath that totally covers the pseudobulb, inflorescence usually lateral (sometimes basal), racemose, with unisexual flowers (staminate or pistillate), rarely bisexual (Holst, 1999; Walker-Larsen & Harder, 2000). Moreover, the female (pistillate) flowers have a simple and uniform structure leading to possible confusion between the different species (Romero, 1992; Gerlach, 2007). Hence only the characters of the male (staminate) flowers (flower resupinate or not, lip bilobed or trilobed, shape of the midlobe, presence of fimbriae, callus, osmophores) can be used to identify the species. It is also highlighted that the male flowers are characterized by the presence on the gynostemium (column) of two modified staminodes so called antennae, the function of which consists in throwing the pollinarium against the pollinator body when it visits the flowers (Romero, 1992; Gerlach, 2007; Walker-Larsen & Harder, 2000).

The Amazon basin is considered as the center of diversity and endemism of the genus (Romero & Carnevali, 2009). In Brazil the genus is indeed represented by 127 species, over 50% of which (87 species) are present in the Brazilian Amazon (Silva & Silva, 1998; Petini-Benelli, 2020). That is why the region takes on great prominence due to its species richness (Silva & Silva, 1998), richness which is continuously increasing because of new discoveries during the last years (e.g. Engels *et al.*, 2016; Petini-Benelli, 2016; Petini-Benelli & Soares-Lopes, 2017; Petini-Benelli & Chiron, 2018; Valsko *et al.*, 2019; Krahl *et al.*, 2021).

Among the species growing in the Brazilian Amazon, *Catasetum barbatum* (Lindley 1835: t. 1778) Lindley (1844: Misc. 38) is very often considered as showing a great morphological variation in the lip (Rocha & Silva, 2001). However possible constant patterns in the morphological characters of the lip in specimens treated as members of this species deserve more thorough study possibly leading to recognition of new taxa, such as *Catasetum teixeiranum* Campacci & Silva (2008: 190) and *Catasetum saracataquerense* Krahl, Cantuária & J.B.F. Silva (in Krahl *et al.*, 2021: 209). The present article aims to propose a new taxon related to *Catasetum saracataquerense* and *Catasetum barbatum*. The new entity is described and illustrated and data on phenology, distribution, habitat and conservation status are given.

Material and methods

Material related to holotype and paratypes were collected in the National Forest Saracá-Taquera, located in the Oriximiná (Porto Trombetas) *município*, in the north-western Pará (PA) (Brazil) – see Fig. 1. The gathering was made by the team of flora rescue of the *Mineração Rio do Norte (MRN)/Biota Projetos e Consultoria Ambiental*, which has been carrying out such a work for twelve years in this area. Specimens have been herborized according to the usual process described in Mori *et al.* (1989); a holotype was included in the collections of the herbarium HAMAB and paratypes shared out into the herbaria EAFM, INPA and HUAM (acronyms according to Thiers, 2021). The separation of species is based on morphological comparison of the male flowers (lip structure) and analyze of the phenology. The terminology used here follows Harris & Harris (2001).

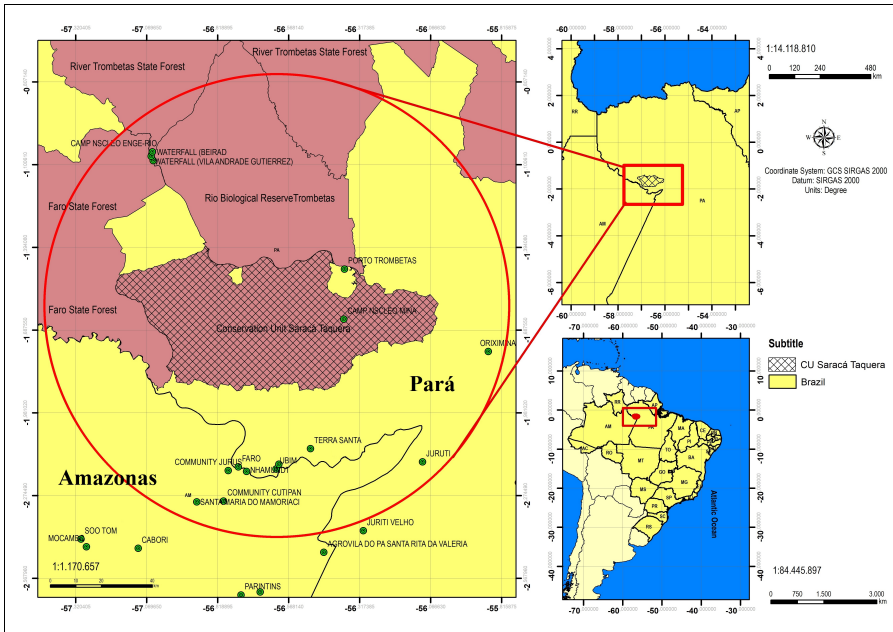


Fig. 1: Location of the Saracá-Taquera National Forest in the State of Pará, Brazil.

Taxonomic treatment

Catasetum taquerense Krahl, Cantuária & J.B.F. Silva, *sp. nov.*

Types. Brazil, Pará, Oriximiná, Porto Trombetas, FLONA Saracá-Taquera, 05/III/2018, J.B.F. da Silva 5270 (Holotype HAMAB); *ibid.*, 06/VIII/2018, J.B.F. da Silva 5474 (paratype INPA); *ibid.*, 18/VIII/2018, J.B.F. da Silva 5483 (paratype INPA); *ibid.*, 23/IX/2018, J.B.F. da Silva 5304 (paratype HUAM); *ibid.*, 23/IX/2018, J.B.F. da Silva 5305 (paratype EAFM).

Haec herba Catasetum saracataquerense Krahl, Cantuária & J.B.F. Silva *similis est sed labello triangulare (versus oblongo) cum fimbriis sparse dispositis secus labelli marginem sed apice aliquantum densis – ergo cum post-saccum superficiete glabra – (versus dispositis secus marginem et in omni post-saccum superficiete) et duplo brevioribus, differt.*

Etymology. The specific epithet refers to the Taquera plateau (elevated area) located in the Saracá-Taquera National Forest, where the type-specimen was found.

Epiphytic cespitose plant. Rhizome short, inconspicuous. Pseudobulb fusiform, 5.6-7.3 × 1.7-2.6 cm, 4-6-leaved, covered by the leaf sheaths. Leaves elliptic, 5.4-25.8 × 1.9-2.9 cm, membranous, plicate, with 4-6 prominent veins, margin entire and slightly wavy, apically acute; leaf sheaths 1.6-3.9 cm long, covering the pseudobulb. Male inflorescence 13.4-23.5 cm long, lateral, racemose, 6-10-flowered, arched; peduncle purple; floral bract lanceolate, ca. 1 × 0.4 cm, greenish, with an entire margin and an acute apex. Female inflorescence 12.9-15.6 cm long, lateral, racemose, 2-4-flowered; peduncle greenish; floral bract triangular, ca. 1 × 0.4 cm, greenish, with an entire concave margin and an acute apex. Male flowers resupinate pedicellate, petals and sepals greenish with brown spots, lip whitish; pedicel ca. 3.6 cm long, cylindrical, erect, purplish; dorsal sepal elliptic, ca. 2.7 × 0.9 cm, concave, symmetrical, with an entire margin and an acute apex; lateral sepals elliptic, ca. 2.7 × 1.1 cm, concave, slightly asymmetrical, with an entire involute margin and an acute apex; petals elliptic, ca. 2.4 × 0.7 cm, symmetrical with an entire margin and an acute apex; lip ca. 1.8 × 0.7 cm (including fimbriae), ca. 1.5 × 0.5 cm (excluding fimbriae), entire, triangular, with near the base a ca. 0.3 cm deep sac, fimbriae spaced along the margin and a little bit concentrated at the apex, ca. 0.2-0.4 cm long, surface after the sac glabrous, base with a simple callus,

apex rounded; callus ca. 0.6 cm long, claw-shaped, acute; column ca. 2 cm long, subtriangular, fleshy, rostrate, contracted at base, brownish with darker spots; rostellum ca. 0.3 cm long, yellowish green; antennae ca. 0.8 cm long, symmetrical, parallel, each one passing on the side of the basal callus; anther ca. 0.9 cm long, yellowish green, anther cap ca. 1 cm long, rostrate; viscidium 0.1-0.2 cm long, whitish; stipe 0.3-0.4 cm long, laminar, involute, yellowish; pollinia 2, obovate, 0.2-0.3 × 0.1-0.2 cm, hard, compressed, yellowish. Female flowers greenish yellow, pedicellate; pedicel and ovary cylindrical, ca. 2.9 cm long, curved; sepals lanceolate, ca. 2 × 1 cm, symmetrical, with an entire margin apically involute and an acute apex; petals elliptic, ca. 2 × 0.9 cm, symmetrical, apically acute; lip globulous, ca. 1.9 × 1.5 cm, ca. 1.1 cm deep, entire, striated inside, wrinkled at apex; column ca. 1.5 cm long, rounded, fleshy, rostrate, greenish; stigma ca. 0.1 cm long, viscous. Fruit not seen. Fig. 2 & 3.

Distribution, habitat and conservation status. The species has been observed in the dense ombrophilous forest *de Terra Firme* (flood-free environment) of the Saracá-Taquera National Forest. It was also found in a forest *de igapó* (floodplain) on the Rio Nhamundá (PA). However, based on informal records (personal and orchid-lover observations), we think that the species could be widely distributed through the Rio Amazonas and Rio Negro basins. The species, (possibly) occurring in a wide area and, in particular, in a Conservation Unit, could be placed – according to the Criterion B of the IUCN (2012) – in the category LC (Least Concerned) because none of the criteria for V (Vulnerable) category is met. However, on the one hand, the area (Amazonian biome) is continuously suffering a strong deforestation (personal as well as general observations), and, on the other hand, orchids are heavily collected by orchid-lovers (personal observations). So that we think better to propose the NT status (Near Threatened), because the area of occupancy is continuously declining (criterion B2bii) and the population size is projected to suffer a reduction of over 10% in any 10 years time (criterion C1), so that the species is likely to qualify for the V category in a near future (IUCN 2012).

Phenology and pollination. Blooming begins during the second half of the year and may last up to the end of the first quarter of the following year. Flowers are visited by male Euglossine bees looking for volatile oils present on the lip.

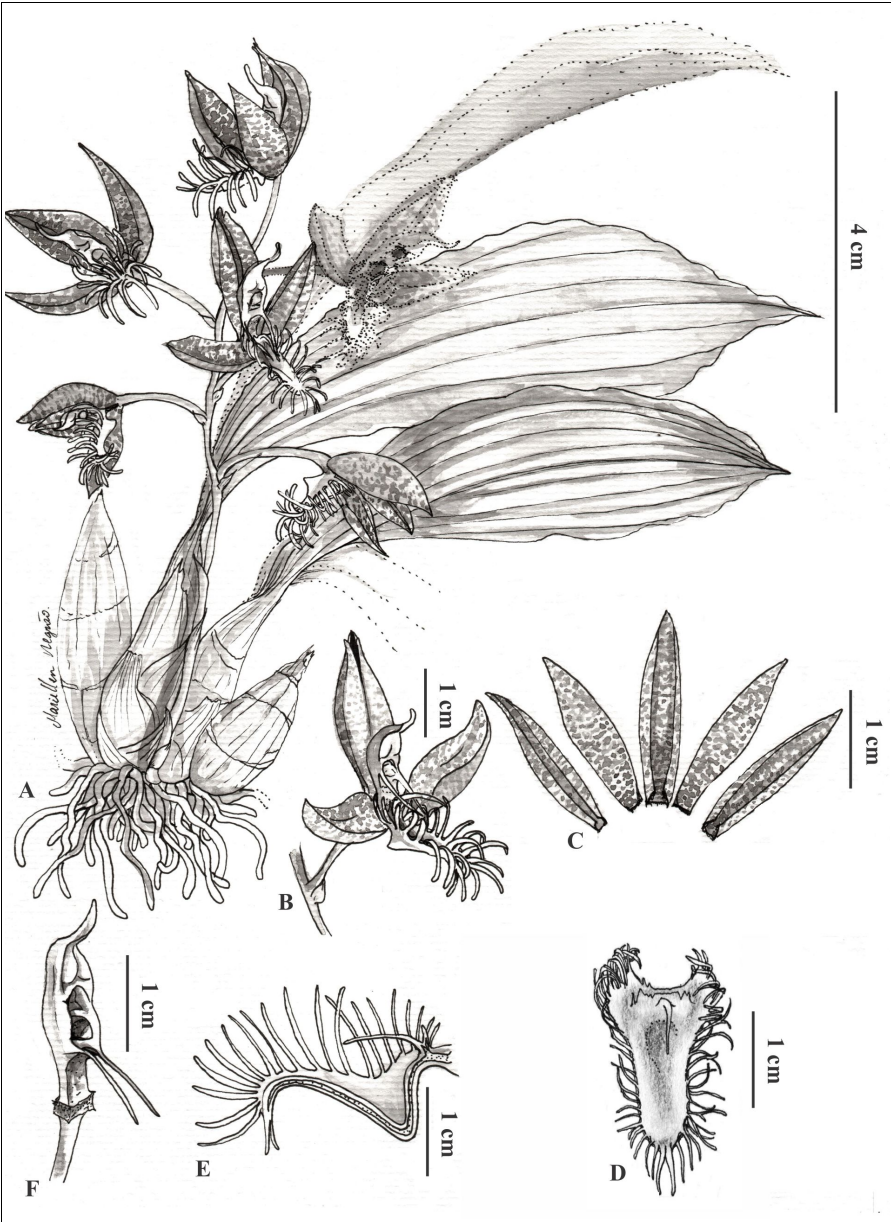


Fig. 2: *Catasetum taquerense*

A. Habit. B. Flower. C. Sepals and petals. D. Lip, front view. E. Lip, longitudinal section. F. Gynostemium. Drawing Mariellen Furtado Negrão



Fig. 3: *Catasetum taquerense*

A. Habit. B. Male flower. C. Female flower. D. Male flower parts. E. Female floral parts. F-H. Lip of male flower. J-L. Male gynostemium. M-O. Female gynostemium
 Photos by A.H. Krahl

Notes. *Catasetum taquerense* (figure 4) is related to the species presenting symmetrical and parallel antennae – subgenus *Catasetum* section *Isoceras*

subsection *Isoceras* – (Bicalho & Barros, 1988; Senghas, 1991) and belongs to the *Catasetum cristatum* alliance (Bicalho & Barros, 1988), mostly defined by a more or less fimbriate lip. It is similar to *Catasetum saracataquerense*, but presents some differences: the lip is distinctly triangular on a large basal half, with fimbriae sparsely spaced and placed on the lip margin with weak concentration at the apex so that the surface after the sac is glabrous, whereas in *C. saracataquerense* the lip is oblong, with fimbriae densely present along the margin and on the entire surface after the lip sac. Besides the fimbriae in *C. taquerense* are distinctly shorter than in *C. saracataquerense* (ca. 2-4 mm *versus* ca. 10 mm). Furthermore, the former is blooming mostly in the second half of the year whereas the latter is blooming in the first half, allowing only rare and short overlaps in the beginning of the year (Krahl *et al.*, 2021). It participates to the quasi-complete reproductive isolation of both taxa.



Fig. 4: Images of *Catasetum taquerense*

Photos by J.B.F. da Silva.

Catasetum taquerense is also similar to *Catasetum barbatum* which has also symmetrical and parallel antennae. However, the latter has an oblong lip densely fimbriate on its entire surface and furnished with a tooth-shaped callus after the sac (Lindley, 1844) – see illustration of the type in Rocha & Silva (2001) and description in Oliveira *et al.* (2021). Besides the fimbriae are, as in *C. tacarataquerense*, much longer (Lindley, 1844).

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