

Re-discovery of *Catasetum mojuense* (Orchidaceae: Catasetinae), a poorly-known Amazonian species

Felipe Fajardo Villela Antolin Barberena^{1,2},
Deivid Lucas de Lima da Costa¹, José Antônio Lima Rocha Junior¹

1 *Universidade Federal Rural da Amazônia – campus Capitão Poço, Herbário HCP, Estrada do Pau Amarelo, s.n., Vila Nova, Capitão Poço, PA, Brazil, CEP 68650-000*

2 *Museu Paraense Emílio Goeldi, Coordenação de Botânica, Avenida Perimetral, 1901, Terra Firme, Belém, PA, Brazil, CEP 66077-830*

Corresponding author: Felipe Fajardo Villela Antolin Barberena (felipe.fajardo@ufra.edu.br)

Academic editor: A. M. Leal-Zanchet | Received 10 May 2020 | Accepted 3 September 2020 | Published 9 October 2020

Citation: Barberena FFVA, da Costa DLL, Rocha Jr JAL (2020) Re-discovery of *Catasetum mojuense* (Orchidaceae: Catasetinae), a poorly-known Amazonian species. *Neotropical Biology and Conservation* 15(4): 447–452. <https://doi.org/10.3897/neotropical.15.e54142>

Abstract

The re-discovery of *Catasetum mojuense* A.T. Oliveira & J.B.F. Silva (Orchidaceae), an Amazonian species described in 1999 from the State of Pará, Brazil, is reported. In addition to geographic distribution data, a morphological description, taxonomical and ecological comments, conservation status assessment and photographs of *C. mojuense* are also provided. The species is characterised by having epiphytic habit, non-resupinate staminate flowers, brown-spotted petals, galeiform and smooth (no ribs) lip, lateral lobes with sparsely short-fimbriate margins and convergent antennae. *Catasetum mojuense* is morphologically similar to *Catasetum discolor* (Lindl.) Lindl, but is easily distinguished by the longer sepals and petals and the spotted petals on the staminate flowers. The new locality of occurrence for *C. mojuense* is approximately 190 km east of the type locality, also in the State of Pará. The species is assessed as Critically Endangered. Habitat depletion and the limited number of sites of occurrence are the main concern for the conservation of *C. mojuense*.

Keywords

Amazon, Capitão Poço, conservation, endemism, orchid, Pará, taxonomy

The genus *Catasetum* Rich. ex Kunth (Epidendroideae, Cymbidieae, Catasetinae) comprises at least 130 species and dozens of natural hybrids and is distributed from México to Argentina, but has its greatest diversity in the Brazilian Amazon (Romero and Carnevali 2009; Flora do Brasil 2020), from where several new taxa have been described recently (e.g. Petini-Benelli 2016a; Petini-Benelli and Soares-Lopes 2017; Valsko et al. 2019). *Catasetum* is characterised by robust pseudobulbs, plicate leaves, basal and racemose inflorescence and commonly unisexual and dimorphic flowers. Species of the genus are mainly distinguished by characteristics of the staminate flowers (Romero and Carnevali 2009; Valsko et al. 2019).

Within the scope of the long-term project “Flora do Pará: Orchidaceae”, a collected individual of *Catasetum* was found to represent the second herbarium record of *C. mojuense* A.T. Oliveira & J.B.F. Silva, a poorly-known Amazonian species. In addition to geographic distribution data, a morphological description, taxonomical and ecological comments, conservation status assessment and photographs of the species are also provided.

The individual was initially cultivated in the orchidarium of Universidade Federal Rural da Amazônia and flowered in August 2019, October 2019 and January 2020 (Fig. 1), when finally it was pressed according to Petini-Benelli (2016b) and deposited at herbarium HCP (acronym according to Thiers 2020). The specimen (R.S. Miranda & F.A. Silva s.n., HCP 405) was identified through consultation of specialised literature on the genus, such as Oliveira and Silva (1998), and analysis of protologues of species closely related to *C. mojuense*. The collections of the Amazonian herbaria HBRA, HCJS, HCP, HF, HIFPA, HSTM, IAN, MFS and MG were also consulted. Digital databases CRIA (2020) and JABOT (2020) were also checked, but proved uninformative. Coordinates of the type locality were inferred using specimen label information (Magdalena et al. 2018). Area of Occupancy (AOO) was calculated using the online platform Geospatial Conservation Assessment Tool (GeoCAT) and was based on a defined cell width of 2 km (Bachman et al. 2011). The conservation status of the species was assessed following IUCN criteria (IUCN 2020). A map was elaborated using ARC-GIS software, version 10.2.

Catasetum mojuense A.T. Oliveira & J.B.F. Silva. Boletim do Museu Paraense Emílio Goeldi, Série Botânica 14: 110. 1998 [1999]. Typus: BRAZIL – Pará, Mojú • J.B.F. Silva 562 (MG 150477!); on state highway PA-150, 10 km from the Mojú River; 13 Apr 1996; fl. masc.

Epiphytic herb. Pseudobulbs ca. 26–30 × 3.5–4.5 cm, aggregated, piriform, 3–4-foliolate. Leaves 31–39 × 5–6 cm, elliptic-lanceolate, apex acuminate. Inflorescence ca. 75 cm long, basal, initially erect, later arched with weight, with up to 15 non-resupinate staminate flowers. Pedicel+ovary ca. 2.5 cm long. Sepals yellowish-brown to greenish, immaculate, oblong to lanceolate, slightly concave, apex acute to acuminate; dorsal sepal ca. 3 × 0.6 cm; lateral sepals ca. 2.5 × 0.5 cm. Petals ca. 3 × 0.8 cm, yellowish-brown to greenish, with brown spots, connivent with dorsal sepal, oblong to slightly lanceolate, revolute when senescent, apex acuminate. Lip 1.5–1.6 × 2.2–2.3 cm, yellowish to yellowish-green, galeiform, ca. 1.3 cm deep, smooth (no veins), trilobed, frontal lobe ca. 0.4 × 1 cm, trapeziform, apex acute, margin en-

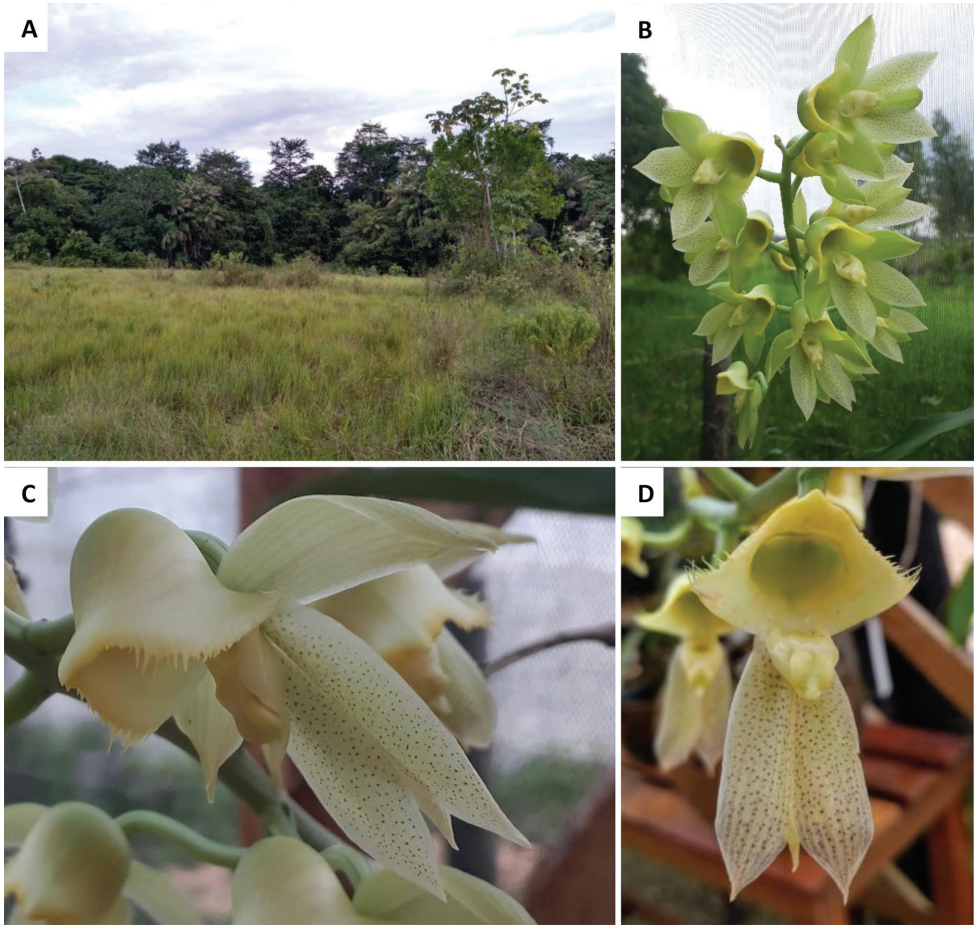


Figure 1. Habitat and morphological details of *Catasetum mojuense* A.T. Oliveira & J.B.F. Silva. (A) Habitat in the Municipality of Capitão Poço, Pará, Brazil. (B–D) The same individual (R.S. Miranda & F.A. Silva, HCP 405) flowering at three different times in the orchidarium of Universidade Federal Rural da Amazônia, campus Capitão Poço. (B) Inflorescence in August 2019. (C) Flower (lateral view) in October 2019. (D) Flower (frontal view) in January 2020. Photographs by Deivid Lucas de Lima da Costa (A and D) and Felipe Fajardo Villela Antolin Barberena (B–C).

tire, lateral lobes 0.7×1.5 cm, sub-triangular, convex, apex acute, margin sparsely short-fimbriate. Column ca. 1.2×0.7 cm, erect. Antennae ca. 0.4 cm long, parallel, convergent, symmetrical. Anther cap ca. 0.7×0.3 cm, whitish. Pollinia 2, $0.3\text{--}0.4 \times$ ca. 0.1 cm, yellow. Stipe ca. $0.5 \times 0.2\text{--}0.3$ cm. Pistillate flowers and fruits not seen.

Examined material: BRAZIL – Pará, Capitão Poço • R.S. Miranda & F.A. Silva (HCP 405); property of Mr. Eduardo, near Cubiteua, on state highway PA-124; $1^{\circ}41'36''\text{S}$, $47^{\circ}3'48''\text{W}$; alt. 80 m; Oct. 2018, fl. cult. 6 Jan 2020; fl. masc.

The species was described based on a single specimen collected in 1996 from the Municipality of Moju, in the State of Pará, Brazil. The holotype *J.B.F. Silva* 562 is deposited in the herbarium of Museu Paraense Emilio Goeldi and consists of

only one flower positioned at the apex of the inflorescence. *Catasetum mojuense* was mistakenly described as having only one resupinate staminate flower (Oliveira and Silva 1998 [1999]), possibly due to the bending and senescence of the collected inflorescence, but the species presents up to 15 non-resupinate staminate flowers (Fig. 1). The vegetative organs of the species (pseudobulbs and leaves) were also originally described and illustrated, although the protologue makes no mention of *ex situ* cultivation of parts of the holotype or the occurrence of other specimens. In any case, pseudobulbs, leaves and mainly the inflorescence of the newly-collected specimen presented larger dimensions than those described by Oliveira and Silva (1998 [1999]), but this may only represent discrete phenotypic variation.

The species is recognised when fertile and is characterised by non-resupinate staminate flowers, brown-spotted petals, galeiform and smooth (no ribs) lip, lateral lobes with sparsely short-fimbriate margins and convergent antennae. *Catasetum mojuense* is morphologically similar to *Catasetum discolor* (Lindl.) Lindl. (Oliveira & Silva, 1998 [1999]), but is easily distinguished by the longer sepals and petals (≥ 2.5 cm long vs. sepals and petals ≤ 2.1 cm long) (Pessoa et al. 2015; Flora do Brasil 2020) and the petals with brown spots on the staminate flowers (vs. immaculate petals).

The second specimen (*R.S. Miranda & F.A. Silva*, HCP 405) of *C. mojuense* was collected in October 2018, more than 20 years after the first record. It was on a palm tree near a stream at an elevation of about 80 m on a farm in an agricultural region of the Municipality of Capitão Poço, State of Pará. The new locality of occurrence for *C. mojuense* is approximately 190 km east of the type locality (Municipality of Moju, Pará) (Fig. 2). Based on these two records, the AOO was determined to be 8 km². According to IUCN criteria (2020), *C. mojuense* is assessed as Critically Endangered (CR B2ab [i, ii, iii, v] + C2a[i]), since it has AOO < 10 km² and is restricted to only two fragmented locations, where there are certainly fewer than 250 adult specimens in total and probably fewer than 50 in each subpopulation.

The Municipalities of Moju and Capitão Poço, wherein *C. mojuense* occurs, are predominantly covered by dense ombrophilous forest (Fig. 2) (IBGE 2019). Nevertheless, the vegetation in the two municipalities has been intensely suppressed. In Moju, pasture and secondary vegetation occupy extensive areas and selective extraction of wood and intensification of oil palm cultivation are notorious (Ferreira et al. 2017). Likewise, the vegetation of Capitão Poço has been replaced by pastures and agricultural activities, mainly for orange and pepper cultivation. Therefore, habitat depletion and the limited number of sites of occurrence are the main concerns for the conservation of *C. mojuense*. The new record of *C. mojuense* in Pará encourages continued floristic-taxonomic projects encompassing Orchidaceae in the state, especially those that include determining population sizes and establishing conservation policies for endemic or threatened species.

We thank Erik Wild for reviewing the English language and Igor Soares dos Santos for helpful suggestions.

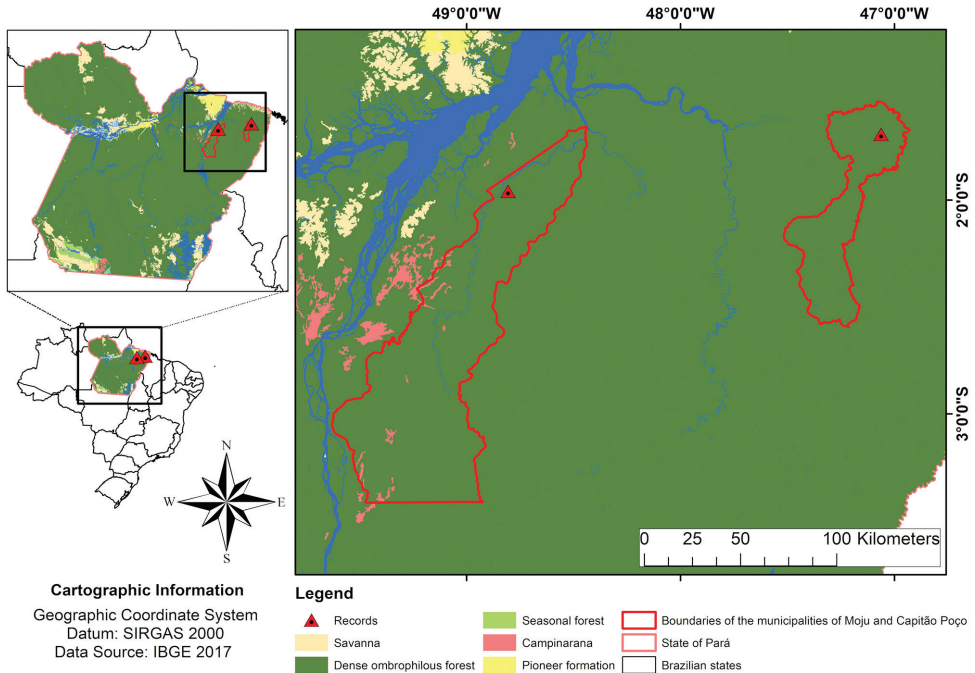


Figure 2. Distribution map for *Catasetum mojuense* A.T. Oliveira & J.B.F. Silva showing localities of occurrence (red triangles) of the species in northern Brazil. Map produced by José Antônio Lima Rocha Junior.

References

- Bachman S, Moat J, Hill AW, De La Torre J, Scott B (2011) Supporting Red List threat assessments with GeoCAT: Geospatial conservation assessment tool. *ZooKeys* 150: 117–126. <https://doi.org/10.3897/zookeys.150.2109>
- CRIA [Centro de Referência em Informação Ambiental] (2020) *Catasetum mojuense*. <http://www.splink.org.br/index?lang=pt> [Accessed on 02.01.2020]
- Ferreira SCG, Lima AMM, Corrêa JAM (2017) Zoneamento da bacia hidrográfica do rio Moju (Pará): usos da água e sua relação com as formas de uso e cobertura do solo. *Revista Ambiente & Água: an Interdisciplinary Journal of Applied Science* 12(4): 680–693. <https://doi.org/10.4136/ambi-agua.2069>
- Flora do Brasil (2020) *Catasetum*. Jardim Botânico do Rio de Janeiro. <http://floradobrasil.jbrj.gov.br/reflora/floradobrasil/FB11312/> [Accessed on 05.01.2020]
- IBGE [Instituto Brasileiro de Geografia e Estatística] (2019) Divisão Regional do Brasil. <https://ibge.gov.br/geoci%c3%aancias/downloads-geociencias.html> [Accessed on 04.01.2020]
- IUCN [International Union for Conservation of Nature and Natural Resources] (2020) IUCN Red List Categories and Criteria: Version 3.1. IUCN Species Survival Commis-

- sion. IUCN, Gland, Switzerland and Cambridge, UK. <https://www.iucnredlist.org/> [Accessed on 12.01.2020]
- JABOT (2020) *Catasetum*. <http://rb.jbrj.gov.br/v2/consulta.php> [Accessed on 02.01.2020]
- Magdalena UR, Silva LAE, Lima RO, Bellon E, Ribeiro R, Oliveira FA, Siqueira MF, Forzza RC (2018) A new methodology for the retrieval and evaluation of geographic coordinates within databases of scientific plant collections. *Applied Geography* 96: 11–15. <https://doi.org/10.1016/j.apgeog.2018.05.002>
- Oliveira AT, Silva JBF (1998) [1999] *Catasetum mojuense* e *Catasetum tucuruense*: Novas espécies de Orchidaceae para o estado do Pará, Brasil. *Boletim do Museu Paraense Emílio Goeldi* 14(2): 109–115. <http://repositorio.museu-goeldi.br/handle/mgoeldi/187>
- Pessoa E, Barros F, Alves M (2015) Orchidaceae from Viruá National Park, Roraima, Brazilian Amazon. *Phytotaxa* 192(2): 61–96. <https://doi.org/10.11646/phytotaxa.192.2.1>
- Petini-Benelli A (2016a) Nova espécie de *Catasetum* para o estado do Amazonas, Brasil. *Orquidário* 30(1–2): 26–36.
- Petini-Benelli A (2016b) Herborização de Orchidaceae com pseudobulbos espessados. *Revista em Agronegócio e Meio Ambiente* 9(4): 935–948. <https://doi.org/10.17765/2176-9168.2016v9n4p935-948>
- Petini-Benelli A, Soares-Lopes CRA (2017) New taxa of *Catasetum* (Orchidaceae, Catasetinae) from Mato Grosso, Brazil. *Richardiana* 1: 31–43. https://richardiana.jardinbotaniquedeguyane.com/new_catasetum_from_mato_grosso/
- Romero GA, Carnevali G (2009) *Catasetum*. In: Pridgeon AM, Cribb PJ, Chase MW, Rasmussen FN (Eds) *Genera Orchidacearum, Epidendroideae – parte II*. Oxford University Press, Oxford, 13–18.
- Thiers B (2020) Index herbariorum: a global directory of public herbaria and associated staff. New York Botanical Garden's Virtual Herbarium. <http://sweetgum.nybg.org/science/ih/> [Accessed on 03.01.2020]
- Valsko JJ, Krahl AH, Petini-Benelli A, Chiron G (2019) *Catasetum sophiae*, a new species of Orchidaceae (Catasetinae) from northern Brazil. *Phytotaxa* 402(2): 104–120. <https://doi.org/10.11646/phytotaxa.402.2.5>