

Confirmation of the presence of *Epidendrum purpureocaulis* (Orchidaceae) in Brazil and expansion of its geographic distribution to the State of Pará¹

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How to cite: Silva, D.F., Nascimento, E.G., Zappi, D.C., & Barberena, F.F.V.A. 2024. Confirmation of the presence of *Epidendrum purpureocaulis* (Orchidaceae) in Brazil and expansion of its geographic distribution to the State of Pará¹. Hoehnea 51: e1082023. <http://dx.doi.org/10.1590/2236-8906e1082023>

ABSTRACT – (Confirmation of the presence of *Epidendrum purpureocaulis* (Orchidaceae) in Brazil and expansion of its geographic distribution to the State of Pará). *Epidendrum purpureocaulis* is a recently described species, belonging to the group *Epidendrum nocturnum*, and was previously known only from French Guiana. *Epidendrum ancipitinocturnum* was described from the Brazilian State of Amazonas, and was later recognized as conspecific with *E. purpureocaulis* by several orchidologists, a position with which we agree. However, the occurrence of *E. purpureocaulis* in Brazil is not included in the main global botanical databases since *E. ancipitinocturnum* has been treated as an autonomous species or even as a synonym of *Epidendrum carpophorum* in these databases. Our objective is to confirm the occurrence of *E. purpureocaulis* in Brazil and report the expansion of its geographic distribution to the State of Pará. We found a small population of *E. purpureocaulis* in a transition area between *campinarana* and *terra firma* forest vegetational types in the municipality of Cachoeira do Arari, Marajó Island, in the Brazilian Amazon. The collected specimen represents the easternmost distribution record of *E. purpureocaulis*, being approximately 650 kilometers away from its nearest location. Field efforts have been intensified in Cachoeira do Arari in order to identify new populations and better understand the ecological requirements of *E. purpureocaulis*.

Keywords: Amazon, Epidendroideae, Marajó Island, new record, orchids

RESUMO – (Confirmação da presença de *Epidendrum purpureocaulis* (Orchidaceae) no Brasil e ampliação de sua distribuição geográfica para o Estado do Pará). *Epidendrum purpureocaulis* é uma espécie recém-descrita, pertencente ao grupo *Epidendrum nocturnum* e, anteriormente, conhecida apenas da Guiana Francesa. *Epidendrum ancipitinocturnum* foi descrito a partir de espécimes procedentes do Estado brasileiro do Amazonas, e, posteriormente, foi reconhecido como coespecífico de *E. purpureocaulis* por vários orquidólogos, posicionamento com o qual concordamos. Entretanto, a ocorrência de *E. purpureocaulis* no Brasil não consta nas principais bases de dados botânicos globais, uma vez que *E. ancipitinocturnum* tem sido tratada como uma espécie autônoma ou ainda como um sinônimo de *Epidendrum carpophorum* nestas bases de dados. Nosso objetivo é confirmar a ocorrência de *E. purpureocaulis* no Brasil e relatar a expansão de sua distribuição geográfica para o Estado do Pará. Encontramos uma pequena população de *E. purpureocaulis* em uma área de transição entre os tipos vegetacionais campinarana e terra firme, no município de Cachoeira do Arari, Ilha de Marajó, na Amazônia brasileira. O espécime coletado representa o registro de distribuição mais oriental de *E. purpureocaulis*, estando a aproximadamente 650 quilômetros de distância de seu local mais próximo. Os esforços de campo têm sido intensificados em Cachoeira do Arari, com o objetivo de identificar novas populações e compreender melhor as exigências ecológicas de *E. purpureocaulis*.

Palavras-chave: Amazônia, Epidendroideae, Ilha do Marajó, novo registro, orquídeas

Introduction

Epidendrum L. is a neotropical genus and one of the largest in Orchidaceae, encompassing around 1,850 species (POWO 2024), and these numbers are growing, with dozens of species being described

annually (Barberena *et al.* 2016). *Epidendrum* species usually present the following set of characteristics: sympodial plants, with distic leaves distributed along the stem or at its apex, apical inflorescence, petals narrower than the sepals, column fully adnate to the lip, rostellum parallel to the axis of the column, and

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a cuniculus in the ovary (Hágsater & Soto-Arenas 2005). The infrageneric classification still needs further improvement (Klein *et al.* 2019), however the most widely used has been that of Hágsater (1985), who established informal morphological groups, and has been continually updated (*e.g.*, Hágsater & Sánchez-Saldaña 2008, Hágsater & Sánchez-Saldaña 2010, Hágsater & Santiago 2020, Hágsater & Santiago 2021).

During field collections at the Marajó Island in the State of Pará, Brazil, we found a small population of *Epidendrum purpureocaulis* Essers & Sambin, a recently described species belonging to the *E. nocturnum* group and, until now, restricted to French Guiana (Sambin & Essers 2018) and the State of Amazonas in Brazil (Hágsater & Santiago 2020). Therefore, we confirm the occurrence of *E. purpureocaulis* in Brazil and report the expansion of its geographic distribution to the State of Pará.

Material and Methods

We present a morphological description of *E. purpureocaulis* based on the analysis of a specimen collected by us in June 2023 in the municipality of Cachoeira do Arari, Pará, Brazil and deposited in the MG herbarium, following the usual techniques in taxonomy (Fidalgo & Bononi 1984). The municipality has an area of 3,100.261 km² and is located on the east coast of Marajó Island (IBGE 2022), where the climate is tropical humid (type Am according to the Köppen classification), with average temperature of around 27°C and average annual rainfall of 2,500 mm (Lima 2005). The predominant vegetation in the region is composed by terra firma forests, flooded fields, *campinaranas* and Amazonian savannas (Brasil 1999, Alves 2010). Eight field expeditions were carried out in the municipality from June 2023 to September 2023, and the area within a radius of 300 meters from the collection site was thoroughly searched.

We analyzed the protologue of *E. purpureocaulis* and the main bibliographical references for *Epidendrum*, notably the Icones Orchidacearum series (*e.g.*, Hágsater & Santiago 2020). Digital images of herborized specimens of *E. purpureocaulis* deposited in the CAY, COL and INPA herbaria, and color photographs of living plants from the HJBG herbarium (acronyms according to Thiers 2024, continuously updated) were also analyzed, aiming to confirm the identification of the specimen from the State of Pará. The REFLORA Virtual Herbarium (REFLORA 2023) and Environmental Information Reference Center (CRIA 2023) databases were consulted in search of additional specimens of *E. purpureocaulis*. We also provide photographic plates of the species and its habitat, geographic distribution

data and ecological information about the taxon. *Epidendrum purpureocaulis* was photographed *in situ* with a Motorola Edge 20 Pro cell phone (Motorola Mobility LLC, Chicago, USA). The morphological terminology is in accordance with Radford *et al.* (1974) and Dressler (1981). A map of the species' distribution in Brazil (also including the nearest location to the new record, in French Guiana) was prepared using QGIS software, version 3.32.1.

Results

Taxonomy

Epidendrum purpureocaulis Essers & Sambin, Richardiana 87(2): 144-151. 2018.

Figure 1

TYPE: FRENCH GUIANA. Sinnamary, Petit-Saut, PK 16, 02-VII-2017 (fl.), *D. Essers & A. Sambin 1083* (holotype: CAY; isotype: HJBG-H photos!).

= *Epidendrum ancipitinocturnum* Hágsater & J.M.P. Cordeiro, Icon. Orchid. 18(1): 30, pl. 1803. 2020. TYPE: BRAZIL. Amazonas: Novo Airão, passando Manacapuru, ramal do Mineiro, km 33, 93 m, 26-II-2017 (fl. cult. 22-X-2020), *E. Hágsater et al. 15079* (barcode INPA0289111, digital image).

Epiphytic herb, ca. 17 cm long; rhizome inconspicuous, stems 2-7 × ca. 0.3-0.7 cm, not thickened in pseudobulbs, subcylindrical, ancipitate, covered with sheaths; leaves 6-10 × 2.1-3 cm, adaxial face purplish-green, abaxial face purplish, sessile, apical, 2-3, coriaceous, elliptical to oblong, margin entire, apex acute to rounded; inflorescence ca. 15 cm long, racemose, apical, 1-flowered; flower resupinate; pedicellate ovary ca. 8.5 cm long; sepals ca. 7 × 0.6 cm, pinkish-purple, linear, margin entire to revolute, apex acuminate, petals 6.5-6.6 × ca. 0.4 cm, greenish-yellow, linear, margin entire, apex acuminate; lip ca. 5.5 × 3 cm, white to yellowish-white, trilobed, lateral lobes triangular ca. 3.5 × 0.6 cm, oblique, margin entire to slightly wavy, apex acuminate, central lobe ca. 4.5 × 0.15 cm, linear, narrower towards the apex, slightly convex, margin wavy, apex acuminate, 2 calli ca. 0.4 × 0.2 cm, yellowish-white, oblong; column ca. 2.3 cm long, white to yellowish-white, clavate, slightly arched; anther cap ca. 0.25 × 0.2 cm, creamy-white, ovoid; 4 pollinia ca. 0.15 × 0.8 cm, yellow, waxy, obovoid, laterally flattened; fruits not seen.

Examined material: BRAZIL. PARÁ. Cachoeira do Arari, Vila Caracará, 01°06'28"S, 48°47'11"S, 30-VI-2023 (fl.), *D.S. Ferreira & E.G. Nascimento 147* (MG).

Additional material: BRAZIL. JAPURUÁ. [Ilha do] Inambú. 17.XI.1952 (fl.), *R. Romero-Castañeda 3590* (paratype, barcode COL [not COAH] 000365417,

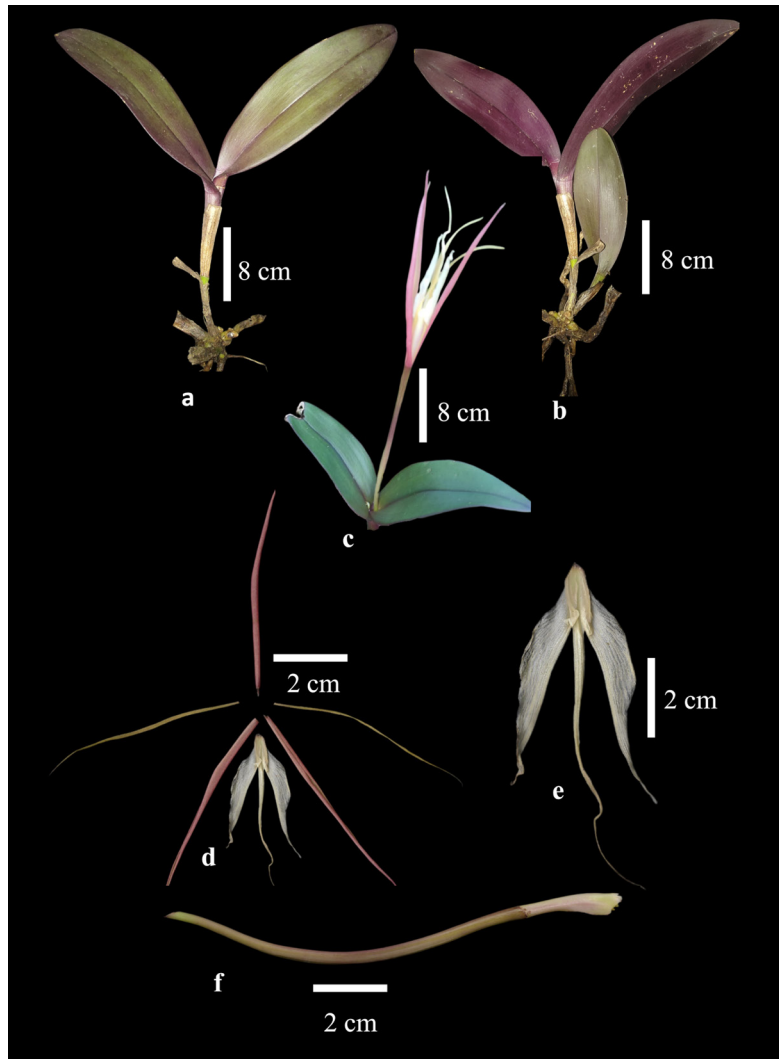


Figure 1. *Epidendrum purpureocaulis* Essers & Sambin. a. Habit, highlighting the stem and leaves on the adaxial side. b. Habitat, highlighting the stem and leaves on the abaxial side. c. Leaves and inflorescence. d. Dissected flower. e. Lip details. f. Pedicellate ovary and column. Plate and photographs by D.F. Silva based on D.S. Ferreira & E.G. Nascimento 147 (MG).

digital image). FRENCH GUIANA. Bassin du Sinnamary, barrage de Petit-Saut, 3 m, 5°3'N, 53°3'W, 30.XI.1994 (fr.), J.J. Granville *et al.* 12671 (paratype, barcode CAY166516, digital image). Monts Bakra, 1,5 Km à l'ouest du Pic Coudreau, 550 m, 3°18'N, 52°57'W, 18-VI-2002 (fl.), J.J. Granville *et al.* 14844 (paratype, barcode CAY 038183, digital image).

Discussion

Epidendrum purpureocaulis is characterized by the stem and abaxial surface of the leaves strongly tinged with purple, ancipitate stems, and lip with slightly oblique lateral lobes, semi-oval to triangular and with acuminate apex (Sambin & Essers 2018; fig. 1). *Epidendrum ancipitinocturnum* Hágsater & J.M.P. Cordeiro (2020) is conspecific with *E. purpureocaulis* as highlighted by several orchidologists (Hágsater & Santiago 2021, Sambin & Aucord 2021, Krahling *et al.* 2022), a position with which we agree. However,

the occurrence of *E. purpureocaulis* in Brazil is not included in the main global botanical databases since *E. ancipitinocturnum* has been treated as an autonomous species (POWO 2024) or even as a synonym of widely distributed *Epidendrum carpophorum* Barb.Rodr. (Pessoa 2024 in Flora e Funga do Brasil, Tropicos 2024) in these databases. *Epidendrum purpureocaulis* and *E. carpophorum* belong to the *Epidendrum nocturnum* group, being characterized by short, racemose or pluri-racemose inflorescences, without spathaceous bracts, with usually large, star-shaped flowers, and morphologically similar sepals and petals. These two species are also part of the subgroup *nocturnum*, which has cane-like stems, non-thickened towards the middle, and usually successive flowers (Hágsater & Sánchez-Saldana 2008, Sambin & Essers 2018).

In our view, *E. purpureocaulis* is easily distinguished from *E. carpophorum* by the narrower leaves, longer and acuminate lateral lobes (vs. acute), and distinctly longer column (Sambin & Essers 2018),

in addition to the purple abaxial surface of the leaves (vs. green, rarely purplish), fewer leaves (2-3 vs. 4-10) that are inserted distally on the stem (vs. distributed throughout the stem), and median lobe of the lip with wavy margin (vs. entire). Among the species that occur in the Brazilian Amazon, *E. pupureocaulis* could also be confused with *E. nocturnum*, but is distinguished primarily by its vegetative morphology — ancipitate stems (vs. cylindrical) and color (purple vs. green) and number of leaves (2-3 vs. 4 or more).

Epidendrum purpureocaulis was previously known only from French Guiana, where it had been recorded in different sites, at altitudes of 30-550 m (Sambin & Essers, 2018), and from two localities in the State of Amazonas, in Brazil, one near the capital Manaus (municipality of Novo Airão), where it was found in *campinarana* (white sand vegetation) at about 100 meters elevation, and another near the border with Colombia

(municipality of Japurá) (Sambin & Essers, 2018; Hágsater & Santiago 2020).

We found seven individuals in a transition area between the *campinarana* and *terra firma* forest vegetation in the municipality of Cachoeira do Arari, Marajó Island, in the eastern Brazilian Amazon (fig. 2). Four individuals of *E. purpureocaulis* were collected: three sterile ones, which are in *ex situ* cultivation in Cachoeira do Arari, under the care of the first author (DFS), and another, which was fertile and was herborized (*D.S. Ferreira & E.G. Nascimento 147*). This specimen had a partially open flower, in line with what was reported by Sambin & Essers (2018), who mentioned that the species generally present cleistogamous flowers. The specimen was collected with flowers in June, differing slightly from the flowering period in French Guiana, which is concentrated from July to September (Sambin & Essers 2018).



Figure 2. *Epidendrum purpureocaulis* Essers & Sambin. a-b. Habitat. c. Details of two individuals on porophyte. Plate and photographs by D.F. Silva.

This record of *E. purpureocaulis* increases to 31 the number of *Epidendrum* species reported to the Pará State (Pessoa 2024). The present record also represents the easternmost distribution locality of *E. purpureocaulis* and is approximately 650 kilometers away from the nearest location of the species has been recorded (Saül, French Guiana; fig. 3). In Brazil, the species occurs mostly in *campinaranas*, and it is important to notice that this vegetation

has been suffering with the intensification of land transformation (sand extraction) and deforestation in Cachoeira do Arari, including in the locality where *E. purpureocaulis* was collected. Field efforts have been intensified in the locality, in order to locate new populations and better understand the ecological requirements of *E. purpureocaulis* aiming at proposing conservation measures to enable the preservation of the species genetic pool.

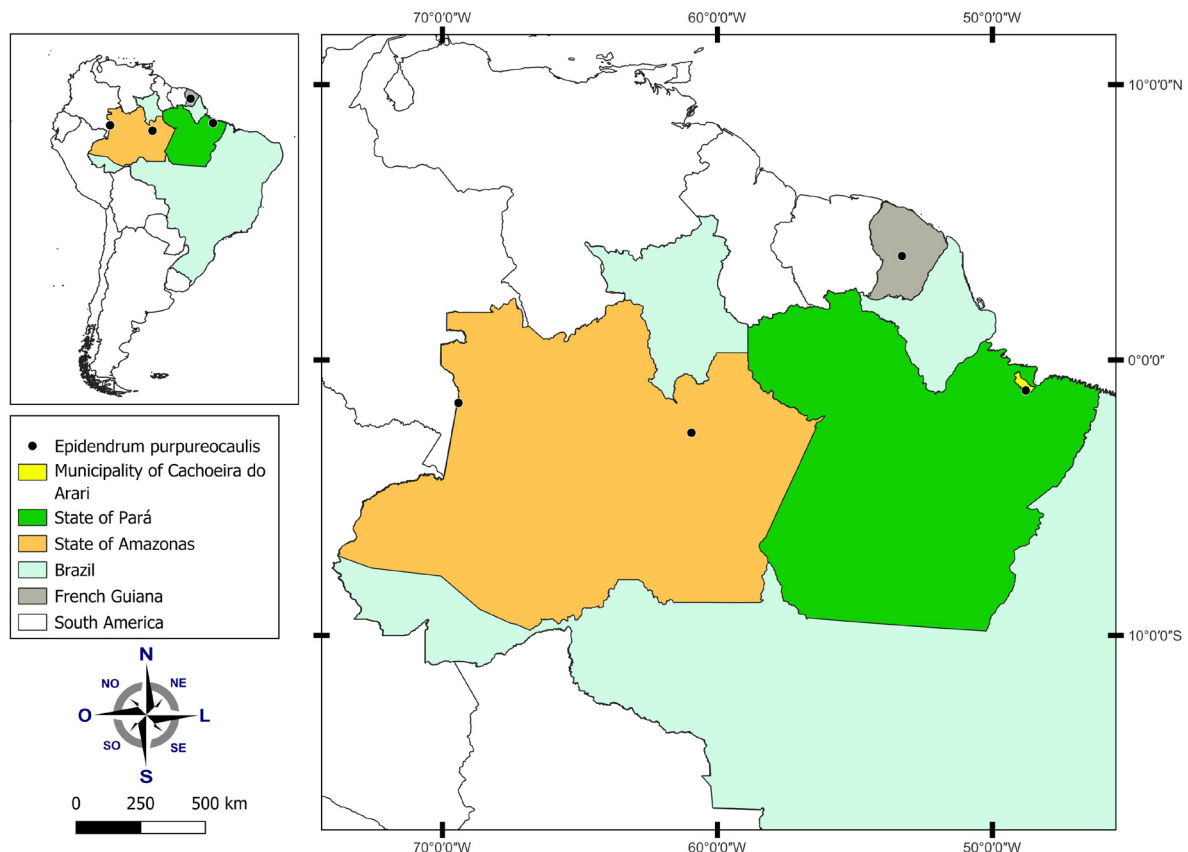


Figure 3. Map showing the distribution of *Epidendrum purpureocaulis* Essers & Sambin in Brazil, including the new record in the municipality of Cachoeira do Arari, in the State of Pará, Brazil, and the nearest location to this record, situated in Saül, in French Guiana. Map prepared by David Ferreira da Silva.

Acknowledgments

This study was financed in part by the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior - Finance Code 001. David Ferreira da Silva thanks the CAPES, for the Masters scholarship awarded (88887.680214/2022-00). Daniela Cristina Zappi is a holder of a Conselho Nacional de Desenvolvimento Científico e Tecnológico Productivity grant (04178/2021-7).

Conflict of interest

The authors declare that they have no conflict of interest.

Authors' contributions

David Ferreira da Silva, Erlediel Gusmão do Nascimento, Daniela Cristina Zappi and Felipe Fajardo Villela Antolin Barberena: Contributed to the investigation and data curation, commented on previous versions of the manuscript and had the opportunity to read and approve the final manuscript.

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Associate Editor: Juliana de Paula Souza

Received: 29/11/2023

Accepted: 03/07/2024



ISSN da publicação online 2236-8906

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