ISSN 2262-9017
Jardin Botanique de Guyane
RICHARDIANA
nouvelle série
Volume 9
http://richardiana.jardinbotaniquedeguyane.com

First record of *Epidendrum puniceoluteum* (Orchidaceae, Laeliinae) for the Minas Gerais state, southeastern Brazil

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Abstract

In this article we extend the geographical distribution of *Epidendrum puniceoluteum* to the state of Minas Gerais, southeastern Brazil. This taxon belongs to the so-called "Atlantic clade" made of five species. Hitherto it was known only from the states of São Paulo, Paraná, Santa Catarina and Rio Grande do Sul. We provide here a short taxonomic description, data relating to geographic distribution and phenology as well as preliminary conservation status and taxonomic notes.

Manuscrit reçu le 28/05/2025 Article mis en ligne le 17 juillet 2025 – pp. 7–19

Résumé

Dans cet article la distribution géographique d'*Epidendrum puniceoluteum* est étendue au Minas Gerais, État du sud-est du Brésil. Ce taxon appartient au « clade atlantique » qui comprend cinq espèces. Jusqu'ici il n'était connu que des États de São Paulo, Paraná, Santa Catarina et Rio Grande do Sul. Nous proposons ici une brève description morphologique, des données relatives à la distribution géographique et à la phénologie ainsi qu'un statut de conservation préliminaire et des notes taxinomiques.

Resumo

Aqui neste trabalho expandimos a distribuição geográfica de *E. puniceoluteum* para o estado de Minas Gerais, sudeste do Brasil. Este táxon faz parte do "clado atlântico" composto por cinco espécies e até então era conhecido apenas para os estados de São Paulo, Paraná, Santa Catarina e Rio Grande do Sul. Aqui apresentamos uma breve descrição taxonômica e dados relativos à distribuição geográfica e fenologia. Um status de conservação preliminar também é fornecido, bem como notas taxonômicas da espécie.

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 genus *Epidendrum* Linnaeus (1763: 1347), belonging to the subtribe Laeliinae (Chase *et al.*, 2015), is one of the largest genera of Orchidaceae in the world, and the largest and most widespread in the Neotropical region. It is composed of about 1500 to 1900 species and 12 natural hybrids (Hágsater & Soto-Arenas, 2005; POWO, 2025). It is widely distributed from the United States (North Carolina) to northern Argentina in South America (Hágsater & Soto-Arenas, 2005). Its members grow in a large variety of habitats, usually as epiphytic plants even if terrestrial or lithophytic individuals can be observed (Dodson, 2001; Hágsater & Soto-Arenas, 2005; Chase *et al.*, 2015).

It is a monophyletic genus (Hágsater & Soto-Arenas, 2005), of which various infrageneric classifications have been proposed, leading to division of the genus into sections or subgenera (*e.g.* Lindley,1841; Bentham, 1883; Brieger, 1977). However, it is also divided into various informal groups based on vegetative characters, as consistently developed by Hágsater and collaborators from 1984 to 2023 (Hágsater, 1984; Hágsater & Santiago, 2023). Despite all these works, which are mostly limited to descriptions of novelties, the genus is known for uncertainties regarding the true delimitation of a number of taxa. More integrative studies are needed to better understand the true taxonomic limits of each species complex (*e.g.* Pinheiro & Barros, 2007a, b; Pessoa *et al.*, 2012; 2020).

One of the best-known subgenera of *Epidendrum* is *Amphyglottium* Lindley (1841: 86) (see Pinheiro *et al.*, 2009; Pessoa *et al.*, 2012). It is a monophyletic group (Hágsater & Soto-Arenas, 2005; Pinheiro *et al.*, 2009) with strongly supported clades representing different biogeographical regions as, for example, the "Andean clade" – with species mainly distributed along the mountain ranges of the Andes and the Guianas – or the "Atlantic clade" –composed of species distributed along the Brazilian coastal region and in Cerrado and Caatinga biomes (Pinheiro *et al.*, 2009). The latter contains five species (Pessoa *et al.*, 2012) among which we find *E. puniceoluteum* Pinheiro & Barros (2006: 248), described from Paraná, in southern Brazil (Pinheiro & Barros, 2006; Stancik *et al.*, 2009) and then reported from the states of São Paulo, Santa Catarina and Rio Grande do Sul (Stancik *et al.*, 2009; Couto *et al.*, 2016; Pessoa, 2025).

The present work aims to report the first record of *E. puniceoluteum* for the state of Minas Gerais, southeastern Brazil (fig. 1). We give a short morphological description of the species as well as data relating to the habitat, the flowering, the geographical distribution and the conservation status. We also provide a geographic distribution map, a photographic plate and an identification key of the "Atlantic clade".

Material and methods

The specimen was found during a casual expedition conducted in the interior of Minas Gerais, more precisely in the municipality of Itatiaiuçu, district of Santa Terezinha de Minas, in a region known through Medeiros (20°17′00.4″S, 44°27′25.8″W). The material has been collected and herborized according to the usual process described in Mori *et al.* (1989) and later incorporated into the collections of the herbaria INPA and HUAM (acronyms according to Thiers, 2025). The specimen was identified using the protologue (in Pinheiro & Barros, 2006), type materials (barcodes: SPF00112493! [holotype]; MBM188717! [isotype] and UB0018391! [isotype]; to get a complete list of paratypes, please see Pinheiro & Barros, 2006) as well as the available literature (*e.g.* Stancik *et al.*, 2009; Couto *et al.*, 2016). Besides we also consulted materials referring to the taxon deposited in the herbaria EFC, FURB, HB, HCF, HUCP, ICN, K, MBM, R, RB, SP, SPF, UB, UPCB and US (acronyms according to Thiers, 2025). The morphological description here proposed is based on the observation of the collected material. The morphological terminology follows Dressler (1993) and Gonçalves & Lorenzi (2007). Information on phenology are based on *in situ* observations as well as data found on the labels of the materials consulted in herbaria. The geographical distribution is based on the occurrences recorded in the consulted herbaria and the distribution map has been produced using the software QGIS 3.40.6 “Bratislava” (QGIS Development Team, 2025), and the datum SIRGAS 2000.

The extension of occurrence (EOO) and the area of occupation (AOO) as defined in IUCN (2024) were calculated using the tool GeoCAT (Bachman *et al.*, 2011; http://geocat.kew.org/). For AOO we used 2 × 2 km cells. To evaluate the conservation status and place the species within one of the nine categories of threat, we used criterion B (size of the geographic distribution and fragmentation, number of locations, decline or fluctuation of population sizes) according to IUCN (2024). On the other hand, we followed Stroh *et al*. (2014) who claim that taxa with AOO or EOO deserving one of the threat categories of IUCN but occurring in 11 to 30 localities must be classified as NT (Near Threatened). To evaluate this number of localities, we considered as a locality a municipality/province in which at least one occurrence record has been confirmed.

Taxonomic treatment

Epidendrum puniceoluteum F. Pinheiro & F. Barros, *Hoehnea* 33: 248 (2006).

Type: BRAZIL: Paraná: Paranaguá, Balneário Sangrilé, I-1996, *O.S. Ribas, E. Barboza & L.B.S. Pereira 1051* (holotype SPF!; isotypes MBM!; UB!).

Brazilian material from Minas Gerais examined: Itatiaiuçu, district of Santa Terezinha de Minas, region of Medeiros, 20°17′00.4″S, 44°27′25.8″W, 22/II/2025, *A.H. Krahl, D.R.P. Krahl & F.C. dos Santos 1746* (INPA!); *idem*, 12/III/2025, *A.H. Krahl, D.R.P. Krahl & F.C. dos Santos 1750* (HUAM!).

Additional material examined: **BRAZIL: Paraná:** Paranaguá, XII/1910, *F.C. Hoehne 4124* (R! - paratype); Caiobá, 02/X/1929, *F.C. Hoehne s.n.* (SP! - paratype); Caiobá (na costa do atlântico), 35 km ao S de Paranaguá, 31/X/1947, *G. Tessmann 2568* (MBM! - paratype); *idem*, *G. Tessmann 2569* (MBM!); Itajaí, entre Praia de Cabeçudas e Praia Brava, I-1950, *M.B.J. Lutz s.n.* (R! - paratype); Paranaguá, Matinhos, 01/I/1950, *G. Hatschbach 1858* (MBM! - paratype; SP!); Guaratuba, Praia de Brejatuba, X-1951, *A. Frenzel s.n.* (MBM! - paratype); Paranaguá, Praia Leste, 27/II/1962, *G. Hatschbach 9057* (MBM!); Paranaguá, Praia dos Mendanhas, 01/XI/1962, *E.A. Moreira 331* (MBM! - paratype); Guaratuba, X-1964, *L.T. Dombrowski & Y. Saito 1143* (MBM!); restinga, 4 km S. Guaratuba, 02/X/1966, *J.C. Lindeman & J.H. Haas 57132* (K!); 4 km N of Guaratuba, 02/X/1966, *J. C. Lindeman & J.H. Hass 2597* (K!; MBM! - paratype); Paranaguá, Pontal Sul, 23/IV/1967, *G. Hatschbach 16386* (MBM!); Paranaguá, Ilha do Mel, 27/XI/1970, *G.G. Hatschbach & C. Koczicki 25654* (K!); Matinhos, Praia das Gaivotas, 28/VIII/1972, *G. Hatschbach 30262* (MBM! - paratype); Paranaguá, Praia dos Ferroviários, 31/I/1974, *R. Kummrow 262* (MBM!); Paranaguá, Ilha do Mel, Morro do Farol, 17/II/1985, *W.S. Souza s.n.* (MBM! - paratype); Paranaguá, Praia Grande, Ilha do Mel, 28/IX/1985, *R.M. Britez 94* (MBM! - paratype); Paranaguá, Ilha do Mel, Praia Farol-Fortaleza, 08/XI/1986, *R.M. Britez & S.M. Silva 1073* (MBM!); Paranaguá, Ilha do Mel, Praia da Fortaleza, 05/V/1996, *R.B. Singer & A.A. Cocucci s.n.* (MBM! - paratype); Paranaguá, Ilha do Mel, Fortaleza, 03/II/1998, *R.B. Singer 032* (MBM! - paratype); Pontal do Paraná, Guarapari, 25/I/2005, *J.F. Stancik, S.C. Massuquetto & F. Pinheiro 53* (UPCB!); Pontal do Paraná, 23/III/2008, *J.V. Lemos 069*

(HUCP!); Pontal do Paraná, Balneário Shangrilá, 06/I/2014, *E.D. Lozano, B.K. Canestrano & B. Damasceno 2550* (MBM!); Guaraqueçaba, Superagui, 08/I/2014, *M.E. Engels, E.D. Lozano, B.K. Canestraro, M. Bolson, L. Bacci & T. Bochorny 2295* (FURB!; HCF!; MBM!; RB!; UPCB); Paranaguá, P.E. Ilha do Mel, 12/X/2014, *R.S. Vieira 562* (EFC!); **Rio Grande do Sul:** São Leopoldo, Morro do Diabo-Lomba Grande, 01/I/1926, *J. Dutra 941* (ICN!); Maquiné, Osório, VI/1950, *G. Pabst 641* (HB! - paratype); Feitoria, Lagoa dos Patos, 16/I/1966, *Z.A. Trinta 1151* (K!); Montenegro, Morro do Cabrito, 30/XII/1988, *I. Fernandes 481* (ICN!); **Santa Catarina:** restinga perto de Laguna, estrada para Florianópolis Cabeçuda, 08/02/1966, *H. Sick 869* (K!); Araranguá, Morro dos Conventos, 26/XI/1980, *A. Krapovickas & R. Vanni 36941* (MBM); Barra Velha, 24/I/1988, *A. Krapovickas & C.L. Cristobal 42116* (K!; MBM - paratype); Porto Belo, Mariscal, 15/X/2006, *Beltrami s.n.* (HUCP!); **São Paulo:** Cananéia, Ararapira, Praia do Meio, 27/IV/1918, *F.C. Hoehne s.n.* (SP! - paratype); Mongaguá-Praia Grande, 23/XII/1953, *J.G. Bartolomeu s.n.* (K!); Cananéia, 01/X/1961, *H.D. Bicalho s.n.* (SP! - paratype); Iguape, 5 km WSW of Iguape, 18/II/1965, *G. Eiten & L.T. Eiten 6199* (SP! - paratype; UB!; US!); Ilha de Cananéia, I-1979, *V.F. Ferreira 516* (RB! – paratype); Praia Grande, restinga, XII/1979, *E. Catharino s.n.* (HB! - paratype); Cananéia, Ilha do Cardoso, 11/III/1982, *F. Barros 704* (SP!); Cananéia, Ilha do Cardoso, Restinga de Itacuruçá, *F. Barros 721* (SP!); Cananéia, Ilha do Cardoso, Restinga de Itacuruçá, 05/VII/1989, *F. Barros & R.T. Ninomia 1690* (SP!); Cananéia, Ilha Comprida, estrada entre a balsa e a praia da Ilha Comprida, 08/IX/1994, *M.E. Basso, E. Moncaio, M.L. Pomari & M.Y. Nakagomi 024* (SP! - paratype); Tapiraí, Sítio da Pedra, 19/X/1994, *K.D. Barreto, G.D. Fernandes & R.D. Fernandes 3091* (RB!); Cananéia, Ilha do Cardoso, Restinga de Marujá, XII-2003, *F. Pinheiro 269* (SP!); *idem*, *F. Pinheiro 270* (SP!); *idem*, *F. Pinheiro 272* (SP!); *idem*, *F. Pinheiro 276* (SP!); Cananéia, Ilha Comprida, ca. 6 km ao S, após posto dos bombeiros, I-2005, *F. Pinheiro 271* (SP!); Cananéia, Ilha do Cardoso, Restinga de Itacuruçá, II/2005, *F. Pinheiro 268* (SP!); Cananéia, Ilha do Cardoso, Restinga de Itacuruçá, 10/IV/2005, *R.P. Romanini & F. Pinheiro 199* (SP! - paratype), *idem*, *R.P. Romanini & F. Pinheiro 200* (SP! - paratype); *idem*, *R.P. Romanini & F. Pinheiro 201* (SP! - paratype); *idem*, *R.P. Romanini & F. Pinheiro 202* (SP! - paratype).

Description (fig. 2)**:** Epiphytic plant, erect or pending. Stem not swollen into a pseudobulb, 33-65 cm long and 0.5–1 cm in diameter, simple, elongated, cylindrical, covered by leaf sheaths, multi-leaved. Leaves 3.8–13.1 × 1.6–2.9 cm, oblong-lanceolate, distichous, slightly conduplicate, coriaceous, rounded at apex. Inflorescence 36–61.5 cm long, apical, simple, corymbiform, 16–37-flowered; floral bract ca. 0.6 × 0.2 cm, linear-triangular, acuminate at apex. Flowers reddish with the lip callus yellowish turning reddish; pedicel + ovary ca. 2.9 cm long; sepals ca. 1.8 × 0.6 cm, obovate, acute at apex, the lateral ones asymmetrical; petals ca. 1.6 × 0.5 cm, elliptical, symmetrical, acute at apex; lip ca. 1.4 × 1.8 cm, clawed, 3-lobed, lip disc callose; callosity ca. 0.4 × 0.2 cm, made of two basal calli and a third longitudinally placed between them; lateral lobes ca. 0.6 × 0.4 cm, obtriangular, margin deeply denticulate; midlobe ca. 0.7 × 1 cm, obtriangular, bilobed, denticulate to fimbriate at apex; column ca. 1 cm long, reddish; pollinia 4. Fruit not seen.

Etymology: According to Pinheiro & Barros (2006), the specific epithet refers to the flower color, purple red (*puniceum*) with a lip callosity yellow (*luteum*).

Distribution: The species is endemic to Brazilian territory and distributed in the southeastern and southern Brazil, occurring in the biome Atlantic Forest, with a single record from areas of the biome Pampa (*Z.A. Trinta 1151* [K!]). Hitherto it was only known from São Paulo, Paraná, Santa Catarina and Rio Grande do Sul (Pinheiro & Barros, 2006; Stancik *et al.*, 2009; Couto *et al.*, 2016; Pessoa, 2025) (fig. 1). The present record is its first occurrence in the state of Minas Gerais.

Phenology (tab. 1)**:** According to the material studied, *E. puniceoluteum* apparently blooms throughout the year with a bigger intensity from December to March.

Preliminary conservation status: We did not observe any population reduction (criterion A of the IUCN Guidelines, IUCN, 2024). As for criterion B, we evaluate the EOO to 172,414,838 km², corresponding to the category Least Concern (LC). AOO was evaluated to 132 km². It places the species in the category Endangered (EN) if at least two of the three necessary conditions are encountered, which seems to be the case: the Atlantic Forest is severely fragmented (condition a) and there is a continuing decline of the habitat (restinga) extent (condition biii). However, the number of known localities (condition a) is relatively large (17). According to Stroh

et al. (2014), in this case, the number of populations ranges from 11 to 30, it is best to choose the category Near Threatened (NT). We follow this recommendation and propose for *E. puniceoluteum* the preliminary status NT.

Notes: *Epidendrum puniceoluteum* belongs to the subgenus *Amphyglottium* because it has the following characteristics: a reed stem, an inflorescence with an elongated peduncle furnished with enclosing sheaths, a raceme usually congested or corymbiform with flowers densely grouped in the peduncle top (Pinheiro *et al.*, 2009). *Epidendrum puniceoluteum* it is characterized by a predominantly terrestrial habit (occasionally rupicolous or epiphytic); simple, cylindrical and elongated stem; ovate to oblong-lanceolate and distichous leaves; apical inflorescence, in corymb and relatively long (up to 50 cm long); reddish flowers with a yellowish lip callus; and trilobed lip with denticulate to fimbriate margins (Pinheiro & Barros, 2006; Stancik *et al.*, 2009). Phylogenetically it is included within the "Atlantic clade", which includes five species sharing a major affinity with the Atlantic Forest, although one or more species may also occur in another Brazilian biome (Pinheiro *et al.*, 2009; Pessoa *et al.*, 2012).

According to Pinheiro & Barros (2006), *E. puniceoluteum* is close to *E. fulgens* Brongniart (1834: t. 43) and *E. denticulatum* Barbosa Rodrigues (1881: 143), by its morphology, mainly vegetative. Only the latter occurs in the state of Minas Gerais (Pessoa, 2025). *E. puniceoluteum* differs from it by its reddish flowers (*vs*. pink lilac) and by a bigger perianth.

Key to *Epidendrum* species of the "Atlantic clade" (*sensu* Pinheiro *et al.,* 2009) within subg. *Amphyglottium* (adapted from Pessoa *et al.*, 2012 and Chiron, 2013)

1. Lateral lobes of the lip deeply laciniate to fimbriate .....***E. cinnabarinum***
1a Lateral lobes of the lip denticulate to erose **2**

2. Flowers pink to lilac, callosity whitish, lateral lobes of the lip denticulate……...
..... ***E. denticulatum***
2a Flowers orange yellow, orange red, purple red, callosity of same coloration, lateral lobes of the lip more or less fimbriate **3**

3. Lateral projections of the column absent.....***E. fulgens***
3a Lateral projections of the column present and directed towards the base of the lip
.....**4**

4. Lip < 15 mm wide; cuniculus < ½ the length of the pedicellate ovary; flower yellow orange ..... ***E. flammeum***
4a Lip ≥ 15 mm wide; cuniculus ≥ ½ the length of the pedicellate ovary; flower red purple ..... ***E. puniceoluteum***

Acknowledgements

The authors thank the Fundação Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES) for the doctoral scholarship offered to D.R.P. Krahl (# 88887.823563/2023-00). To the Universidade Federal do Amapá for the support and logistics offered to D.R.P. Krahl. We are also grateful to the Mineração Rio do Norte (MRN) for funding, support and logistics offered to J.B.F. da Silva. We also thank the anonymous reviewers for their suggestions and contributions to the manuscript text throughout the blind review process.

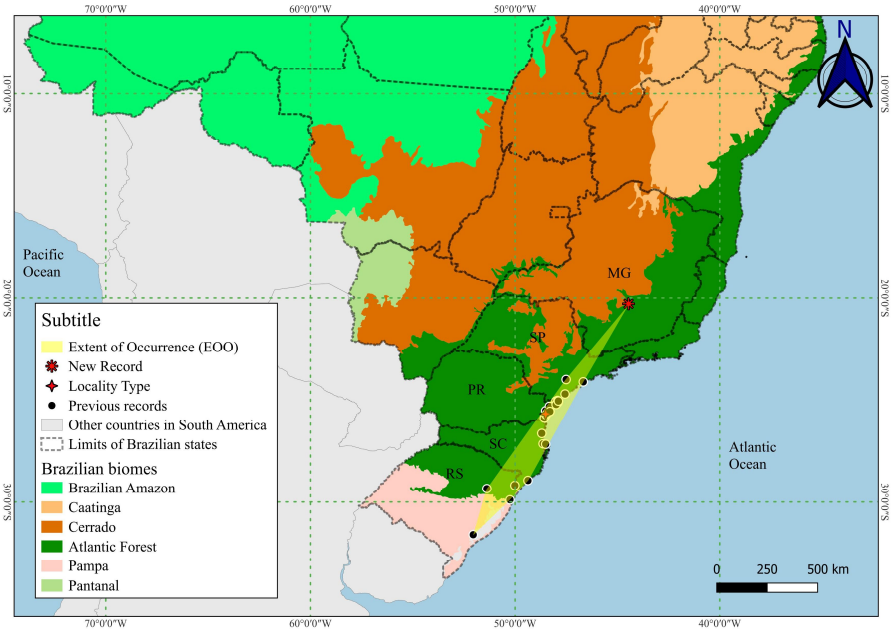

Fig. 1: Geographic distribution map of *Epidendrum puniceoluteum*. Map: A.H. Krahl.

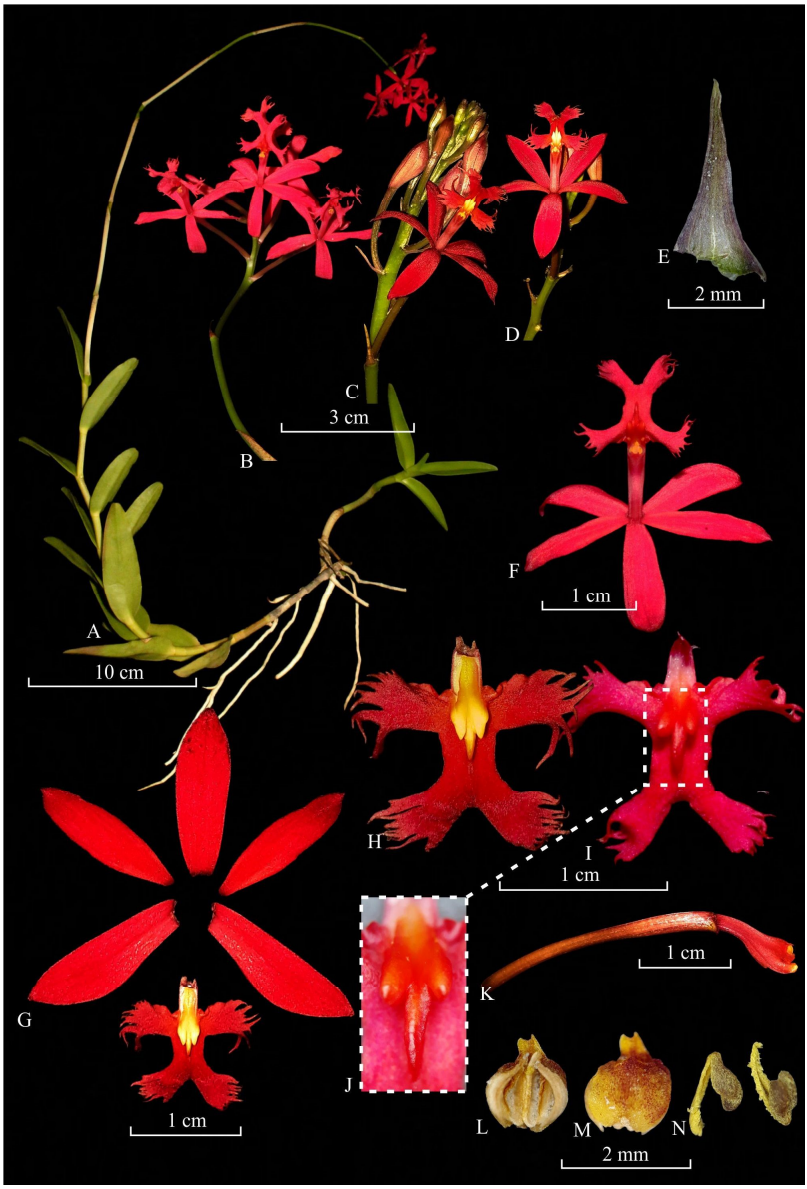

Fig. 2: ***Epidendrum puniceoluteum*****.** A – Habit; B-D – Inflorescence; E – Floral bract; F – Flower. G – Perianth; H-I – Lip; J – Lip callus; K – Pedicel, ovary and column; L-M – Anther cap; N – Pollinarium. C, D, G, H and K based on *A.H. Krahl, D.R.P. Krahl & F.C. dos Santos 1746* (INPA); A, B, E, F, I, J, L, M and N based on *A.H. Krahl, D.R.P. Krahl & F.C. dos Santos 1750* (HUAM). Plate: A.H. Krahl.

Tab. 1. Flowering period of *Epidendrum puniceoluteum*

January	February	March	April	May	June
Ribas et al.1051 (SPF)	*Krahl et al. 1746* (INPA)	*Krahl et al. 1750* (HUAM)	*Romanini & Pinheiro 199* (SP)	no record	*Barros 721* (SP)
July	**August**	**September**	**October**	**November**	**December**
Barros & Ninomia 1690 (SP)	*Engels et al. 2295* (UPCB)	*Basso et al.* 24 (SP)	*Lindeman & Haas 57132* (K)	*Britez & Silva 1073* (MBM)	*Fernandes 481* (ICN)

References

Bachman S., J. Moat, A.W. Hill, J. De La Torre & B. Scott, 2011. Supporting Red List threat assessments with GeoCAT: Geospatial conservation assessment tool. *ZooKeys* 150: 117–126.

Barbosa Rodrigues, J., 1881. *Epidendrum denticulatum*. *Genera et Species Orchidearum Novarum* 2: 143.

Bentham, G., 1883. List of garden orchids: *Epidendrum*. *The Gardeners' Chronicle* 20: 42.

Brieger, F.G., 1977. Gattungsreiche Epidendra: *Epidanthus*, *Nanodes*, *Pleuranthium*, *Physinga*, *Oerstedella*, *Epidendrum*, *Auliza*, *Pseudoepidendrum*, in F.G. Brieger, R. Maatsch & K. Senghas (Eds.) *Rudolf Schlechter, Die Orchideen*. pp. 509–549, Berlin, Paul Parey.

Brongniart, A.T., 1834. *Epidendrum fulgens*. *Voyage Autour du Monde* 196: t. 43.

Chase, M.W., K. Cameron, J. Freudenstein, A.M. Pridgeon, G. Salazar, C. van den Berg & A. Schuiteman, 2015. An updated classification of Orchidaceae. *Botanical Journal of the Linnean Society* 177: 151–174.

Chiron, G.R., 2013. Contribution à la flore d'orchidées d'Espírito Santo (Brésil): notes taxinomiques dans le genre *Epidendrum*. *Richardiana* 14: 39–53.

Couto, C.C.M., J.O. Caetano, M.V. Nascimento & L.R.S. Guimarães, 2016, Morro das Aranhas, Florianópolis, Santa Catarina, BRASIL - ORCHIDACEAE da RPPN (Reserva Particular do Patrimônio Natural). The Field Museum Field Guides. Accessed 24/IV/2025. [1]

Dodson, C.H., 2001. *Epidendrum*, in C.H. Dodson (Ed.) *Native Ecuadorian Orchids: Vol. II: Dresslerella–Lepanthes*. Quito, Imprenta Mariscal, pp. 268–297.

Dressler, R.L., 1993. *Phylogeny and Classification of the Orchid Family.* Dioscorides Press, Portland, 314 p.

Gonçalves, E.G. & H. Lorenzi, 2007. *Morfologia Vegetal: Organografia e Dicionário Ilustrado de Morfologia das Plantas Vasculares*. Instituto Plantarum de Estudo da Flora, São Paulo, 416 p.

Hágsater, E., 1984. Towards an Understanding of the Genus *Epidendrum*, in K.W. Tan (Ed.), *Proceedings of the Eleventh World Orchid Conference*, Miami, U.S.A. pp. 195–201.

Hágsater, E. & E. Santiago, 2023. The genus *Epidendrum,* Part 15, Species new & old in *Epidendrum. Icones Orchidacearum* 19(3): pl. 1963–2000.

Hágsater, E. & M.A. Soto-Arenas, 2005. *Epidendrum* L., in A.M. Pridgeon, P.J. Cribb, M.W. Chase & F.N. & Rasmussen (Eds.) *Genera Orchidacearum – Part IV*. New York, Oxford University Press, pp. 236–251.

IUCN, 2024. Guidelines for Using the IUCN Red List Categories and Criteria. Version 16. Prepared by the standards and Petitions Committee of the IUCN Species Survival Commission. Accessed 01/V/2025. [2]

Lindley, J., 1841. Notes upon the genus *Epidendrum*. *Journal of Botany* 3: 81–89.

Linnaeus, C., 1763. Gynandria Diandra. Classis XX. *Species Plantarum, Ed. 2.* Impensis direct, Laurentii Salvii, Stockholm, pp. 1347–1353.

Mori, S. A., L. A. Silva, G. Lisboa & L. Coradin, 1989. *Manual de Manejo do Herbário Fanerogâmico*. Ilhéus, Ceplac, 104 p.

Pessoa, E.M., 2025. *Epidendrum*, in Flora e Funga do Brasil 2020, Jardim Botânico do Rio de Janeiro, Brasil. Accessed 24/IV/2025. [3]

Pessoa, E.M., M. Alves, A. Alves-Araújo, C. Palmas-Silva & F. Pinheiro, 2012. Integrating different tools to disentangle species complexes: A case study in *Epidendrum* (Orchidaceae). *Taxon* 61: 721–734.

Pessoa, E.M., J.M.P. Cordeiro, L.P. Félix, E.M. Almeida, L. Costa, A. Nepomuceno, G. Souza, M.W. Chase, M. Alves & C. van den Berg, 2020. Too many species: morphometrics, molecular, phylogenetics and genome structure of a Brazilian species complex in *Epidendrum* (Laeliinae; Orchidaceae) reveal fewer species than previously thougth. *Botanical Journal of the Linnean Society* 195: 161–188.

Pinheiro, F. & F. Barros, 2006. *Epidendrum puniceoluteum*, uma nova espécie de Orchidaceae do litoral brasileiro. *Hoehnea* 33: 247–250.

Pinheiro, F. & F. Barros, 2007a. Morphometric analysis of *Epidendrum secundum* (Orchidaceae) in southeastern Brazil. *Nordic Journal of Botany* 25: 129–136.

Pinheiro, F. & F. Barros, 2007b. *Epidendrum secundum* Jacq. e *E. denticulatum* Barb. Rodr. (Orchidaceae): Caracteres úteis para a sua separação. *Hoehnea* 34: 563–570.

Pinheiro F., S. Koehler, A.M. Corrêa, M.L.F. Salatino, A. Salatino & F. Barros, 2009. Phylogenetic relationships and infrageneric classification of *Epidendrum* subgenus *Amphyglottium* (Laeliinae, Orchidaceae). *Plant Systematics and Evolution* 283: 165–177.

POWO, 2025. *Plants of the World Online*. Royal Botanic Gardens, Kew. Accessed 24/IV/2025. [4]

QGIS Development Team, (2025) QGIS geographic information system. Open source geospatial foundation project. Accessed 24/IV/2025. [5]

Stancik, J.F., R. Goldenberg & F. Barros, 2009. O gênero *Epidendrum* L. (Orchidaceae) no Estado do Paraná, Brasil. *Acta Botanica Brasilica* 23: 864–880.

Stroh, P. A., S.J. Leach, T.A. August, K.J. Walker, D.A. Pearman, F.J. Rumsey, C.A. Harrower, M.F. Fay, J.P. Martin, T. Pankhurst, C.D. Preston & I. Taylor, 2014. *A vascular plant red list for England*. Botanical Society of Britain and Ireland, Bristol, 188 pp.

Thiers, B.M. (ed.), 2025 [continuously updated]. *Index Herbariorum*: A global directory of public herbaria and associated staff. New York Botanical Garden's Virtual Herbarium. Accessed 24/IV/2025. [6]

[1] https://fieldguides.fieldmuseum.org/sites/default/files/rapid-color-guides-pdfs/774-brazil-orchidaceae_morro_das_aranhas.pdf

[2] https://www.iucnredlist.org/resources/redlistguidelines

[3] http://floradobrasil.jbrj.gov.br/

[4] http://www.plantsoftheworldonline.org/

[5] https://qgis.org/en/site/

[6] http://sweetgum.nybg.org/ih/