Original Paper

Synopsis of Orchidaceae from Fazenda Sete Irmãos: a fragment of Amazon Forest in northwestern Maranhão, Brazil

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Abstract
This study provides an inventory of the Orchidaceae in one of the most threatened areas of the Brazilian Amazon, situated in the eastern portion of the Belém Endemism Center. A total of 51 species, distributed in 24 genera, are recorded. Epiphytes represent 86% of the species, the remaining are terricolous (6%), hemiepiphytic (6%) or myco-heterotrophic (2%). The most representative genera were Epidendrum (6 spp.) and Maxillaria (5 spp.). This study cites for the first time five genera (Coryanthes, Sarcoglottis, Stelis, Trichosalpinx and Wullschlaegelia) and ten species for the flora of Maranhão, of which four are new records to the Brazilian Northeast. An identification key, photographs of the new records, taxonomic and ecological comments, as well as geographic distribution are provided. The data reinforce the importance of the forest fragments of the Amazon Forest in Maranhão for the conservation of Orchidaceae which is constantly threatened by deforestation in the Belém Endemism Center.

Key words: Belém Endemism Center, epiphytes, inventory, taxonomy.

Resumo
Este estudo apresenta um inventário das Orchidaceae em uma das áreas mais ameaçadas da Amazônia Brasileira, localizada na porção mais oriental do Centro de Endemismo Belém. São registradas 51 espécies distribuídas em 24 géneros. Epífitas representam 86% das espécies, as demais são terrícolas (6%), hemiepífitas (6%) ou micoheterotróficas (2%). Os géneros mais representativos foram Epidendrum (6 spp.) e Maxillaria (5 spp.). Este estudo registra pela primeira vez cinco géneros (Coryanthes, Sarcoglottis, Stelis, Trichosalpinx e Wullschlaegelia) e dez espécies para a flora do Maranhão, dos quais, quatro também são novos registros para a Região Nordeste do Brasil. Uma chave de identificação, pranchas fotográficas dos novos registros e comentários taxonômicos, ecológicos e de distribuição geográfica são apresentados. Os dados evidenciam a importância dos fragmentos de Floresta Amazônica do Maranhão para a proteção das Orchidaceae, constantemente ameaçadas pelo desmatamento no Centro de Endemismo Belém.

Palavras-chave: Centro de Endemismo Belém, epífitas, inventário, taxonomia.

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Introduction

Orchidaceae Juss. is widely known as one of the most species-rich plant families (Dressler 1981; Chase et al. 2015). It is especially diverse in the Neotropical region where Brazil stands out with about 220 genera and 2,500 species recorded, of which about 65% are endemic (BFG 2015, 2018). In northeastern Brazil inventories of Orchidaceae species have been conducted in areas of the states of Bahia (Bastos & Van den Berg 2012; Marinho & Azevedo 2014; Vieira et al. 2014), Maranhão (Silva et al. 1999; Oliveira et al. 2021), Paraíba (Almeida et al. 2007; Moreira et al. 2020), Pernambuco (Pessoa & Alves 2012, 2014, 2015) and Sergipe (Pessoa & Alves 2011; Monteiro et al. 2012). However, knowledge of the eastern portion of the Amazon forest located in the state of Maranhão is fairly low.

Some recent studies have pointed out new records of Orchidaceae for the state (Ferreira et al. 2017, 2019c; Gomes et al. 2021; Oliveira et al. 2021), indicating that it is still in need of further taxonomic studies, yet it remains neglected by the majority of Brazilian botanists. Currently 115 species and 49 genera of the family are cited to Maranhão (BFG 2015, 2018), however a large portion of its area remains fairly poorly collected, especially the northwest region where it includes part of the Belém Endemism Center, one of the most threatened portions of the Brazilian Amazon (Almeida & Vieira 2010).

Thus, this study aims to provide a synopsis of the Orchidaceae species from a fragment of Amazon Forest located in the northwest part of the state. In addition to the inventory, we provide an identification key, photographs of the new records, taxonomic and ecological comments, as well as the geographic distribution of each species. This study will contribute to expanding the knowledge of the orchid flora along the eastern border of the Amazon domain.

Material and Methods

The state of Maranhão, with an area of 331,983 km², presents vegetation with ecotonal features since it is located in a transition zone among the Amazon Forest, the Cerrado and the Caatinga (Muniz 2006). The northwest portion of the state is dominated by ombrophilous and semi-deciduous forests, while savannahs and palm rich ecosystems locally called “mata dos cocais” are more common in the south and east portions (Abreu 1949; Froés 1953; Ribeiro 1971; Muniz 2004; Almeida & Vieira 2010; Celentano et al. 2017; Silva et al. 2017; Silva-Moraes et al. 2019). The study area is in the northwest part of the state, in the municipality of Cândido Mendes, on a private property called Fazenda Sete Irmãos (01°51’37”S, 45°46’10”W) (Fig. 1). The area includes a fragment of about 7,000 ha of Amazon Forest (Almeida & Vieira 2010), considered one of the largest of the state (Koch & Araújo-Silva 2014; Celentano et
al. 2017). According to Köppen the climate type is “Am” (Alves et al. 2013) with mean temperatures between 26–27 °C and annual precipitation between 2,300–2,500 mm (NuGeo 2016).

Field expeditions were conducted monthly between August 2017 and February 2020. The fertile specimens were processed following standard procedures (Fidalgo & Bononi 1984) and deposited at SLUI (Thiers, continuously updated). Sterile specimens were kept under cultivation, awaiting flowering. Taxonomic identification was based upon the specialized literature (Pabst & Dungs 1975, 1977; Batista et al. 2008; Pessoa & Alves 2011, 2012, 2014, 2015; Pessoa et al. 2015; Koch et al. 2018; Klein & Piedade 2019) in addition to an analysis of type specimens when available on-line. The circumscription of the genera follows the Flora do Brasil 2020 (continuously updated).

The morphological terminology follows Harris & Harris (2001), the data on geographical distribution of the species follow Flora do Brasil 2020 (continuously updated) and Govaerts et al. (2020). The map was produced using QGis* 2.18.12 Essen (QGIS Development Team 2020) under SIRGAS 2000 datum.

**Results and Discussion**

Orchidaceae is represented in the study area by 51 species distributed in 24 genera. Epiphytes represent 86% of the species (34 spp.), the remaining are terricolous (6%, 3 spp.), hemiepiphytic (6%, 3 spp.), or myco-heterotrophic (2%, one sp.) (Tab. 1; Figs. 2-3). The predominance of epiphytes can be explained by the dense canopy observed in the area which does not allow much light to reach the soil. This result agrees with Dressler (1993) who argued that at least 2/3 of the orchid species in the tropics are epiphytes. Epidendrum L. with six species (12%) and Maxillaria Ruiz & Pav. with five species (10%) are the most representative genera in the area. These genera have also been found to be representative in other studies conducted in the Amazon domain (Silveira et al. 1995; Pessoa et al. 2015; Koch et al. 2018; Klein & Piedade 2019).

According to BFG (2015, 2018), five genera are cited for the first time for the Maranhão: Coryanthes Hook., Sarcoglottis C. Presl., Stelis Sw., Trichosalpinx Luer and Wullschlaegelia Rchb.f. Ten species (about 20%) are new records for the state: Campylocentrum pachyrrhizum (Rchb.f.) Rolfe, Coryanthes speciosa Hook., Lockhartia imbricata (Lam.) Hoehne, Notylia microchila Cogn., Ornithocephalus cujeticola Barb. Rodr., Sarcoglottis acaulis (Sm.) Schltr., Scaphyglottis prolifer (R.Br.) Cogn., Stelis paraensis Barb. Rodr., Trichosalpinx egléri Pabst and Wullschlaegelia calcara Benth. Furthermore, four of the species were collected for the first time in northeastern Brazil: L. imbricata, S. paraensis, T. egléri and W. calcara. These four species are restricted to the Amazon dominion (Flora do Brasil 2020, continuously updated), and the presence of W. calcara is even more interesting due to the particular ecology of this species which is highly water-dependent.

Another five species cited by Silva et al. (1999) for Maranhão but without testimony vouchers, Campylocentrum micranthum Rolfe., Dichaea picta Rchb.f., Laelia gloriosa (cited as Schomburgkia gloriosa Rchb.f.), Oncidium baueri Lindl and Polystachya concreta (Jacq.) Garay & H.R.Sweet, have their occurrence currently not confirmed to the state in Flora do Brasil 2020 (continuously updated), yet they were collected by us. These do not represent new records, but confirmations of occurrence.

Among the species 30% are widespread in the Neotropics, while 47% are endemic to South America, and only 6% are restricted to Brazil (BFG 2015, 2018; Govaerts et al. 2020). The majority of the species (about 75%) were collected along rivers or water courses, these areas work as corridors for epiphytes linking the Cerrado and the Amazon (Pabst & Dungs 1975). In the anthropized portion of the Fazenda Sete Irmãos only three species were observed, Catasetum macrocarpum Rich. ex Kunth. and Vanilla palmarum Lindl. growing in Attalea speciosa Mart. (Arecales, locally called “Babaçu”) and Sacoila lanceolata (Aubl.) Garay a terricolous species.

The Fazenda Sete Irmãos is one of the last well-preserved localities of Amazon Forest in Maranhão, at least 3,000 ha are primary forest. Our results indicate it is one of the richest areas in Orchidaceae species in northeastern Brazil (Coelho & Amorim 2014; Pessoa & Alves 2015) and it is fundamental for conservation of the Belém Endemism Center (Almeida & Vieira 2010; Celentano et al. 2017). The new records of species presented here are just part of several other studies recently undertaken in the Amazon portion of Maranhão that are also expanding distributions of taxa of other families (Guaçonê et al. 2018, 2020; Ferreira et al. 2019a, 2019b, 2019c; Silva et al. 2016; Koch & Araújo Silva 2014; Scatigna et al. 2019; Silva-Júnior et al. 2020). We highlight the need for a stronger effort of studying this neglected and threatened region of Brazil.
Key for the orchid species from the Fazenda Sete Irmãos

1. Myco-heterotrophic, achlorophyllous herbs ........................................... 51. Wullschlaegelia calcarata
1’. Autotrophic, chlorophyllous herbs .......................................................... 2

2. Leafless plants; roots flat, green ................................................................. 4. Campylocentrum pachyrhizum
2’. Leafy plants; roots cylindrical, grayish or white ...................................... 3

3. Hemiepiphytes; stem voluble ................................................................. 4
4. Lip with a multi-ridged callus on the disc .................................................. 50. Vanilla pompona
4’. Lip without a callus on the disc ................................................................. 4

5. Sepals and petals undulate at margin; green ............................................. 48. Vanilla mexicana
5’. Sepals and petals flat at margin; yellow .................................................. 49. Vanilla palmarum

3’. Epiphytes or terrestrial herbs; stem erect or pendulous, never voluble ........ 6

6. Inflorescence terminal ............................................................................. 7
7. Terrestrial herbs; leaves convolute ............................................................ 8

8. Leaves present during flowering; flowers greenish-white ......................... 40. Sarcoglottis acaulis
8’. Leaves absent during flowering; flowers magenta ................................. 39. Sacoila lanceolata

7’. Epiphytes; leaves conduplicate or plicate .............................................. 9

9. Leaves plicate .......................................................................................... 44. Sobralia macrophylla
9’. Leaves conduplicate .............................................................................. 10

10. Pseudobulbs ovoid, clavate or fusiform ................................................. 11

11. Flowers non-resupinate ........................................................................... 12
12. Lip 3-lobed; flowers greenish-yellow ...................................................... 36. Polystachya concreta
12’. Lip entire; flowers white with purple stripes ......................................... 37. Prosthechea aemula

11’. Flowers resupinate ............................................................................... 13

13. Peduncle at least four times longer than the rachis ................................. 18. Laelia gloriosa
13’. Peduncle as long as the rachis, to slightly longer or shorter ................ 12. Epidendrum purpurascens

10’. Pseudobulbs cylindrical or stem not swollen ........................................ 14

14. Leaves 1 on each stem ............................................................................ 15
15. Dorsal sepals connate with the lateral sepals .......................................... 45. Stelis paraensis
15’. Dorsal sepals free .................................................................................. 16

16. Lepanthiform sheaths absent; flowers yellow, lateral sepals free ........... 29. Octomeria grandiflora
16’. Lepanthiform sheaths present; flowers dark purple, lateral sepals connate ............................ 47. Trichosalpinx egleri

14’. Leaves 2–several .................................................................................. 17
17. Pseudobulbs superposed; leaves terminal ............................................. 18
18. Sepals connate at base; perianth < 3.0 mm long ................................. 42. Scaphyglossis sickii
18’. Sepals free; perianth > 5.0 mm long ...................................................... 19
19. Flowers pink; lip 3-lobed; column with lateral appendixes .............. 43. Scaphyglossis stellata
19’. Flowers white or beige; lip entire; column without lateral appendixes ...... 41. Scaphyglossis prolifera

17’. Pseudobulbs not superposed; leaves distributed along the stem ........ 20

20. Column free or adnate at base to the lip ............................................... 21
21. Flowers pink, column adnate at base with the lip
21’. Flowers yellowish-brown, column free
20’. Column completely adnate to the lip
22. Rachis completely covered by bracts; lip entire
23. Flowers green, lip suborbicular
23’. Flowers white, lip cordate
22’. Rachis exposed; lip obscurely to clearly 3-lobed
24. Inflorescence short pedunculate (< 1 cm long) 24’. Inflorescence long pedunculate (at least 1.6 cm long)
25. Peduncle completely covered by bracts; lip margin entire
25’. Peduncle exposed; lip margin denticulate
6’. Inflorescence lateral
26. Leaves cylindrical
27. Inflorescence uniflorous; flowers white
27’. Inflorescence multiflorous; flowers yellow with brown spots
28. Leaves equitant, unifacial
29. Leaves much shorter than the stem
29’. Leaves as long as or longer than the stem
30. Flowers pink; lip clawed
30’. Flowers white, green or yellow; lip not clawed
31. Flowers yellow with brown dots; petal margins entire; lip apex 2-lobed; column wings developed
31’. Flowers white or greenish; petal margins minutely denticulate; lip apex rounded
32. Sepal apex rounded to obtuse; lip entire
32’. Sepal apex acuminate; lip 3-lobed
28’. Leaves not equitant, dorso-ventrally flattened
33. Flowers with a spur
34. Pseudobulb present; leaves 1, terminal
34’. Pseudobulb absent; leaves 3-12, distributed along the stem
35. Pseudobulb absent
35’. Pseudobulb present
36. Pseudobulb homoblastic; flowers unisexual
36’. Pseudobulb heteroblastic; flowers bisexual
37. Inflorescences uniflorous
38. Peduncle > 6.5 cm long; lip < 0.6 cm long
38’. Peduncle < 4.5 cm long; lip > 1.0 cm long
39. Rhizome fully fixed in the substrate; flowers yellow
39’. Rhizome pendent, fixed in the substrate only at the base; flowers white
40. Apical leaves 2; lateral lobes of the lip developed
40’. Apical leaf 1; lateral lobes of the lip vestigial
37’. Inflorescences multiflorous
1. *Aspasia variegata* Lindl. Edwards’s Bot. Reg. 22: t. 1907. 1836.

**Examined material:** trail near the Pirarucu lake, 01°50’45.2”S, 45°47’17.5”W, 3.XI.2017, fl., M.J.C. Silva & A.W.C. Ferreira 001 (SLUI 5724); Igarapé Reno, 01°51’48”S, 45°46’02”W, 3.XI.2017, fl., A.W.C. M.J.C. Silva & A.W.C. Ferreira 002 (SLUI 5725).

Widespread in northern South America, in Brazil it is widely distributed in the Amazon domain, but it is also recorded to Cerrado. It is a species that while sterile can be confused in the area with *O. baueri* and *B. caudata* but in flower is recognized by the lip adnate to the base of the column and with an erose margin (vs. free and entire). The local flowering period is between November and January.

2. *Brassia caudata* (L.) Lindl., Bot. Reg. 10: t. 832.1825.

**Examined material:** Igarapé Cumaruzal, 01°50’36”S, 45°47’09”W, 3.VII.2017, fl., M.J.C. Silva & A.W.C. Ferreira 005 (SLUI 5726).

Widespread in the Neotropical region, in Brazil it is widely distributed in the Amazon domain. This species is easily recognized by its long caudate sepals, the most similar species in the area is *A. variegata* from which it can be distinguished by having more flowers per inflorescence (5–8 vs. 1–3). The local flowering period is between May and July.

3. *Campylocentrum micranthum* (Lindl.) Rolfe, Orchid Rev. 9: 136. 1903.

**Examined material:** Igarapé Cumaruzal, 01°50’36.6”S, 45°47’09.8”W, 3.VII.2017, fl., M.J.C. Silva & A.W.C. Ferreira 006 (SLUI 5727).

Widespread in northern South America and the Caribbean, in Brazil it is found in the Amazon and Atlantic Forest domains. This species was cited by Silva *et al.* (1999) to Maranhão, but without a testimony voucher. As it is not listed to the state in BFG (2015, 2018), here its presence is confirmed. It is easily distinguished from the other species of the genus in the area by the presence of leaves (vs. leafless). The local flowering period is between June and July.

4. *Campylocentrum pachyrhizum* (Rehb.f.) Rolfe, Orch. Rev. 11(128): 246. 1903.

**Examined material:** Igarapé Cumaruzal, 01°50’36.6”S, 45°47’09.8”W, 3.VII.2017, fl., M.J.C. Silva & A.W.C. Ferreira 007 (SLUI 5728).
### Table 1 – Orchidaceae from Fazenda Sete Irmãos, Cândido Mendes, Maranhão. (Habit: E = Epiphyte; HE = Hemiepiphyte; T = Terricolous; MI = Mycoheterotrophic). ** = first record for Maranhão. ## = first registration for the Northeast region of Brazil. ++ = exsiccate to confirm the report by Silva et al. (1999).

| Species                                      | Vouchers                                                                 | Habit(s) | Flowering |
|----------------------------------------------|--------------------------------------------------------------------------|----------|-----------|
| Aspasia variegata Lindl.                      | M.J.C. Silva & A.W.C. Ferreira 001 (SLUI 5724); A.W.C. M.J.C. Silva & A.W.C. Ferreira 002 (SLUI 5725). | E        | NOV-JAN   |
| Brassia caudata (L.) Lindl.                   | M.J.C. Silva & A.W.C. Ferreira 005 (SLUI 5726).                          | E        | MAY-JUL   |
| Campylocentrum micranthum Rolfe ++           | M.J.C. Silva & A.W.C. Ferreira 006 (SLUI 5727).                          | E        | JUN-JUL   |
| Campylocentrum pachyrrhyzum (Rehb. f.) Rolfe ** | M.J.C. Silva & A.W.C. Ferreira 007 (SLUI 5728).                          | E        | JUN-AUG   |
| CataSEPum macrocarpum Rich. ex Kunth.         | M.J.C. Silva & A.W.C. Ferreira 009 (SLUI 5730).                          | E        | APR-NOV   |
| Coryanthes speciosa Hook. **                  | M.J.C. Silva, W.R. Silva Junior & A.W.C. Ferreira 012 (SLUI 5731); M.J.C. Silva, W.R. Silva Junior & A.W.C. Ferreira 013 (SLUI 5732). | E        | SEP-NOV   |
| Dichaea picta Rchb.f. ++                      | W.R. Silva Junior, M.J.C. Silva & A.W.C. Ferreira 014 (SLUI 5733).       | E        | JUN-JUL   |
| Dimerandra emarginata (G.Mey.) Hoehne         | W.R. Silva Junior, M.J.C. Silva & A.W.C. Ferreira 015 (SLUI 5734).       | E        | MAY-JUL   |
| Epidendrum anceps Jacq.                      | M.J.C. Silva & A.W.C. Ferreira 018 (SLUI 5699).                          | E        | OCT-NOV   |
| Epidendrum carpophorum Barb. Rodr.           | M.J.C. Silva & A.W.C. Ferreira 020 (SLUI 5702); A.W.C. Ferreira 021 (SLUI 5703). | E        | FEB-AUG   |
| Epidendrum macrocarpum Rich.                 | M.J.C. Silva & A.W.C. Ferreira 032 (SLUI 5713).                          | E        | JUL-SEP   |
| Epidendrum purpurascens Focke                 | M.J.C. Silva & A.W.C. Ferreira 036 (SLUI 5716).                          | E        | OCT-FEB   |
| Epidendrum rigidum Jacq.                     | M.J.C. Silva & A.W.C. Ferreira 038 (SLUI 5719).                          | E        | MAR-APR   |
| Epidendrum strobiliferum Rchb.f.             | M.J.C. Silva & A.W.C. Ferreira 040 (SLUI 5721).                          | E        | MAY-JUL   |
| Erycina pusilla (L.) Williams & M.W. Chase    | A.W.C. Ferreira 042 (SLUI 5735).                                         | E        | JUN-AUG   |
| Gongora nigrita Lindl.                       | M.J.C. Silva & A.W.C. Ferreira 048 (SLUI 5736); M.J.C. Silva & A.W.C. Ferreira 049 (SLUI 5737). | E        | OCT-NOV   |
| Species                                           | Vouchers                                      | Habit(s) | Flowering |
|--------------------------------------------------|----------------------------------------------|----------|-----------|
| *Gongora quinquenervis* Ruiz & Pavon.           | M.J.C. Silva & A.W.C. Ferreira 050           | E        | OCT-NOV  |
|                                                  | (SLUI 5738); M.J.C. Silva & A.W.C. Ferreira 051 |          |           |
|                                                  | (SLUI 5739).                                |          |           |
| *Laelia gloriosa* (Rchb.f.) L.O. Williams ++    | M.J.C. Silva & A.W.C. Ferreira 055           | E        | APR-MAY  |
|                                                  | (SLUI 5740); A.W.C. Ferreira 056 (SLUI 5741) |          |           |
| *Lockhartia imbricata* (Lam.) Hoehne **; ##     | M.J.C. Silva & A.W.C. Ferreira 057           | E        | MAY-JUL  |
|                                                  | (SLUI 5742).                                |          |           |
| *Macroclinium wullschlaegelianum* Focke (Dodson) | M.J.C. Silva & A.W.C. Ferreira 058           | E        | OCT-DEC  |
|                                                  | (SLUI 5743).                                |          |           |
| *Maxillaria alba* (Hook.) Lindl.                | W.R. Silva Junior & A.W.C. Ferreira 105      | E        | MAY-JUN  |
|                                                  | (SLUI 5744).                                |          |           |
| *Maxillaria aureoglobula* Christenson            | A.W.C. Ferreira 100 (MAR 11538).             | E        | FEB-APR  |
| *Maxillaria lutescens* Scheidw.                 | M.J.C. Silva & A.W.C. Ferreira 059           | E        | JAN-APR  |
|                                                  | (SLUI 5745); M.J.C. Silva & A.W.C. Ferreira 060 |          |           |
|                                                  | (SLUI 5746).                                |          |           |
| *Maxillaria subrepens* (Rolfe) Schuit. & M.W. Chase | M.J.C. Silva & A.W.C. Ferreira 061           | E        | JUN-NOV  |
|                                                  | (SLUI 5747); M.J.C. Silva & A.W.C. Ferreira 062 |          |           |
|                                                  | (SLUI 5748).                                |          |           |
| *Maxillaria uncata* Lindl.                      | M.J.C. Silva & A.W.C. Ferreira 063           | E        | NOV-MAY  |
|                                                  | (SLUI 5749); M.J.C. Silva & A.W.C. Ferreira 064 |          |           |
|                                                  | (SLUI 5750).                                |          |           |
| *Notylia aromatica* Barker ex Lindl.            | M.J.C. Silva & A.W.C. Ferreira 065           | E        | SEP-DEC  |
|                                                  | (SLUI 5751); M.J.C. Silva & A.W.C. Ferreira 066 |          |           |
|                                                  | (SLUI 5752).                                |          |           |
| *Notylia microchila* Cogn. **                   | M.J.C. Silva & A.W.C. Ferreira 069           | E        | NOV-DEC  |
|                                                  | (SLUI 5753); W.R. Silva Junior & A.W.C. Ferreira 070 |          |           |
|                                                  | (SLUI 5754).                                |          |           |
| *Notylia yauaperiensis* Rchb.f.                 | W.R. Silva Junior & A.W.C. Ferreira 071      | E        | NOV-DEC  |
|                                                  | (SLUI 5755).                                |          |           |
| *Octomeria grandiflora* Lindl.                  | M.J.C. Silva & A.W.C. Ferreira 072           | E        | APR-MAY  |
|                                                  | (SLUI 5756).                                |          |           |
| *Oeoeoclades maculata* (Lind.) Lindl.           | M.J.C. Silva & A.W.C. Ferreira 073           | T        | FEB-MAY  |
|                                                  | (SLUI 5757).                                |          |           |
| *Oncidium baueri* Lindl. ++                     | A.W.C. Ferreira 075 (SLUI 5758).             | E        | NOV-APR  |
| *Orleanesia amazonica* Barb. Rodr.              | A.W.C. Ferreira 076 (SLUI 5759).             | E        | SEP-FEB  |
| *Ornithocephalus cujeticola* Barb. Rodr. **     | M.J.C. Silva & A.W.C. Ferreira 077           | E        | JUN-AUG  |
|                                                  | (SLUI 5760); M.J.C. Silva & A.W.C. Ferreira 078 |          |           |
|                                                  | (SLUI 5761).                                |          |           |
| Species                                  | Vouchers                                      | Habit(s) | Flowering |
|------------------------------------------|-----------------------------------------------|----------|-----------|
| *Ornithocephalus gladiatus* Hook.        | M.J.C. Silva & A.W.C. Ferreira 079 (SLUI 5762); M.J.C. Silva & A.W.C. Ferreira 080 (SLUI 5763). | E        | JUN-SEP   |
| *Peristeria serroniana* Knowles & Westc. | M.J.C. Silva & A.W.C. Ferreira 081 (SLUI 5764). | E        | JAN-FEB   |
| *Polystachya concreta* (Jacq.) Garay & H.R.Sweet ++ | M.J.C. Silva & A.W.C. Ferreira 082 (SLUI 5765). | E        | FEB-MAY   |
| *Prosthechea aemula* (Lindl.) W.E. Higgins | M.J.C. Silva & A.W.C. Ferreira 083 (SLUI 5766); M.J.C. Silva & A.W.C. Ferreira 084 (SLUI 5767). | E        | OCT-APR   |
| *Rodriguezia lanceolata* Ruiz & Pavon   | M.J.C. Silva & A.W.C. Ferreira 085 (SLUI 5768); M.J.C. Silva & A.W.C. Ferreira 086 (SLUI 5769). | E        | JAN-MAR   |
| *Sacoila lanceolata* (Aubl.) Garay       | M.J.C. Silva & A.W.C. Ferreira 087 (SLUI 5770). | T        | OCT-JAN   |
| *Sarcoglottis acaulis* (Sm.) Schltr. ** | A.W.C. Ferreira 088 (SLUI 5771).              | T        | AUG-SEP   |
| *Scaphyglottis prolifera* (R.Br.) Cogn. ** | M.J.C. Silva & A.W.C. Ferreira 089 (SLUI 5772); M.J.C. Silva & A.W.C. Ferreira 090 (SLUI 5773). | E        | JUL-AUG   |
| *Scaphyglottis sickii* Pabst             | M.J.C. Silva & A.W.C. Ferreira 091 (SLUI 5774); M.J.C. Silva & A.W.C. Ferreira 092 (SLUI 5775). | E        | MAY-JUL   |
| *Scaphyglottis stellata* Lodd. ex Lindl. | M.J.C. Silva & A.W.C. Ferreira 093 (SLUI 5776). | E        | AUG-SEP   |
| *Sobralia macrophylla* Rchb.f.           | M.J.C. Silva & A.W.C. Ferreira 094 (SLUI 5777). | E        | MAR-APR   |
| *Stelis paraensis* Barb. Rodr. **; ###  | M.J.C. Silva & A.W.C. Ferreira 095 (SLUI 5778); M.J.C. Silva & A.W.C. Ferreira 096 (SLUI 5779). | E        | FEB-APR   |
| *Trichocentrum cepula* (Hoffmans.) J.M.H. Shaw | M.J.C. Silva & A.W.C. Ferreira 097 (SLUI 5780). | E        | OCT-JAN   |
| *Trichosalpinx egleri* Pabst **; ###     | M.J.C. Silva & A.W.C. Ferreira 098 (SLUI 5781). | E        | JAN-APR   |
| *Vanilla mexicana* Mill.                 | M.J.C. Silva & A.W.C. Ferreira 099 (SLUI 5782). | HE       | JUL-AUG   |
| *Vanilla palmarum* Lindl.               | M.J.C. Silva & A.W.C. Ferreira 101 (SLUI 5783). | E        | SEP-JAN   |
| *Vanilla pompona* Schiede                | A.W.C. Ferreira 102 (SLUI 5784).              | HE       | AUG-OCT   |
| *Wallischaegelia calcarata* Benth **; ### | W.R. Silva Junior & A.W.C. Ferreira 103 (SLUI 5785); W.R. Silva Junior & A.W.C. Ferreira 104 (SLUI 5786). | MI       | OCT-NOV   |
Widespread in the Neotropical region, in Brazil it is found in the Amazon and Atlantic Forest domains. This study presents its first record to Maranhão. It is easily recognized among the species of the area by being leafless and by the flat, green roots. The local flowering period is between June and August.

5. *Catasetum macrocarpum* Richard, L. C. & Kunth, C., Syn. Pl. Aequin., I: 331, 1822.

**Examined material:** near the border with Zé Pedro’s farm, 02°07’47.4”S, 45°48’42.2”W, 15.X.2017, fl., M.J.C. Silva & A.W.C. Ferreira 009 (SLUI 5730).

Widespread in South America, in Brazil it is widely distributed, except in the South region.

![Figure 2](image_url)

**Figure 2** – a-h. Orchidaceae of Fazenda Sete Irmãos – a. *Campylocentrum micranthum*; b. *Campylocentrum pachyrhizum*; c. *Coryanthes speciosa*; d. *Dichaea picta*; e. *Laelia gloriosa*; f. *Lockhartia imbricata*; g. *Maxillaria alba*; h. *Notylia microchila*. (a. M.J.C. Silva & A.W.C. Ferreira 006; b. M.J.C. Silva & A.W.C. Ferreira 007; c. M.J.C. Silva, W.R. Silva Junior & A.W.C. Ferreira 012; d. W.R. Silva Junior, M.J.C. Silva & A.W.C. Ferreira 014; e. M.J.C. Silva & A.W.C. Ferreira 055; f. M.J.C. Silva & A.W.C. Ferreira 057; g. W.R. Silva Junior & A.W.C. Ferreira 105; h. M.J.C. Silva & A.W.C. Ferreira 069). Photos: a-h. A.W.C Ferreira.
It is distinguished in the area by its homoblastic pseudobulbs and it is also the only species with unisexual flowers. The local flowering period is between April and November.

6. **Coryanthus speciosa** Hooker, W.J., Bot. Mag., 58: 3102, 1831.

**Examined material:** Igarapé Reno, near the wood bridge, 01°52’35.6”S, 45°45’18.9”W, 13.X.2017, fl., M.J.C. Silva, W.R. Silva Junior & A.W.C. Ferreira 012 (SLUI 5731); 01°52’35.6”S, 45°45’18.9”W, 13.X.2017, fl., M.J.C. Silva, W.R. Silva Junior & A.W.C. Ferreira 013 (SLUI 5732).

Widespread in northern South America, in Brazil it is widely distributed, except in the South region. This study presents its first record to Maranhão. It is characterized by the lip divided into epichile, mesochile and hypochile and column with a pair of glands. The local flowering period is between September and November.

7. **Dichaea picta** Rchb.f. W.W.Saunders, Refug. Bot. (Saunders), 2: t. 84, 1872.

**Examined material:** Igarapé Cumaruzal, 01°50’55.0”S, 45°45’35.4”W, 14.VII.2017, fl., W.R. Silva Junior, M.J.C. Silva & A.W.C. Ferreira 014 (SLUI 5733).

Widespread in northern South America, in Brazil it is cited only to the states of Amazonas, Pará and Rondônia. This species was cited by Silva et al. (1999) to Maranhão, but without a testimony voucher. As it is not listed to the state in BFG (2015, 2018), here its presence is confirmed. It can be confused in the area with a member of **Epidendrum** due to the cespitose habit and leaves distributed along the stem, but it differs by membranaceous leaves and 1-flowered inflorescences (vs. coriaceous, multiflorous). The local flowering period is between June and July.

8. **Dimerandra emarginata** (G.Mey.) Hoehne, Bol. Agric. Estado São Paulo 34: 618. t. 9. 1934.

**Examined material:** trail to Igarapé Cumaruzal, 01°50’55.0”S, 45°45’35.4”W, 15.VI.2017, fl., W.R. Silva Junior, M.J.C. Silva & A.W.C. Ferreira 015 (SLUI 5734).

Widespread in the Neotropical region, in Brazil it is found in the Amazon and Atlantic Forest domains. It is a species that can be confused in the area with **Epidendrum**, but is distinguished by the column adnate only at base with the lip (vs. fully adnate). The local flowering period is between May and July.

9. **Epidendrum anceps** Jacq., Select. Stirp. Amer. Hist. 224 (t. 138). 1763.

**Examined material:** trail to Igarapé Cumaruzal, 01°50’47.7”S, 45°45’48.7”W, 14.X.2017, fl., M.J.C. Silva & A.W.C. Ferreira 018 (SLUI 5699).

Widespread in the Neotropical region, and widely distributed in Brazil. It can be distinguished from the other species of the genus in the area by its pedunculate inflorescence (at least 1.6 cm long) with peduncle completely covered by bracts, whereas in **E. rigidum** and **E. strobiliferum** the rachis is covered by bracts. The local flowering period is between October and November.

10. **Epidendrum carpophorum** Barb.Rodr., Gen. Sp. Orchid. 2: 148. 1882.

**Examined material:** Igarapé Cumaruzal, 01°50’48”S, 45°46’02”W, 15.VI.2017, fl., M.J.C. Silva & A.W.C. Ferreira 020 (SLUI 5702); Macaxeira river, 01°52’47”S, 45°47’54”W, 20.II.2020, fl., A.W.C. Ferreira 021 (SLUI 5703).

Widespread in northern South America, in Brazil it is widely distributed, except in the South region. Among the **Epidendrum** species of the area it can be confused with **E. purpurascens** due to the deeply 3-lobed white lip, but in **E. carpophorum** the stem is not swollen (vs. swollen). The local flowering period is between February and August.

11. **Epidendrum macrocarpum** Rich., Actes Soc. Hist. Nat. Paris 1(1): 112. 1792.

**Examined material:** Macaxeira river, near the bridge of the old road, 01°52’43”S, 45°45’37”W, 15.VII.2017, fl., M.J.C. Silva & A.W.C. Ferreira 032 (SLUI 5713).

Widespread in northern South America, in Brazil it is found in the Amazon and Atlantic Forest domains. It is distinguished from the other species of the genus in the area by its long inflorescence and red flowers. The local flowering period is between July and September.

12. **Epidendrum purpurascens** Focke. Tijdschr. Nat. Wetensch. 4: 64-65. 1851.

**Examined material:** Igarapé Cumaruzal, 01°50’47.7”S, 45°45’48.7”W, 14.X.2017, fl., M.J.C. Silva & A.W.C. Ferreira 036 (SLUI 5716).

Widespread in northern South America, in Brazil it is widely distributed in the Amazon domain. Among the **Epidendrum** species of the area it is the only one with pseudobulbs. The local flowering period is between October and February.

13. **Epidendrum rigidum** Jacq., Enum. Syst. Pl.: 29. 1760.

**Examined material:** Macaxeira river, 01°52’44.4”S, 45°45’36.2”W, 15.IV.2019, fl., M.J.C. Silva & A.W.C. Ferreira 038 (SLUI 5719).
Widespread in the Neotropical region, it is also widely distributed in Brazil. It can be confused with *E. strobiliferum* but the stem of this epiphyte is not branched and the flowers are green (vs. branched, white). The local flowering period is between March and April.

### 14. Epidendrum strobiliferum* Rchb. f., Ned. Kruidk. Arch. 4: 333. 1859.

**Examined material:** Igarapé Cumaruzal, 01°50'47"S, 45°45'36.2"W, 3.XI.2017, fl., *M.J.C. Silva & A.W.C. Ferreira* 050 (SLUI 5739).

Widespread in the Neotropical region, it is also widely distributed in Brazil. Among the *Epidendrum* species of the area it is the only one with ramified, pendent stems. The local flowering period is between May and July.

### 15. Erycina pusilla* (L.) N.H.Williams & M.W.Chase. Lindleyana 16: 136. 2001.

**Examined material:** Macaxeira, near the border of the Fazenda Sete Irmãos, 01°52'06"S, 45°48'01"W, 29.VI.2019, fl., *A.W.C. Ferreira* 042 (SLUI 5735).

Widespread in the Neotropical region, in Brazil it is widely distributed, except in the South region. This twig epiphyte with equitant leaves can be confused in the area, if sterile, with a member of *Ornithocepalus*, but the flowers are fairly distinctive, and it can be recognized by the color (yellow vs. white or greenish), margin of the petals (entire vs. minutely denticulate), and the presence of wings on the column (vs. without wings). The local flowering period is between June and August.

### 16. Gongora nigrita* Lindl. Lindley, J., Edwards’s Bot. Reg., 25: 59. 1839.

**Examined material:** Macaxeira river, 01°50'47.6"S, 45°45'36.2"W, 15.X.2017, fl., *M.J.C. Silva & A.W.C. Ferreira* 048 (SLUI 5736); trail on Igarapé Reno, 01°50'55"S, 45°45'35.4"W, 3.XI.2017, fl., *M.J.C. Silva & A.W.C. Ferreira* 049 (SLUI 5737).

Distributed in Guyana, Suriname and Brazil, where it is found in the Amazon and Atlantic Forest domains, it has been cited only to the states of Amazonas, Maranhão, Pará and Pernambuco. It is similar to *G. quinquenervis* but differs by the perianth length (4–5 cm long vs. 2.5–4 cm long). The local flowering period is between October and November.

### 17. Gongora quinquenervis* Ruiz & Pav. Syst. Veg. Fl. Peruv. Chil. 1: 227. 1798.

**Examined material:** Macaxeira river, 01°52'44.4"S, 45°45'36.2"W, 3.XI.2017, fl., *M.J.C. Silva & A.W.C. Ferreira* 051 (SLUI 5738); Fazenda Sete Irmãos, 02°52'44.4"S, 45°45'36.2"W. 3.XI.2018, fl., *M.J.C. Silva & A.W.C. Ferreira* 052 (SLUI 5739).

Distributed in Colombia, Ecuador, Peru and Brazil, where it is found in the Amazon and Atlantic Forest domains. As mentioned above, it is similar to *G. nigrita*, but can also be distinguished by the length of lip callus (< 0.1 cm long vs. > 0.2 cm long). The local flowering period is between October and November.

### 18. Laelia gloriosa* (Rchb.f.) L.O. Williams. Darwiniana 5: 76. 1941.

**Examined material:** Igarapé Cumaruzal, 01°50'36.6"S, 45°47'09.8"W, 15.VII.2017, fl., *M.J.C. Silva & A.W.C. Ferreira* 040 (SLUI 5721).

Widespread in northern South America, in Brazil it is widely distributed. This species was cited by Silva *et al.* (1999) to Maranhão, but without a testimony voucher. As it is not listed to the state in BFG (2015, 2018), here its presence is confirmed. Among the species of the area, young individuals of this species can be confused with *E. purpurascens* due to the heteroblastic fusiform pseudobulbs, but these species are easily distinguished by the length of the peduncle (> 20 cm long vs. < 8 cm long) and color of the flowers (sepal and petals brown, lip pale pink vs. completely white). The local flowering period is between April and May.

### 19. Lockhartia imbricata* (Lam.) Hoehne. Arq. Bot. Estado São Paulo 2: 139. 1952.

**Examined material:** Macaxeira river, 01°50'36.6"S, 45°47'09.8"W, 5.V.2018, fl., *A.W.C. Ferreira* 056 (SLUI 5740); Macaxeira river, 01°52'44.4"S, 45°45'36.2"W, 3.V.2018, fl., *A.W.C. Ferreira* 057 (SLUI 5741).

Widespread in northern South America, in Brazil it is widely distributed. This species was cited by Silva *et al.* (1999) to Maranhão, but without a testimony voucher. As it is not listed to the state in BFG (2015, 2018), here its presence is confirmed. Among the species of the area, young individuals of this species can be confused with *E. purpurascens* due to the heteroblastic fusiform pseudobulbs, but these species are easily distinguished by the length of the peduncle (> 20 cm long vs. < 8 cm long) and color of the flowers (sepal and petals brown, lip pale pink vs. completely white). The local flowering period is between April and May.

### 20. Macroclinium wullschlaegelianum* (Focke) Dodson. Icon. Pl. Trop. 10: t. 939. 1984.

**Examined material:** Igarapé Cumaruzal, 01°50'40.4"S, 45°46'01"W, 2.X.2019, fl., *M.J.C. Silva & A.W.C. Ferreira* 058 (SLUI 5742).

Widespread in northern South America, in Brazil it is widely distributed. This species was cited by Silva *et al.* (1999) to Maranhão, but without a testimony voucher. As it is not listed to the state in BFG (2015, 2018), here its presence is confirmed. Among the species of the area, young individuals of this species can be confused with *E. purpurascens* due to the heteroblastic fusiform pseudobulbs, but these species are easily distinguished by the length of the peduncle (> 20 cm long vs. < 8 cm long) and color of the flowers (sepal and petals brown, lip pale pink vs. completely white). The local flowering period is between April and May.
Orchids of Fazenda Sete Irmãos, Maranhão, Brazil

21. *Maxillaria alba* (Hook.) Lindl. Gen. Sp. Orchid. Pl., 143, 1832. Fig. 2g

**Examined material:** Igarapé affluent of Macaíuba river, near the border of Fazenda Sete Irmãos, 01°52’08”S, 45°48’03”W, 29.VI.2019, fl., W.R. Silva Junior & A.W.C. Ferreira 105 (SLUI 5744).

Widespread in the Neotropical region, in Brazil it is widely distributed in the Amazon and Cerrado domains. It can be confused in the area with *M. lutescens* due to the pendent habit, but differs by having 1 apical leaf (vs. 2) and vestigial lateral lobes of the lip (vs. developed). The local flowering period is between May and June.

22. *Maxillaria aureoglobula* Christenson, Orchids (West Palm Beach) 71: 125 (2002).

**Examined material:** Igarapé Cumaruzal, 01°50’36.6”S, 45°46’10”W, 9.III.2019, fl., A.W.C. Ferreira 100 (MAR 11538).

It is distributed in Costa Rica, Venezuela, Colombia and Brazil, where it is cited only to the states of Maranhão and Mato Grosso. Among the species of *Maxillaria* in the area, it can be confused with young individuals of *M. alba* or *M. lutescens*, but these two species have a pendent habit while *M. aureoglobula* has its rhizome fully fixed in the substrate. The local flowering period is between February and April.

23. *Maxillaria lutescens* Scheidw. F Allg. Gartenzeitung, 7: 145, 1839.

**Examined material:** near the Pirapucu lake and the old headquarter, 01°50’38.1”S, 45°46’07.7”W, 1.IV.2017, fl., M.J.C. Silva & A.W.C. Ferreira 059 (SLUI 5745); trail to igarapé Cumaruzal, 01°50’36.6”S, 45°47’09.8”W, 2.IV.2017, fl., M.J.C. Silva & A.W.C. Ferreira 060 (SLUI 5746).

Widespread in the Neotropical region, and also in Brazil. It is similar to *M. alba*, but the leaves are wider (up to 2.5 cm wider vs. < 1 cm wider), other features used to distinguish these two species are in the comments of *M. alba*. The local flowering period is between January and April.

24. *Maxillaria subrepens* (Rolfe) Schuit. & M.W.Chase. Phytotaxa, 225: 73, 2015.

**Examined material:** Igarapé Cumaruzal, 01°50’36.6”S, 45°47’09.8”W, 6.VII.2018, fl., M.J.C. Silva & A.W.C. Ferreira 061 (SLUI 5747); 01°49’34.6”S, 45°46’09.8”W, 7.VII.2018, fl., M.J.C. Silva & A.W.C. Ferreira 062 (SLUI 5748).

Widespread in southern South America, in Brazil it is widely distributed in the Amazon and Atlantic Forest domains. It is easily distinguished among the other *Maxillaria* of the area by its longer peduncle (> 6.5 cm long vs. < 2.0 cm long) and shorter lip (< 0.6 cm long vs. > 1.0 cm long). This species was formerly included under *Trigonidium*, considered part of *Maxillaria s.l.* today. The local flowering period is between June and November.

25. *Maxillaria uncata* Lindl. Edwards’s Bot. Reg., 23: t. 1886, 1837.

**Examined material:** Igarapé Cumaruzal, 01°50’46.3”S, 45°47’17.5”W, 3.XI.2017, fl., M.J.C. Silva & A.W.C. Ferreira 063 (SLUI 5749); 01°50’37”S, 45°47’10”W, 3.XI.2018, fl., M.J.C. Silva & A.W.C. Ferreira 064 (SLUI 5750).

Widespread in northern South America, in Brazil it is widely distributed in the Amazon domain. It can be distinguished from the other *Maxillaria* of the area by its cylindrical leaves. The local flowering period is between November and May.

26. *Notylia aromatica* Barker ex Lindl. Edwards’s Botanical Register 27: Misc. 40. 1841.

**Examined material:** Igarapé Cumaruzal, 01°50’36.6”S, 45°47’09.8”W, 3.XI.2017, fl., M.J.C. Silva & A.W.C. Ferreira 065 (SLUI 5751); 01°50’37”S, 45°47’10”W, 3.XI.2017, fl., M.J.C. Silva & A.W.C. Ferreira 066 (SLUI 5752).

Distributed in French Guyana, Guyana, Suriname, Venezuela and Brazil, where it is widely distributed in the Amazon domain. It is similar to *N. yauaperyensis* but differs by its longer inflorescences (6–22 cm long vs. 3–5 cm long) and number of flowers (15–70 vs. 8–22). The local flowering period is between September and December.

27. *Notylia microchila* Cogn., Fl. Bras. (Martius) 3(6): 123 (1904). Fig. 2h

**Examined material:** Igarapé Cumaruzal, 01°50’36.6”S, 45°47’09.8”W, 3.XI.2017, fl., M.J.C. Silva & A.W.C. Ferreira 069 (SLUI 5750); igarapé affluent of Macaíuba river, near the border of Fazenda Sete Irmãos, 01°52’07.3”S, 45°48’02.2”W, 27.XI.2019, fl., W.R. Silva Junior & A.W.C. Ferreira 070 (SLUI 5754).

Distributed in Ecuador, Guyana, Peru, Venezuela and Brazil, where it is cited only to the states of Bahia, Espírito Santo, Mato Grosso, Pará and Pernambuco. This study presents its
first record to Maranhão. This species is easily distinguished from the other *Notylia* of the area by its lateral sepal completely connate (vs. free at distal half) and lip blade ovate (vs. lanceolate). The local flowering period is between November and December.

28. *Notylia yauaperyensis* Barb. Rodr. Vellosia (ed. 2) 1: 131. 1891.  
**Examined material**: Igarapé affluent of Macaxeira river, near the border of Fazenda Sete Irmãos, 01°52'07.3"S, 45°48'02.2"W, 27.XI.2019, fl., W.R. Silva Junior & A.W.C. Ferreira 071 (SLUI 5755).  
Distributed in French Guyana, Peru, Venezuela and Brazil, where it is widely distributed in the Amazon domain. It can be confused in the area with *N. aromatica*, but it differs by the morphological features cited in the comment above. The local flowering period is between November and December.

29. *Octomeria grandiflora* Lindl. Edwards’s Bot. Reg. 28 (Misc.): 64. 1842.  
**Examined material**: Igarapé Cumaruzal, 01°50'36"S, 45°47'09"W, 15.IV.2017, fl., M.J.C. Silva & A.W.C. Ferreira 072 (SLUI 5756).  
Distributed in Bolivia, Colombia, Ecuador, Peru, and Brazil, where it is widely distributed. Its most similar species in the area is *T. egleri*, but these species are easily distinguished by the color the flowers (dark purple vs. yellow) and the fusion of the lateral sepal (free vs. connate). The local flowering period is between January and May.

30. *Oeceoclades maculata* (Lindl.) Lindl., Gen. Sp. Orchid. Pl.: 237. 1833.  
**Examined material**: trail to igarapé Cumaruzal, 01°50'37"S, 45°47'10"W, 15.IV.2017, fl., M.J.C. Silva & A.W.C. Ferreira 073 (SLUI 5757).  
Widely distributed in the Neotropics and tropical Africa, as well as in Brazil. It is the only terrestrial species in the area with lateral inflorescences and flowers with a distinct spur. The local flowering period is between February and May.

31. *Oncidium baueri* Lindl., A.C., Fl. Bras. (Martius), 3(6): t. 85, 1906.  
**Examined material**: Macaxeira river, 01°52'11.0"S, 45°47'59.8"W, 21.XII.2019, A.W.C. Ferreira 075 (SLUI 5758).  
Widespread in northern South America, the species has also been recorded to Costa Rica, in Brazil it is widely distributed in the Amazon and Atlantic Forest domains. This species was cited by *Silva et al.* (1999) to Maranhão, but without a testimony voucher. As it is not listed to the state in BFG (2015, 2018), here its presence is confirmed. Its flowers are somewhat similar to *E. pusilla*, but the presence of pseudobulbs (vs. absent) and the bi-facial leaves (vs. unifacial) distinguish these two. The local flowering period is between November and April.

32. *Orleanesia amazonica* Barb.Rodr., Genera et Species Orchidearum Novarum, 1, 1877.  
**Examined material**: Macaxeira river, 01°52’15.1"S, 45°47’58.5"W, 20.II.2020, fl., A.W.C. Ferreira 076 (SLUI 5759).  
Widespread in northern South America, in Brazil it is widely distributed in the Amazon domain. It can be confused in the area with a member of *Epidendrum* but differs by its column totally free (vs. adnate to the lip claw). The local flowering period is between September and February.

33. *Ornithocephalus cujetica* Barb. Rodr., Gen. Sp. Orch. Nov. 1:133.1877. Fig. 3b  
**Examined material**: Igarapé Cumuruzal, 01°50’36.6"S, 45°47’09.8"W, 11.VIII.2017, fl., M.J.C. Silva & A.W.C. Ferreira 077 (SLUI 5760); Macaxeira river, 01°52’37.6"S, 45°47’09"W, 12.VIII.2017, fl., M.J.C. Silva & A.W.C. Ferreira 078 (SLUI 5761).  
Endemic to Brazil where it is cited only to the states of Amazonas, Ceará, Mato Grosso, Pará and Rondônia. This study presents its first record to Maranhão. In the area it is similar to *O. gladiatus* Hook. but differs by the sepals rounded to obtuse at apex (vs. acuminate) and the lip entire (vs. 3-lobed). The local flowering period is between June and August.

34. *Ornithocephalus gladiatus* Hook., Exot. Fl. 2:t. 127. 1824.  
**Examined material**: trail to igarapé Cumuruzal, 01°50’40.4"S, 45°01’01"W, 13.IX.2017, fl., M.J.C. Silva & A.W.C. Ferreira 079 (SLUI 5762); Igarapé Reno, 01°51’47.4"S, 45°45’03"W, 14.IX.2017, fl., M.J.C. Silva & A.W.C. Ferreira 080 (SLUI 5763).  
Widespread in northern South America, in Brazil it is widely distributed, except in the South and Southeast regions. As mentioned before, it is similar to *O. cujetica*; the features used to distinguish them are described in the comment above. The local flowering period is between June and September.
35. *Peristeria serroniana* (Barb. Rodr) Garay, Arch. Jard. Bot. Rio de Janeiro 13: 47 (1954).

**Examined material:** Macaxeira river, 01°52’11.0"S, 45°47’59.8”W, 20.II.2019, fl., M.J.C. Silva & A.W.C. Ferreira 081 (SLUI 5764).

Endemic to Brazil, where it is cited only to the states of Pará and Maranhão, in the Amazon domain. It can be confused with *C. speciosa* due to the heteroblastic pseudobulbs and plicate leaves but is easily distinguished by its smooth pseudobulb (vs. ribbed). The local flowering period is between January and February.

36. *Polystachya concreta* (Jacq.) Garay & H.R. Sweet, Orquideología, 9: 206, 1974. Fig. 3c

**Examined material:** trilha para o igarapé Cumaruzal, 01°50’36.6”S, 45°47’09.8”W, 4.V.2018, fl., M.J.C. Silva & A.W.C. Ferreira 082 (SLUI 5765).

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**Figure 3** – a-h. Orchidaceae of Fazenda Sete Irmãos – a. *Oncidium baueri*; b. *Ornithocephalus cujeticola*; c. *Polystachya concreta*; d. *Sarcoglottis acaulis*; e. *Scaphyglottis prolifera*; f. *Stelis paraensis*; g. *Trichosalpinx egleri*; h. *Wullschlægelia calcarata*. (a. A.W.C. Ferreira 075; b. M.J.C. Silva & A.W.C. Ferreira 077; c. M.J.C. Silva & A.W.C. Ferreira 082; d. A.W.C. Ferreira 088; e. M.J.C. Silva & A.W.C. Ferreira 089; f. M.J.C. Silva & A.W.C. Ferreira 095; g. M.J.C. Silva & A.W.C. Ferreira 098; h. W.R. Silva Junior & A.W.C. Ferreira 103). Photos: a-h. A.W.C Ferreira.
Widespread in the Neotropical region, in Brazil it is cited only to the states of Amapá, Goiás, Mato Grosso and Rondônia, in the Amazon and Cerrado domains. This species was cited by Silva et al. (1999) to Maranhão, but without a testimony voucher. As it is not listed to the state in BFG (2015, 2018), here its presence is confirmed. In the area, the only other species with swollen stems, terminal inflorescence and non-resupinate flowers is *P. aemula*, but it is easily distinguished by its 3-lobed lip (vs. entire). The local flowering period is between February and May.

37. **Prosthechea aemula** (Lindl.) W.E.Higgins, Phytologia 82: 376 (1997 publ. 1998).

**Examined material**: near the pirarucu lake, 01°50’46.3”S, 45°47’17.5”W, 3.XI.2017, fl., M.J.C. Silva & A.W.C. Ferreira 083 (SLUI 5766); 01°50’46.3”S, 45°50’19.5”W, 4.XI.2017, fl., M.J.C. Silva & A.W.C. Ferreira 084 (SLUI 5767).

Widespread in northern South America, it has also been recorded to Panama, in Brazil it is widely distributed. Young specimens of this species can be confused in the area with *E. purpurascens*, due to the fusiform heteroblastic pseudobulbs, but it is easily distinguished by the entire lip (vs. 3-lobed). Specimens of *P. aemula* have been identified as *P. fragrans*, but this second species is not found in the state. The local flowering period is between October and April.

38. **Rodrigueza lanceolata** Ruiz & Pav. Syst. Veg. Fl. Peruv. Chil. 1: 219. 1798.

**Examined material**: Igarapé Cumuruzal, 01°50’45.2”S, 45°47’17.5”W, 3.II.2018, fl., M.J.C. Silva & A.W.C. Ferreira 085 (SLUI 5768); 01°50’45.2”S, 45°50’19.5”W, 10.III.2019, fl., M.J.C. Silva & A.W.C. Ferreira 086 (SLUI 5769).

Widespread in northern South America, it has also been recorded to Panama, in Brazil it is widely distributed in the Amazon domain, but is also cited to surrounding Cerrado. Among the species with heteroblastic pseudobulbs, lateral inflorescences and lip not clawed in the area it is the only one with white flowers and lateral sepals connate. The local flowering period is between January and March.

39. **Sacoila lanceolata** (Aubl.) Garay, Bot. Mus. Leaff. 28: 352. 1980.

**Examined material**: campo na trilha para o Igarapé Cumuruzal, 01°50’36.6”S, 45°47’09.8”W, 3.XI.2017, fl., M.J.C. Silva & A.W.C. Ferreira 087 (SLUI 5770).

Widespread in the Neotropical region, and also in Brazil. Before flowering it can be confused with *S. acaulis*, but all the leaves shed before the flowering period (vs. leaves present during flowering). The local flowering period is between October and January.

40. **Sarcoglottis acaulis** (Sm.) Schltr. Fl. Bras. (Martius), 3(4): t. 50, 1895. Fig. 3d

**Examined material**: near the pirarucu lake, 01°51’51.5”S, 45°45’56.5”W, 10.IX.2019, fl., A.W.C. Ferreira 088 (SLUI 5771).

Widespread in northern South America and Central America, in Brazil it is widely distributed. This study presents its first record to Maranhão. As mentioned before, it can be confused with *S. lanceolata*, but its greenish-white flowers are fairly distinctive for lacking a spur (vs. flowers magenta, spur present). The local flowering period is between August and September.

41. **Scaphyglossis prolifera** (R.Br.) Cogn., Fl. Bras. 3(5): 15. 1898.

**Examined material**: trail to igarapé Cumuruzal, 01°51’11.4”S, 45°47’34.6”W, 11.III.2017, fl., M.J.C. Silva & A.W.C. Ferreira 089 (SLUI 5772); 01°51’11.4”S, 45°47’34.6”W, 11.III.2017, fl., M.J.C. Silva & A.W.C. Ferreira 090 (SLUI 5773).

Widespread in the Neotropical region, in Brazil it is widely distributed, except in the South region. This study presents its first record to Maranhão. It is similar to *S. stellata* but differs by the white to beige flowers (vs. pink) and column without lateral appendixes (vs. with lateral appendixes). The local flowering period is between July and August.

42. **Scaphyglossis sickii** Pabst, Orquidea (Rio de Janeiro) 18: 7. 1956.

**Examined material**: Igarapé Cumuruzal, 01°50’36.6”S, 45°47’09.8”W, 15.VI.2017, fl., M.J.C. Silva & A.W.C. Ferreira 091 (SLUI 5774); 01°50’36.6”S, 45°47’09.8”W, 15.VI.2017, fl., M.J.C. Silva & A.W.C. Ferreira 092 (SLUI 5775).

Widespread in northern South America, in Brazil it is found in the Amazon and Atlantic Forest domains. This species differs from the other *Scaphyglossis* of the area by its sepals connate at base (vs. free) and shorter perianth (< 3.0 mm long vs. > 5.0 mm long). The local flowering period is between May and July.

43. **Scaphyglossis stellata** Lodd. ex Lindl., Edwards Bot. Reg. 25: 44. 1839.

**Examined material**: Igarapé Reno, 01°51’11”S, 45°47’34”W, 17.IX.2017, fl., M.J.C. Silva & A.W.C. Ferreira 093 (SLUI 5776).
44. **Sobralia macrophylla** Rehb. f., Bot. Zeitung (Berlin) 10: 713 (1852).

**Examined material:** Igarapé Cumaruza, 01°50’36.6”S, 45°47’09.8”W, 15.IV.2017, fl., M.J.C. Silva & A.W.C. Ferreira 094 (SLUI 5777).

Widespread in northern South America and Central America, in Brazil it is cited only to the states of Amazonas and Paraíba. This study presents its first record to Maranhão and also to northeastern Brazil. It can be confused in the area with *S. paraensis* but can be easily recognized by its lepanthiform sheaths. The local flowering period is between January and April.

45. **Stelis paraensis** Barb.Rodr. Gen. Sp. Orchid. ii. 88. 1881.

**Examined material:** Igarapé Cumaruza, 01°50’58.4”S, 45°45’30.7”W, 15.IV.2017, fl., M.J.C. Silva & A.W.C. Ferreira 095 (SLUI 5778); Macaxeira river, 01°52’58.4”S, 45°47’30.7”W, 16.IV.2017, fl., M.J.C. Silva & A.W.C. Ferreira 096 (SLUI 5779).

Endemic to Brazil, where it is cited only to the states of Mato Grosso, Pará and Rondônia in the Amazon domain. This study presents its first record to Maranhão and also to northeastern Brazil. It can be confused in the area with *S. egleri* and *O. grandiflora* but differs by its lateral and dorsal sepals fused (vs. dorsal sepal free). The local flowering period is between February and April.

46. **Trichocentrum cepula** (Hoffmanns.) J.M.H.Shaw. Orchid Rev. 120(1297, Suppl.): 16 (2012).

**Examined material:** Igarapé Reno, 01°51’11.4”S, 45°47’34.6”W, 3.XI.2017, fl., M.J.C. Silva & A.W.C. Ferreira 097 (SLUI 5780).

Widespread in northern South America, in Brazil it is widely distributed, except in the South region. It can be confused in the area with *V. palmarum* but differs by its sepal and petals undulate at margin, green (vs. flat, yellow). The local flowering period is between July and August.

47. **Trichosalpinx egleri** (Pabst) Luer, Phytologia 54(5): 395. 1983.

**Examined material:** Igarapé Reno, 01°51’07.5”S, 45°47’36.9”W, 21.IV.2018, fl., M.J.C. Silva & A.W.C. Ferreira 098 (SLUI 5781).

Widespread in northern South America, in Brazil it is widely distributed in the Amazon domain. This study presents its first record to Maranhão and also to northeastern Brazil. It can be confused in the area with *O. grandiflora* and *S. paraensis* but can be easily recognized by its lepanthiform sheaths. The local flowering period is between January and April.

48. **Vanilla mexicana** Mill., Gard. Dict. ed. 8: n.º 1 (1768).

**Examined material:** Macaxeira river, 01°52’59”S, 45°47’31”W, 12.VIII.2017, fl., M.J.C. Silva & A.W.C. Ferreira 099 (SLUI 5782).

Widespread in the Neotropical region, in Brazil it is also widely distributed, except in the South region. It can be confused in the area with *V. palmarum* but differs by its sepal and petals undulate at margin, green (vs. other phorophytes). The local flowering period is between July and August.

49. **Vanilla palmarum** (Salzm. ex Lindl.) Lindl., Gen. Sp. Orchid. Pl.: 436. 1832.

**Examined material:** near the Igarapé Reno, 01°51’11.4”S, 45°47’34.6”W, 3.XI.2017, fl., M.J.C. Silva & A.W.C. Ferreira 101 (SLUI 5783).

Widespread in northern South America, in Brazil it is widely distributed, except in the South and Southeast regions. In the area it can be confused with *V. mexicana* but it grows exclusively on palm species (vs. other phorophytes). The local flowering period is between September and January.

50. **Vanilla pompona** Schiede, C.J.W., Linnaea, 4: 573-574, 1829.

**Examined material:** branch near to Carvoaria project, 01°51’48”S, 45°46’02”W, 10.IX.2019, A.W.C. Ferreira 102 (SLUI 5784).

Widespread in the Neotropical region, in Brazil it is widely distributed, except in the South region. It is easily distinguished from the other species of *Vanilla* in the area by its lip with a multi-ridged calyx on the disc (vs. callus absent). The local flowering period is between August and October.

51. **Wullschlaegelia calcarata** Bentham., J. Linn. Soc., Bot. 18: 342 (1881).

**Examined material:** trail near to Pirarucu lake, 01°51’51.5”S, 45°45’56.5”W, 26.X.2019, fl. and fr., W.R. Silva Junior & A.W.C. Ferreira 103 (SLUI 5785); 01°51’51.5”S, 45°45’56.5”W, 26.X.2019, fl. and fr., W.R. Silva Junior & A.W.C. Ferreira 104 (SLUI 5786).
Widespread in the Neotropical region, in Brazil it is widely distributed in the Amazon domain. This study presents its first record to Maranhão and also to northeastern Brazil. It is the only myco-heterotrophic herb in the area, recognized by achlorophyllous stems and scale-like leaves. The plants arise from the soil in the area between March and July, and local flowering period is between October and November.

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