

Estado da publicação: O preprint não foi publicado em outro meio.

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<https://doi.org/10.1590/2236-8906e092025>

Submetido em: 2026-04-01

Postado em: 2026-04-14 (versão 1)

(AAAA-MM-DD)

New records of Araceae Juss. from Amapá State, Brazil

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How to cite: Camelo, M.C., Silva, A.N. & Pereira, L.A. 2026. New records of Araceae Juss. from Amapá State, Brazil. *Hoehnea* 53: e092025, 2026. <https://doi.org/10.1590/2236-8906e092025>.

ABSTRACT - (New records of Araceae Juss. from Amapá State, Brazil). We present two new records of Araceae from Amapá State, Brazil. The species were collected in Floresta de Terra Firme úmida and Floresta de Igapó. The diagnoses, illustrations, maps and georeferenced specimen citations are provided. These new records contribute to the expansion of the knowledge of the Amapá flora and the geographic distribution of the Araceae of the North region of Brazil.

Keywords: Alismatales, flora, Floresta Estadual do Amapá, taxonomy

RESUMO - (Novos registros de Araceae Juss. no Estado do Amapá, Brasil). Apresentamos dois novos registros de Araceae para o estado do Amapá, Brasil. As espécies foram coletadas na Floresta de Terra Firme úmida e na Floresta de Igapó. São fornecidos diagnoses, ilustrações, mapas, citações de espécimes georreferenciados. Estes novos registros contribuem para a ampliação do conhecimento sobre a flora do Amapá e a distribuição geográfica das Araceae na região Norte do Brasil.

Palavras-chave: Alismatales, flora, Floresta Estadual do Amapá, taxonomia

Introduction

The State of Amapá is located within the Amazonian Domain, one of the most biodiverse biomes on the planet, characterized by a rich variety of fauna and flora (SEMA 2025).

The first floristic survey of the state was conducted by the Brazilian botanist João Murça Pires in 1966. In his survey, he described several botanical families. His publication remains a foundational reference for taxonomic studies in the region to this day. More recently, Pereira & Costa-Neto (2011), in a floristic inventory in Terra Firme Forest in the Iratapuru River Sustainable Development Reserve, in the southern region of the state, identified the occurrence of 101 species in 32 botanical families, highlighting the richness of taxa for that region. Costa-Neto *et al.* (2017), in a floristic survey of the Amazonian Savanna of Amapá, highlighted the diversity of species in the biome, documenting 378 taxa distributed in 221 genera and 73 families, including 160 new records for the State.

Additionally, Cantuária *et al.* (2021), in their study of the Flora of the Fazendinha Environmental

Protection Area, cataloged 14 genera and 21 species, including a new record of *Vanilla cribbiana* Soto Atenas (Orchidaceae). They also noted that, despite the region's remarkable diversity, the Amazon Rainforest remains insufficiently studied.

These studies, along with others, underscore the extensive and largely unexplored biodiversity of Amapá. Floristic research in the State primarily focuses on conservation areas, reflecting their critical role in biodiversity preservation. Currently, approximately 70% of the State's territory is protected, comprising 21 Conservation Units and five Indigenous Lands (SEMA 2025). Conservation Units are essential for safeguarding ecological and ecosystem attributes, as well as the populations of plant and animal species, including those that are threatened or endemic (Hassler 2005, Rylands & Brandon 2005, Seto *et al.* 2013).

Based on field collections and a review of unidentified herbarium specimens, we present two new records of Araceae species for Amapá State, Brazil. We describe and illustrate critical morphological characters and geographic distributions in Amapá.

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Material and methods

The State of Amapá has an area of 142,471 km² (IBGE 2012). Its climatic classification is Tropical Superhumid, with three dry months - September, October, and November (SEMA 2025). The soil types include Latosol Yellow, Latosol Red-Yellow, Red Yellow Argisol, and Gleysols (Jacomine 2008, 2009). The vegetation is diverse, encompassing Mangrove, Floodplain Forest (Várzea and Igapó), Dense Upland Forest (Terra Firme), Transition Forest (Ecotone), Amazon Savanna (Cerrado) and Surface Waters. The most extensive vegetation type is the Dense Upland Forest (IBGE 2012).

The georeferenced data and photographs of the plants observed and collected during the field studies were obtained with a GPS and digital camera respectively (figure 1). Geographic distributions of non-Amapá records were checked by referring to scientific articles, monographs, and the databases of GBIF.org, REFLORA, Specieslink.org and Tropicos.org. During the field collections, samples were prepared following Croat (1985). The vouchers of these new records were incorporated in the AMAPA, UB and RB (acronyms according to Theirs 2021, continuously updated). Specialized literature, including monographs, scientific articles and field guides were used to identify species. Subsequently, experts taxonomist of Araceae family confirmed their identification.

The diagnosis follow the terms and concepts of Croat & Bunting (1979) and Ellis *et al.* (2009). The morphological characteristics were examined and the colors of both vegetative and reproductive structures



Figure 1. Collection area of Várzea Forest, Floresta Estadual do Amapá, Amapá State, Brazil. Photograph: M.C. Camelo, 2023.

were described according to The Kew Plant Glossary (Beentje 2010). The maps were made using QGIS software 3.22-Biatowezia (QGIS Development Team 2021). The shape files (vectors) of South America, Brazil and the Amapá state, conservation units and Floresta Estadual do Amapá are from IBGE (2012).

Results and Discussion

We present two new records of Araceae in Amapá State and the new geographical distribution data are presented in figure 2. Both species belong to the Aroideae subfamily: *Dieffenbachia elegans* A.M.E. Jonker & Jonker and *Philodendron toshibai* M.L. Soares & Mayo. We present a diagnostic descriptions of these species below. The occurrence and range expansion of *D. elegans* and *P. toshibai* reinforce the need for further floristic studies in areas experiencing rapid habitat loss, highlighting the importance of conserving endemic species in Brazil. Although the studied species are not currently at risk of extinction in the areas studied, as they do not face significant habitat loss or excessive exploitation, climate change represents a global threat that may impact their distribution and survival in the future (IPBES, no date). The loss of plant species can have severe ecological consequences, including soil degradation, increased erosion, and the loss of habitat for various animal species (IPBES 2019, UNEP 2025).

Despite the existence of several protected areas in the state of Amapá, the development of a recovery and conservation program is necessary to effectively protect these species, including those recorded within conservation units. Additionally, an environmental education program aimed at raising awareness and engaging local communities could be a decisive factor in the success of these initiatives. Community involvement is essential, as it strengthens support for conservation efforts and promotes a sustainable coexistence between people and native flora.

In this context, the Flora e Funga do Brasil (2025) platform plays a crucial role in providing information on species occurrence by State, assisting in identifying knowledge gaps and mapping the distribution of Brazilian plants. Thus, this study contributes to filling these gaps and supports the development of public policy strategies aimed at conserving threatened environments and endemic species.

Dieffenbachia elegans Jonker in Acta Bot. Neerl. 15: 135 (1966).

Figures 2a-c



Figure 2. a-c. *Dieffenbachia elegans*. a. entire plant and habit. b. Detail of flowers on spadix. c. Detail of leaf blade, midrib and venation. d-e. *Philodendron toshibai*. d. Habit. e. Detail of Leaf blade. Photographs: a-c by M.C. Camelo, 2023. a-e: A.N. Nunes, 2024.

Diagnosis: Terrestrial herb with unisexual flowers. Stem erect, brown. Leaves forming an apical crown, petiole green, without markings, sulcate adaxially, obtuse abaxially; leaf blade asymmetrical, green or sometimes variegated with white, midrib grooved adaxially, prominent abaxially, primary lateral veins impressed on both sides, venation reticulate. Inflorescences erect, several, green peduncle, cylindrical, spathe strongly constricted, light green; female flowers white, male sterile flowers translucent, fertile male flowers white.

Geographic distribution: *D. elegans* is not endemic to Brazil. It has been recorded previously in French Guiana and the Brazilian States of Amazonas and Pará (GBIF and Specieslink.org) and now in Amapá State, Floresta Estadual do Amapá. (figure 3).

Material examined: BRAZIL. CALÇOENE. Fazenda Alto Bonito, E.G. Gonçalves 503, 23-VIII-2000 (UB). Serra do Navio, R.C. Forzza 9560, 28-XI-2017 (RB).

Amapá, Colônia agrícola Piquiá, Floresta Estadual do Amapá, M.C. Camelo 162, 21-IV-2023 (UB); M.C. Camelo 168, 22-IV-2023 (UB).

Philodendron toshibai M.L. Soares & Mayo in Feddes Repertorium 112: 1-2. 2001.

Figure 2d-e

Diagnosis: Hemiepiphyte herb with unisexual flowers. Stem climbing, cylindrical, smooth, grayish to dark green, intravaginal squamules absent; prophylls persistent. Leaves not forming an apical crown, not asymmetrical; petiole 4-9 × 0.5-0.9 cm, canaliculate, verrucose, green, not purplish at the base, leaf blade 11-17.5 × 7-14 cm, with whitish spots adaxially, ovate, base cordate, apex acute to apiculate; primary lateral veins impressed, prominent on abaxial side, dark green with graying patches of variable size on adaxial side, light green on abaxial side, variations in size, margins straight, venation parallel-pinnate.

Geographic Distribution: *P. toshibai* is endemic to Brazil, occurring in Amazonas State, previously recorded in the Reserva Florestal Ducke, and now in Amapá State in Amapá municipality, Floresta Estadual do Amapá (figure 3).

Material examined: BRAZIL. AMAPÁ. Comunidade do Piquá, FLOTA-AP, 1º 4-II-2023, A.N. Silva *et al.* 30 (AMAPA). Porto Grande, Ramal Vila Nova, 15-II-2024, A.N. Silva 57, (AMAPA); *ibidem*, A.N. Silva *et al.* 58 (AMAPA).

Conclusion

This research highlights the importance of Araceae in the North Region of Brazil, emphasizing the need for taxonomic and conservation studies in the Amazon. The discovery of new species records of Araceae in the state of Amapá represents a significant advance in local botanical knowledge. Through taxonomic studies, it is possible not only to document new occurrences but also to gain a deeper understanding of the diversity and distribution of these plants, which is crucial for developing effective conservation strategies.

Although the studied area does not face significant threats such as deforestation, fires, or illegal mining, continued research remains essential to monitoring species populations and assessing potential environmental changes over time. The existence of poorly known or under-explored areas further underscores the importance of ongoing scientific studies, contributing to the recognition and long-term conservation of local biodiversity.

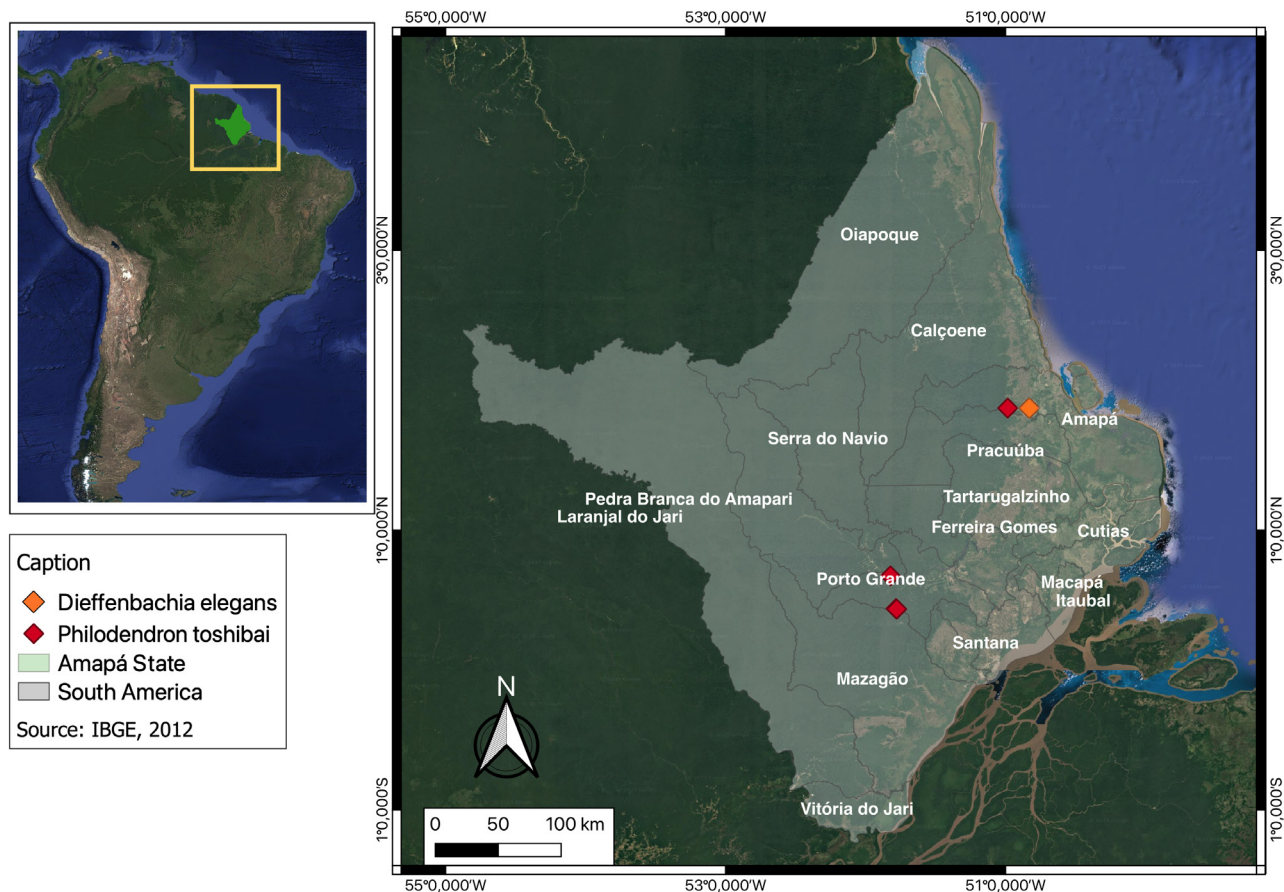


Figure 3. Geographic distribution map of two new records of Araceae. Caption: South America (Google Satellite), Amapá State (yellow line), *Dieffenbachia elegans* (orange rhombus) and *Philodendron toshibai*. (red rhombus). Source: IBGE, 2012.

Acknowledgements

We would like to thank CAPES-BRASIL for the postdoctoral fellowship 2023-2024 granted to the first author under project no “88887.800986/2023-00” at the Programa de Pós-Graduação em Botânica, Universidade de Brasília. We thank the HAMAB herbaria for the support received during the identification of Araceae family. We thank the Herbário Virtual Reflora (<https://floradobrasil.jbrj.gov.br/reflora/herbarioVirtual/>), that is an integral part of the REFLORA Program, along with the Flora e Funga do Brasil, that provides over 4.2 million high-resolution images of Brazilian and South American specimens, including more than 156,000 nomenclatural types.

Conflito de interesses

Os autores declaram não terem conflito de interesses relacionado à publicação deste manuscrito.

Authors contributions

Mel de Castro Camelo: Substantial contribution to the concept and design of the study; Contribution to data collection; Contribution to data analysis and interpretation; Contribution to the preparation of plates and maps; Contribution to manuscript preparation.

Ariel Nunes: Substantial contribution to the concept and design of the study; Contribution to data collection; Contribution to data analysis and interpretation; Contribution to manuscript preparation.

Luciano Araujo Pereira: Substantial contribution to the concept and design of the study; Contribution to supporting data collection; Contribution of financial resources for scientific collections; Contribution to manuscript preparation; Contribution to critical review, adding intellectual content.

Declaração de disponibilidade de dados

O conjunto de dados está contido no próprio manuscrito.

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Associate Editor: Alain Chautems

Received: 01/02/2025

Accepted: 17/10/2025



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