



# Universidade de Brasília

Instituto de Ciências Biológicas

Departamento de Botânica

Programa de Pós-graduação em Botânica

## **Avaliação de Conservação de Espécies de *Peperomia* (Piperaceae) no Brasil**

Discente: Edimara Silva Reis

Orientador: Dr<sup>a</sup>. Micheline Carvalho-Silva

Brasília, DF

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Dissertação submetida ao Programa de Pós-Graduação em Botânica, como requisito para a obtenção do título de Mestre em Botânica pela Universidade de Brasília.

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## Abstract

The Piperaceae family includes approximately 3,700 species, with the genus *Peperomia* being particularly noteworthy. It is diverse in tropical forests and adapted to humid environments through its epiphytic habit, dispersal by birds, and self-fertilization. Despite the high number of endemic species in Brazil, few have been assessed for extinction risk. This study evaluated species of the subgenera *Micropiper*, *Leptorhynchum*, and *Oxyrhynchum* based on IUCN Criterion B. The study assessed the extinction risk of 32 endemic *Peperomia* species in Brazil using occurrence data, Extent of Occurrence (EOO), and Area of Occupancy (AOO). The results indicated a critical scenario, with 53.1% of the species classified as Critically Endangered (CR) and 46.9% as Endangered (EN), reflecting the restricted geographic distribution, the low number of localities, and the decline in habitat quality. The Atlantic Forest concentrates the greatest biodiversity, but presents high levels of fragmentation and anthropogenic pressure. It is concluded that the species analyzed are highly vulnerable, making it urgent to expand sampling efforts and implement effective conservation strategies.

**Keywords:** aoo; eoo; habitat fragmentation; land cover; risk.

## Resumo

A família Piperaceae inclui aproximadamente 3.700 espécies, com destaque para o gênero *Peperomia*. É diverso em florestas tropicais e adaptado a ambientes úmidos por meio de seu hábito epífita, dispersão por aves e autofecundação. Apesar do elevado número de espécies endêmicas no Brasil, poucas foram avaliadas quanto ao risco de extinção. Este estudo avaliou espécies dos subgêneros *Micropiper*, *Leptorhynchum* e *Oxyrhynchum* com base no Critério B da IUCN. O estudo avaliou o risco de extinção de 32 espécies endêmicas de *Peperomia* no Brasil utilizando dados de ocorrência, Extensão de Ocorrência (EOO) e Área de Ocupação (AOO). Os resultados indicaram um cenário crítico, com 53,1% das espécies classificadas como Criticamente em Perigo (CR) e 46,9% como Em Perigo (EN), refletindo a distribuição geográfica restrita, o baixo número de localidades e o declínio na qualidade do habitat. A Mata Atlântica concentra a maior biodiversidade, mas apresenta altos níveis de fragmentação e pressão antrópica. Conclui-se que as espécies analisadas são altamente vulneráveis, tornando urgente a expansão dos esforços de amostragem e a implementação de estratégias de conservação eficazes.

**Palavras-chave:** aoo; cobertura da terra; eoo; fragmentação de habitat; risco.

## Introdução Geral

A família Piperaceae está representada no Brasil por três gêneros — *Manekia* Trel., *Peperomia* Ruiz & Pav. e *Piper* L. — compreendendo 482 espécies, das quais 309 são consideradas endêmicas (Guimarães et al., 2026, atualizado continuamente). Entre esses gêneros, *Peperomia* destaca-se pela elevada diversidade taxonômica e ampla distribuição em ambientes tropicais.

Inicialmente, o gênero *Peperomia* foi subdividido em cinco subgêneros com base principalmente em características dos frutos: *Peperomia* subg. *Acrocarpidium* (Miq.) Dahlst., *Micropiper* (Miq.) Dahlst., *Rhynchophorum* (Miq.) Dahlst., *Sphaerocarpidium* Dahlst. e *Tildenia* (Miq.) Dahlst. (Yuncker, 1974). Posteriormente, estudos filogenéticos e morfológicos ampliaram essa classificação, reconhecendo atualmente 14 subgêneros, delimitados a partir de características morfológicas e moleculares, especialmente relacionadas aos frutos e às inflorescências (Frenzke et al., 2015).

Apesar da elevada diversidade do gênero, as avaliações conservacionistas ainda são insuficientes. A IUCN, fundada em 1948 e responsável pela Lista Vermelha de Espécies Ameaçadas, estabelece critérios científicos, quantitativos e padronizados para avaliação do risco de extinção das espécies (IUCN, 2022). Contudo, até o momento, nenhuma espécie endêmica brasileira de *Peperomia* foi avaliada globalmente pela instituição. No Brasil, a adaptação e aplicação desses critérios são realizadas pelo CNCFlora, vinculado ao Instituto de Pesquisas Jardim Botânico do Rio de Janeiro, que considera as especificidades ecológicas, geográficas e socioambientais do território nacional para subsidiar listas oficiais de espécies ameaçadas e estratégias de conservação, que possui apenas uma espécie endêmica avaliada (Martinelli & Moraes, 2013; CNCFlora, 2024).

Diante desse cenário, este estudo buscou responder às seguintes questões: (1) quais são os principais fatores de ameaça às espécies endêmicas de *Peperomia* no Brasil? (2) qual a relação entre a distribuição geográfica das espécies e suas categorias de ameaça? (3) qual a representatividade das populações dessas espécies em Unidades de Conservação? (4) de que forma a disponibilidade de dados influencia as avaliações de risco? e (5) quais medidas podem ser propostas para a conservação das espécies mais ameaçadas?

O capítulo 1 deste trabalho será publicado na revista *Biodiversity and Conservation* (referência em pesquisas de biodiversidade).

## Introduction

Piperaceae is one of the most diverse families of angiosperms worldwide, is monophyletic, and exhibits a wide variety of forms and habitats (Frodin, 2004; Yuncker, 1974; APG IV, 2016). The family comprises approximately 3,700 species, distributed pantropically among five genera (Yuncker, 1974; Wanke et al., 2006).

The genus *Peperomia* exhibits one of the highest levels of diversity among plants inhabiting the understory of tropical forests, with an estimated 1,700 accepted species (Wanke et al., 2006). *Peperomia* species are characterized as herbs, generally succulent, bearing flowers composed of a pistil with a single stigma and two lateral stamens, while the fruit is a drupe (Yuncker, 1974). Long-distance dispersal in *Peperomia* is favored by the production of fruits with a sticky surface, which can adhere to bird feathers and enable transport between isolated areas. In addition, the ability of self-fertilization in some species of the genus increases the likelihood of establishment after dispersal, contributing to the success of colonization. (Valdebenito et al., 1990; Marcusso, G. M., & Monteiro, R, 2016). In some cases, entomophily involving insect visitors may also occur (Figueiredo & Sazima, 2008; Machado-Silva et al., 2020).

The high water retention capacity in *Peperomia* is associated with the predominance of the epiphytic habit among its species (Helbsing et al. 2000). Even so, representatives of the genus can also occur on the ground or in rocky crevices, being more common in humid, shaded environments and at higher altitudes, while their presence tends to be reduced in dry forests ( Medeiros 2006; Carvalho-Silva 2008).

Despite the high diversity of the genus *Peperomia*, only 78 species are currently included in the IUCN Red List (IUCN, 2023). This scenario highlights a significant gap in extinction risk assessments for the group.

In the national context, the application and adaptation of IUCN criteria are carried out by the National Center for Plant Conservation (CNCFlora), which considers the ecological, geographic, and socio-environmental particularities of the country (Martinelli & Moraes, 2013; CNCFlora, 2024). Recent data indicate that only ten species of *Peperomia* have been formally evaluated in Brazil, nine of which are endemic (CNCFlora, 2024), while Moura et al. (2022) recognize 100 endemic species, highlighting a significant gap in risk assessments and the urgent need for targeted studies and conservation actions.

Initially, the genus *Peperomia* was divided into five subgenera based on fruit characteristics (Yuncker, 1974). However, fourteen subgenera are currently recognized, still

primarily based on fruit characteristics, as well as additional morphological and molecular characters (Frenzke et al., 2015).

*Peperomia* subg. *Micropiper* sensu Frenzke et al. (2015), is primarily distinguished by the morphology of its inflorescences and leaves, characterized by terminal or lateral spikes, simple to branched, generally slender, with flowers densely or loosely arranged, and bearing peltate bracts. Leaves are alternate or whorled, rarely opposite, with blades of varied shapes, succulent or membranaceous, palmate or pinnate venation, and surfaces ranging from glabrous to pilose (Frenzke et al. 2015).

The subgenus *Leptorhynchum* (Dahlst.) comprises approximately 150 species, including seven endemics (Frenzke et al., 2015; Moura et al., 2022), characterized by a perennial habit and epiphytic, terrestrial, or lithophytic life forms (Dahlstedt, 1927; Yuncker, 1974), with prostrate or pendulous stems and nodes that frequently root. It presents alternate, generally succulent leaves (Mathieu, 2001), simple and pendulous inflorescences, flowers with two stamens (Yuncker, 1974), and ovoid to cylindrical fruits with a prominent rostrum and dispersal-related structures (Wanke et al., 2006).

The subgenus *Oxyrhynchum* (Dahlst.) Samain (Dahlstedt, 1900; Samain et al., 2007) comprises approximately 60 species, including four endemic to Brazil, characterized by perennial epiphytic or terrestrial herbs with erect to decumbent stems (Samain et al., 2007) and alternate leaves with coriaceous to succulent texture (Dahlstedt, 1900; Samain et al., 2007). It presents predominantly erect inflorescences, simple or branched, flowers with two persistent stamens, and generally recurved fruits with an elongated beak and glandular structures associated with dispersal (Dahlstedt, 1900; Samain et al., 2007).

This study aimed to assess the threat status of endemic *Peperomia* species from the subgenera *Micropiper*, *Leptorhynchum*, and *Oxyrhynchum* in Brazil, based on the IUCN guidelines (2022) and applying Criterion B. The study sought to identify the main threat factors, examine the relationship between geographic distribution and risk category, evaluate species representation within protected areas, and assess the influence of data availability on extinction risk assessments.

## **Materials and Methods**

### **1. Field of study**

The study was conducted on a national scale, covering the entire territory of Brazil. The occurrences of species of the genus *Peperomia* are distributed across different biogeographical regions, mainly encompassing the Atlantic Forest, but also areas of transition

with other biomes, such as the Cerrado and the Caatinga, according to the classification of Brazilian biomes (Olson et al., 2001; IBGE, 2012).

The records analyzed include both areas within conservation units and regions under different levels of human pressure, reflecting a broad gradient of conservation and land use. This scenario is consistent with widely documented patterns of habitat loss and fragmentation in tropical ecosystems (Haddad et al. 2015). This approach allows for a more comprehensive assessment of distribution patterns and the conservation status of species on a national scale.

## 2. Assessed species

The 32 species of the genus *Peperomia* endemic of Brazil) belonging to the subgenera: *Micropiper*, *Leptorhynchum*, *Oxyrhynchum*, and the *Incertae sedis* were evaluated, whose occurrence data were compiled from bibliographic sources (Moura et al. 2022) and public databases, including the Global Biodiversity Information Facility (GBif), speciesLink, REFLORA, and the specialized repository [peperomia.net](http://peperomia.net).

The collected information underwent a curation process aimed at eliminating doubtful, duplicate, and/or geographically inconsistent records and adding new records. The herbarium specimens of the species deposited at the UB herbarium were analyzed through loans, and the identification of all specimens was confirmed based on photographs available in online databases, ensuring the reliability of the data.

## 3. IUCN assessment

Validated occurrence records were analysed using GeoCAT (Bachman S et al., 2011), following the recommendations of the International Union for Conservation of Nature (IUCN). For each species, the Extent of Occurrence (EOO) and Area of Occupancy (AOO) were calculated. EOO was defined as the minimum convex polygon encompassing all known records, while AOO overlays a grid with 2 x 2 km cells over the occurrence points representing the area actually occupied, considering only suitable habitats. These metrics were used to support preliminary conservation assessments under IUCN Criterion B (2022) (Figure 1).

## 4. Maps

The species occurrence data were obtained in CSV format and subjected to prior organization and standardization steps. Then, the files were imported into the QGIS environment, where the records were converted into point-type vector layers, based on the geographic coordinates associated with each occurrence. To ensure the spatial consistency of the data, all processing was performed using the WGS 84 coordinate reference system (EPSG:4326), adopted as the standard throughout all analyses.

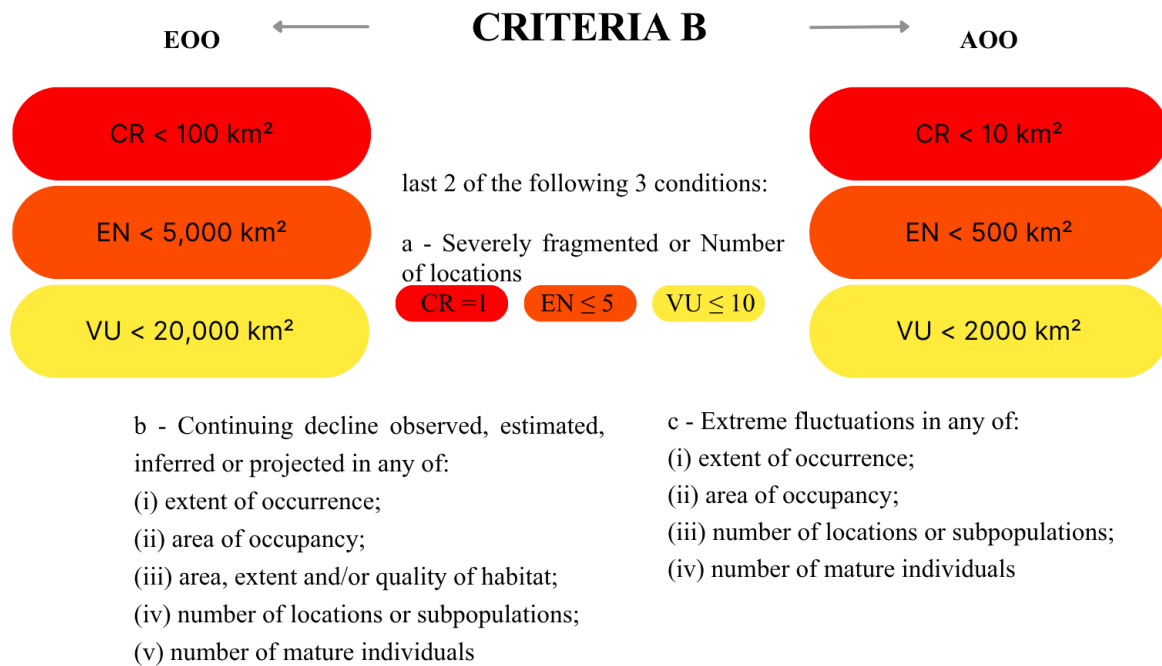
Once imported, the occurrence points were overlaid on satellite images available in the QGIS environment itself, allowing the spatial visualization of the species in relation to the landscape. This step made it possible to verify the consistency of the records and identify possible geographic inconsistencies. From this spatial base, maps were created that were used to support subsequent spatial analyses and to interpret the species occurrence patterns.

## 5. Data analysis

The number of locations — defined by the IUCN as geographically or ecologically distinct areas affected by a single threatening event — was estimated using spatial analyses in QGIS. This step involved the detailed spatial interpretation of occurrence points in relation to environmental and threat factors, such as land use, presence of conservation units, and native vegetation cover, allowing for a more precise delineation of localities according to IUCN criteria.

Regarding land use and land cover, we collected data over a decade, from 2013 to 2023. For species with only one occurrence record, a complementary analysis was applied through the creation of a buffer with a radius of 5 km around the known point, with the aim of evaluating the spatial context of land use and occupation and inferring potential threats impacting the locality.

The assessment also critically considered the adequacy and quality of the data, following the guidelines established in the document *Guidelines for Using the IUCN Red List Categories and Criteria*, in order to ensure consistent and robust extinction risk classifications for each species analyzed.



**Figure 1.** Adaptation of IUCN Criterion B (authors, 2026).

## Results

Thirty two (32) species were evaluated, from an initial set of 100 species pre-selected by Moura et al. (2022). In the original material, considering the species that were later excluded, there were a total of 1,448 specimens. After the curation process, 1,173 records were removed. With the data update and the inclusion of new records for the 32 species analyzed, the final set comprises 487 specimens.

The assessed species were distributed into two threat categories according to IUCN criteria. Of these, 17 species (53.1%) were classified as CR and 15 species (46.9%) as EN (Table 1).

Among the species classified as CR, the combination of criteria B1ab(iii)+2ab(iii) predominated, indicating an extremely restricted distribution in both EOO and AOO, associated with few locations and a continuous decline in habitat quality. Some species were classified exclusively under criterion B2ab(iii), mainly reflecting very reduced AOO. In more critical cases, sub-criterion (iv) was also recorded, indicating a decline in the number of locations or subpopulations.

The species classified as EN mostly met criterion B2ab(iii), characterized by restricted AOO, a limited number of locations, and a decline in habitat quality. Some species also simultaneously met criteria B1 and B2, although with less restrictive limits compared to CR species.

In general, all species evaluated fell under Criterion B, with the combination of sub-criteria a — reduced number of locations and b(iii) — continuous decline in habitat quality being recurrent, evidencing a consistent pattern of restricted geographic distribution associated with environmental degradation.

**Table 1.** Distribution and sampling data of the species analyzed for conservation assessment (authors, 2026).

| Species                                                                     | AOO(km <sup>2</sup> ) | EOO(km <sup>2</sup> ) | n° of records | locations | criterion |
|-----------------------------------------------------------------------------|-----------------------|-----------------------|---------------|-----------|-----------|
| <i>Peperomia acreana</i> C.DC.                                              | 4                     | 4*                    | 1             | 1         | CR        |
| <i>Peperomia adsurgens</i> Yunck.                                           | 32                    | 31,13                 | 8             | 6         | CR        |
| <i>Peperomia aggregata</i> E.F. Guim. & M. Carv.-Silva                      | 16                    | 6,538                 | 11            | 8         | CR        |
| <i>Peperomia apiahyensis</i> Yunck.                                         | 4                     | 4*                    | 1             | 1         | CR        |
| <i>Peperomia bradei</i> Yunck.                                              | 4                     | 4*                    | 3             | 1         | CR        |
| <i>Peperomia ciliato-caespitosa</i> Carv.-Silva & E.F.Guim.                 | 12                    | 994,332               | 5             | 3         | EN        |
| <i>A peperomia cruzeirensis</i> M. Carvalho-Silva, E.F. Guim. & P.S. Câmara | 12                    | 1,159                 | 3             | 3         | EN        |
| <i>Peperomia diamantinensis</i> M. Carvalho-Silva, E.F. Guim. & P.S. Câmara | 12                    | 2,961                 | 5             | 1         | EN        |
| <i>Peperomia flexicaulis</i> Wawra                                          | 4                     | 4*                    | 2             | 1         | CR        |
| <i>Peperomia fluviatilis</i> Yunck.                                         | 44                    | 897,930               | 12            | 9         | EN        |
| <i>Peperomia hemmendorffii</i> Yunck.                                       | 8                     | 8*                    | 2             | 2         | CR        |
| <i>Peperomia humifusa</i> Yunck.                                            | 4                     | 4*                    | 1             | 1         | CR        |
| <i>Peperomia incana</i> (Haw.) Hook.                                        | 160                   | 373,749               | 100           | 14        | EN        |
| <i>Peperomia itatiaiana</i> Yunck.                                          | 12                    | 705,223               | 6             | 4         | EN        |
| <i>Peperomia lanceolatopeltata</i> C.DC.                                    | 4                     | 4*                    | 2             | 1         | CR        |
| <i>Peperomia lindmaniana</i> Dahlst.                                        | 4                     | 4*                    | 1             | 1         | CR        |
| <i>Peperomia mosenii</i> Dahlst.                                            | 20                    | 44,965                | 7             | 5         | EN        |
| <i>Peperomia papillispica</i> C.DC.                                         | 20                    | 20,913                | 5             | 5         | EN        |
| <i>Peperomia parcifolia</i> C.DC.                                           | 8                     | 8*                    | 5             | 3         | CR        |

| Species                                                             | AOO(km <sup>2</sup> ) | EOO(km <sup>2</sup> ) | n° of records | locations | criterion |
|---------------------------------------------------------------------|-----------------------|-----------------------|---------------|-----------|-----------|
| <i>Peperomia polystachyoides</i> Dahlst.                            | 36                    | 82,141                | 10            | 9         | EN        |
| <i>Peperomia ramboi</i> Yunck.                                      | 44                    | 57,941                | 15            | 10        | EN        |
| <i>Peperomia retivenulosa</i> Yunck.                                | 12                    | 190,515               | 4             | 3         | CR        |
| <i>Peperomia schenkiana</i> Dahlst.                                 | 8                     | 8*                    | 2             | 2         | CR        |
| <i>Peperomia schwackei</i> C.DC.                                    | 40                    | 415,063               | 18            | 16        | CR        |
| <i>Peperomia segregata</i> T.S.Dantas, Carv.-Silva & P.E.A.S.Câmara | 4                     | 4*                    | 11            | 1         | CR        |
| <i>Peperomia sincorana</i> C.DC.                                    | 172                   | 47,697                | 77            | 21        | EN        |
| <i>Peperomia spiritus-sancti</i> E.F. Guim. & M. Carv.-Silva        | 12                    | 1,023                 | 4             | 3         | EN        |
| <i>Peperomia stroemfeltii</i> Dahlst.                               | 56                    | 2,525,011             | 17            | 13        | EN        |
| <i>Peperomia subrubricaulis</i> C.DC.                               | 92                    | 534,177               | 28            | 18        | EN        |
| <i>Peperomia turbinata</i> Dahlst.                                  | 88                    | 472,210               | 28            | 25        | CR        |
| <i>Peperomia velloziana</i> Miq.                                    | 264                   | 1,521,946             | 82            | 43        | EN        |
| <i>Peperomia warmingii</i> C.DC.                                    | 52                    | 268,766               | 16            | 12        | EN        |

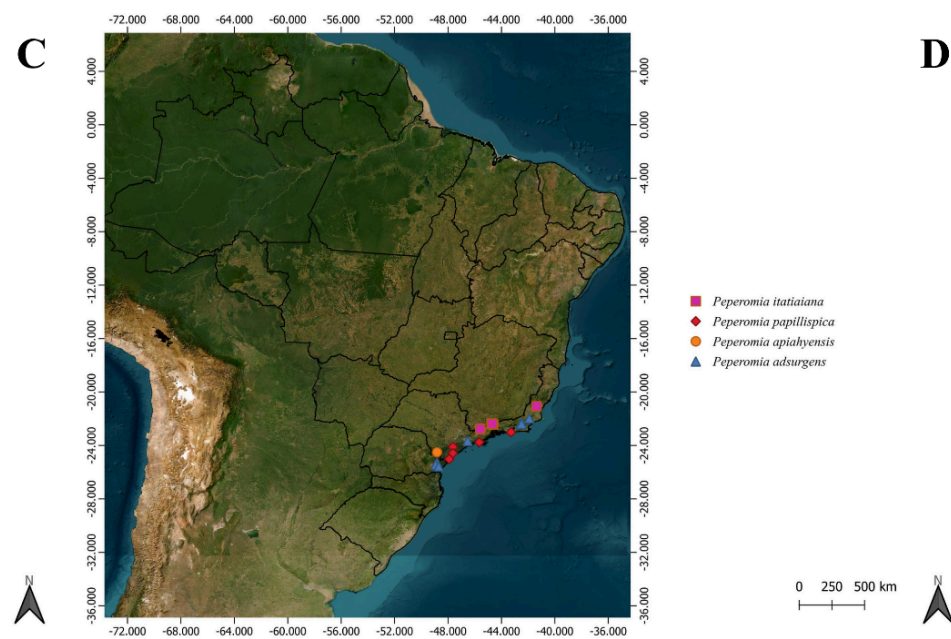
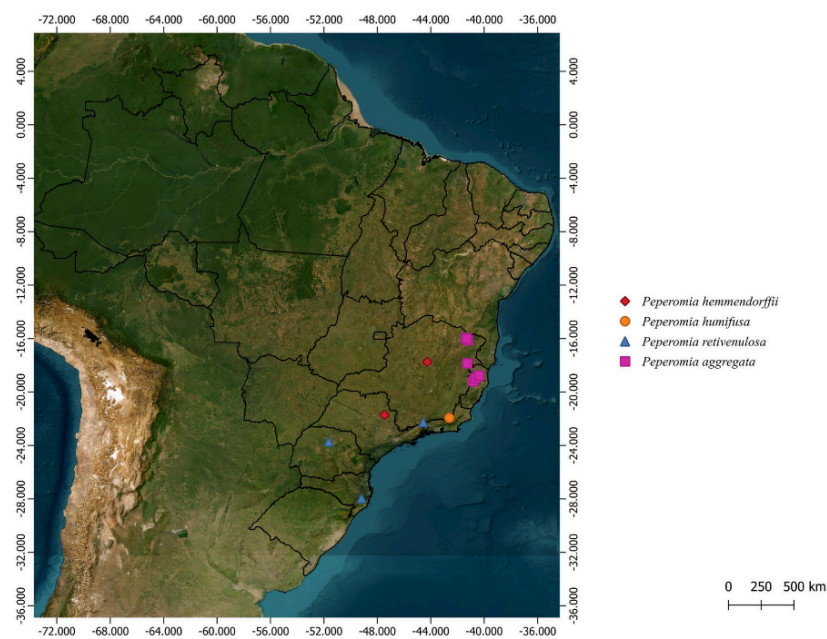
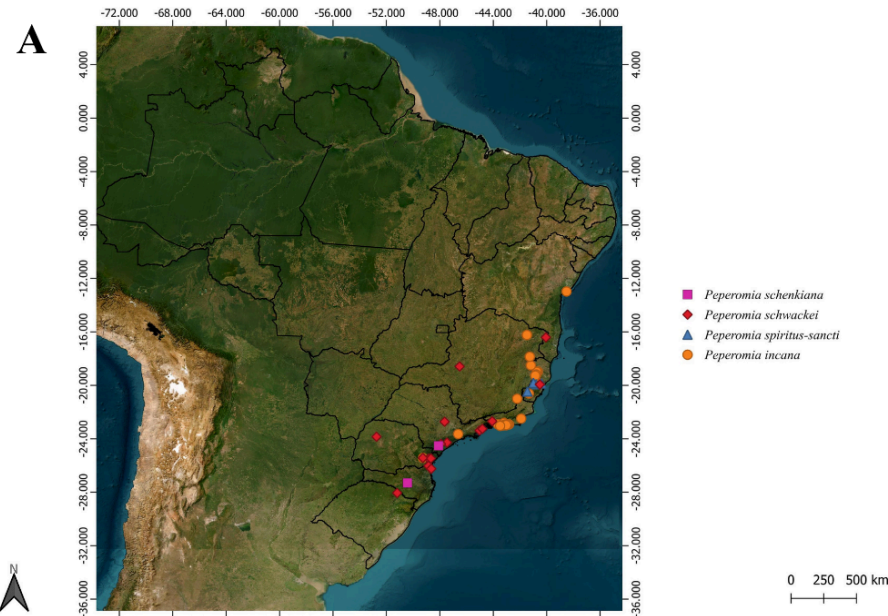
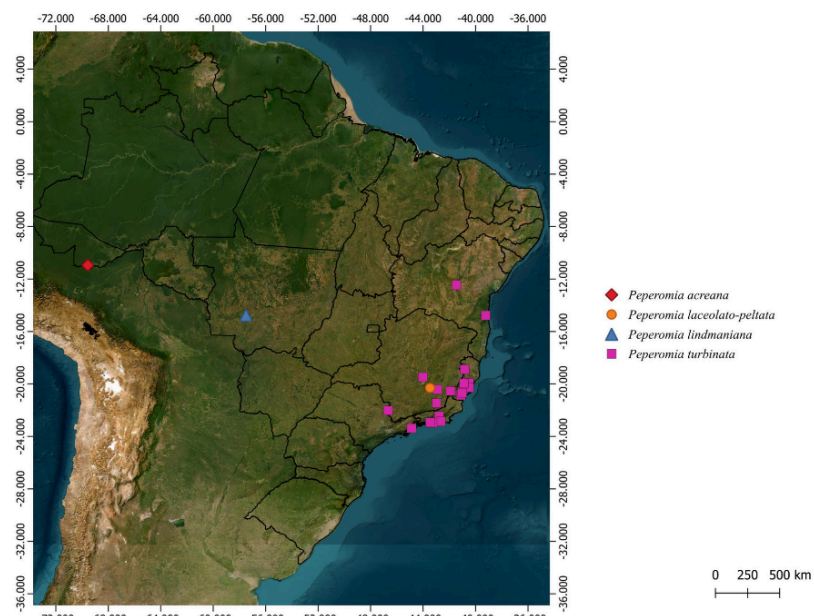
\*EOO equal to zero was replaced by the corresponding value of AOO

**Tabel 2.** Percentage variation in ground cover (2013/2023) for *Peperomia* species.

| Species                                                                    | Vegetacion<br>2013 (%) | Vegetacion<br>2023 (%) | Agriculture<br>2013 (%) | Agriculture<br>2023 (%) | Non-vegetated<br>area 2013 (%) | Non-vegetated<br>area 2023 (%) | Body of water<br>2013 (%) | Body of water<br>2023 (%) |
|----------------------------------------------------------------------------|------------------------|------------------------|-------------------------|-------------------------|--------------------------------|--------------------------------|---------------------------|---------------------------|
| <i>P. adsurgens</i> Yunck.                                                 | 63,38                  | 63,91                  | 22,51                   | 21,56                   | 5,21                           | 5,57                           | 8,90                      | 8,96                      |
| <i>P. aggregata</i> E.F. Guim. & M.<br>Carv.-Silva                         | 24,78                  | 27,00                  | 74,71                   | 72,35                   | 0,22                           | 0,30                           | 0,29                      | 0,34                      |
| <i>P. apiahyensis</i> Yunck.                                               | 70,82                  | 72,71                  | 24,18                   | 21,78                   | 4,95                           | 5,49                           | 0,04                      | 0,02                      |
| <i>P. bradei</i> Yunck.                                                    | 80,27                  | 80,77                  | 13,07                   | 12,32                   | 6,53                           | 6,77                           | 0,13                      | 0,13                      |
| <i>P. ciliato-caespitosa</i><br>Carv.-Silva & E.F.Guim.                    | 15,62                  | 16,04                  | 81,59                   | 80,33                   | 1,99                           | 2,67                           | 0,80                      | 0,96                      |
| <i>P. cruzeirensis</i> M.<br>Carvalho-Silva, E.F. Guim. &<br>P.S. Câmara   | 67,68                  | 61,42                  | 30,21                   | 36,08                   | 1,70                           | 2,07                           | 0,40                      | 0,43                      |
| <i>P. diamantinensis</i> M.<br>Carvalho-Silva, E.F. Guim. &<br>P.S. Câmara | 100,00                 | 87,43                  | -                       | 12,57                   | -                              | -                              | -                         | -                         |
| <i>P. flexicaulis</i> Wawra                                                | -                      | 49,22                  | 19,17                   | 26,03                   | 10,74                          | 12,19                          | 12,70                     | 12,55                     |
| <i>P. fluviatilis</i> Yunck.                                               | 93,40                  | 86,91                  | 6,49                    | 9,81                    | 0,09                           | 0,13                           | 0,02                      | 3,15                      |
| <i>P. hemmendorffii</i> Yunck.                                             | 55,29                  | 54,79                  | 39,36                   | 39,11                   | 5,29                           | 6,04                           | 0,05                      | 0,06                      |
| <i>P. humifusa</i> Yunck.                                                  | 20,34                  | 21,97                  | 77,12                   | 75,37                   | 2,23                           | 2,49                           | 0,31                      | 0,17                      |
| <i>P. incana</i> (Haw.) Hook.                                              | 34,36                  | 35,14                  | 62,00                   | 60,89                   | 2,36                           | 2,65                           | 1,28                      | 1,33                      |

| Species                                                  | Vegetacion<br>2013 (%) | Vegetacion<br>2023 (%) | Agriculture<br>2013 (%) | Agriculture<br>2023 (%) | Non-vegetated<br>area 2013 (%) | Non-vegetated<br>area 2023 (%) | Body of water<br>2013 (%) | Body of water<br>2023 (%) |
|----------------------------------------------------------|------------------------|------------------------|-------------------------|-------------------------|--------------------------------|--------------------------------|---------------------------|---------------------------|
| <i>P. itatiaiana</i> Yunck.                              | 56,35                  | 56,98                  | 43,02                   | 42,39                   | 0,61                           | 0,60                           | 0,03                      | 0,03                      |
| <i>P. lanceolatopeltata</i> C.DC.                        | 73,78                  | 69,05                  | 19,03                   | 21,52                   | 2,17                           | 8,48                           | 1,01                      | 0,94                      |
| <i>P. lindmaniana</i> Dahlst.                            | 68,14                  | 25,38                  | 31,72                   | 72,07                   | 0,05                           | 2,46                           | 0,10                      | 0,08                      |
| <i>P. mosenii</i> Dahlst.                                | 30,27                  | 30,81                  | 64,69                   | 63,53                   | 2,85                           | 3,24                           | 2,19                      | 2,42                      |
| <i>P. papillispica</i> C.DC.                             | 76,14                  | 76,54                  | 11,21                   | 10,53                   | 3,76                           | 4,07                           | 8,89                      | 8,87                      |
| <i>P. parcifolia</i> C.DC.                               | 54,18                  | 53,56                  | 43,85                   | 44,20                   | 1,32                           | 1,52                           | 0,65                      | 0,72                      |
| <i>P. polystachyoides</i> Dahlst.                        | 25,65                  | 26,85                  | 71,83                   | 70,37                   | 1,94                           | 2,17                           | 0,58                      | 0,61                      |
| <i>P. ramboi</i> Yunck.                                  | 61,51                  | 59,32                  | 32,48                   | 34,16                   | 3,37                           | 3,83                           | 2,63                      | 2,69                      |
| <i>P. retivenulosa</i> Yunck.                            | 42,34                  | 47,04                  | 51,54                   | 46,95                   | 3,80                           | 3,86                           | 2,32                      | 2,15                      |
| <i>P. schenkiana</i> Dahlst.                             | 42,10                  | 43,00                  | 54,51                   | 53,30                   | 1,57                           | 1,88                           | 1,83                      | 1,81                      |
| <i>P. schwackei</i> C.DC.                                | 30,43                  | 30,73                  | 66,09                   | 65,42                   | 1,94                           | 2,24                           | 1,53                      | 1,61                      |
| <i>P. sincorana</i> C.DC.                                | 62,96                  | 61,46                  | 36,52                   | 37,70                   | 0,38                           | 0,59                           | 0,14                      | 0,25                      |
| <i>P. spiritus-sancti</i> E.F. Guim. &<br>M. Carv.-Silva | 37,30                  | 37,09                  | 62,28                   | 62,22                   | 0,35                           | 0,57                           | 0,07                      | 0,11                      |
| <i>P. stroemfeltii</i> Dahlst.                           | 37,45                  | 37,31                  | 59,43                   | 59,21                   | 1,66                           | 1,94                           | 1,46                      | 1,54                      |
| <i>P. subrubricaulis</i> C.DC.                           | 42,90                  | 41,79                  | 54,33                   | 55,06                   | 1,69                           | 1,97                           | 1,07                      | 1,18                      |

| Species                     | Vegetacion<br>2013 (%) | Vegetacion<br>2023 (%) | Agriculture<br>2013 (%) | Agriculture<br>2023 (%) | Non-vegetated<br>area 2013 (%) | Non-vegetated<br>area 2023 (%) | Body of water<br>2013 (%) | Body of water<br>2023 (%) |
|-----------------------------|------------------------|------------------------|-------------------------|-------------------------|--------------------------------|--------------------------------|---------------------------|---------------------------|
| <i>P. turbinata</i> Dahlst. | 26,94                  | 36,99                  | 70,22                   | 60,69                   | 2,14                           | 1,44                           | 0,69                      | 0,88                      |
| <i>P. velloziana</i> Miq.   | 39,07                  | 38,48                  | 58,12                   | 58,36                   | 1,46                           | 1,72                           | 1,35                      | 1,43                      |
| <i>P. warmingii</i> C.DC.   | 28,55                  | 29,21                  | 67,54                   | 66,40                   | 2,79                           | 3,17                           | 1,11                      | 1,22                      |



**Figure 2.** Distribution map of species at risk: green - vegetation; orange - agriculture; pink - area without vegetation; blue - water **(A)** Subgenus Oxyrhynchum: *P. acreana*; *P. lanceolato-peltada*; *P. lindmaniana*, and *P. turbinata*. **(B)** Subgenus Leptorhynchum: *P. schenkiana*; *P. schwackei*; *P. spiritus-sancti* and *P. incana*. **(C)** Subgenus Leptorhynchum and Micropiper: *P. aggregata*; *P. humifusa*; *P. hemmendorffii* and *P. retivenulosa*. **(D)** Subgenus Micropiper: *P. itatiaiana*; *P. papillispica*; *P. apiahyensis*, and *P. adsurgens*.

- *Peperomia acreana* C.DC. — CR B1ab(iii,iv)+2ab(iii,iv)

It has a restricted record near the Acre River from 1911 in the Triple Border, in Assis, Brazil in the state of Acre (AC), on the border with Peru and Bolivia. The city was created in 1976 on the former Paraguru rubber plantation, a pioneer in 1908 (IBGE, 2023). It presents a mix of physiognomies among which can be found: open forest with a large concentration of bamboo, and open forest with palm trees, as well as small patches of dense forest (SEMA, 2011). Mapping indicates its occurrence in areas of high rainfall, and the possibility that it is still present in nature is low, the importance of collections in this remote region.

- *Peperomia lanceolatopeltata* C.DC. — CR B1ab(iii,iv)+2ab(iii,iv)

The species is distributed throughout the central region of Brazil, with records in the states of the Federal District (DF), Goiás (GO), and Minas Gerais (MG). In the Federal District, it has been observed in highly anthropized cave areas. In Goiás, it occurs both in protected areas and outside conservation units, including the Pirineus National Park, protected since 1987 and located within the Cerrado biome. This park has great ecological importance, especially due to its water resources, as it is situated in a region of basin divides between the Tocantins and Paraná river systems, in addition to harboring streams that supply neighboring communities. In Minas Gerais, the species also has a recorded occurrence. Additionally, there is a sporadic record of 1939 in the state of Ceará (CE), in an Environmental Protection Area (APA) of the Serra de Baturité.

- *Peperomia lindmaniana* Dahlst. — CR B1ab(iii,iv)+2ab(iii,iv)

It is recorded exclusively in the central region of the Brazilian territory, in the state of Mato Grosso (MT). The location of occurrence is situated in a critical area of the Cerrado, being a grassland formation (MapBiomass, 2024), representing the only record of the species. This result is corroborated by the fact that the most recent collections are over a century old. Despite the geographic restriction, attempts at collection are necessary.

- *Peperomia turbinata* Dahlst. — CR B2ab(iii)

It presents a wide ecological and geographical range. Its distribution covers the coast and the interior, extending from the Northeast to the Southeast. A dense occurrence core is observed from the Cerrado to the Atlantic Forest, with significant expansion to the interior. Its presence stands out in important conservation units, such as the Reserva Biológica de Sooretama, the Reserva Natural Vale, the Parque Nacional Serra do Cipó, the Parque Nacional Serra dos Órgãos, the Parque Nacional Itatiaia, and the Parque Nacional Chapada Diamantina. Most of the mentioned areas are Federal Conservation Units, managed by ICMBio, except for the Reserva Natural Vale, which is a Private Natural Heritage Reserve (RPPN) maintained by private initiative.

- *Peperomia schenkiana* Dahlst. — CR B1ab(iii,iv)+2ab(iii,iv)

The species has only two known collections: the type material, collected in 1886 in the state of Santa Catarina (SC), without photographic records available in online databases, and a second collection carried out in 2005, in the interior of the state of São Paulo (SP), in an area protected by the Lei Mata Atlântica. This most recent occurrence is associated with areas with forest cover and proximity to the Rio Ribeira de Iguape (MapBiomias, 2024). Analysis of satellite images indicates the persistence of native vegetation in the region, suggesting potential for the occurrence of new records of the species.

- *Peperomia schwackei* C.DC. — CR B2ab(iii)

It maintains its distribution in the Southeast and South regions of Brazil and demonstrates ecological plasticity, occupying both coastal slopes and inland areas, indicating an expansion beyond the immediate escarpments. Altitude allows *P. schwackei* to occupy ecological niches that strictly coastal species cannot inhabit due to direct maritime influence and the higher temperatures of the lowlands.

- *Peperomia spiritus-sancti* E.F. Guim. & M. Carv.-Silva — EN B1ab(iii,iv)+2ab(iii,iv)

This species is endemic to the interior of the state of Espírito Santo (ES), where it occurs under specific microclimatic and/or edaphic conditions, apparently essential for its survival. The species is known from only four collections distributed across two locations, evidencing an extremely restricted distribution and high vulnerability to environmental impacts and stochastic events.

- *Peperomia incana* (Haw.) Hook. — EN B2ab(iii)

It exhibits a predominantly coastal and longitudinal distribution pattern, extending southward under maritime influence along the Brazilian coast. The species occurs in the states of Bahia (BA), Minas Gerais (MG), Espírito Santo (ES), and Rio de Janeiro (RJ). Despite the

considerable number of recorded collections, most known locations are spatially close, highlighting its vulnerability to disaster events and other localized threats.

- *Peperomia hemmendorffii* Yunck. — CR B1ab(iii,iv)+2ab(iii,iv)

The species has only two known records, spatially dispersed and associated with fragmented areas. The holotype was collected in 1898 in the interior of the state of São Paulo, near the Cachoeira Três Quedas. Only in 2004 was a second record made, in the state of Minas Gerais (MG), in the Parque Estadual da Serra do Cabral. Despite the scarcity of collections and the large temporal gap between records, it is possible that the species still persists in nature due to the conservation status of the areas where the collections are located.

- *Peperomia humifusa* Yunck. — CR B1ab(iii,iv)+2ab(iii,iv)

The epithet *humifusa* suggests a creeping habit. The species has an extremely restricted distribution, being known from a single occurrence in 1891 in the current region of Praça Getúlio Vargas, in Botafogo, Rio de Janeiro state (RJ), near the coast. Due to the absence of new collections over more than a century and the intense anthropization of the original area of occurrence, it is possible that the species is extinct in the wild.

- *Peperomia retivenulosa* Yunck. — CR B2ab(iii,iv)

The species exhibits a disjunct distribution, with relatively spaced records in coastal areas of Santa Catarina (SC) and Rio de Janeiro (RJ), in addition to one occurrence in the interior of Paraná (PR). The holotype, collected in Paraná, comes from the region currently occupied by the municipality of Marumbi, whose landscape is heavily modified and surrounded by anthropized areas and pastures. The record made in 1996 in the state of Rio de Janeiro was obtained in the Parque Nacional do Itatiaia, a legally protected area, although subject to environmental pressures and anthropogenic vulnerabilities. The most recent collection, carried out in Santa Catarina in 2020, is in an area with relatively preserved surrounding vegetation.

- *Peperomia aggregata* E.F. Guim. & M. Carv.-Silva — CR B2ab(iii,iv)

The species is concentrated in the eastern portion of Minas Gerais (MG) and the north of Espírito Santo (ES), suggesting a possible pattern of regional endemism. Known records are associated with low-altitude areas, rarely near watercourses, urbanized zones, cultivated areas, and regions with tourism potential. This context highlights the occurrence of the species in environments subject to intense anthropogenic pressure, which may represent a threat to the maintenance of its natural populations.

- *Peperomia itatiaiana* Yunck. — EN B2ab(iii,iv)

The species' distribution is restricted to the municipality of Itatiaia, in the state of Rio de Janeiro (RJ), occurring mainly in mountainous areas associated with the Atlantic Forest. The area of occupancy (AOO) revealed a quite limited spatial distribution, concentrated in a few localities. Currently, the species is known from only five collection records, indicating the need for new field surveys to confirm the persistence of natural populations and expand knowledge about its distribution and conservation status.

- *Peperomia papillispica* C.DC. — EN B2ab(iii,iv)

The species is restricted to the southeastern coast of Brazil, with known records in the states of São Paulo (SP) and Rio de Janeiro (RJ), especially in coastal areas under intense anthropogenic pressure. The most recent record dates from 1998, in the state of São Paulo. The type material was collected in 1899 in the Pedra da Gávea region (RJ), currently a widely visited tourist area and historically botanically explored. The absence of new records in this location suggests a low chance of the species remaining in its original area of occurrence. Despite this, three of the five known records are located near bodies of water and still have relatively preserved vegetation cover, indicating the possible persistence of remnant populations in more conserved environments.

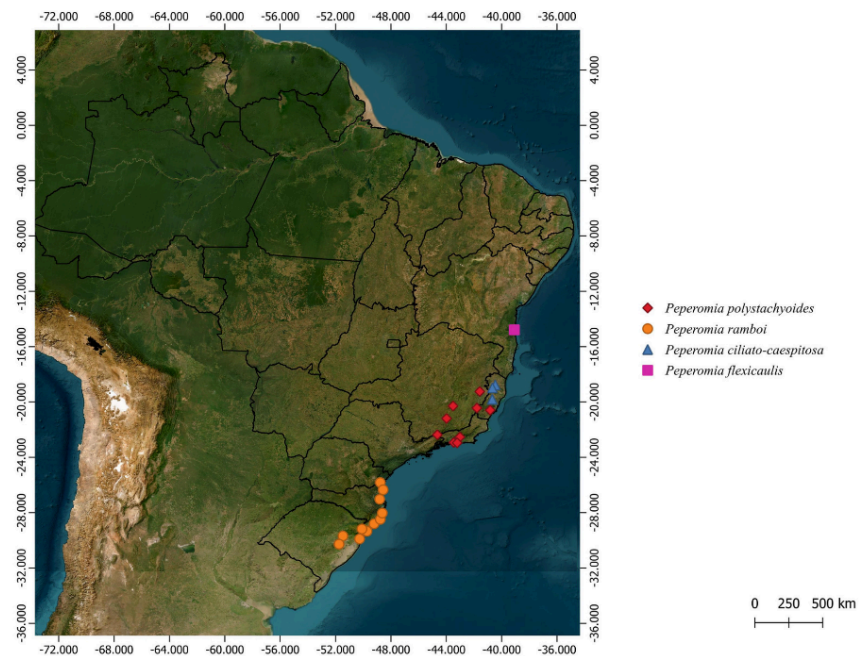
- *Peperomia apiahyensis* Yunck. — CR B1ab(iii,iv)+2ab(iii,iv)

This species has only one collection dated 1885 in the city of Apiaí (SP), and the coordinate no longer corresponds to an endemic environment of the species, highlighting the stochastic risk where the Atlantic Forest has its habitat highly threatened.

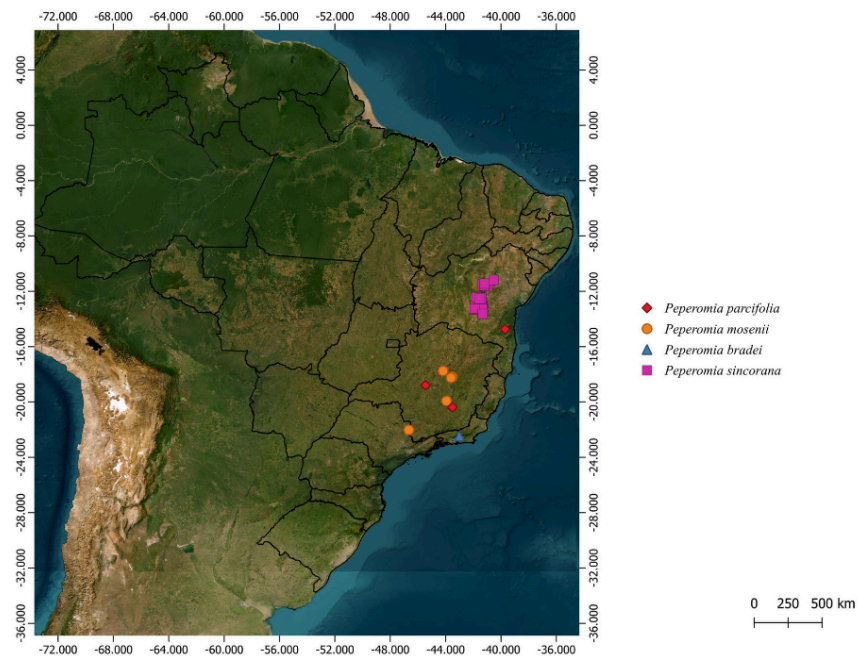
- *Peperomia adsurgens* Yunck. — CR B1ab(iii,iv)+2ab(iii,iv)

The species has records in the states of Rio de Janeiro (SP), Paraná (PR), and São Paulo (SP), with all collections associated with areas that still have good vegetation cover. The known records cover a time interval between 1939 and 2016, the latter being the most recent data available.

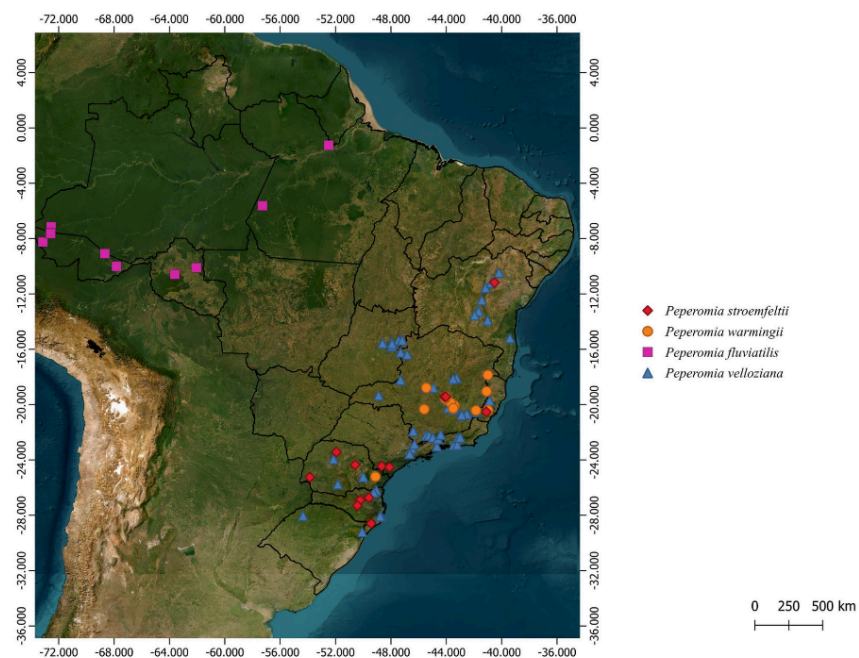
The relatively preserved conditions of the areas of occurrence suggest the possibility of the permanence of natural populations, highlighting the need for new surveys in the vicinity of the points already recorded, in order to confirm their current distribution, abundance, and conservation status.



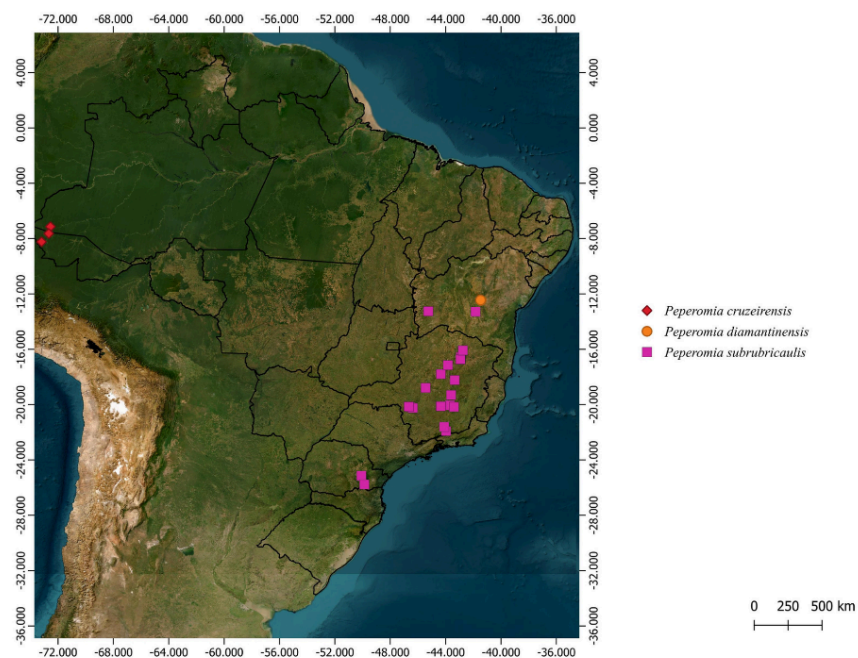
E



F



G



H

**Figure 3.** Distribution map of species at risk: green - vegetation; orange - agriculture; pink - area without vegetation; blue - water **(E)** Subgenus Micropiper: *P. polystachyioides*; *P. ramboi*; *P. ciliato-caespitosa* and *P. flexicaulis*. **(F)** Subgenus Micropiper: *P. parcifolia*; *P. moseni*; *P. bradei* and *P. sincorana*. **(G)** Incertae sedis: *P. stroemfeltii*; *P. warmingii*; *P. fluviatilis* and *P. velloziana*. **(H)** Incertae sedis: *P. cruzeirensis*; *P. diamantinensis* and *P. subrubricaulis*.

- *Peperomia polystachyioides* Dahlst. — EN B2ab(iii)

The species has been recorded in the states of Espírito Santo (ES), Rio de Janeiro (RJ), Minas Gerais (MG), and São Paulo (SP). A significant portion of historical collections, including records from the 19th century in the state of Rio de Janeiro, is associated with important conservation areas, such as the Parque Estadual da Pedra Branca, Parque Nacional da Serra dos Órgãos, the Parque Nacional do Itatiaia, and regions near Cristo Redentor.

In Minas Gerais, records are concentrated in protected areas, including the Sete Salões State Park, the Caparaó National Park, and the Serra do Gandarela National Park. In Espírito Santo and São Paulo, known occurrences are found in areas with less vegetation cover and a higher degree of environmental alteration.

- *Peperomia ramboi* Yunck. — EN B2ab(iii)

The species is recorded along the coast of southern Brazil, associated with environments under intense forest fragmentation. In Paraná (PR), there is only one known record, dated 1971, from the Parque Nacional Guaricana. In the state of Santa Catarina (SC), known occurrences are found in environments with low vegetation cover and evident signs of human impact. One record is located in a protected area of the Parque Nacional do Acaraí, although the surrounding area shows significant landscape alterations. A strong indication of the advance of human impact over time is the fact that, among the few known collections of the species, three currently correspond to urbanized areas.

In Rio Grande do Sul (RS), all known records date from the 20th century. One occurrence is located in the Parque Nacional dos Aparados da Serra, while the others are associated with five currently urbanized municipalities. This scenario highlights the continuous reduction and transformation of the natural habitats originally occupied by the species.

- *Peperomia ciliato-caespitosa* Carv.-Silva & E.F.Guim. — EN B2ab(iii,iv)

Endemic to the state of Espírito Santo (ES), the species is known from only five records, one of which is a duplicate, highlighting the reduced number of truly distinct occurrences. The few known locations indicate high vulnerability, associated with the species' extremely restricted distribution.

The records are concentrated in areas such as Pedra do Elefante, the surroundings of the IFES campus — marked by a high degree of human impact — and the Monumento Natural dos Pontões Capixabas. The limited number of locations and the anthropogenic pressure observed in some areas reinforce the need for new surveys and monitoring of known populations.

- *Peperomia flexicaulis* Wawra — CR B1ab(iii,iv)+2ab(iii,iv)

The only known record of the species was made in 1859 in the state of Bahia (BA), in an area that currently still presents relative environmental preservation and proximity to bodies of water, in the vicinity of the coastal municipality of Ilhéus.

Despite the large time gap since the collection of the type material to the present day, the environmental characteristics of the region suggest the possibility of the species remaining in nature. Therefore, the need for new botanical surveys in the locality and adjacent areas is reinforced, aiming to obtain new records that will confirm its persistence and prevent the species from being considered extinct or possibly extinct in the wild.

- *Peperomia parcifolia* C.DC. — CR B1ab(iii,iv)+2ab(iii,iv)

The species has one known record in the state of Bahia (BA) and four others in the state of Minas Gerais (MG), with no collections recorded in the 21st century. The Bahia record is currently located in an area with low vegetation cover and evident signs of human impact.

In Minas Gerais, collections were mainly carried out on roadsides and in areas near waterfalls in the Parque de las Andorinhas. One of the historical records currently corresponds to an area occupied by plantations, and the surrounding vegetation has been almost entirely suppressed, leaving predominantly environments destined for human use.

- *Peperomia mosenii* Dahlst. — EN B2ab(iii,iv)

The species is known from collections made during the 1970s and currently has a distribution restricted to the interior of the states of Minas Gerais (MG) and São Paulo (SP). This pattern may be related to low population density, associated with vulnerability resulting from habitat loss and fragmentation.

In Minas Gerais, records are associated with areas such as the Parque Estadual do Biribiri and the Parque Estadual da Serra do Cabral. Some historical occurrences are currently in urbanized areas, showing significant changes in the original landscape. There are also records on the border between the states of Minas Gerais and São Paulo, in locations that still maintain relatively preserved vegetation cover.

- *Peperomia bradei* Yunck. — CR B1ab(iii,iv)+2ab(iii,iv)

Three confirmed records of the species were analyzed, consisting of collections of the holotype and isotypes. The calculated Extent of Occurrence (EOO) was 0 km<sup>2</sup>, a value

resulting from the spatial coincidence of the points, making it impossible to form a minimum convex polygon. The estimated Area of Occupancy (AOO) was 4 km<sup>2</sup>, corresponding to a single grid cell.

The known records of the species were made in the Serra dos Órgãos mountain range, in the state of Rio de Janeiro (RJ). Despite the large time gap between historical collections and the present day, the region still presents a predominance of preserved areas, favoring the possible permanence of the species in nature.

However, considering that the Serra dos Órgãos is a frequent target of botanical expeditions and floristic surveys, the absence of recent records may indicate population rarity, low detectability, or a possible decline in natural populations.

- *Peperomia sincorana* C.DC. — EN B2ab(iii)

Although it has a relatively high number of records, the species has an Area of Occupation (AOO) of less than 500 km<sup>2</sup>, placing it in the Endangered (EN) category under sub-criterion B2. Its distribution is regionally restricted and strongly associated with specific environments, suggesting probable ecological specialization and dependence on particular environmental conditions.

Records are concentrated in the Parque Nacional da Chapada Diamantina, in the state of Bahia (BA), indicating a high degree of regional endemism. This limited distribution makes the species potentially vulnerable to environmental changes, stochastic events, and changes in habitat quality, even when occurring in a legally protected area.

- *Peperomia stroemfeltii* Dahlst. — EN B1ab(iii)+2ab(iii)

The species has records in the states of Santa Catarina (SC), Paraná (PR), Bahia (BA), São Paulo (SP), Minas Gerais (MG), and Espírito Santo (ES), with collections made over a wide period of time. The oldest known record dates from 1875, in the state of São Paulo, while the most recent was made in 2021 (ES). Despite the relatively small number of collections, there is temporal continuity in the records of the species, indicating that it has been occasionally rediscovered over the decades.

The known records are associated with different environmental contexts. In Bahia, the occurrence is located in an urbanized area. In São Paulo, the species was collected on the banks of the Rio Ribeira de Iguapé. In Espírito Santo, there is a record in the Parque Estadual Forno Grande, an area with significant preserved vegetation cover.

In Santa Catarina and Paraná, some occurrences are in areas that are currently anthropized or urbanized, possibly reflecting inaccuracies related to the historical coordinates of collection.

Even so, there are records associated with regions with good forest formation, suggesting the species' persistence in relatively preserved environments in these states.

- *Peperomia warmingii* C.DC. — EN B2ab(iii)

The species has records in the states of Espírito Santo (ES), Minas Gerais (MG), and Paraná (PR), with a predominance of collections in Minas Gerais. Known records cover a wide time span, from the oldest collection, made in 1816 in Minas Gerais, to the most recent record, obtained in 2024 in the same state, highlighting the species' temporal persistence in the region.

Occurrences are frequently associated with areas near roads, cities, and environments subject to intense anthropogenic pressure, including regions converted into pastures, which demonstrates high environmental vulnerability. In Minas Gerais, some records are found in protected areas, such as the Parque Nacional do Caparaó and the Pedra da Moça region, locations that still maintain remnants of natural vegetation and may favor the permanence of populations of the species.

- *Peperomia fluviatilis* Yunck. — EN B2ab(iii,iv)

Endemic to the Northern region of Brazil, this species exhibits a distribution associated with spatially isolated populations, indicating possible regional vulnerability resulting from the fragmentation and discontinuity of its habitats. In the state of Amazonas (AM), the record was made near the Juruá-Mirim River. In Pará (PR), the species occurs in areas within the Amazon Rainforest, near the Tapajós River. In Rondônia (RO), collections are associated with regions showing signs of forest fragmentation and human impact.

In Acre (AC), records are concentrated in small towns and anthropized areas, possibly representing approximate coordinates of the original collection locations. Even so, some occurrences are associated with small fragments of remaining native vegetation, preserved forest environments, and areas near lakes in the interior of the Amazon. This set of characteristics highlights the species' dependence on forest remnants and reinforces its susceptibility to environmental changes in the region.

- *Peperomia velloziana* Miq. — EN B2ab(iii)

The species' geographic distribution demonstrates a wide historical occurrence throughout the Southeast, South, and Central-West regions of Brazil, with records in the states of Minas Gerais (MG), Federal District (DF), São Paulo (SP), Espírito Santo (ES), Santa Catarina (SC), Rio de Janeiro (RJ), Goiás (GO), Bahia (BA), and Paraná (PR). The coordinates indicate a predominant association with remnants of the Atlantic Forest, mountainous areas, riparian environments, and transition zones with the Cerrado. Despite the intense

fragmentation observed in parts of its range, the temporal continuity of collections, from the 19th century to recent records, suggests the species' capacity for persistence in nature over time. However, many current records coincide with urbanized, agricultural, or highly anthropized areas, indicating a possible reduction in habitat quality and increasing dependence on preserved forest remnants and conservation units.

- *Peperomia cruzeirensis* M. Carvalho-Silva, E.F. Guim. & P.S. Câmara — EN B1ab(iii,iv)+B2ab(iii,iv)

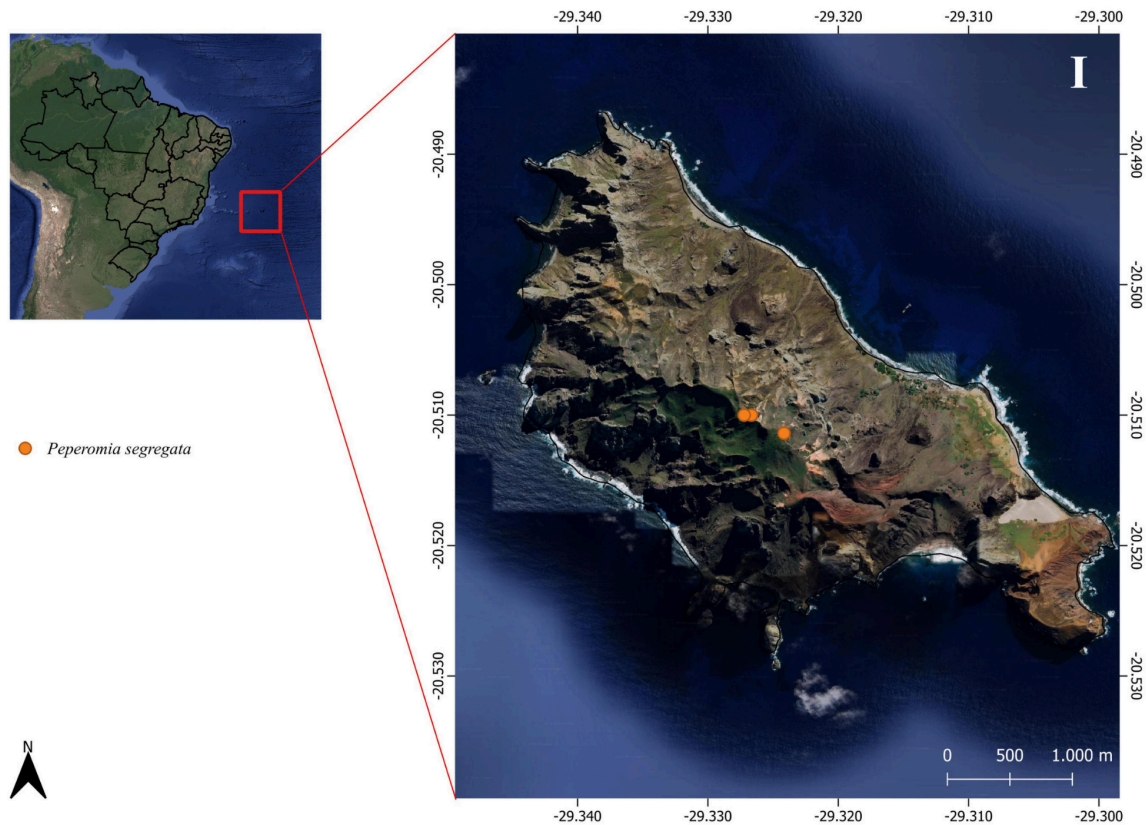
Endemic to the state of Acre, the species is known from only three records, including the holotype and paratype, highlighting its limited taxonomic knowledge and apparently restricted distribution. Known occurrences are located in the Serra do Divisor National Park, near the Juruá-Mirim River, as well as in areas within the Amazon Rainforest and regions currently associated with urbanized areas.

- *Peperomia diamantinensis* M. Carvalho-Silva, E.F. Guim. & P.S. Câmara — EN B1ab(iii,iv)+2ab(iii,iv)

Endemic to the Chapada Diamantina region in the state of Bahia (BA), this species has a restricted distribution and a reduced number of known records, indicating high vulnerability. Even with occurrences within conservation areas, the scarcity of records suggests that the species may be sensitive to both natural causes and pressures resulting from human activities, factors that potentially affect the stability and maintenance of its natural populations.

- *Peperomia subrubricaulis* C.DC. — EN B2ab(iii)

Has a wide geographic range, covering different states of Brazil. Despite the very high EOO, the actual occupancy is relatively small, indicating that the species occurs discontinuously with isolated populations. There is a potential wide distribution, fragmented occupancy, and a possible dependence on specific microhabitats.



**Figure 4. (I)** Distribution map of *Peperomia segregata* on Trindade Island (ES): green - vegetation; orange - agriculture; pink - area without vegetation; blue - water

- *Peperomia segregata* T.S.Dantas, Carv.-Silva & P.E.A.S.Câmara — CR B1ab(iii,iv)+2ab(iii,iv)

The species *P. segregata* is endemic to Trindade Island. Regarding land use and land cover analysis, it was not possible to obtain results, since MapBiomas does not yet provide data for oceanic territories, only covering the Brazilian continental territory. This limitation resulted in a specific gap for the island area.

Additionally, all specimens collected in Trindade were considered to belong to a single location due to the island's geographical characteristics, which include a small territorial extension, oceanic isolation, and high susceptibility to stochastic events. Therefore, the species was classified as Critically Endangered (CR), based on both the EOO and the AOO.

## Discussion

### 1. Distribution and sampling gaps

The *Peperomia* species analyzed in this study exhibit a wide latitudinal range in Brazilian territory. However, they show a clear core of diversity concentrated in the Southeast and East regions of Brazil. This distribution pattern is intrinsically linked to the phytogeographical domain of the Atlantic Forest, particularly along the coastal corridor and mountain ranges, where high humidity and topographical complexity favor speciation. While the genus occupies a continuous strip along the coast, there is a transition to more fragmented and disjunct distribution patterns as the taxa extend into the interior of the country or to enclaves in other biogeographical regions.

In this context, the interpretation of the results must consider important limitations related to the available knowledge about *Peperomia* species. Many of these species were described several decades ago, which implies significant gaps regarding their geographic distribution, ecology, and population size. This scenario can directly influence conservation assessments, especially by restricting the actual understanding of the range of occurrence and the ecological conditions of the species. In addition, the scarcity of specialists working with the group in Brazil stands out, which may result in taxonomic gaps, underestimation of diversity, and limitations in the quality and availability of data. Added to this is the low sampling effort in certain regions, with areas still under-sampled and historically little explored from a botanical point of view.

### 2. Habitat degradation and protected areas

Considering these limitations, the temporal analysis of land cover between 2013 and 2023 shows that the evaluated *Peperomia* species are situated within a landscape conservation gradient, ranging from areas with a high proportion of vegetation to heavily anthropized environments (Venter et al., 2016; Song et al., 2018). In general, it is observed that, although some areas maintain relative stability in vegetation cover, there is a recurring pattern of dominance by the agricultural matrix and, in some cases, expansion of anthropic uses associated with the reduction of natural vegetation (Curtis et al., 2018). Even in scenarios where there is an increase in vegetation cover, this increase mostly occurs within previously altered landscapes, which may limit the effective recovery of habitat quality, especially in terms of structure and connectivity (Arroyo-Rodríguez et al., 2017; Haddad et al., 2017). These results indicate that the environmental integrity of the areas where the

species occur is heterogeneous, but often compromised by historical and ongoing land-use processes (IPBES, 2019).

The species *Peperomia lindmaniana*, *Peperomia flexicaulis*, *Peperomia cruzeirensis*, and *Peperomia diamantinensis* showed patterns associated with the conversion of natural areas to anthropogenic uses, with reduced vegetation cover and expansion of agricultural or non-vegetated areas. These results indicate landscape degradation processes and a possible decline in habitat quality over the analyzed period.

The species *Peperomia turbinata*, *Peperomia humifusa*, *Peperomia aggregata*, and *Peperomia mosenii* showed signs of partial recovery of vegetation cover. However, despite this positive trend, the landscapes remain strongly influenced by anthropogenic activities, especially agricultural activities, which may limit the connectivity and habitat quality of the species.

The species *Peperomia schwackei*, *Peperomia spiritus-sancti*, *Peperomia itatiaiana*, and *Peperomia adsurgens* showed patterns of relative landscape stability, with few changes in land cover throughout the analyzed period. These results suggest the maintenance of vegetation as the predominant matrix and possible habitat stability.

The species *Peperomia papillispica* and *Peperomia bradei* showed patterns associated with good environmental conservation, characterized by high vegetation cover and low anthropogenic pressure, indicating relatively preserved habitats.

The species *Peperomia ciliato-caespitosa* and *Peperomia sincorana* showed evidence of increased anthropogenic pressure on the landscape. In *P. ciliato-caespitosa*, a scenario of high anthropization and low remaining vegetation cover is observed, while *P. sincorana* demonstrates a gradual replacement of natural cover by anthropogenic areas, suggesting the beginning of habitat degradation processes. For *Peperomia apiahyensis*, the absence of new records reinforces the low probability of the species remaining in the wild, despite the environmental analyses carried out.

A particular case that reinforces these patterns is observed in oceanic island environments. The vegetation of Trindade Island has been investigated since the beginning of the 20th century, showing, since then, vulnerability to different pressures, including anthropogenic impacts, fires, extreme weather events, and herbivory by introduced mammals (Alves, 1998; Carvalho-Silva et al., 2013). Being an isolated oceanic environment, the island currently maintains about 65% of its original vegetation cover, with degradation mainly associated with the historical introduction of exotic species, whose influence on landscape modification over time is widely recognized (Alves, 1998; Silva & Alves, 2011).

The dynamics observed for *P. lindmaniana* highlight one of the most critical scenarios among the species evaluated, characterized by a sharp conversion of natural areas into anthropic uses over the last decade. The significant reduction in vegetation cover, associated with the predominant expansion of the agricultural matrix, indicates an intensive process of landscape transformation, with potential direct impacts on habitat quality and availability. This pattern suggests not only a loss of suitable area but also a compromise of the structure and connectivity of the environment, factors essential for maintaining viable populations. Furthermore, the increase in non-vegetated areas reinforces the intensification of anthropic pressures, evidencing a scenario of continuous degradation.

### 3. Conservation implications

From a conservation perspective, differences in data availability among species also provide important insights. A relevant case among the evaluated species is *Peperomia pseudoestrellensis* C.DC., which was initially included in the analysis but later excluded due to the high number of available specimens. This pattern indicates broad sample representativeness and suggests good quality and continuity of habitats throughout its distribution, which extends from the Northeast to the South of Brazil. The species shows a consistent history of collections over time, evidencing its recurrence and relative stability in different regions.

In contrast, insular endemism represents a distinct conservation scenario. Trindade Island (ES) has an endemic species of extreme conservation value and its preservation is linked to the appreciation of the flora of oceanic islands, *P. segregata*. Trindade Island has a coastline of approximately 21.8 km, with rocky formations prevailing (about 76%), while areas composed of sand and pebbles represent approximately 24%. As it is the emerged portion of an underwater elevation, the island has a small insular platform (SECIRM, 2017).

The predominance of species classified as CR highlights a worrying scenario for the conservation of *Peperomia* in Brazil, especially considering the high degree of endemism of the group. This pattern mainly reflects the strong association between restricted geographic distribution and vulnerability to habitat loss, factors widely recognized as determinants of extinction risk in tropical plants. The recurring presence of subcriterion b(iii) reinforces that the decline in habitat quality, possibly related to the expansion of anthropogenic activities, fragmentation, and changes in land use, plays a central role in increasing the risk of extinction.

Species classified as CR tend to have extremely restricted distributions, often associated with specific and isolated environments, which makes them highly susceptible to

stochastic events and local pressures. On the other hand, species classified as EN, although also having geographic restrictions, demonstrate a slightly wider distribution or a lower degree of fragmentation, which may confer relative resilience to environmental disturbances. Species that are poorly collected or have limited records tend to have reduced AOO and EOO, which can lead to an overestimation of the extinction risk. This pattern highlights the need to expand floristic inventories and field studies in order to refine assessments and reduce uncertainties.

The presence of the species in conservation units suggests the potential for the permanence and maintenance of natural populations in these environments, favored by the relatively preserved state of the vegetation. Therefore, it is important to conduct new botanical surveys in these locations to confirm the species' persistence, expand knowledge about its current distribution, and assess its population conditions.

Finally, the results highlight the urgency of targeted conservation strategies, especially for species that occur in few locations and outside protected areas, since even in these protected environments, the species are not immune to deforestation, the presence of livestock, and fires (Livre Vermelho da Flora do Brasil, 2013). Expanding knowledge about the distribution, ecology, and population dynamics of *Peperomia* is essential to support effective conservation and management actions for the group in Brazil.

These regions exhibit high environmental heterogeneity, including variations in altitude, climate, and vegetation cover, factors that directly influence species distribution (Safford, 2007). The Atlantic Forest, the main area of occurrence, is recognized as a global biodiversity hotspot, characterized by high levels of endemism and intense habitat fragmentation (Myers et al. 2000; Ribeiro et al. 2009).

## **Conclusion**

The results obtained show that the evaluated *Peperomia* species are embedded in a scenario of environmental heterogeneity, frequently marked by different levels of landscape degradation. Although some areas still present significant proportions of vegetation, there is a predominance of anthropized matrices, especially those associated with agriculture and livestock farming, which can compromise the quality and connectivity of the habitats. This context reinforces the vulnerability of the environments where these species occur and highlights the need for conservation strategies that consider not only the extent of vegetation cover but also its ecological integrity. Additionally, the importance of expanding botanical collection efforts, including apparently common species, is emphasized, especially in the case

of *Peperomia*, whose epiphytic species tend to be undersampled due to difficulties in field detection, resulting in gaps in knowledge about their distribution.

The assessments carried out in this study were based exclusively on IUCN Criterion B, grounded in spatial parameters. However, the incorporation of other criteria, especially those related to population dynamics and collection history, may indicate more critical scenarios for some species. The limitation of population data, associated with difficulties in accessing habitats and the epiphytic habit of many species, restricts the application of more complete assessments. Finally, the data generated have the potential to support official databases, such as CNCFlora, contributing to the improvement of lists of threatened species and to the planning of conservation actions, as well as reinforcing the importance of integrating spatial, taxonomic, and ecological data in biodiversity assessments.

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» [https://gaigerco.furg.br/images/Arquivos-PDF/protrindade-10anos\\_so\\_praias.pdf](https://gaigerco.furg.br/images/Arquivos-PDF/protrindade-10anos_so_praias.pdf)

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## Supplementary material

**Table 1.** Curated database of *Peperomia* occurrences, after filtering, validation, and standardization of records.

| species                                                   | family_recordedBy_recordNumber      | lon        | lat        | year | stateProvince  | CatalogNumber |
|-----------------------------------------------------------|-------------------------------------|------------|------------|------|----------------|---------------|
| <i>Peperomia acreana</i> C.DC.                            | Piperaceae_Ule, E._9304             | -69.5667   | -10.9417   | 1911 | Acre           | NY00222644    |
| <i>Peperomia adsurgens</i> Yunck.                         | Piperaceae_PEREIRA,E_1314           | -41.913124 | -21.969756 | 1955 | Rio de Janeiro | NY00222647    |
| <i>Peperomia adsurgens</i> Yunck.                         | Piperaceae_BONNET,A_1600230         | -42.466885 | -22.339841 | 2011 | Rio de Janeiro | RB00682868    |
| <i>Peperomia adsurgens</i> Yunck.                         | Piperaceae_Lozano, ED_2617          | -48.929798 | -25.450342 | 2014 | Paraná         | MBM00428359   |
| <i>Peperomia adsurgens</i> Yunck.                         | Piperaceae_Ariati, V H_1219         | -48.831990 | -25.287792 | 2016 | Paraná         | MBM00437693   |
| <i>Peperomia adsurgens</i> Yunck.                         | Piperaceae_A. Bonnet_121            | -42.566763 | -22.359663 | 2012 | Rio de Janeiro | RB00757424    |
| <i>Peperomia adsurgens</i> Yunck.                         | Piperaceae_P. Rosa_978              | -42.487222 | -22.377777 | 2016 | Rio de Janeiro | RB01162946    |
| <i>Peperomia adsurgens</i> Yunck.                         | Piperaceae_Labiak, P.H. et al._3634 | -48.700000 | -25.566667 | 2006 | Paraná         | UPCB00034960  |
| <i>Peperomia adsurgens</i> Yunck.                         | Piperaceae_O. Handro_s.n.           | -46.313063 | -23.774617 | 1939 | São Paulo      | NY00558670    |
| <i>Peperomia aggregata</i> E.F. Guim. &<br>M. Carv.-Silva | Piperaceae_FORZZA,RC_5172           | -40.443889 | -18.776944 | 2008 | Espírito Santo | MBML36134     |
| <i>Peperomia aggregata</i> E.F. Guim. &<br>M. Carv.-Silva | Piperaceae_ASSIS,A_2462             | -40.443889 | -18.776944 | 2010 | Espírito Santo |               |
| <i>Peperomia aggregata</i> E.F. Guim. &<br>M. Carv.-Silva | Piperaceae_SAAVEDRA,M_684           | -40.661389 | -18.981111 | 2008 | Espírito Santo |               |
| <i>Peperomia aggregata</i> E.F. Guim. &<br>M. Carv.-Silva | Piperaceae_HARLEY,RM_25203          | -41.200000 | -16.133333 | 1988 | Minas Gerais   |               |

| species                                                     | family_recordedBy_recordNumber   | lon        | lat        | year | stateProvince  | CatalogNumber |
|-------------------------------------------------------------|----------------------------------|------------|------------|------|----------------|---------------|
| <i>Peperomia aggregata</i> E.F. Guim. & M. Carv.-Silva      | Piperaceae_HARLEY,RM_25159       | -41.366667 | -15.950000 | 1988 | Minas Gerais   | UB237033      |
| <i>Peperomia aggregata</i> E.F. Guim. & M. Carv.-Silva      | Piperaceae_Taylor_1518           | -41.366667 | -15.950000 | 1991 | Minas Gerais   | BHCB21284     |
| <i>Peperomia aggregata</i> E.F. Guim. & M. Carv.-Silva      | Piperaceae_De Paula, LFA_1519    | -40.821944 | -19.201944 | 2021 | Espírito Santo | RB01455736    |
| <i>Peperomia aggregata</i> E.F. Guim. & M. Carv.-Silva      | Piperaceae_Pinto Junior, H.V_165 | -40.651860 | -18.963562 | 2015 | Espírito Santo | SAMES01211    |
| <i>Peperomia aggregata</i> E.F. Guim. & M. Carv.-Silva      | Piperaceae_Pinto Junior, H.V_240 | -40.375227 | -18.766990 | 2016 | Espírito Santo | SAMES01663    |
| <i>Peperomia aggregata</i> E.F. Guim. & M. Carv.-Silva      | Piperaceae_De Paula, LFA_632     | -41.260833 | -17.856111 | 2013 | Minas Gerais   | BHCB167253    |
| <i>Peperomia aggregata</i> E.F. Guim. & M. Carv.-Silva      | Piperaceae_Taylor, NP_1518       | -41.297199 | -16.005301 | 1991 | Minas Gerais   | BHCB21284     |
| <i>Peperomia apiahyensis</i> Yunck.                         | Piperaceae_GLAZIOU,AFM_3068      | -48.824410 | -24.504196 | 1885 | São Paulo      |               |
| <i>Peperomia bradei</i> Yunck.                              | Piperaceae_BRADE,AC_16464        | -43.005000 | -22.459444 | 1940 | Rio de Janeiro | NY00222688    |
| <i>Peperomia bradei</i> Yunck.                              | Piperaceae_BRADE,AC_43408        | -43.005000 | -22.459444 | 1940 | Rio de Janeiro | MO1788178     |
| <i>Peperomia bradei</i> Yunck.                              | Piperaceae_BRADE,AC_16469        | -43.005000 | -22.459444 | 1940 | Rio de Janeiro | RB00285473    |
| <i>Peperomia ciliato-caespitosa</i> Carv.-Silva & E.F.Guim. | Piperaceae_KOLLMANN,L_10684      | -40.457739 | -18.764991 | 2008 | Espírito Santo | RB00522059    |

| species                                                                           | family_recordedBy_recordNumber    | lon        | lat        | year | stateProvince  | CatalogNumber |
|-----------------------------------------------------------------------------------|-----------------------------------|------------|------------|------|----------------|---------------|
| <i>Peperomia ciliato-caespitosa</i><br>Carv.-Silva & E.F.Guim.                    | Piperaceae_DEMUNER,V_1342         | -40.676316 | -19.804266 | 2000 | Espírito Santo | MBML013422    |
| <i>Peperomia ciliato-caespitosa</i><br>Carv.-Silva & E.F.Guim.                    | Piperaceae_Elton John de Lório_91 | -40.676316 | -19.804266 | 2012 | Espírito Santo | RB00817649    |
| <i>Peperomia ciliato-caespitosa</i><br>Carv.-Silva & E.F.Guim.                    | Piperaceae_Elton John de Lório_92 | -40.676316 | -19.804266 | 2012 | Espírito Santo | RB00817650    |
| <i>Peperomia ciliato-caespitosa</i><br>Carv.-Silva & E.F.Guim.                    | Piperaceae_DEMUNER,V_2285         | -40.665583 | -18.977916 | 2006 | Espírito Santo | RB00555575    |
| <i>Peperomia cruzeirensis</i> M.<br>Carvalho-Silva, E.F. Guim. & P.S.<br>Câmara   | Piperaceae_MAAS,PJM_12939         | -73.194995 | -8.231018  |      | Acre           | INPA31302     |
| <i>Peperomia cruzeirensis</i> M.<br>Carvalho-Silva, E.F. Guim. & P.S.<br>Câmara   | Piperaceae_PRUSKI,JF_3491         | -72.5500   | -7.133333  | 1987 | Acre           | INPA0155277   |
| <i>Peperomia cruzeirensis</i> M.<br>Carvalho-Silva, E.F. Guim. & P.S.<br>Câmara   | Piperaceae_MAAS,PJM_13062         | -72.669998 | -7.631110  | 1971 | Acre           | RB00566361    |
| <i>Peperomia diamantinensis</i> M.<br>Carvalho-Silva, E.F. Guim. & P.S.<br>Câmara | Piperaceae_LIMA,R_2186            | -41.4500   | -12.466667 | 1996 | Bahia          | HUEFS0063744  |

| species                             | family_recordedBy_recordNumber | lon        | lat        | year | stateProvince | CatalogNumber |
|-------------------------------------|--------------------------------|------------|------------|------|---------------|---------------|
| <i>Peperomia diamantinensis</i> M.  |                                |            |            |      |               |               |
| Carvalho-Silva, E.F. Guim. & P.S.   | Piperaceae_CARVALHO-SILVA,M_2  |            |            |      |               |               |
| Câmara                              | 17                             | -41.4525   | -12.457222 | 2003 | Bahia         | CEN00054560   |
| <i>Peperomia diamantinensis</i> M.  |                                |            |            |      |               |               |
| Carvalho-Silva, E.F. Guim. & P.S.   |                                |            |            |      |               |               |
| Câmara                              | Piperaceae_E. Melo_1683        | -41.470000 | -12.450278 | 1995 | Bahia         | RB00274297    |
| <i>Peperomia diamantinensis</i> M.  |                                |            |            |      |               |               |
| Carvalho-Silva, E.F. Guim. & P.S.   |                                |            |            |      |               |               |
| Câmara                              | Piperaceae_Harley_22357        | -41.45     | -12.45     | 1980 | Bahia         | RB00649843    |
| <i>Peperomia diamantinensis</i> M.  |                                |            |            |      |               |               |
| Carvalho-Silva, E.F. Guim. & P.S.   |                                |            |            |      |               |               |
| Câmara                              | Piperaceae_CONCEICAO,AA_1253   | -41.471944 | -12.4425   | 2005 | Bahia         | HUEFS0093251  |
| <i>Peperomia flexicaulis</i> Wawra  | Piperaceae_WAWRA,H_            | -39.082138 | -14.781196 | 1859 | Bahia         | W0024295      |
|                                     | Piperaceae_E. Pereira; G.F.J.  |            |            |      |               |               |
| <i>Peperomia flexicaulis</i> Wawra  | Pabst_5996                     | -47.634009 | -24.320583 | 1961 | São Paulo     | NY559082      |
|                                     | Piperaceae_ROMANIUC-NETO,S_5   |            |            |      |               |               |
| <i>Peperomia fluviatilis</i> Yunck. | 34                             | -62.0500   | -10.1000   | 1986 | Rondônia      | SP212845      |
| <i>Peperomia fluviatilis</i> Yunck. | Piperaceae_VIEIRA,MG_442       | -63.616666 | -10.583333 | 1979 | Rondônia      | NY01397264    |
| <i>Peperomia fluviatilis</i> Yunck. | Piperaceae_NELSON,BW_824       | -67.8300   | -10.0000   | 1980 | Acre          | NY01397266    |
| <i>Peperomia fluviatilis</i> Yunck. | Piperaceae_NELSON,BW_589       | -68.666667 | -9.083333  | 1980 | Acre          | NY01397267    |

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| <i>Peperomia fluviatilis</i> Yunck.   | Piperaceae_ULE,EHG_5785        | -73.1425   | -8.2402777 | 1901 | Amazonas       | MG005694      |
| <i>Peperomia fluviatilis</i> Yunck.   | Piperaceae_Mike Hopkins_138    | -52.5      | -1.25      |      | Pará           | INPA169636    |
| <i>Peperomia fluviatilis</i> Yunck.   | Piperaceae_Mike Hopkins_824    | -67.83     | -10.0      |      | Acre           | INPA110239    |
| <i>Peperomia fluviatilis</i> Yunck.   | Piperaceae_Mike Hopkins_3490   | -72.55     | -7.133.333 |      | Acre           | INPA155276    |
| <i>Peperomia fluviatilis</i> Yunck.   | Piperaceae_Mike Hopkins_3593   | -57.28     | -5.619.722 |      | Pará           | INPA256830    |
| <i>Peperomia fluviatilis</i> Yunck.   | Piperaceae_Mike Hopkins_62367  | -72.62     | -7.616.667 |      | Acre           | INPA168332    |
| <i>Peperomia fluviatilis</i> Yunck.   | Piperaceae_Mike Hopkins_62483  | -72.6      | -7.616.667 |      | Acre           | INPA168450    |
| <i>Peperomia fluviatilis</i> Yunck.   | Piperaceae_Mike Hopkins_62620  | -72.58     | -7.633.333 |      | Acre           | INPA168584    |
| <i>Peperomia hemmendorffii</i> Yunck. | Piperaceae_MELLO-SILVA,R_2511  | -44.261388 | -17.748055 | 2004 | Minas Gerais   | RB00273938    |
| <i>Peperomia hemmendorffii</i> Yunck. | Piperaceae_Hemmendorff, E._79  | -47.470194 | -21.721708 | 1898 | São Paulo      | S-R-4224      |
| <i>Peperomia humifusa</i> Yunck.      | Piperaceae_ARMOND,AFN_318      | -42.608600 | -21.933599 | 1891 | Rio de Janeiro | R-TIPOS43976  |
| <i>Peperomia incana</i> (Haw.) Hook.  | Piperaceae_COSTA,CF_           | -38.5108   | -12.9711   | 1963 | Bahia          | BAH1610       |
| <i>Peperomia incana</i> (Haw.) Hook.  | Piperaceae_KOLLMANN,L_4339     | -40.637344 | -19.879113 | 2001 | Espírito Santo | RB00695102    |
| <i>Peperomia incana</i> (Haw.) Hook.  | Piperaceae_DEMUNER,V_3994      | -40.662778 | -18.971944 | 2007 | Espírito Santo | RB00584530    |
| <i>Peperomia incana</i> (Haw.) Hook.  | Piperaceae_SAAVEDRA,MM_1036    | -40.665277 | -18.978888 | 2010 | Espírito Santo | RB00594298    |
|                                       | Piperaceae_FERNANDES,HQB_171   |            |            |      |                | MBML-HERBARI  |
| <i>Peperomia incana</i> (Haw.) Hook.  | 2                              | -40.681389 | -19.805556 | 1985 | Espírito Santo | O 3076        |
| <i>Peperomia incana</i> (Haw.) Hook.  | Piperaceae_PINTO,HV_165        | -40.740299 | -18.983100 | 2015 | Espírito Santo | RB01189008    |
|                                       |                                |            |            |      |                | MBML-HERBARI  |
| <i>Peperomia incana</i> (Haw.) Hook.  | Piperaceae_FONTANA,AP_2342     | -40.774889 | -19.191472 | 2006 | Espírito Santo | O 39935       |

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|                                      | Piperaceae_HATSCHBACH,GG_463   |            |            |      |                |               |
| <i>Peperomia incana</i> (Haw.) Hook. | 28                             | -41.4767   | -16.2225   | 1983 | Minas Gerais   | MO2860197     |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_ROSA,P_1121         | -43.021275 | -22.972164 | 2016 | Rio de Janeiro | RB01198247    |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_SAAVEDRA,MM_320     | -43.024166 | -22.966388 | 2006 | Rio de Janeiro | HEPH00017710  |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_FERREIRA,VF_464     | -43.054983 | -22.915126 | 1978 | Rio de Janeiro | RB00522956    |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_PLOWMAN,TC_13934    | -43.054983 | -22.915126 | 1985 | Rio de Janeiro | RB00523092    |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_SANTOS,MG_85        | -43.054983 | -22.915126 | 1995 | Rio de Janeiro | RB00491432    |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_PINTO,LJS_53        | -43.054983 | -22.915126 | 1997 | Rio de Janeiro | RFFP128       |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_QUEIROZ,GA_1        | -43.054983 | -22.915126 | 2011 | Rio de Janeiro | RB00874380    |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_QUEIROZ,GA_6        | -43.054983 | -22.915126 | 2011 | Rio de Janeiro | RB00874385    |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_MACHADO,DNS_2170    | -43.0875   | -22.945555 | 2017 | Rio de Janeiro | RB01387107    |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_FERNANDES,T_278     | -43.103599 | -22.883300 | 2018 | Rio de Janeiro | RB01395388    |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_MEIRELLES,ST_23209  | -43.207500 | -22.902799 | 1989 | Rio de Janeiro | UEC59227      |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_GLAZIOU,AFM_5997    | -43.45788  | -22.9255   | 1872 | Rio de Janeiro | P01656349     |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_BRADE,AC_18019      | -43.45788  | -22.9255   | 1945 | Rio de Janeiro | RB00522974    |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_DUARTE,AP_280       | -43.45788  | -22.9255   | 1946 | Rio de Janeiro | RB00522971    |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_BARROSO,GM_         | -43.45788  | -22.9255   | 1955 | Rio de Janeiro | RB00522990    |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_LIANE_3725          | -43.45788  | -22.9255   | 1958 | Rio de Janeiro | RB00523100    |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_DUARTE,AP_4989      | -43.45788  | -22.9255   | 1959 | Rio de Janeiro | RB00523096    |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_MARTINS,HF_185      | -43.45788  | -22.9255   | 1960 | Rio de Janeiro | RB00522959    |

| <b>species</b>                       | <b>family_recordedBy_recordNumber</b> | <b>lon</b> | <b>lat</b> | <b>year</b> | <b>stateProvince</b> | <b>CatalogNumber</b> |
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| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_LANNA,JP_100               | -43.45788  | -22.9255   | 1961        | Rio de Janeiro       | RB00522968           |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_SUCRE,D_1541               | -43.45788  | -22.9255   | 1967        | Rio de Janeiro       | RB00522963           |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_SUCRE,D_7865               | -43.45788  | -22.9255   | 1971        | Rio de Janeiro       | RB00522970           |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_MARTINELLI,G_1031          | -43.45788  | -22.9255   | 1976        | Rio de Janeiro       | RB00522962           |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_MAUTONE,L_191              | -43.45788  | -22.9255   | 1977        | Rio de Janeiro       | RB00522955           |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_ANDREATA,RHP_315           | -43.45788  | -22.9255   | 1981        | Rio de Janeiro       | RB00522966           |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_MARTINELLI,G_7632          | -43.45788  | -22.9255   | 1981        | Rio de Janeiro       | RB00522965           |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_MARQUETE,R_553             | -43.45788  | -22.9255   | 1992        | Rio de Janeiro       | RB00424183           |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_MARQUETE,R_604             | -43.45788  | -22.9255   | 1992        | Rio de Janeiro       | RB00424186           |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_MARQUETE,R_682             | -43.45788  | -22.9255   | 1992        | Rio de Janeiro       | RB00424184           |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_GIORDANO,LC_1573           | -43.45788  | -22.9255   | 1993        | Rio de Janeiro       | RB00522986           |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_BRAGA,JMA_3551             | -43.45788  | -22.9255   | 1996        | Rio de Janeiro       | RB00523098           |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_SANTIAGO,DS_36             | -43.45788  | -22.9255   | 1998        | Rio de Janeiro       | RB00523094           |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_CARDOSO,LJT_136            | -43.45788  | -22.9255   | 2004        | Rio de Janeiro       | RB00273683           |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_CARDOSO,LJT_99             | -43.45788  | -22.9255   | 2004        | Rio de Janeiro       | RB00522985           |
|                                      | Piperaceae_CARVALHO-SILVA,M_3         |            |            |             |                      |                      |
| <i>Peperomia incana</i> (Haw.) Hook. | 92                                    | -43.45788  | -22.9255   | 2005        | Rio de Janeiro       | RB00556856           |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_FRAGA,CN_1759              | -43.45788  | -22.9255   | 2007        | Rio de Janeiro       | RB00550317           |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_PIMENTA,D_                 | -43.45788  | -22.9255   | 2012        | Rio de Janeiro       | RB00872023           |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_SCHWACKE,CAW_4277          | -43.45788  | -22.9255   |             | Rio de Janeiro       | RB00522967           |

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| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_BELEM,RP_3775              |            |            | 1968        | Minas Gerais         | RB00822333           |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_Handro.O_s.n               | -46.627373 | -23.639120 | 1942        | São Paulo            | SP010998             |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_Paula, LFA de_347          | -41.260944 | -17.855972 | 2011        | Minas Gerais         | BHCB157318           |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_A.A.M. de Barros_4219      | -43.1036   | -22.883301 | 2010        | Rio de Janeiro       | RFFP13661            |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_QUEIROZ,GA_63              | -43.1036   | -22.883301 | 2012        | Rio de Janeiro       | RFFP15202            |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_QUEIROZ,GA_155             | -43.1036   | -22.883301 | 2014        | Rio de Janeiro       | RFFP16304            |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_MAIA,SMS_3                 | -43.1036   | -22.883301 | 2014        | Rio de Janeiro       | RFFP16566            |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_Machado,DNS_774            | -43.1036   | -22.883301 | 2015        | Rio de Janeiro       | RFFP17036            |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_QUEIROZ,GA_381             | -42.8186   | -22.919399 | 2016        | Rio de Janeiro       | RFFP17834            |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_QUEIROZ,GA_399             | -42.8186   | -22.919399 | 2016        | Rio de Janeiro       | RFFP17944            |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_Ule, E.H.G_4594            | -43.2075   | -22.9028   | 1897        | Rio de Janeiro       | NY559350             |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_L. Smith_6399              | -43.3469   | -23.0036   | 1952        | Rio de Janeiro       | US2124406            |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_Miers_3423                 | -43.19646  | -22.80552  | 1878        | Rio de Janeiro       | K004452596           |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_G. Hatschbach_46328        | -41.478403 | -16.22718  | 1983        | Minas Gerais         | MBM082692            |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_G. Hatschbach_53340        | -41.478403 | -16.22718  | 1989        | Minas Gerais         | MBM131809            |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_Moll, JW_1138              |            |            | 1903        |                      | WAG.1880523          |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_H.V. Pinto Junior_502      | -40.601079 | -18.620781 | 2019        | Espírito Santo       | VIC052729            |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_C. Baez_301                | -43.240000 | -22.990833 | 2015        | Rio de Janeiro       | NY04091954           |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_Duarte, A.P_250            | -43.197715 | -22.968359 | 1946        | Rio de Janeiro       | NY559352             |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_Braga, R.E_1045            | -49.262675 | -25.429091 | 1959        | Paraná               | NY559348             |

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| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_J.P.P. Carauta_5587        | -43.660336 | -22.912130 | 1988        | Rio de Janeiro       | RB01228665           |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_Araujo, D_3220             | -43.043334 | -22.974025 |             | Rio de Janeiro       | RB01228661           |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_J.P.P. Carauta_115         | -43.005757 | -22.947460 | 1994        | Rio de Janeiro       | RB01228667           |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_Araujo, D_3845             | -43.043231 | -22.973997 | 1980        | Rio de Janeiro       | RB01228660           |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_SENNA, P_21                | -43.164170 | -22.963054 | 1987        | Rio de Janeiro       | RB01228664           |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_MARTINELLI, G_8528         | -43.018860 | -22.974019 | 1982        | Rio de Janeiro       | RB00522958           |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_CARAUTA, J.P.P_6881        | -43.164170 | -22.963054 | 1993        | Rio de Janeiro       | RB01228666           |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_QUEIROZ, G.A_156           | -43.016667 | -22.95     | 2014        | Rio de Janeiro       | RB00879611           |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_FRAGA,C.N_3289             | -43.019722 | -22.973056 | 2011        | Rio de Janeiro       | RB00859239           |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_DE PAULA, L.F.A_347        | -41.260833 | -17.856111 | 2011        | Minas Gerais         | RB00722459           |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_FONTANA,AP_2393            | -42.210278 | -21.001667 | 2006        | Minas Gerais         | RB00562177           |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_FONTANA,AP_2349            | -40.848889 | -19.264722 | 2006        | Espírito Santo       | RB00562167           |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_DOS SANTOS,<br>M.C.F_481   | -43.005754 | -22.947509 | 2000        | Rio de Janeiro       | RB00520931           |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_DE BARROS,<br>A.A.M_1184   | -43.021681 | -22.952559 | 2001        | Rio de Janeiro       | RB00520721           |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_PINTO, L.J.S_53            | -43.021681 | -22.952559 | 1997        | Rio de Janeiro       | RB00520738           |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_Machado, D.N.S_759         | -42.963056 | -22.938889 | 2015        | Rio de Janeiro       | RB01206579           |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_Machado, D.N.S_776         | -43.116667 | -22.944167 | 2015        | Rio de Janeiro       | RB01206571           |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_Machado, D.N.S_766         | -43.116667 | -22.944167 | 2015        | Rio de Janeiro       | RB01206582           |

| <b>species</b>                       | <b>family_recordedBy_recordNumber</b> | <b>lon</b> | <b>lat</b> | <b>year</b> | <b>stateProvince</b> | <b>CatalogNumber</b> |
|--------------------------------------|---------------------------------------|------------|------------|-------------|----------------------|----------------------|
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_DE QUEIROZ, G.A_401        | -42.911944 | -22.9225   | 2016        | Rio de Janeiro       | RB01191959           |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_DE QUEIROZ, G.A_397        | -42.916667 | -22.927222 | 2016        | Rio de Janeiro       | RB01191955           |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_DE QUEIROZ, G.A_399        | -42.914167 | -22.924722 | 2016        | Rio de Janeiro       | RB01191957           |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_DE QUEIROZ, G.A_381        | -42.893333 | -22.925833 | 2016        | Rio de Janeiro       | RB01156285           |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_DE QUEIROZ, G.A_313        | -43.1      | -22.945278 | 2016        | Rio de Janeiro       | RB01156210           |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_DE QUEIROZ, G.A_314        | -43.1      | -22.945278 | 2016        | Rio de Janeiro       | RB01156211           |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_AZEVEDO, L.O_386           | -43.239722 | -22.990555 | 2016        | Rio de Janeiro       | RB01115626           |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_BAEZ, C_301                | -43.24     | -22.990833 | 2015        | Rio de Janeiro       | RB01057558           |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_DE QUEIROZ, G.A_263        | -42.909722 | -22.931389 | 2015        | Rio de Janeiro       | RB01015387           |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_DE QUEIROZ, G.A_255        | -43.081944 | -22.939444 | 2015        | Rio de Janeiro       | RB01015378           |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_Völtz, RR_2698             | -41.180556 | -18.508333 | 2022        | Minas Gerais         | MBM00439860          |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_Marquete, R_282            | -41.909167 | -22.490833 | 1982        | Rio de Janeiro       | IBGE00030982         |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_V.C.Manhães_968            | -41.328889 | -20.610556 | 2023        | Espírito Santo       | MBM56259             |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_NUNES, D_1755              | -43.0225   | -22.971389 | 2023        | Rio de Janeiro       | RB01498921           |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_Paula, LFA_139             | -41.260944 | -17.855972 | 2011        | Minas Gerais         | BHCB007069           |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_SAAVEDRA, M.M_320          | -43.024164 | -22.966376 | 2006        | Rio de Janeiro       | HEPH00017710         |
| <i>Peperomia incana</i> (Haw.) Hook. | Piperaceae_H. F. Martins_185          | -43.487456 | -23.028221 | 1960        | Rio de Janeiro       | RB00522959           |
| <i>Peperomia itatiaiana</i> Yunck.   | Piperaceae_MARQUETE,R_4082            | -44.745    | -22.369166 | 2007        | Rio de Janeiro       | RB00495159           |
| <i>Peperomia itatiaiana</i> Yunck.   | Piperaceae_M. Kuhlmann_s.n            | -45.583611 | -22.762448 | 1935        | São Paulo            | NY00559354           |
| <i>Peperomia itatiaiana</i> Yunck.   | Piperaceae_A.C.Brade_14634            | -44.58832  | -22.441781 | 1935        | Rio de Janeiro       | RB00285157           |

| species                                  | family_recordedBy_recordNumber     | lon        | lat        | year | stateProvince  | CatalogNumber |
|------------------------------------------|------------------------------------|------------|------------|------|----------------|---------------|
| <i>Peperomia itatiaiana</i> Yunck.       | Piperaceae_D. Nunes_331            | -44.745277 | -22.368888 | 2020 | Minas Gerais   | RB01435204    |
| <i>Peperomia itatiaiana</i> Yunck.       | Piperaceae_Couto, D.R._2102        | -41.365845 | -21.061099 | 2012 | Espírito Santo | RB00760764    |
| <i>Peperomia itatiaiana</i> Yunck.       | Piperaceae_T.Fernandes_248         | -44.691149 | -22.368102 | 2018 | Rio de Janeiro | RB01395371    |
| <i>Peperomia lanceolatopeltata</i> C. DC | Piperaceae_DAMAZIO, LB_1831        | -43.467489 | -20.300425 | 1907 | Minas Gerais   | G00328367     |
| <i>Peperomia lanceolatopeltata</i> C. DC | Piperaceae_M.F. Vieira_236         |            |            | 1985 | Minas Gerais   | RB00273649    |
| <i>Peperomia lindmaniana</i> Dahlst.     | Piperaceae_LINDMAN, CAM_2925       | -57.498529 | -14.746361 | 1894 | Mato Grosso    | B 10 0004886  |
| <i>Peperomia mosenii</i> Dahlst.         | Piperaceae_IRWIN, HS_28056         | -43.519722 | -18.18055  | 1970 | Minas Gerais   |               |
|                                          | Piperaceae_HATSCHBACH, GG_316      |            |            |      |                |               |
| <i>Peperomia mosenii</i> Dahlst.         | 36                                 | -43.6003   | -18.2494   | 1973 | Minas Gerais   |               |
| <i>Peperomia mosenii</i> Dahlst.         | Piperaceae_Mosén, C.W.H._1664      | -46.661189 | -22.021579 | 1874 | São Paulo      | S-R-4265      |
| <i>Peperomia mosenii</i> Dahlst.         | Piperaceae_Mosén_1663              | -46.661189 | -22.021579 | 1873 | São Paulo      | P00868355     |
|                                          | Piperaceae_H. S. Irwin & et        |            |            |      |                |               |
| <i>Peperomia mosenii</i> Dahlst.         | al._30509                          | -43.934542 | -19.920071 | 1971 |                | V0454745F     |
| <i>Peperomia mosenii</i> Dahlst.         | Piperaceae_Howard S._27111         | -44.181647 | -17.749058 | 1970 | Minas Gerais   | MO2868100     |
| <i>Peperomia mosenii</i> Dahlst.         | Piperaceae_Howard S._27818         | -43.604215 | -18.245636 | 1970 | Minas Gerais   | MO2868024     |
| <i>Peperomia papillispica</i> C.DC.      | Piperaceae_Basso, M.E_MEB - 39     | -47.9125   | -25.017777 | 1994 | São Paulo      | ESA22405      |
| <i>Peperomia papillispica</i> C.DC.      | Piperaceae_Souza, V.C. et al._s.n  | -45.653611 | -23.754444 | 1998 | São Paulo      | ESA63129      |
| <i>Peperomia papillispica</i> C.DC.      | Piperaceae_Miyagi, P.H. et al._229 | -47.624722 | -24.105305 | 1994 | São Paulo      | ESA17949      |
| <i>Peperomia papillispica</i> C.DC.      | Piperaceae_Catharino, E.L.M_477    | -47.627777 | -24.576666 | 1985 | São Paulo      | ESA4563       |
| <i>Peperomia papillispica</i> C.DC.      | Piperaceae_E. H. G. Ule_4858       | -43.284705 | -22.997739 | 1899 | Rio de Janeiro | B 10 0005028  |

| species                                  | family_recordedBy_recordNumber      | lon        | lat        | year | stateProvince  | CatalogNumber |
|------------------------------------------|-------------------------------------|------------|------------|------|----------------|---------------|
| <i>Peperomia parcifolia</i> C.DC.        | Piperaceae_JARDIM,JG_975            | -39.6961   | -14.7350   | 1997 | Bahia          | NY00559546    |
| <i>Peperomia parcifolia</i> C.DC.        | Piperaceae_L. B. Damazio_1710       | -43.502513 | -20.381069 | 1905 | Minas Gerais   | RB00273737    |
| <i>Peperomia parcifolia</i> C.DC.        | Piperaceae_Nogueira, R.E._56        | -43.489007 | -20.358239 | 1999 |                |               |
| <i>Peperomia parcifolia</i> C.DC.        | Piperaceae_Damazio, S._1712         | -43.502513 | -20.381069 | 1905 | Minas Gerais   | RB00285159    |
| <i>Peperomia parcifolia</i> C.DC.        | Piperaceae_Damazio, L. B._s.n       | -45.44222  | -18.78778  |      | Minas Gerais   | G-DC-265695/1 |
|                                          | Piperaceae_HATSCHBACH,GG_614        |            |            |      |                |               |
| <i>Peperomia polystachyoides</i> Dahlst. | 34                                  | -40.825614 | -20.586416 | 1985 | Espírito Santo | RB00410151    |
| <i>Peperomia polystachyoides</i> Dahlst. | Piperaceae_GLAZIOU,AFM_7839         | -43.45788  | -22.9255   | 1874 | Rio de Janeiro | P02030468     |
| <i>Peperomia polystachyoides</i> Dahlst. | Piperaceae_ASSIS,LCS_456            | -43.975799 | -21.186899 | 2002 | Minas Gerais   | RB00437590    |
| <i>Peperomia polystachyoides</i> Dahlst. | Piperaceae_C. W. H. Mosen_2574      | -43.008333 | -22.530833 | 1874 | Rio de Janeiro | NY00559645    |
|                                          | Piperaceae_Eduardo P.               |            |            |      |                |               |
| <i>Peperomia polystachyoides</i> Dahlst. | Fernandez_929                       | -41.581388 | -19.24     | 2022 | Minas Gerais   | RB01472001    |
| <i>Peperomia polystachyoides</i> Dahlst. | Piperaceae_Glaziou, A.F.M._9595     |            |            | 1899 | Rio de Janeiro | S14-40381     |
| <i>Peperomia polystachyoides</i> Dahlst. | Piperaceae_Mendonça, F.R. de_731    | -43.211441 | -22.952309 | 1887 | Rio de Janeiro | HBG523011     |
| <i>Peperomia polystachyoides</i> Dahlst. | Piperaceae_Lisboa, M.A._s.n.        | -44.644187 | -22.366684 | 1975 | Rio de Janeiro | OUPR42951     |
| <i>Peperomia polystachyoides</i> Dahlst. | Piperaceae_Silveira, A.L._12        | -43.508098 | -20.287500 | 1999 | São Paulo      | OUPR9527      |
|                                          | Piperaceae_Gonçalves, EG; Salviani, |            |            |      |                |               |
| <i>Peperomia polystachyoides</i> Dahlst. | ER; Leoni, LS; Peixoto, M_721       | -41.784898 | -20.434810 | 2001 | Minas Gerais   | UB156561      |
| <i>Peperomia ramboi</i> Yunck.           | Piperaceae_BRAGA,PIS_2351           | -48.768654 | -25.817635 | 1971 | Paraná         |               |
| <i>Peperomia ramboi</i> Yunck.           | Piperaceae_LANDRUM,LR_3988          | -48.806678 | -27.028386 | 1981 | Santa Catarina | MO2872752     |

| species                        | family_recordedBy_recordNumber    | lon        | lat        | year | stateProvince  | CatalogNumber |
|--------------------------------|-----------------------------------|------------|------------|------|----------------|---------------|
|                                |                                   |            |            |      | Rio Grande do  |               |
| <i>Peperomia ramboi</i> Yunck. | Piperaceae_Rambo, B., Padre_54469 | -49.728913 | -29.338579 | 1954 | Sul            | S05-9734      |
| <i>Peperomia ramboi</i> Yunck. | Piperaceae_Korte, A._5505         | -49.218342 | -28.802654 | 2010 | Santa Catarina | FURB02984     |
| <i>Peperomia ramboi</i> Yunck. | Piperaceae_Korte, A._5235         | -48.563188 | -26.345782 | 2010 | Santa Catarina | FURB37605     |
|                                |                                   |            |            |      | Rio Grande do  |               |
| <i>Peperomia ramboi</i> Yunck. | Piperaceae_Rambo, B._45159        | -50.261751 | -29.892446 | 1950 | Sul            | CM261346      |
|                                | Piperaceae_A. Krapovickas & C. L. |            |            |      | Rio Grande do  |               |
| <i>Peperomia ramboi</i> Yunck. | Cristóbal_37655                   | -49.72779  | -29.33850  | 1982 | Sul            | V0443414F     |
|                                |                                   |            |            |      | Rio Grande do  |               |
| <i>Peperomia ramboi</i> Yunck. | Piperaceae_Rambo, B._s.n          | -49.728913 | -29.338579 |      | Sul            | HERB70625     |
|                                |                                   |            |            |      | Rio Grande do  |               |
| <i>Peperomia ramboi</i> Yunck. | Piperaceae_Rambo, B._s.n          | -51.467913 | -29.681616 | 1935 | Sul            | PACA-AGP2202  |
|                                |                                   |            |            |      | Rio Grande do  |               |
| <i>Peperomia ramboi</i> Yunck. | Piperaceae_Sehnem, A._s.n         | -50.089287 | -29.178661 | 1971 | Sul            | PACA-AGP84848 |
|                                | Piperaceae_Krapovickas, A; et     |            |            |      |                |               |
| <i>Peperomia ramboi</i> Yunck. | al._37767                         | -48.767211 | -28.484513 | 1982 | Santa Catarina | MBM77435      |
| <i>Peperomia ramboi</i> Yunck. | Piperaceae_Hentschel, R_s.n.      | -48.623895 | -28.028213 | 2007 | Santa Catarina | ICN158002     |
|                                |                                   |            |            |      | Rio Grande do  |               |
| <i>Peperomia ramboi</i> Yunck. | Piperaceae_Hagelund, K_12909      | -51.744873 | -30.276844 | 1979 | Sul            | ICN127376     |

| species                              | family_recordedBy_recordNumber    | lon        | lat        | year | stateProvince  | CatalogNumber |
|--------------------------------------|-----------------------------------|------------|------------|------|----------------|---------------|
|                                      |                                   |            |            |      | Rio Grande do  |               |
| <i>Peperomia ramboi</i> Yunck.       | Piperaceae_Hagelund, K_9137       | -51.744874 | -30.276845 | 1975 | Sul            | ICN127374     |
|                                      |                                   |            |            |      | Rio Grande do  |               |
| <i>Peperomia ramboi</i> Yunck.       | Piperaceae_Hagelund, K_11319      | -51.744875 | -30.276846 | 1977 | Sul            | ICN127375     |
| <i>Peperomia retivenulosa</i> Yunck. | Piperaceae_DUSEN,PKH_3709         | -51.6392   | -23.7061   | 1904 | Paraná         | NY00250584    |
| <i>Peperomia retivenulosa</i> Yunck. | Piperaceae_DUSEN,PKH_3711         | -51.639400 | -23.706100 | 1904 | Paraná         | NY00559710    |
| <i>Peperomia retivenulosa</i> Yunck. | Piperaceae_J.M.A. Braga_3723      | -44.5666   | -22.25     | 1996 | Rio de Janeiro | RB00476855    |
| <i>Peperomia retivenulosa</i> Yunck. | Piperaceae_V. Lino_186            | -49.183888 | -27.949722 | 2020 | Santa Catarina | RB01441355    |
| <i>Peperomia schenkiana</i> Dahlst.  | Piperaceae_Oriani, A. et al_505   | -48.099998 | -24.52     | 2005 | São Paulo      | ESA096501     |
| <i>Peperomia schenkiana</i> Dahlst.  | Piperaceae_SCHENK_848             | -50.4224   | -27.3006   | 1886 | Santa Catarina | MO2479727     |
| <i>Peperomia schwackei</i> C.DC.     | Piperaceae_LOMBARDI,JA_5519       | -40.055833 | -16.4050   | 2003 | Minas Gerais   | RB00523423    |
| <i>Peperomia schwackei</i> C.DC.     | Piperaceae_CARAUTA,P_1751         | -45.023751 | -23.380237 | 1974 | São Paulo      | RB00297882    |
| <i>Peperomia schwackei</i> C.DC.     | Piperaceae_PIRANI,JR_3110         | -47.459999 | -24.280000 | 1994 | São Paulo      | UEC149559     |
| <i>Peperomia schwackei</i> C.DC.     | Piperaceae_BARRETO,KD_3000        | -47.639999 | -22.719999 | 1994 | São Paulo      | ESA021228     |
| <i>Peperomia schwackei</i> C.DC.     | Piperaceae_MIYAGI,PH_474          | -47.919998 | -24.379999 | 1995 | São Paulo      | SP292285      |
| <i>Peperomia schwackei</i> C.DC.     | Piperaceae_KUMMROW,R_1939         | -48.8342   | -25.4769   | 1982 | Paraná         | NY00555156    |
| <i>Peperomia schwackei</i> C.DC.     | Piperaceae_Schwacke_13173         | -44.07856  | -22.683553 | 1897 | Santa catarina | RB00533755    |
|                                      | Piperaceae_Radavelli, J.; Coelho, |            |            |      |                |               |
| <i>Peperomia schwackei</i> C.DC.     | S._85                             | -48.68111  | -26.227777 | 2020 | Santa catarina | FLOR0072623   |
| <i>Peperomia schwackei</i> C.DC.     | Piperaceae_M.G. Caxambú_5521      | -52.737389 | -23.845639 | 2014 | Paraná         | HCF000014303  |

| species                                                                | family_recordedBy_recordNumber       | lon        | lat        | year | stateProvince  | CatalogNumber |
|------------------------------------------------------------------------|--------------------------------------|------------|------------|------|----------------|---------------|
| <i>Peperomia schwackei</i> C.DC.                                       | Piperaceae_R. Reitz_4591             | -48.8547   | -26.0269   | 1957 | Santa Catarina | NY00555157    |
| <i>Peperomia schwackei</i> C.DC.                                       | Piperaceae_M. Borgo_351              | -48.67     | -25.47     | 1998 | Paraná         | NY00776821    |
|                                                                        |                                      |            |            |      | Rio Grande do  |               |
| <i>Peperomia schwackei</i> C.DC.                                       | Piperaceae_L. Borges_322             | -51.190556 | -28.054167 | 2002 | Sul            | RSPF00009850  |
| <i>Peperomia schwackei</i> C.DC.                                       | Piperaceae_July, V.H._214            | -48.6381   | -26.243299 |      | Santa Catarina | MBM338961     |
| <i>Peperomia schwackei</i> C.DC.                                       | Piperaceae_M.S.Wängler_2410          | -44.811111 | -23.253333 | 2019 | Rio de Janeiro | RB01410868    |
| <i>Peperomia schwackei</i> C.DC.                                       | Piperaceae_AP. Duarte_3059           | -46.518485 | -18.582979 | 1950 | Minas Gerais   | RB00523421    |
| <i>Peperomia schwackei</i> C.DC.                                       | Piperaceae_R.R. Vervloet_824         | -40.5175   | -19.926667 | 2002 | Espírito Santo | RB00695115    |
| <i>Peperomia schwackei</i> C.DC.                                       | Piperaceae_L. Kollmann; et al_8180   | -40.506944 | -19.936111 | 2005 | Espírito Santo | RB00523492    |
| <i>Peperomia schwackei</i> C.DC.                                       | Piperaceae_Schwacker,C.A._3523       | -49.267841 | -25.430239 | 1882 | Paraná         | RB00285406    |
| <i>Peperomia segregata</i> T.S.Dantas,<br>Carv.-Silva & P.E.A.S.Câmara | Piperaceae_CARVALHO-SILVA,M_1<br>781 | -29.324167 | -20.511389 | 2012 | Espírito Santo | UB189574      |
| <i>Peperomia segregata</i> T.S.Dantas,<br>Carv.-Silva & P.E.A.S.Câmara | Piperaceae_CARVALHO-SILVA,M_1<br>787 | -29.327222 | -20.5100   | 2012 | Espírito Santo | UB189580      |
| <i>Peperomia segregata</i> T.S.Dantas,<br>Carv.-Silva & P.E.A.S.Câmara | Piperaceae_CARVALHO-SILVA,M_1<br>782 | -29.324166 | -20.511388 | 2012 | Espírito Santo | UB189575      |
| <i>Peperomia segregata</i> T.S.Dantas,<br>Carv.-Silva & P.E.A.S.Câmara | Piperaceae_CARVALHO-SILVA,M_1<br>783 | -29.327222 | -20.5100   | 2012 | Espírito Santo | UB189576      |
| <i>Peperomia segregata</i> T.S.Dantas,<br>Carv.-Silva & P.E.A.S.Câmara | Piperaceae_CARVALHO-SILVA,M_1<br>785 | -29.327222 | -20.5100   | 2012 | Espírito Santo | UB189578      |

| species                                                                | family_recordedBy_recordNumber            | lon        | lat        | year | stateProvince  | CatalogNumber |
|------------------------------------------------------------------------|-------------------------------------------|------------|------------|------|----------------|---------------|
| <i>Peperomia segregata</i> T.S.Dantas,<br>Carv.-Silva & P.E.A.S.Câmara | Piperaceae_CARVALHO-SILVA,M_1<br>791      | -29.327222 | -20.51     | 2012 | Espírito Santo | UB189584      |
| <i>Peperomia segregata</i> T.S.Dantas,<br>Carv.-Silva & P.E.A.S.Câmara | Piperaceae_Faria, ALA; Dantas,<br>TS_1088 | -29.326666 | -20.51     | 2015 | Espírito Santo | UB215321      |
| <i>Peperomia segregata</i> T.S.Dantas,<br>Carv.-Silva & P.E.A.S.Câmara | Piperaceae_Faria, ALA; Dantas,<br>TS_1089 | -29.326666 | -20.51     | 2015 | Espírito Santo | UB215322      |
| <i>Peperomia segregata</i> T.S.Dantas,<br>Carv.-Silva & P.E.A.S.Câmara | Piperaceae_Faria, ALA; Dantas,<br>TS_1096 | -29.326666 | -20.51     | 2015 | Espírito Santo | UB215329      |
| <i>Peperomia segregata</i> T.S.Dantas,<br>Carv.-Silva & P.E.A.S.Câmara | Piperaceae_Alchimim-Faria, AL_1568        | -29.326666 | -20.51     | 2024 | Espírito Santo | UB247345      |
| <i>Peperomia segregata</i> T.S.Dantas,<br>Carv.-Silva & P.E.A.S.Câmara | Piperaceae_Alchimim-Faria, AL_1589        | -29.327222 | -20.51     | 2024 | Espírito Santo | UB247366      |
| <i>Peperomia sincorana</i> C.DC.                                       | Piperaceae_AMORIM,AM_1778                 | -40.5181   | -11.1808   | 1995 | Bahia          |               |
| <i>Peperomia sincorana</i> C.DC.                                       | Piperaceae_RAPINI,A_965                   | -40.916667 | -11.4500   | 2002 | Bahia          |               |
| <i>Peperomia sincorana</i> C.DC.                                       | Piperaceae_PEREIRA-SILVA,G_846<br>9       | -41.00083  | -11.62806  | 2004 | Bahia          |               |
| <i>Peperomia sincorana</i> C.DC.                                       | Piperaceae_FRANCA,F_2791                  | -41.116666 | -11.626666 | 1999 | Bahia          |               |
| <i>Peperomia sincorana</i> C.DC.                                       | Piperaceae_GUEDES,ML_10090                | -41.1500   | -11.5500   | 2002 | Bahia          |               |
| <i>Peperomia sincorana</i> C.DC.                                       | Piperaceae_HATSCHBACH,GG_424<br>06        | -41.1558   | -11.5503   | 1979 | Bahia          |               |

| species                          | family_recordedBy_recordNumber | lon        | lat        | year | stateProvince | CatalogNumber |
|----------------------------------|--------------------------------|------------|------------|------|---------------|---------------|
|                                  | Piperaceae_HATSCHBACH,GG_442   |            |            |      |               |               |
| <i>Peperomia sincorana</i> C.DC. | 43                             | -41.1558   | -11.5503   | 1981 | Bahia         |               |
| <i>Peperomia sincorana</i> C.DC. | Piperaceae_MORI,SA_14457       | -41.1558   | -11.5503   | 1981 | Bahia         |               |
| <i>Peperomia sincorana</i> C.DC. | Piperaceae_AMORIM,AM_2989      | -41.1561   | -11.5500   | 1999 | Bahia         |               |
| <i>Peperomia sincorana</i> C.DC. | Piperaceae_DAVIDSE,G_11917     | -41.156101 | -11.550000 | 1976 | Bahia         |               |
| <i>Peperomia sincorana</i> C.DC. | Piperaceae_MELO,E_3127         | -41.164722 | -11.5700   | 1999 | Bahia         |               |
| <i>Peperomia sincorana</i> C.DC. | Piperaceae_HARLEY,RM_19342     | -41.2000   | -11.5800   | 1977 | Bahia         |               |
| <i>Peperomia sincorana</i> C.DC. | Piperaceae_HARLEY,RM_5948      | -41.207222 | -11.590556 | 1997 | Bahia         |               |
| <i>Peperomia sincorana</i> C.DC. | Piperaceae_FRANCA,F_4003       | -41.207222 | -11.591111 | 2003 | Bahia         |               |
|                                  | Piperaceae_CARVALHO-SILVA,M_2  |            |            |      |               |               |
| <i>Peperomia sincorana</i> C.DC. | 54                             | -41.2075   | -11.591111 | 2003 | Bahia         |               |
|                                  | Piperaceae_SIQUEIRA-FILHO,JA_1 |            |            |      |               |               |
| <i>Peperomia sincorana</i> C.DC. | 864                            | -41.207777 | -11.591111 | 2007 | Bahia         |               |
| <i>Peperomia sincorana</i> C.DC. | Piperaceae_RAMOS,AE_1182       | -41.26667  | -12.9500   | 1996 | Bahia         |               |
| <i>Peperomia sincorana</i> C.DC. | Piperaceae_MELLO-SILVA,R_789   | -41.326900 | -13.626099 | 1992 | Bahia         |               |
|                                  | Piperaceae_MATTOS-SILVA,LA_15  |            |            |      |               |               |
| <i>Peperomia sincorana</i> C.DC. | 93                             | -41.331401 | -12.807200 | 1983 | Bahia         |               |
| <i>Peperomia sincorana</i> C.DC. | Piperaceae_HARLEY,RM_18872     | -41.333333 | -12.9500   | 1977 | Bahia         |               |
| <i>Peperomia sincorana</i> C.DC. | Piperaceae_HARLEY,RM_18875     | -41.333333 | -12.9500   | 1977 | Bahia         |               |
| <i>Peperomia sincorana</i> C.DC. | Piperaceae_FERREIRA-SILVA,A_3  | -41.333333 | -12.983333 | 2004 | Bahia         |               |

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|----------------------------------|--------------------------------|------------|------------|------|---------------|---------------|
|                                  | Piperaceae_HATSCHBACH,GG_501   |            |            |      |               |               |
| <i>Peperomia sincorana</i> C.DC. | 10                             | -41.3706   | -13.0056   | 1985 | Bahia         |               |
| <i>Peperomia sincorana</i> C.DC. | Piperaceae_FURLAN,A_1568       | -41.370800 | -13.005299 | 1981 | Bahia         |               |
| <i>Peperomia sincorana</i> C.DC. | Piperaceae_GIULIETTI,AM_1439   | -41.370800 | -13.005299 | 1981 | Bahia         |               |
| <i>Peperomia sincorana</i> C.DC. | Piperaceae_QUEIROZ,LP_5651     | -41.370800 | -13.005299 | 2000 | Bahia         |               |
| <i>Peperomia sincorana</i> C.DC. | Piperaceae_CERATI,TM_295       | -41.389999 | -12.563099 | 1985 | Bahia         |               |
| <i>Peperomia sincorana</i> C.DC. | Piperaceae_CONCEICAO,AA_284    | -41.389999 | -12.563099 | 1997 | Bahia         |               |
| <i>Peperomia sincorana</i> C.DC. | Piperaceae_PEREIRA,A_1842      | -41.420833 | -12.452777 | 1995 | Bahia         |               |
|                                  | Piperaceae_CARVALHO-SILVA,M_2  |            |            |      |               |               |
| <i>Peperomia sincorana</i> C.DC. | 14                             | -41.444166 | -12.466944 | 2003 | Bahia         |               |
| <i>Peperomia sincorana</i> C.DC. | Piperaceae_HARLEY,RM_22337     | -41.4500   | -12.4500   | 1980 | Bahia         |               |
| <i>Peperomia sincorana</i> C.DC. | Piperaceae_GUEDES,ML_4994      | -41.4500   | -12.466667 | 1997 | Bahia         |               |
| <i>Peperomia sincorana</i> C.DC. | Piperaceae_MELO,E_1245         | -41.452777 | -12.456666 | 1994 | Bahia         |               |
| <i>Peperomia sincorana</i> C.DC. | Piperaceae_GUEDES,ML_617       | -41.472222 | -12.4500   | 1994 | Bahia         |               |
| <i>Peperomia sincorana</i> C.DC. | Piperaceae_ORLANDI,RP_563      | -41.472222 | -12.4500   | 1994 | Bahia         |               |
| <i>Peperomia sincorana</i> C.DC. | Piperaceae_HARLEY,RM_22555     | -41.4800   | -12.6000   | 1980 | Bahia         |               |
| <i>Peperomia sincorana</i> C.DC. | Piperaceae_NOBLICK,LR_2837     | -41.553922 | -12.552429 | 1983 | Bahia         |               |
| <i>Peperomia sincorana</i> C.DC. | Piperaceae_COSTA,J_1290        | -41.566667 | -13.233333 | 2005 | Bahia         |               |
| <i>Peperomia sincorana</i> C.DC. | Piperaceae_MIRANDA,EB_441      | -41.849444 | -13.3300   | 2000 | Bahia         |               |
| <i>Peperomia sincorana</i> C.DC. | Piperaceae_SANTOS,AKA_841      | -41.850833 | -13.326111 | 2006 | Bahia         |               |

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|----------------------------------|-------------------------------------------------------------------------------------------------|------------|------------|------|---------------|---------------|
| <i>Peperomia sincorana</i> C.DC. | Piperaceae_HARLEY,RM_28311                                                                      | -41.877448 | -13.04604  | 1996 | Bahia         |               |
| <i>Peperomia sincorana</i> C.DC. | Piperaceae_GUEDES,ML_11826                                                                      | -41.888611 | -13.285278 | 2005 | Bahia         |               |
| <i>Peperomia sincorana</i> C.DC. | Piperaceae_GUEDES,ML_11827                                                                      | -41.888611 | -13.285278 | 2005 | Bahia         |               |
| <i>Peperomia sincorana</i> C.DC. | Piperaceae_ROSSI,L_1101                                                                         | -44.172199 | -17.757499 | 1981 | Minas Gerais  |               |
| <i>Peperomia sincorana</i> C.DC. | Piperaceae_Ule_7125                                                                             | -41.289331 | -13.253139 | 1906 |               |               |
| <i>Peperomia sincorana</i> C.DC. | Piperaceae_Guedes, ML_7416                                                                      | -41.420556 | -12.459722 | 2000 |               |               |
| <i>Peperomia sincorana</i> C.DC. | Piperaceae_Hatschbach, G._48226                                                                 | -41.370800 | -13.005300 | 1984 |               |               |
| <i>Peperomia sincorana</i> C.DC. | Piperaceae_Orlandi, RP; Guedes, ML;<br>Bautista, HP; Pereira, A PCD341_s.n                      | -41.447222 | -12.453611 | 1994 |               |               |
| <i>Peperomia sincorana</i> C.DC. | Piperaceae_Passos Júnior, LA;<br>Guedes, ML; Stannard, B; Atkins, S;<br>Saar, E PCD4609_s.n     | -41.4175   | -12.569722 | 1997 |               |               |
| <i>Peperomia sincorana</i> C.DC. | Piperaceae_Pimenta, K.M._692                                                                    | -41.370833 | -13.005278 | 2015 |               |               |
| <i>Peperomia sincorana</i> C.DC. | Piperaceae_Guedes, ML; Valadão,<br>RM; Santos, JS; Carvalho, G; Alunos<br>de Botânica III_12253 | -41.833333 | -13.283333 | 2006 |               |               |
| <i>Peperomia sincorana</i> C.DC. | Piperaceae_Conceição, A.A._4063                                                                 | -41.603056 | -12.599444 | 2011 |               |               |
| <i>Peperomia sincorana</i> C.DC. | Piperaceae_Harley, RM_H50319                                                                    | -41.85     | -13.283333 | 1991 |               |               |
| <i>Peperomia sincorana</i> C.DC. | Piperaceae_Queiroz, L.P.de_13308                                                                | -41.208611 | -11.591111 | 2007 |               |               |
| <i>Peperomia sincorana</i> C.DC. | Piperaceae_Melo, E._5062                                                                        | -41.202222 | -11.583333 | 2007 |               |               |

| species                          | family_recordedBy_recordNumber                               | lon        | lat        | year | stateProvince | CatalogNumber |
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| <i>Peperomia sincorana</i> C.DC. | Piperaceae_Conceição, AA_132                                 | -41.389999 | -12.563100 | 1996 |               |               |
| <i>Peperomia sincorana</i> C.DC. | Piperaceae_R. M. Harley_H51962                               | -41.87     | -13.28     | 1992 |               |               |
|                                  | Piperaceae_Carvalho, MLS; Alunos<br>de Métodos de Estudos em |            |            |      |               |               |
| <i>Peperomia sincorana</i> C.DC. | Biologia_667                                                 | -41.62     | -13.0225   | 2018 |               |               |
| <i>Peperomia sincorana</i> C.DC. | Piperaceae_Queiroz, L.P.de_13120                             | -40.998056 | -11.625556 | 2007 |               |               |
| <i>Peperomia sincorana</i> C.DC. | Piperaceae_Queiroz, L.P.de_13301                             | -41.208611 | -11.591111 | 2007 |               |               |
|                                  | Piperaceae_B.L. Stannard Wilson                              |            |            |      |               |               |
| <i>Peperomia sincorana</i> C.DC. | Ganev R.F. Queiroz_51962                                     | -41.86666  | -13.28333  | 1992 |               |               |
| <i>Peperomia sincorana</i> C.DC. | Piperaceae_H. S. Irwin_30998                                 | -41.7703   | -12.4186   | 1971 |               |               |
| <i>Peperomia sincorana</i> C.DC. | Piperaceae_Rapini, A._965                                    | -40.916667 | -11.45     | 2002 |               |               |
| <i>Peperomia sincorana</i> C.DC. | Piperaceae_Mattos-Silva, L.A._1593                           | -41.331402 | -12.807200 | 1983 |               |               |
| <i>Peperomia sincorana</i> C.DC. | Piperaceae_Souza, I.M._43                                    | -40.983333 | -11.633333 | 2011 |               |               |
| <i>Peperomia sincorana</i> C.DC. | Piperaceae_H. S. Irwin_32351                                 | -41.1558   | -11.5503   | 1971 |               |               |
| <i>Peperomia sincorana</i> C.DC. | Piperaceae_Queiroz, L.P.de_4278                              | -41.156101 | -11.550000 | 1998 |               |               |
| <i>Peperomia sincorana</i> C.DC. | Piperaceae_Conceição, A.A._1858 1                            | -41.366667 | -13.083333 | 2006 |               |               |
| <i>Peperomia sincorana</i> C.DC. | Piperaceae_Laessoe, T_H53318                                 | -41.9      | -13.25     | 1992 |               |               |
| <i>Peperomia sincorana</i> C.DC. | Piperaceae_Stannard, BL_CFCR7260                             | -41.389999 | -12.563100 | 1984 |               |               |
| <i>Peperomia sincorana</i> C.DC. | Piperaceae_Oliveira, R.P._813                                | -41.332222 | -11.497778 | 2002 |               |               |
| <i>Peperomia sincorana</i> C.DC. | Piperaceae_Tavares, P._23                                    | -41.2075   | -11.583333 | 2007 |               |               |

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|-----------------------------------------------------------------|--------------------------------------------|------------|------------|------|----------------|---------------|
| <i>Peperomia sincorana</i> C.DC.                                | Piperaceae_Melo, E._5203                   | -41.193889 | -11.437222 | 2007 |                |               |
| <i>Peperomia sincorana</i> C.DC.                                | Piperaceae_Mello-Silva, R_789              | -41.326900 | -13.626100 | 2003 |                |               |
| <i>Peperomia sincorana</i> C.DC.                                | Piperaceae_Lídio Coradin_6528              | -41.416666 | -12.466666 | 1983 |                |               |
| <i>Peperomia sincorana</i> C.DC.                                | Piperaceae_França, F. et al._3141          | -40.518299 | -11.180600 | 1998 |                |               |
| <i>Peperomia sincorana</i> C.DC.                                | Piperaceae_Carvalho, EO_190                | -41.558899 | -12.528900 | 2017 |                |               |
| <i>Peperomia spiritus-sancti</i> E.F.<br>Guim. & M. Carv.-Silva | Piperaceae_KOLLMANN,L_4339                 | -40.791667 | -19.913889 | 2001 | Espírito Santo |               |
| <i>Peperomia spiritus-sancti</i> E.F.<br>Guim. & M. Carv.-Silva | Piperaceae_SARNAGLIA-JUNIOR,<br>VB_407     | -40.988889 | -19.807778 | 2011 | Espírito Santo | UB00041182    |
| <i>Peperomia spiritus-sancti</i> E.F.<br>Guim. & M. Carv.-Silva | Piperaceae_Sagrillo, TF_16B                | -40.38230  | -19.86001  | 2011 | Espírito Santo | UB00041183    |
| <i>Peperomia spiritus-sancti</i> E.F.<br>Guim. & M. Carv.-Silva | Piperaceae_D.R. Couto,_4940                | -41.437883 | -20.456913 | 2019 | Espírito Santo | RB01454915    |
| <i>Peperomia stroemfeltii</i> Dahlst.                           | Piperaceae_Vanilde Citadini-Zanette_       | -49.425277 | -28.598888 | 1982 | Santa Catarina | CRI005942     |
| <i>Peperomia stroemfeltii</i> Dahlst.                           | Piperaceae_Milaneze-Gutierre, M.A._        | -50.583333 | -24.35     | 2012 | Paraná         | HUEM000009833 |
| <i>Peperomia stroemfeltii</i> Dahlst.                           | Piperaceae_Milaneze-Gutierre,<br>M.A._1038 | -51.938599 | -23.425301 | 2017 | Paraná         | HUEM000016876 |
| <i>Peperomia stroemfeltii</i> Dahlst.                           | Piperaceae_Milaneze-Gutierre, M.A._        | -50.583333 | -24.35     | 2011 | Paraná         | HUEM000009879 |
| <i>Peperomia stroemfeltii</i> Dahlst.                           | Piperaceae_Milaneze-Gutierre, M.A._        | -50.583333 | -24.35     | 2011 | Paraná         | HUEM000014328 |

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|---------------------------------------|----------------------------------|------------|------------|------|----------------|----------------|
|                                       | Piperaceae_A. M. V. de           |            |            |      |                |                |
| <i>Peperomia stroemfeltii</i> Dahlst. | Carvalho_4179                    | -40.518055 | -11.180833 |      | Bahia          | NY01198171     |
| <i>Peperomia stroemfeltii</i> Dahlst. | Piperaceae_CADORIN,TJ_2374       | -49.5850   | -26.7275   | 2010 | Santa Catarina | RB00610108     |
| <i>Peperomia stroemfeltii</i> Dahlst. | Piperaceae_KORTE,A_1933          | -50.220277 | -26.9100   | 2010 | Santa Catarina | RB01300198     |
| <i>Peperomia stroemfeltii</i> Dahlst. | Piperaceae_Mosén, C.W.H._3460    |            |            | 1875 | São Paulo      | S06-20144      |
| <i>Peperomia stroemfeltii</i> Dahlst. | Piperaceae_A. Korte_2015         | -50.129166 | -26.90861  | 2010 | Santa Catarina | RB00687248     |
| <i>Peperomia stroemfeltii</i> Dahlst. | Piperaceae_M.G. Caxambu_6572     | -53.85555  | -25.240555 | 2015 | Paraná         | RB01300198     |
| <i>Peperomia stroemfeltii</i> Dahlst. | Piperaceae_Casella, C.E._68      | -48.658889 | -24.446611 | 2015 | São Paulo      | HRCB064627     |
| <i>Peperomia stroemfeltii</i> Dahlst. | Piperaceae_Melo,P.H.A._4711      | -44.118636 | -19.423047 | 2016 | Minas Gerais   | HRCB072171     |
| <i>Peperomia stroemfeltii</i> Dahlst. | Piperaceae_Melo,P.H.A._5273      | -44.037678 | -19.428258 | 2016 | Minas Gerais   | HRCB072201     |
| <i>Peperomia stroemfeltii</i> Dahlst. | Piperaceae_Schenck H._           | -50.4224   | -27.3006   | 1886 |                | POZG-V-0069515 |
| <i>Peperomia stroemfeltii</i> Dahlst. | Piperaceae_G.S. Martins_3        | -41.105833 | -20.520277 | 2021 | Espírito Santo | CAP007074      |
| <i>Peperomia stroemfeltii</i> Dahlst. | Piperaceae_Souza, VC et al._9052 | -48.099998 | -24.52     | 1995 | São Paulo      | SP011024       |
| <i>Peperomia subrubricaulis</i> C.DC. | Piperaceae_ALVES,FE_129          | -43.96607  | -21.9071   | 2011 | Minas Gerais   | RB00718421     |
| <i>Peperomia subrubricaulis</i> C.DC. | Piperaceae_GOMES,JC_1130         | -50.080793 | -25.139699 | 1962 | Paraná         | RB00275079     |
|                                       |                                  | -41.833333 | -13.283333 |      |                |                |
| <i>Peperomia subrubricaulis</i> C.DC. | Piperaceae_GUEDES,ML_12264       | 3333333    | 3333333    | 2006 | Bahia          | ALCB002408     |
|                                       |                                  | -46.365798 | -20.245300 |      |                |                |
| <i>Peperomia subrubricaulis</i> C.DC. | Piperaceae_NAKAJIMA,JN_1011      | 9501953    | 2929688    | 1995 | Minas Gerais   | HUFU00035776   |
| <i>Peperomia subrubricaulis</i> C.DC. | Piperaceae_NAKAJIMA,JN_1924      | -46.365798 | -20.245300 | 1996 | Minas Gerais   | RB00484750     |

| <b>species</b>                        | <b>family_recordedBy_recordNumber</b>     | <b>lon</b> | <b>lat</b> | <b>year</b> | <b>stateProvince</b> | <b>CatalogNumber</b> |
|---------------------------------------|-------------------------------------------|------------|------------|-------------|----------------------|----------------------|
| <i>Peperomia subrubricaulis</i> C.DC. | Piperaceae_NAKAJIMA,JN_2795               | -46.513549 | -20.18704  | 1997        | Minas Gerais         | RB00484134           |
| <i>Peperomia subrubricaulis</i> C.DC. | Piperaceae_RAPINI,A_577                   | -43.600833 | -19.303055 | 1998        | Minas Gerais         | RB00561265           |
| <i>Peperomia subrubricaulis</i> C.DC. | Piperaceae_ROMERO,R_2356                  | -46.365798 | -20.245300 | 1995        | Minas Gerais         | HUFU00035777         |
| <i>Peperomia subrubricaulis</i> C.DC. | Piperaceae_ROMERO,R_3986                  | -46.365798 | -20.245300 | 1997        | Minas Gerais         | CEN00049339          |
| <i>Peperomia subrubricaulis</i> C.DC. | Piperaceae_SILVA,JM_4644                  | -49.871091 | -25.77052  | 2006        | Paraná               | RB00520852           |
| <i>Peperomia subrubricaulis</i> C.DC. | Piperaceae_Damazio, L_1724                | -45.44222  | -18.78778  | 1905        | Minas Gerais         | RB00533728           |
| <i>Peperomia subrubricaulis</i> C.DC. | Piperaceae_EP. Heringer_                  | -44.999722 | -21.245278 | 1947        | Minas Gerais         | RB00522542           |
| <i>Peperomia subrubricaulis</i> C.DC. | Piperaceae_Zappi,DC_CFCR_8480             | -42.893312 | -16.56102  | 1985        | Minas Gerais         | RB00304287           |
| <i>Peperomia subrubricaulis</i> C.DC. | Piperaceae_L.Rossi_                       | -44.340071 | -17.792286 | 1981        | Minas Gerais         | RB00274036           |
| <i>Peperomia subrubricaulis</i> C.DC. | Piperaceae_A.Salino_6794                  | -44.104444 | -21.601388 | 2001        | Minas Gerais         | RB00275289           |
| <i>Peperomia subrubricaulis</i> C.DC. | Piperaceae_Massuo Jorge Kato_633          | -46.662523 | -20.144630 | 2005        | Minas Gerais         | RB00515837           |
| <i>Peperomia subrubricaulis</i> C.DC. | Piperaceae_P.L.Viana_2783                 | -43.342777 | -18.226111 | 2007        | Minas Gerais         | RB00609929           |
| <i>Peperomia subrubricaulis</i> C.DC. | Piperaceae_M.Verdi_7138                   | -42.923611 | -16.721666 | 2014        | Minas Gerais         | RB00875689           |
| <i>Peperomia subrubricaulis</i> C.DC. | Piperaceae_J.E.Q.Faria_5380               | -42.92361  | -16.721666 | 2016        | Minas Gerais         | RB01306996           |
| <i>Peperomia subrubricaulis</i> C.DC. | Piperaceae_V.C.Souza_25780                | -42.928333 | -16.724444 | 2001        | Minas Gerais         | RB01334977           |
| <i>Peperomia subrubricaulis</i> C.DC. | Piperaceae_Harley,RM_H50767               | -45.25     | -13.25     | 1992        | Bahia                | SPF00090548          |
| <i>Peperomia subrubricaulis</i> C.DC. | Piperaceae_H.S.Irwin_                     | -43.832326 | -17.1439   | 1970        | Minas Gerais         | RB00522737           |
| <i>Peperomia subrubricaulis</i> C.DC. | Piperaceae_Rezende, SG; Justo,<br>AG_6965 | -43.684722 | -20.043333 | 2018        | Minas Gerais         | BHCB197958           |
| <i>Peperomia subrubricaulis</i> C.DC. | Piperaceae_Carmo, FF_1625                 | -44.362139 | -20.121389 | 2008        | Minas Gerais         | BHCB047425           |

| <b>species</b>                        | <b>family_recordedBy_recordNumber</b>      | <b>lon</b> | <b>lat</b> | <b>year</b> | <b>stateProvince</b> | <b>CatalogNumber</b> |
|---------------------------------------|--------------------------------------------|------------|------------|-------------|----------------------|----------------------|
| <i>Peperomia subrubricaulis</i> C.DC. | Piperaceae_Carmo, FF_3652                  | -44.340972 | -20.12     | 2008        | Minas Gerais         | BHCB047414           |
| <i>Peperomia subrubricaulis</i> C.DC. | Piperaceae_Carmo, FF_5166                  | -42.751111 | -16.075833 | 2010        | Minas Gerais         | BHCB038125           |
| <i>Peperomia subrubricaulis</i> C.DC. | Piperaceae_Mota, RC da; Junior,<br>RT_4149 | -42.751111 | -16.073889 | 2017        | Minas Gerais         | BHCB186332           |
| <i>Peperomia subrubricaulis</i> C.DC. | Piperaceae_Carvalho-Silva, M_3483          | -43.391111 | -20.165555 | 2023        | Minas Gerais         | UB0326685            |
| <i>Peperomia turbinata</i> Dahlst.    | Piperaceae_KOLLMANN.L_5497                 | -40.553056 | -19.9075   | 2002        | Espírito Santo       | MBML016162           |
| <i>Peperomia turbinata</i> Dahlst.    | Piperaceae_KOLLMANN.L_4086                 | -40.637344 | -19.879113 | 2001        | Espírito Santo       | MBML014258           |
| <i>Peperomia turbinata</i> Dahlst.    | Piperaceae_CARVALHO-SILVA,M_4<br>40        | -40.637344 | -19.879113 | 2006        | Espírito Santo       | RB00556865           |
| <i>Peperomia turbinata</i> Dahlst.    | Piperaceae_KOLLMANN,L_6242                 | -40.80389  | -20.085261 | 2003        | Espírito Santo       | MBML021145           |
| <i>Peperomia turbinata</i> Dahlst.    | Piperaceae_GUIMARAES,EF_10                 | -43.45788  | -22.9255   | 1966        | Rio de Janeiro       | RB00523426           |
| <i>Peperomia turbinata</i> Dahlst.    | Piperaceae_mosen_1662                      | -46.66258  | -22.02216  | 1874        | São Paulo            | S08-20358            |
| <i>Peperomia turbinata</i> Dahlst.    | Piperaceae_Ceccantini_2868                 | -44.01502  | -19.47691  | 2006        | Minas Gerais         | OUPR000036050        |
| <i>Peperomia turbinata</i> Dahlst.    | Piperaceae_Valente, G.E.; et al_83         | -42.9086   | -20.416401 | 1995        | Minas Gerais         | VIC023125            |
| <i>Peperomia turbinata</i> Dahlst.    | Piperaceae_Magnago_533                     | -40.825833 | -18.890278 | 2006        | Espírito Santo       | MBML028600           |
| <i>Peperomia turbinata</i> Dahlst.    | Piperaceae_L. Kollmann_6889                | -40.593889 | -19.973056 | 2004        | Espírito Santo       | RB00523428           |
| <i>Peperomia turbinata</i> Dahlst.    | Piperaceae_R. M. Harley_22357              | -41.45     | -12.45     | 1980        | Bahia                | CEPEC00032093        |
| <i>Peperomia turbinata</i> Dahlst.    | Piperaceae_A. Furlan_821                   | -44.878    | -23.3754   | 1989        | São Paulo            | RB00274844           |
| <i>Peperomia turbinata</i> Dahlst.    | Piperaceae_Massuo Jorge Kato_603           | -40.6034   | -19.9740   | 2005        | Espírito Santo       | RB00514525           |
| <i>Peperomia turbinata</i> Dahlst.    | Piperaceae_R.C. Forzza_2099                | -42.9670   | -21.4594   | 2002        | Minas Gerais         | RB00523428           |

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| <i>Peperomia turbinata</i> Dahlst. | Piperaceae_Annete Bonnet_5014         | -42.7703   | -22.4481   | 2009        | Rio de Janeiro       | RB00573447           |
| <i>Peperomia turbinata</i> Dahlst. | Piperaceae_Annete Bonnet_5020         | -42.7703   | -22.4481   | 2009        | Rio de Janeiro       | RB00573448           |
|                                    | Piperaceae_Valderes Bento Sarnaglia   |            |            |             |                      |                      |
| <i>Peperomia turbinata</i> Dahlst. | Junior_569                            | -40.4847   | -19.9368   | 2013        | Espírito Santo       | RB00817658           |
| <i>Peperomia turbinata</i> Dahlst. | Piperaceae_Lima, M. T. F._            | -42.774167 | -22.448333 | 2023        | Rio de Janeiro       | R020000509           |
| <i>Peperomia turbinata</i> Dahlst. | Piperaceae_D.N.S. Machado_2640        | -42.648611 | -22.856944 | 2021        | Rio de Janeiro       | RB01443041           |
| <i>Peperomia turbinata</i> Dahlst. | Piperaceae_G.M. Marcusso_966          | -40.482778 | -20.270556 | 2018        | Espírito Santo       | RB01454388           |
| <i>Peperomia turbinata</i> Dahlst. | Piperaceae_L.C. de Moura_15           | -43.278056 | -22.960833 | 2019        | Rio de Janeiro       | RB01453795           |
| <i>Peperomia turbinata</i> Dahlst. | Piperaceae_BRADE,AC_18255             | -40.884085 | -19.954583 | 1946        | Espírito Santo       | NY00555194           |
| <i>Peperomia turbinata</i> Dahlst. | Piperaceae_BRADE,AC_18510             | -40.884085 | -19.954583 | 1946        | Espírito Santo       | NY00555193           |
| <i>Peperomia turbinata</i> Dahlst. | Piperaceae_BRADE,AC_19894             | -41.1128   | -20.8492   | 1949        | Espírito Santo       | K000543584           |
| <i>Peperomia turbinata</i> Dahlst. | Piperaceae_HAGE,JL_221                | -39.220950 | -14.773969 | 1979        | Bahia                | NY00555196           |
| <i>Peperomia turbinata</i> Dahlst. | Piperaceae_HERINGER,EP_2237           | -41.904848 | -20.533847 | 1946        | Minas Gerais         | RB00285179           |
| <i>Peperomia turbinata</i> Dahlst. | Piperaceae_PEREIRA,E_42               | -43.45788  | -22.9255   | 1946        | Rio de Janeiro       | RB00533695           |
| <i>Peperomia turbinata</i> Dahlst. | Piperaceae_A.C. Brade_19968           | -41.018318 | -20.669524 | 1949        | Espírito Santo       | NY00555195           |
|                                    | Piperaceae_AMARAL-SANTOS,A_1          |            |            |             |                      |                      |
| <i>Peperomia velloziana</i> Miq.   | 661                                   | -47.29806  | -16.22222  | 2002        | Minas Gerais         | CEN00047023          |
|                                    | Piperaceae_AMARAL-SANTOS,A_1          |            |            |             |                      |                      |
| <i>Peperomia velloziana</i> Miq.   | 683                                   | -47.29806  | -16.22222  | 2002        | Minas Gerais         | CEN00047673          |
| <i>Peperomia velloziana</i> Miq.   | Piperaceae_BELEM,RP_1                 | -47.929698 | -15.779700 | 1964        | Distrito Federal     | IAN118477            |

| <b>species</b>                   | <b>family_recordedBy_recordNumber</b> | <b>lon</b> | <b>lat</b> | <b>year</b> | <b>stateProvince</b> | <b>CatalogNumber</b> |
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| <i>Peperomia velloziana</i> Miq. | Piperaceae_BOSCOLO,D_45               | -46.490277 | -23.163055 | 2016        | São Paulo            | RB01411956           |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_BRADE,AC_18201             | -40.864571 | -19.728438 | 1946        | Espírito Santo       | NY00555492           |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_BRAGA,JP_115               | -45.465801 | -22.242799 | 2002        | Minas Gerais         | CESJ42008            |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_BRAGA,JP_215               | -45.465801 | -22.242799 | 2004        | Minas Gerais         | UB244166             |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_CADORIN,TJ_1978            | -49.047777 | -26.1925   | 2010        | Santa Catarina       | FURB25919            |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_CADORIN,TJ_2111            | -49.235555 | -26.3650   | 2010        | Santa Catarina       | FURB25853            |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_CAMARA,UC_11683            | -43.45788  | -22.9255   | 1972        | Rio de Janeiro       | RB00522725           |
|                                  | Piperaceae_FARIA-JUNIOR,JEQ_27        |            |            |             |                      |                      |
| <i>Peperomia velloziana</i> Miq. | 62                                    | -47.929698 | -15.779700 | 2012        | Distrito Federal     | UB191355             |
|                                  | Piperaceae_FARIA-JUNIOR,JEQ_30        |            |            |             |                      |                      |
| <i>Peperomia velloziana</i> Miq. | 21                                    | -47.929698 | -15.779700 | 2012        | Distrito Federal     | UB199084             |
|                                  | Piperaceae_FARIA-JUNIOR,JEQ_36        |            |            |             |                      |                      |
| <i>Peperomia velloziana</i> Miq. | 25                                    | -47.9600   | -15.5100   | 2013        | Distrito Federal     | UB203845             |
|                                  | Piperaceae_FARIA-JUNIOR,JEQ_44        |            |            |             |                      |                      |
| <i>Peperomia velloziana</i> Miq. | 50                                    | -47.451944 | -15.365278 | 2015        | Goiás                | UB209348             |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_FIASCHI,P_1344             | -41.4300   | -12.4500   | 2003        | Bahia                | NY01095531           |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_FORZZA,RC_1228             | -41.663600 | -13.249699 | 1999        | Bahia                | SPF00136131          |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_GRANDI,TSM_108             | -43.474585 | -20.106590 | 1980        | Minas Gerais         | FUEL25422            |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_HARLEY,RM_7653             | -40.189399 | -10.461400 | 1984        | Bahia                | RB00280778           |

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|                                  | Piperaceae_HATSCHBACH,GG_314   |            |            |      |                |               |
| <i>Peperomia velloziana</i> Miq. | 55                             | -41.9000   | -20.5200   | 1973 | Minas Gerais   | MBM025336     |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_HENSCHEN,SE_        | -46.384166 | -21.918055 | 1871 | Minas Gerais   | G00314271     |
|                                  | Piperaceae_MACHADO-SILVA,T_17  |            |            |      |                |               |
| <i>Peperomia velloziana</i> Miq. | 2                              | -49.993578 | -25.226713 | 2017 | Paraná         | UNOP00008799  |
|                                  | Piperaceae_MACHADO-SILVA,T_28  |            |            |      |                |               |
| <i>Peperomia velloziana</i> Miq. | 6                              | -49.993578 | -25.226713 | 2018 | Paraná         | UNOP009080    |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_MARTINELLI,G_1735   | -43.157306 | -22.398552 | 1977 | Rio de Janeiro | RB00280704    |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_MEIRELES,LD_1904    | -44.96834  | -22.405782 | 2005 | Minas Gerais   | RB00527346    |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_MENINI-NETO,L_208   | -43.246898 | -18.077199 | 2006 | Minas Gerais   | CESJ47706     |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_MONTEIRO,D_131      | -44.58832  | -22.441781 | 2005 | Rio de Janeiro | RB00476847    |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_MONTEIRO,D_152      | -44.58832  | -22.441781 | 2006 | Rio de Janeiro | RB00476850    |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_MONTEIRO,D_169      | -44.58832  | -22.441781 | 2006 | Rio de Janeiro | RB00476853    |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_MONTEIRO,D_211      | -44.58832  | -22.441781 | 2006 | Rio de Janeiro | RB00490571    |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_MONTEIRO,D_606      | -41.843611 | -20.419444 | 2012 | Minas Gerais   | RB00690810    |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_ORMINDO,P_          | -41.948213 | -13.536629 | 2004 | Bahia          | RB00275647    |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_PEREIRA,BAS_2491    | -46.819723 | -16.375835 | 1993 | Minas Gerais   | IBGE00031250  |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_SCHMITT,JL_2062     | -50.074444 | -29.2050   | 2010 | Santa Catarina | FURB26004     |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_TEIXEIRA,WA_26254   | -43.867129 | -20.240372 | 1995 | Minas Gerais   | RB00280731    |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_THOMAS,WW_14070     | -39.3972   | -15.1981   | 2004 | Bahia          | NY01419150    |

| <b>species</b>                   | <b>family_recordedBy_recordNumber</b> | <b>lon</b>  | <b>lat</b> | <b>year</b> | <b>stateProvince</b> | <b>CatalogNumber</b> |
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| <i>Peperomia velloziana</i> Miq. | Piperaceae_VERDI,M_4523               | -48.6900    | -28.0800   | 2010        | Santa Catarina       | RB00652461           |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_VERDI,M_4555               | -48.7800    | -28.0800   | 2010        | Santa Catarina       | FURB38409            |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_VIEIRA,MF_379              | -42.51379   | -20.66912  | 1986        | Minas Gerais         | RB00430822           |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_H.S.Irwin_19111            | -48.6000    | -15.57000  | 1968        | Goiás                | NY00679957           |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_Henschen, S.E._1431        | -44.934661  | -18.779551 | 1868        | Minas Gerais         | S14-40458            |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_Sano.P.T_14574             | -41.0161111 | -13.908056 | 1994        | Bahia                | HUEFS0050916         |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_P.K.H. Dusén_9489          | -52.151099  | -23.943145 | 1910        | Paraná               | NY00250346           |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_F.F.F. Mazziero_3973       | -43.306388  | -20.263333 | 2018        | Minas Gerais         | RB01448479           |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_H.S.Irwin_11281            | -47.916666  | -15.5575   | 1965        | Distrito Federal     | NY00957058           |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_Rezende, S.G._2543         | -43.432222  | -20.197222 | 2008        | Minas Gerais         | BHZZB00011812        |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_Ordonez, J._635            | -43.408015  | -20.071550 | 2000        | Minas Gerais         | BHZZB00011813        |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_F.N. Ramos                 | -45.256944  | -22.222777 | 2023        | Minas Gerais         | UALF00009279         |
|                                  | Piperaceae_Aécio                      |             |            |             |                      |                      |
| <i>Peperomia velloziana</i> Miq. | Amaral-Santos_1844                    | -47.296944  | -18.223888 | 2003        | Minas Gerais         | CEN00047602          |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_F.C.Hoehne_53              | -46.649224  | -23.556238 | 1937        | São Paulo            | CEN00051591          |
|                                  | Piperaceae_Gert G.                    |             |            |             |                      |                      |
| <i>Peperomia velloziana</i> Miq. | Hatschbach_47691                      | -48.884648  | -19.33689  | 1984        | Espírito Santo       | MO1153434            |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_M. Kuhlmann_               | -46.646163  | -23.561273 | 1941        | São Paulo            | NY00555489           |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_A. Löfgren_2437            | -44.684444  | -23.018611 | 1894        | São Paulo            | NY00555491           |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_E.Pereira_2022             | -41.155833  | -11.550277 |             | Bahia                | NY00555493           |

| <b>species</b>                   | <b>family_recordedBy_recordNumber</b> | <b>lon</b> | <b>lat</b> | <b>year</b> | <b>stateProvince</b> | <b>CatalogNumber</b> |
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| <i>Peperomia velloziana</i> Miq. | Piperaceae_E.Pereira_6989             | -44.563055 | -22.496111 | 1962        | Rio de Janeiro       | NY00555494           |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_H. S. Irwin_22923          | -43.5047   | -18.14985  | 1969        | Minas Gerais         | NY00555495           |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_H. S. Irwin_11336          | -47.9167   | -15.60256  | 1965        | Distrito Federal     | NY00679953           |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_C. W. H. Mosen_1028        | -46.385833 | -21.923611 | 1873        | Minas Gerais         | NY00957060           |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_L.B.Damazio_1836           | -45.442222 | -18.787777 | 1907        | Minas Gerais         | NY00957061           |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_L.B.Damazio_1726           | -45.442222 | -18.787777 | 1905        | Minas Gerais         | G00321953            |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_A. C. Brade_18937          | -44.966666 | -22.390555 | 1948        | Minas Gerais         | NY00957062           |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_Y. Mexia_4214              | -42.885011 | -20.753264 | 1939        | Minas Gerais         | P02025356            |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_Y. Mexia_4485              | -42.885011 | -20.753264 | 1930        | Minas Gerais         | P02025357            |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_J. A. Lombardi_1442        | -44.088293 | -19.5605   | 1996        | Minas Gerais         | RB00280738           |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_R. Marquete_4070a          | -44.60272  | -22.490719 | 2007        | Rio de Janeiro       | RB00494729           |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_Massuo Jorge Kato_518      | -43.450344 | -20.079136 | 2005        | Minas Gerais         | RB00515843           |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_Dusén, P. K._3019          | -51.83381  | -25.75264  | 1903        | Paraná               | US01334914           |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_L. Biral_1976              | -46.296944 | -22.862777 | 2020        | Minas Gerais         | RB01506541           |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_Lombardi, JA_1611          | -43.490833 | -20.108611 | 1997        | Minas Gerais         | BHCB35696            |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_Melo, P.H.A._6351          | -47.185056 | -15.352528 | 2017        | Goiás                | HRCB72211            |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_Melo, P.H.A._5061          | -47.184944 | -15.352631 | 2016        | Goiás                | HRCB72212            |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_Vasconcelos, MF de_        | -43.407501 | -20.074699 | 1997        | Minas Gerais         | BHCB052422           |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_Mazziero, FFF_3973         | -43.4161   | -20.3778   | 2018        | Minas Gerais         | MBM420784            |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_R.C. Mota_209              | -43.407501 | -20.074699 | 2000        | Minas Gerais         | CESJ033054           |

| species                          | family_recordedBy_recordNumber | lon        | lat        | year | stateProvince  | CatalogNumber |
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| <i>Peperomia velloziana</i> Miq. | Piperaceae_H. Strang; A_963    | -43.2075   | -22.9028   | 1967 | Rio de Janeiro | HB000045666   |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_Salimena, FRG_      | -44.394699 | -22.1675   | 2001 | Minas Gerais   | UB0338086     |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_Souza, VC de_2076   | -43.669701 | -19.879999 | 1992 | Minas Gerais   | BHCB008565    |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_R. Mello Silva_     | -40.754724 | -11.18895  | 1984 | Bahia          | RB00280787    |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_D. Sucre_2396       | -42.994625 | -22.375465 | 1968 | Rio de Janeiro | RB00280689    |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_Bünger, MO_505      | -41.854167 | -20.433889 | 2010 | Minas Gerais   | BHCB052425    |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_Pedrosa, L.G._6045  | -43.508099 | -20.2875   | 2024 | Minas Gerais   | OUPR000045173 |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_Hagelund, K_5333    | -54.349701 | -28.028299 |      | Rio de Janeiro |               |
| <i>Peperomia velloziana</i> Miq. | Piperaceae_Sellow, F.          |            |            |      |                | K000324700    |
|                                  | Piperaceae_HATSCHBACH,GG_476   |            |            |      |                |               |
| <i>Peperomia warmingii</i> C.DC. | 91                             | -40.975816 | -20.404052 | 1984 | Espírito Santo | NY00555496    |
|                                  | Piperaceae_FERREIRA-JUNIOR,CA  |            |            |      |                |               |
| <i>Peperomia warmingii</i> C.DC. | _1483                          | -43.407501 | -20.074699 | 2014 | Minas Gerais   | BHQB00011814  |
| <i>Peperomia warmingii</i> C.DC. | Piperaceae_EITEN,G_6938        | -43.5081   | -20.2878   | 1965 | Minas Gerais   | UB1255368     |
|                                  | Piperaceae_FERREIRA-JUNIOR,CA  |            |            |      |                |               |
| <i>Peperomia warmingii</i> C.DC. | _1624                          | -43.669700 | -19.879999 | 2016 | Minas Gerais   |               |
|                                  | Piperaceae_HATSCHBACH,GG_466   |            |            |      |                |               |
| <i>Peperomia warmingii</i> C.DC. | 64                             | -49.1150   | -25.2061   | 1983 | Paraná         | NY00555497    |
| <i>Peperomia warmingii</i> C.DC. | Piperaceae_J. A. Lombardi_1442 | -44.081402 | -19.5578   | 1996 | Minas Gerais   | CEN00051623   |
| <i>Peperomia warmingii</i> C.DC. | Piperaceae_B.V.Tinti_208       | -41.85325  | -20.421578 | 2006 | Minas Gerais   | HUEMG00005003 |

| <b>species</b>                   | <b>family_recordedBy_recordNumber</b> | <b>lon</b>  | <b>lat</b>  | <b>year</b> | <b>stateProvince</b> | <b>CatalogNumber</b> |
|----------------------------------|---------------------------------------|-------------|-------------|-------------|----------------------|----------------------|
| <i>Peperomia warmingii</i> C.DC. | Piperaceae_A. Saint-Hilaire_B1/476    | -41.85326   | -20.421578  | 1816        | Minas Gerais         | P01633756            |
| <i>Peperomia warmingii</i> C.DC. | Piperaceae_L.P. Mauad_316             | -40.995     | -17.863333  | 2016        | Minas Gerais         | RB01115558           |
| <i>Peperomia warmingii</i> C.DC. | Piperaceae_Pinto Junior, H.V_230      | -41.0861111 | -19.041666  | 2016        | Espírito Santo       | RB01141243           |
| <i>Peperomia warmingii</i> C.DC. | Piperaceae_Pedrosa, L.G._5522         | -43.508099  | -20.2875    | 2023        | Minas Gerais         | OUPR000043784        |
| <i>Peperomia warmingii</i> C.DC. | Piperaceae_Araújo-Silva, V._393       | -43.490833  | -20.258611  | 2024        | Minas Gerais         | OUPR000044253        |
| <i>Peperomia warmingii</i> C.DC. | Piperaceae_Melo, P.H.A._2480          | -45.587.581 | -20.335.60  | 2006        | Minas Gerais         | HRCB72165            |
| <i>Peperomia warmingii</i> C.DC. | Piperaceae_Melo, P.H.A._6016          | -44.035.389 | -19.430.611 | 2017        | Minas Gerais         | HRCB72206            |
| <i>Peperomia warmingii</i> C.DC. | Piperaceae_Melo, P.H.A._6014          | -44.035.389 | -19.430.611 | 2017        | Minas Gerais         | HRCB72205            |
| <i>Peperomia warmingii</i> C.DC. | Piperaceae_Warming, J. E. B._         | -45.442222  | -18.787777  | 1870        | Minas Gerais         | G00326020            |