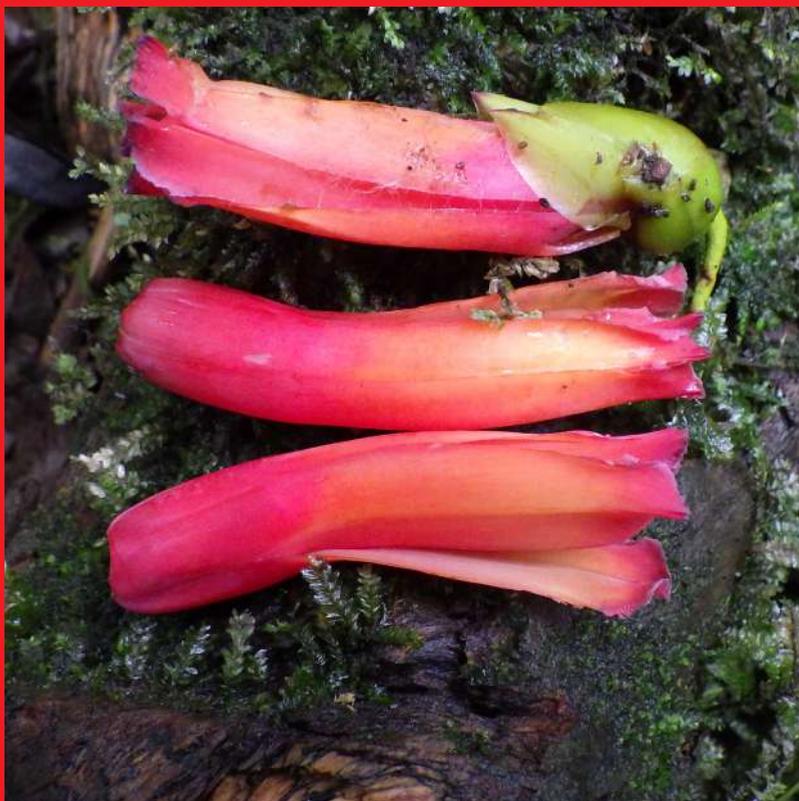


# RED DATA BOOK

## of the Plant Species Endemic to São Tomé and Príncipe



Collaborative publication  
conducted by the Flora  
Ameaçada team

CRITICAL ECOSYSTEM  
PARTNERSHIP FUND



# RED DATA BOOK

of the Plant  
Species Endemic  
to São Tomé  
and Príncipe

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# Background

According to the most recent synthesis of knowledge on the flora of São Tomé & Príncipe (STP), around 930 plant species are recorded in these islands, among which a bit more than 800 are native and a hundred are strict endemics to the archipelago.

Unfortunately, native plant populations and vegetation of STP have been strongly impacted since the discovery of the islands and is nowadays increasingly threatened by human pressures linked to the development of agro-industrial plantations, demand for timbers and touristic activities.

Implementing effective conservation activities for protecting the native flora and vegetation in STP was difficult partly because of a lack of unified database documenting species distribution, and unknown and/or outdated evaluation of species extinction risk following categories and criteria of the International Union for Conservation of Nature (IUCN).

Key Biodiversity Areas (KBAs) are the most important places in the world for conservation of species and ecosystems. The KBA Program supports the identification, mapping, monitoring and conservation of KBAs to help safeguard the most critical sites for nature on our planet. KBAs can support strategic decisions on protected areas by governments or civil society towards. Currently, the network of Key Biodiversity Areas of STP include 7 terrestrial areas and cover 512 km<sup>2</sup> (i.e. around 50% of STP). However, its delimitation did not take into account plant biodiversity and vegetation distribution.

Limited resources also hampered the characterization and dynamics of plant diversity in STP. Two herbaria exist, one on each island, but remain underused because of lack of logistics, appropriated materials, and most importantly trained botanists/field technicians with skills in specimens collection.

Based on this ascertainment, a multipartners project has been funded by the CEPF, that aims to identify threatened plant species using categories and criteria of IUCN, characterize their distribution, habitat and threats they are facing. Then, based on these data, to reassess the network of Key Biodiversity Areas of STP, while training local botanists and technicians and equip the two herbarias (ST and P). This Red List data book aims to provide a first overview of the endemic species that were assessed during this project and present key data that can be used for targeting conservation actions and attract attention to the most threatened species.

# Introduction

To improve the documentation of the floristic diversity of São Tomé & Príncipe and to identify conservation priorities, several botanical expeditions were undertaken between 2019 and 2021 (Flora Ameaçada 2021). Various localities across the island were visited, from the dry North to the wet South, and from the coast to the summit of the Pico de São Tomé at 2 024 m, covering most vegetation types. A book chapter dedicated to the vascular plants is currently being published (Stévant et al 2022). It summarizes most of the current statistics on the flora.

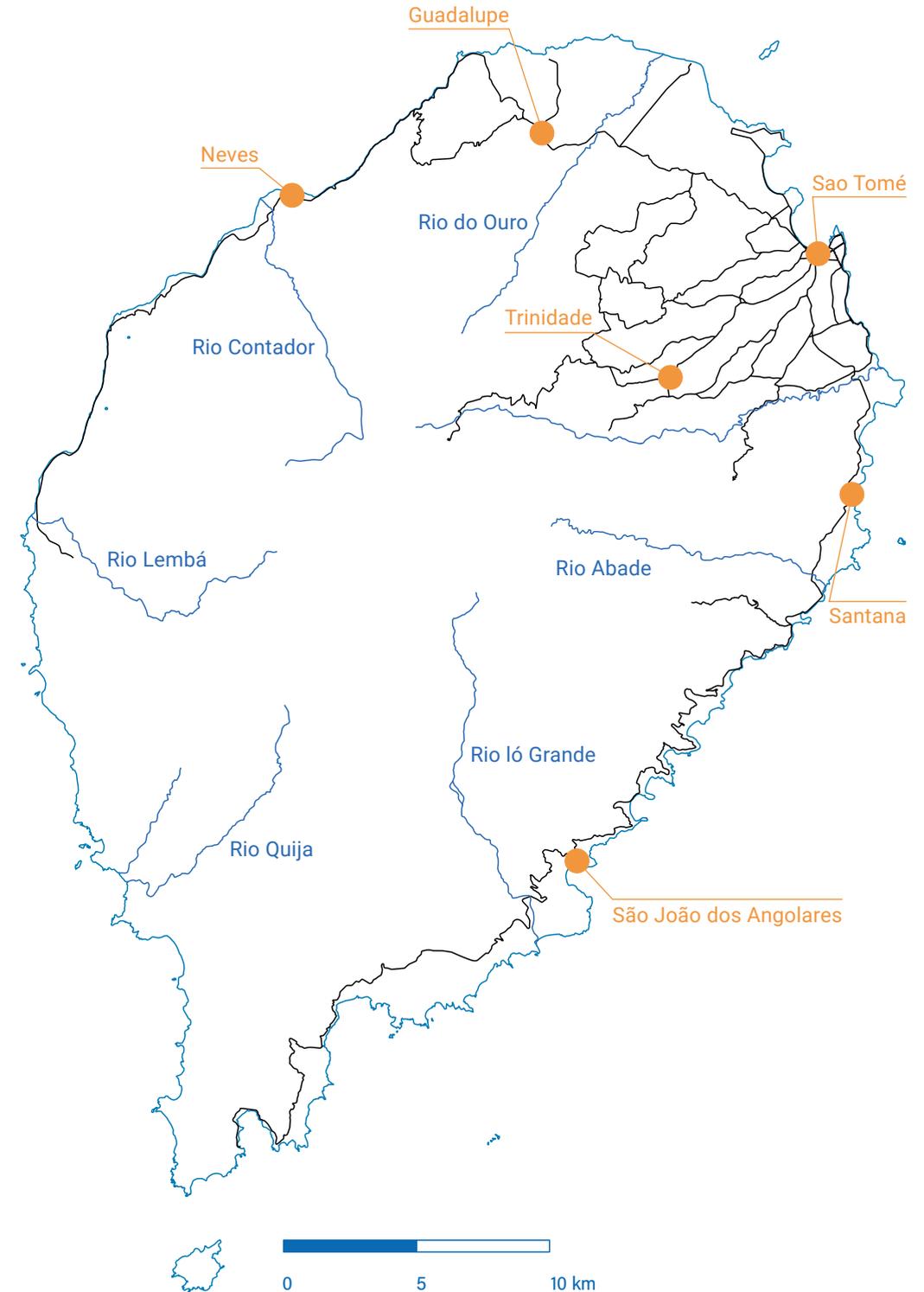
## Sao Tomé and Principe

The mainland of São Tomé Island has a maximum length of 43.6 km (north to south) and 33.4 km in its maximum width (east to west), with an area of approximately 855 km<sup>2</sup>. Elevation reaches a maximum of 2 024 m at Pico de Sao Tome, to the northwest of the center of the island, which is surrounded by a multitude of smaller peaks, ridges and strong slopes. Overall, the island is divided by a North-South ridge, extending from Pico de Sao Tome to Pico Cabumbé (1400 m), which separates the island into a wetter west flank and a drier east flank. Apart from the northeast and a few flat areas and gentle slopes in the south and southeast, the topography of most of the island is complex and dominated by steep ridges and mountains. Anthropogenic impacts have been felt mostly in the flat lowlands of the drier north, where fire maintains large extents of open vegetation.

The mainland of Príncipe Island has a maximum length of 18.5 km (north to south) and 11 km in its maximum width (east to west), with an area of approximately 139 km<sup>2</sup>. It is located 220 km off the West African coast and 146 km north of Sao Tome. The north of the island is relatively flat, whereas the south-center has the largest elevated area (> 500 m), including Pico do Príncipe that reaches 942 m, and multiple peaks surrounded by steep slopes and ridges.

Nearly all lowland forests in Príncipe have been disturbed by human activities, creating a mosaic of native and secondary forest, as well as active and abandoned agricultural land. Most of the remaining native vegetation occurs at mid and high elevation and is included in the Príncipe Natural Park (PNP); a protected area created in 2006 that covers around 21 % of Príncipe.

## Sao Tomé





# How to use this book

This book focuses mostly on species endemic to São Tomé and Príncipe. However, some species presented here are not endemic anymore since they were found recently in other islands or on the mainland or were endemic to the Gulf of Guinea islands. We decided to keep them as they are rare or threatened. Most of the species were assessed during the CEPF project, and some are published on the RL. Indeed, most of the assessments prepared for the project are already in the Red List database and will be published in the following years. Some still need to be validated and are not included in this book. They are considered as not evaluated even if a draft is available. We provide here the list of these species, with their preliminary status. Note that this status could change during the validation process. All assessments are also available online as part of the book and included on the project website ([https://gdauby.github.io/saothreath\\_book/](https://gdauby.github.io/saothreath_book/)).

## The Database

Recent data on the flora of Principe, Sao Tome, and Annobon collected during these last four years were included in an updated version of the RAINBIO database (Dauby et al 2016). The quality and accuracy of georeferencing of all specimen records were assessed first by verifying whether they fell within the limits of the islands and, if not, at what distance from the coast, using the CoordinateCleaner R package (Zizka et al 2019). When errors or inaccuracies were detected, or when coordinates were entirely missing, georeferencing was corrected or added manually using the locality information indicated on specimen labels. A scale from one to nine was used to indicate the precision of the georeferencing of each record, assigned based on label coordinates, either manually or automatically (Dauby et al 2016). When the elevation was provided on the specimen label, it was recorded on the database, otherwise, it was retrieved from an elevation raster based on the geo-coordinates. The resulting database includes 14 376 records, among which 12 077 represent collections identified to the species level, and 12 790 are georeferenced, constituting the largest and most comprehensive dataset ever compiled for the islands.

## Red List Assessments of species

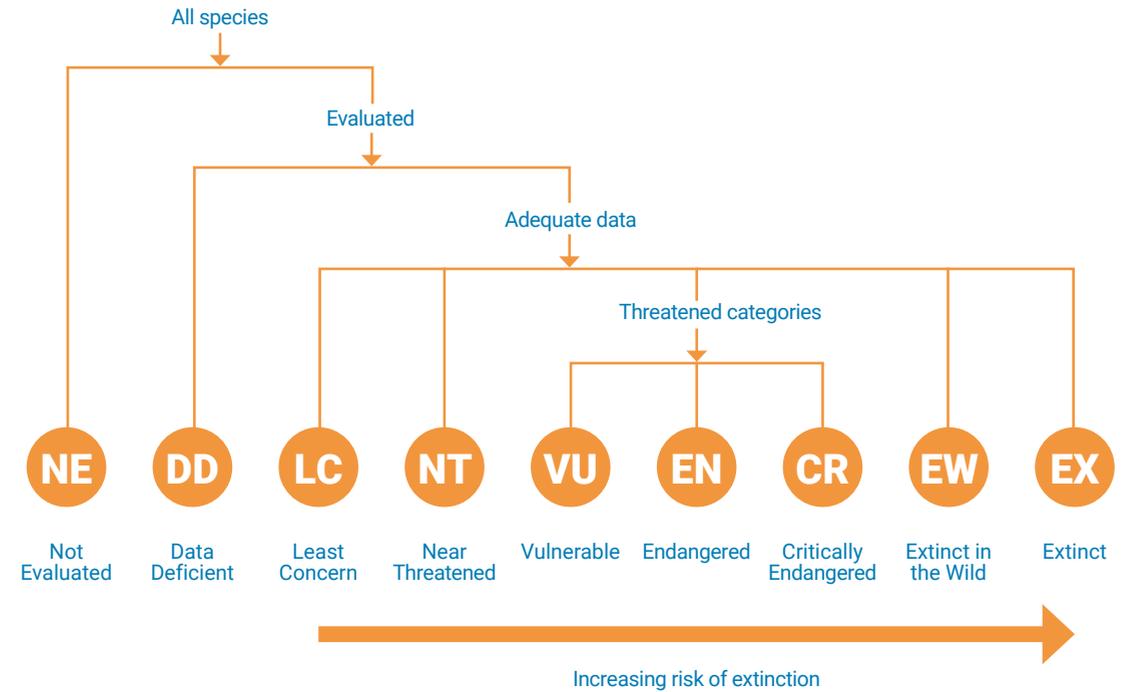
The International Union for Conservation of Nature (IUCN) Red List is the world's most comprehensive inventory of the global conservation status of plant and animal species.

Based on sound scientific information, its main purpose is to identify conservation priorities and provide a coherent basis for guiding policies and action strategies. It prioritizes species according to their risk of extinction, provides a framework for monitoring trends, raises awareness of the urgency and extent of threats to biodiversity, and encourages all stakeholders to take action to limit the rate of species extinction.

The IUCN Red List is based on a set of precise criteria to assess the risk of extinction of each species, based on the best available knowledge. The assessment methodology is the result of an extensive consultation and validation process conducted over several years by the experts of the IUCN Species Survival Commission. It was then supplemented by the publication of guidelines for its application at different levels.

For the species endemic to STP, the assessments carried out mobilized the expertise of some thirty specialists: after a preliminary phase of data compilation and verification, all the available information was analyzed, then the results were validated by a group of experts during several workshops and meetings organized at the beginning of 2022, to determine a category for each species. Moreover, all species were reviewed by the appropriate Red List Authority (RLA), which for STP, is the Central African plant Red List Authority (CARLA).

IUCN has developed a system of nine Red List categories to which each species can be assigned. In addition, an assessment can be either Global or Regional. For STP only Global assessments were made which means that the whole distribution of the distribution was considered.



The classification of species into threatened categories is based on five assessment criteria involving, among others, quantitative factors such as population size, rate of decline, range size, or fragmentation. If at least one of the criteria A to E is met, the species could be classified as Critically Endangered (CR), Endangered (EN), or Vulnerable (VU).

A	Population reduction
B	Restricted distribution
C	Small population size and decline
D	Very small or restricted population
E	Quantitative Analysis

## The 5 Red List criteria

In our case, because of the limited amount of information available for each species, in most cases, only two IUCN Red List Criteria can be applied: Criterion B and Criterion D. These Criteria are based on information on the geographical distribution of the species, the threats relevant to localities where the species has been observed and the extent of the decline in a proportion of population factors caused by those threats.

Indeed, "Criterion B has been designed to identify populations with restricted distributions that are also severely fragmented or have few locations, undergoing a form of continuing decline, and/or exhibiting extreme fluctuations (in the present or near future)" (IUCN, 2019). Three important parameters must be calculated for the application of this criterion:

B1: Extent of occurrence (EOO) is defined as «the area contained within the shortest continuous imaginary boundary which can be drawn to encompass all the known, inferred or projected sites of present occurrence of a taxon, excluding cases of vagrancy» (IUCN 2001, 2012b).

B2: Area of occupancy (AOO) is a scaled metric that represents the area of suitable habitat currently occupied by the taxon. To ensure valid use of the criteria and maintain consistency of Red List assessments across taxa, it is essential to scale estimates of AOO using 2 × 2 km grid cells.

Locations: "The term 'location' defines a geographically or ecologically distinct area in which a single threatening event can rapidly affect all individuals of the taxon. The size of the location depends on the area covered by the threatening event and may include part of one or many subpopulations. Where a taxon is affected by more than one threatening event, location should be defined by considering the most serious plausible threat." (IUCN 2001, 2012b).

To be classified under criterion B, a species must:

Have an area of occurrence (B1) or occupancy (B2) below one of the indicated area thresholds			
	Critically Endangered	Endangered	Vulnerable
<b>B1.</b> Extent of occurrence (EOO)	<100 km <sup>2</sup>	<5,000km <sup>2</sup>	<20,000km <sup>2</sup>
<b>B2.</b> Area of occupancy (AOO)	< 10 km <sup>2</sup>	<500 km <sup>2</sup>	<2,000 km <sup>2</sup>
and meet at least two of the three proposed sub-conditions a, b and c.			
<b>a.</b> Severely fragmented, OR, Number of locations	= 1	≤ 5	≤ 10
<b>b.</b> Continuing decline in any of: (i) extent of occurrence; (ii) area of occupancy; (iii) area, extent and/or quality of habitat; (iv) number of locations or subpopulations; (v) number of mature individuals.			
<b>c.</b> Extreme fluctuations in any of: (i) extent of occurrence; (ii) area of occupancy; (iii) number of locations or subpopulations; (iv) number of mature individuals.			

Some species were also assessed under Criterion D. To be classified under this criterion, a species must have a number of mature individuals below the proposed thresholds or meet the conditions for sub-criterion D2 for a Vulnerable (VU) classification. The particular use of sub-criterion D2 for the VU category is conditional on the existence of plausible threats that could lead the species to become more threatened or even extinct in the near future (IUCN 2019).

Criterion A was not used for STP because it is necessary to be able to justify a quantified reduction in the number of mature individuals over 10 years or 3 generations, whichever is the longer of these two durations (maximum 100 years), and this was not easily applicable to the area.

## Species sheets description

The treatment of 106 taxa of (sub)endemic STP species is presented in three main sections: 1) Pteridophytes, 2) Gymnosperm, 3) Angiosperm, and then in alphabetical order, first of the family and then of the species. These information are easily identifiable on each sheet at the bottom of the page. Access to the records is facilitated by the index provided at the end of the book.

Each species is presented on one or two pages depending on the availability of photos and information on the species.

Different headings are proposed:

### 1 Name of the species

Accepted name of the species with its authority. Synonyms of the accepted taxon names have only been provided when they are the most commonly used synonym.

### 2 IUCN Red List Category

In this book, each species has been classified in one of the 7 following Red List categories:

Logo EX : Extinct. A taxon is presumed Extinct when exhaustive surveys in known and/or expected habitat, throughout its historic range have failed to record an individual.

The three categories Critically Endangered (CR), Endangered (EN), and Vulnerable (VU) are made for species that are threatened with extinction. These species face a relatively high (VU), high (EN), or very high (CR) risk of extinction.

**CR** Critically Endangered

**EN** Endangered

**VU** Vulnerable

**NT** The Near Threatened category includes species that are close to meeting the quantitative thresholds for threatened species, and which could become threatened if specific conservation measures are not conservation measures were not taken.

**LC** The Least Concern category includes species that are at low risk of extinction.

**DD** The Data Deficient category includes species for which the best available data are insufficient to directly or indirectly determine their risk of extinction.

### 3 Physionomy of the species

herbaceous plant, annual, biennial, or perennial.

perennial shrub small (chamaephyte) or large (phanerophyte) up to 6 m tall.

small or large tree (phanerophyte) from 6 m high.

long-stemmed, woody vine that is rooted in the soil at ground level and uses trees, as well as other means of vertical support, to climb up to the canopy in search of direct sunlight.

plants growing on other plants, but not parasitic.

ferns that grow with a trunk elevating the fronds above ground level, making them trees.

### 4 Iconography

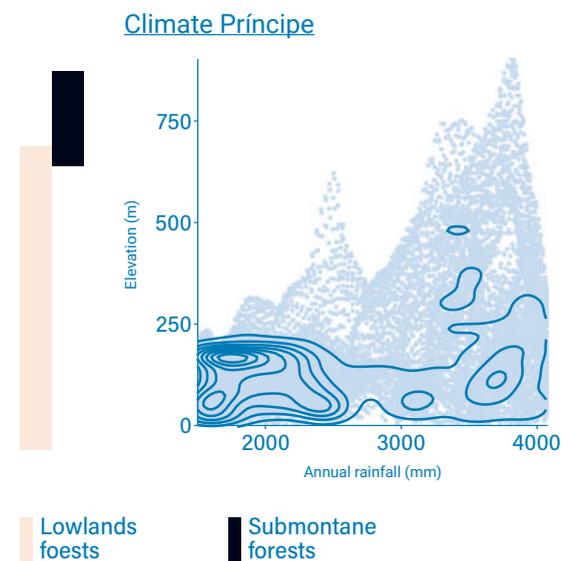
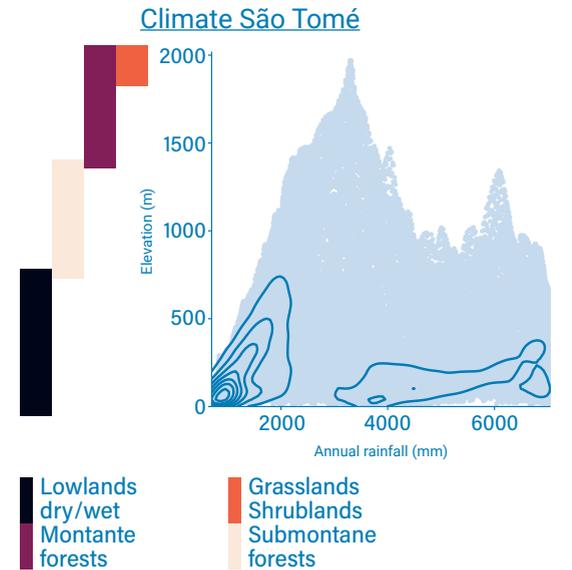
Depending on the availability of photographs, several photos may illustrate the species sheet. They were chosen both for their aesthetic value and for the morphological and ecological information they provide.

### 5 Distribution

A simplified distribution map accompanies each description sheet. Maps provide, for each taxon, all occurrence points based on herbarium specimen data. Points used in the assessment are given in orange; those that were excluded because the local population was considered extinct are given in the blue triangle.

### 6 Climate

To illustrate the distribution of species across environmental gradients, we build plot that show the covariation between the two most contrasted environmental factors of the island namely elevation (in metres) and annual rainfall (in mm) (see figures 12 for São Tomé and 13 for Príncipe). Details on the data used to build these plots can be found in Dauby et al. 2022.





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# Heteradelphina paulowilhelmia Lindau

1

2 **VU** 3 



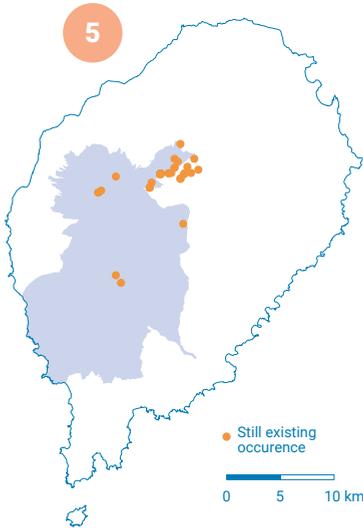
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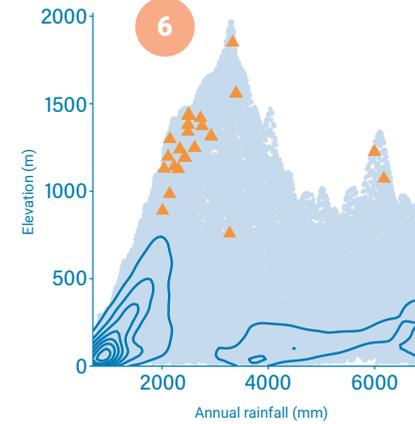
## Distribution

São Tomé



Angiosperm - Acanthaceae

## Climate



## Rationale

8

*Heteradelphina paulowilhelmia* is a small shrub, glabrescent, more rarely up to 1 m high. It is found in open places on secondary submontane rainforest around the Lago Amélia crater, open montane forest, along roads and tracks, plantations, between 600 and 1,700 m in elevation. The species is endemic to São Tomé Island and is known from 47 collections made between 1861 (Mann 1094) and 2020 (Lachenaud 3008) in the North-center and south of the island. Six occurrences (Mann 1094, Moller 198, Campos 6, Paiva 45, Chevalier 13681 and Chevalier 14577) were excluded because they are not precisely located. These 47 specimens represent 19 occurrences. Despite the old age of some collections, we consider that only one of the 19 occurrences represent individuals that are extirpated (Moller 162 at Bom Sucesso).

The habitat of the species does not appear as fragmented, so the 18 occurrences represent 1 subpopulation. Based on a 2 x 2 km cell size, the AOO of this species is estimated as 44 km<sup>2</sup>, and the EOO is calculated as 66 km<sup>2</sup>, both below the upper threshold for EN status under Criterion B.

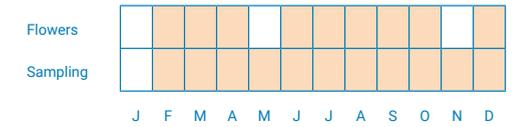
Of the 10 occurrences located within the PNST, 8 are located along the tourist path from Bom Sucesso to Pico São Tomé, and Lago Amélia and 2 were collected in the south part of the park. The occurrences around Lago Amélia and along the path to the Pico are threatened by invasive species, and represent one location, while the two other occurrences are not threatened, representing another location. The seven occurrences located around Bom Sucesso are threatened by field establishment. However, such open space is also profitable for this sunny lover species. The occurrence collected between S. Luís and Chamiço was threatened by former plantations; it represents one location. The occurrence at Macambara is threatened by logging

Angiosperm - Acanthaceae

## Phenology

*Heteradelphina paulowilhelmia*

7



but the ridge is still covered by forest, it represents one location. Overall, we can infer that the habitat of this species in this area is threatened by the invasive species that are planted to delineate the fields, and they represent one location. Finally, one occurrence collected near Bombaim (Formoso Pequeno) was threatened by past large plantations and current logging, representing one location.

Therefore, these 18 occurrences represent 6 locations (sensu IUCN 2019), with regards to the most important threat (agriculture). Moreover, we infer a past, current, and future continuing decline in the extent and habitat quality and population based on the extirpation of one occurrence at Bom Sucesso. This species is thus assessed as VU B1ab(iii,v)+2ab(iii,v).

## Habitat and ecology

9

The species is known from open submontane rainforest around crater, open montane forest, along roads and tracks, plantations, between 600 and 1,700 m in elevation.

## Use and trade

10

The species is not utilized.

## Population

11

The population of this species is unknown, but it is confined to a single mountain. The species appears as locally abundant, especially in open habitat.

## 7 Phenology

Where data permit, information on the flowering and fruiting period is given. Sometimes only the harvest periods are mentioned.

## 8 Rationale

Text justifying the category of threat according to the IUCN Red List Categories and Criteria.

## 9 Habitat and ecology

The habitat and ecology of the species, and its altitudinal range, are presented here.

## 10 Uses and trade

Information about how a taxon is utilized and what level of trade occurs for the taxon.

## 11 Population

Information on population data, and the number of known individuals.

## Other acronyms

**PNOST:** Ôbo Natural Park of São Tomé.

**PNOP:** Ôbo Natural Park of Príncipe.

**s.n.:** indicate a collection without a number.

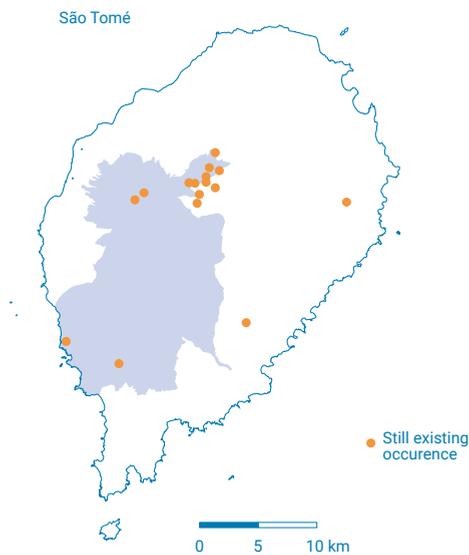
**IUCN:** International Union for Conservation of Nature.

# Pteridophytes



© Ehoam Bidault

# Asplenium eurysorum Hieron



## Distribution

Gabon, São Tomé and Príncipe

## Rationale

*Asplenium eurysorum* is an epiphyte fern. The species is known from Gabon and the islands of São Tomé and Príncipe. It occurs frequently within dense, tall, very wet forests with submontane affinity on rock faces in terra firme forest on ridge, between 160 and 1,987 m in elevation. It was previously assessed as VU D2 by Figueiredo and Gascoigne (2001), as the population was present in two locations, São Tomé and Príncipe (D2). This assessment was never published on the Red List and the fact it has been conducted 20 years ago as well as the availability of distribution data justify its reassessment.

*Asplenium eurysorum* is known from 31 collections made between 1853 (Welwitsch 14, Watt 14) and 2018 (Bidault 3983). One collection (Barter 1896) does not have precise coordinates and was not taken into account for estimating the assessment parameters. The 30 remaining collections represent 19 occurrences. In São Tomé, there are fifteen occurrences, eight of which are located within the PNOT, one outside PNOT to the southeast, and the six others to the northeast outside PNOT. However, the occurrence of São Pedro-Lagoa Amélia (Monod 11714) is considered extirpated and therefore was not taken into account for this assessment. In Príncipe, there are three occurrences, two inside the PNOP and one outside. The occurrence in Gabon is located within the Ramsar site of Birougou. The 18 remaining occurrences represent 3 subpopulations (the seeds of the species are mainly dispersed by wind). Based on a 2 x 2 km cell size, the AOO is estimated as 64 km<sup>2</sup>, below the upper threshold of the EN status under subcriterion B2. The EOO is calculated as 65,392 km<sup>2</sup>, above the upper threshold of the "Vulnerable" status under subcriterion B1. The two occurrences south of PNOT (Oliveira 424, Espírito Santo 5139) are threatened by old cocoa plantations and represent one location. The occurrence that is southeast of São Tomé (Oliveira 1419) is threatened by small-scale agriculture and represents one location. The two occurrences between Zampalma and Calvario (Oliveira 1461, Espírito Santo 5070) are threatened by small-scale agriculture and illegal logging and represent one location. The occurrence of Macambrara (Exell 132) is threatened by vegetable agriculture and represents one location. We infer a future disappearance of this occurrence. All occurrences that are in the touristic path in the PNOT (Gascoigne 10, Oliveira 1212, Paiva 883, Sousa 1267, Stévant 1267, Moller 28, Lejoly 1, Matos 7382) are threatened by ecotourism and invasive plants and represent one location. The occurrence in the north on the periphery of the PNOT (Paiva 467) is threatened by small-scale agriculture and illegal logging and represents one location. The occurrence between São Joaquim and São Carlos de Fundão (Gascoigne 35) in the PNOP is not threatened and represents one location. The occurrences at Pico Papagaio (Watt 24, Welwitsch 14, Paiva 595) are indirectly threatened

by ecotourism and represent one location. The third occurrence of Príncipe at Ôquê Nazaré (Newton 27) is threatened by old cocoa plantations and quarries and represents one location. The occurrence of Gabon (Bidault 3983) is not threatened and represents one location. Therefore, these 18 occurrences represent 10 locations (sensu IUCN, 2019), with regards to the most important threat (small-scale agriculture). We infer a continuing decline in the extent and quality of its habitat. We also infer a continuing decline in its AOO, the number of mature individuals, and the number of subpopulations based on inferred future disappearance of one occurrence situated at Macambrara. Therefore, *Asplenium eurysorum* is assessed as VU B2ab(ii,iii,iv,v).

## Habitat and ecology

The species occurs frequently in dense, tall, very wet lowland and submontane forests, on rocky habitat, in terra firme forest, on ridges, between 160 and 1,987 m in elevation.

## Use and trade

There are no known uses of this species.

## Population

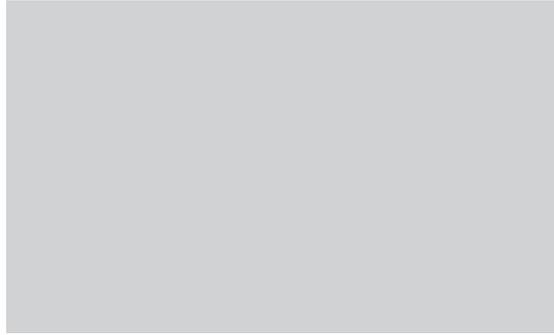
The species has been collected more in São Tomé than in Príncipe and Gabon where it is under-collected. Its current distribution represents 3 subpopulations.



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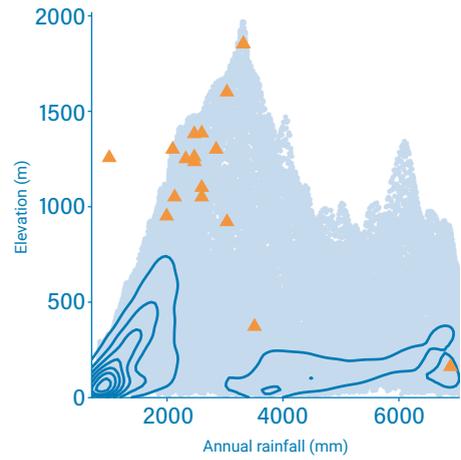


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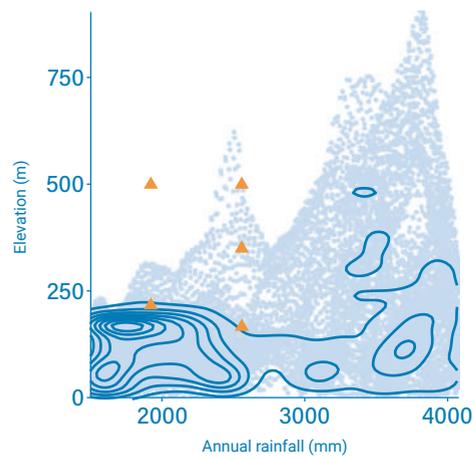


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Climate São Tomé



Climate Príncipe

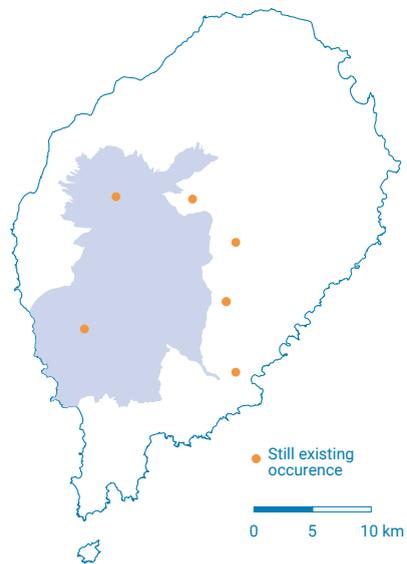


# Asplenium exhaustum (H.Christ) Alston

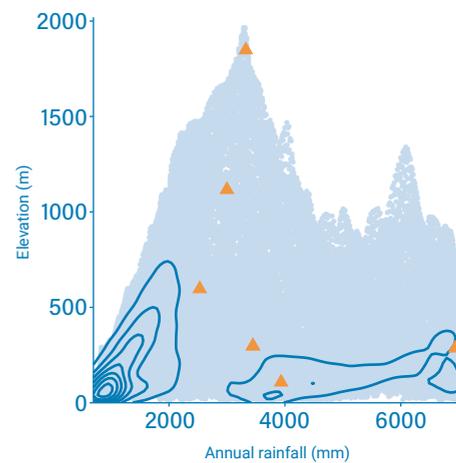


## Distribution

São Tomé



## Climate



## Rationale

*Asplenium exhaustum* is an epiphytic fern, most often found in old plantations as well as in secondary forests, between 110 and 1,120 m in elevation. It is an endemic species of São Tomé. A preliminary evaluation was already made by Figueiredo and Gascoigne in 2001, who evaluated it as EN. The species is known from 13 collections made between 1905 (Chevalier 14587) and 2008 (Oliveira 1348, 1432). Five of these collections do not have precise coordinates and were not taken into account for estimating the assessment parameters. The seven remaining collections represent 6 occurrences and 1 subpopulation (the seeds of the species are mainly dispersed by wind). Based on a 2 x 2 km cell size, the AOO is estimated as 24 km<sup>2</sup>, below the upper threshold of the EN status under subcriterion B2. The EOO is calculated as 146.357 km<sup>2</sup>, below the upper threshold of the EN status under subcriterion B1. The occurrence (Oliveira 1348) in the south of the PNOST is not threatened and represents one location. The occurrence that is located between Valcarmo and Roça S. João (Oliveira 1432) is threatened by small-scale agriculture and oil palm plantations and represents one location. We infer a future disappearance of this occurrence due to the oil palm plantation project in this locality. The Roça Cruzeiro occurrence (Thorold 2072 and Strickland 2072) is threatened by small-scale agriculture and illegal logging and represents one location. The area around the Ecofac Center (Oliveira 98) and the area between Bom sucesso and Bom-baim are threatened by small-scale agriculture and illegal logging and represent one location. The pico occurrence (Chevalier 14587) is threatened indirectly by invasive plants and represents one location. Therefore, the 6 occurrences represent 5 locations (sensu IUCN, 2019). We infer a continuing decline in EOO, AOO, habitat extent, and quality, number of locations, and number of mature individuals. The species is therefore assessed as EN B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v).

## Habitat and ecology

The species is most often found in old plantations, as well as in secondary forests, between 110 and 1,120 m in elevation.

## Use and trade

There are no known uses of this species.

## Population

Population information is not precisely known for this species.

# *Alsophila camerooniana* (Hook.) R.M.Tryon var. *currorii* (Holttum) J.P.Roux

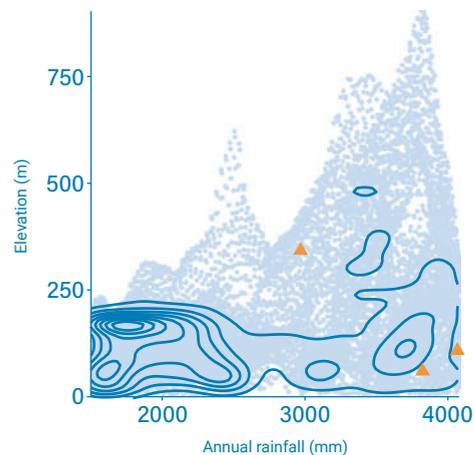


## Distribution

Príncipe



## Climate



## Rationale

*Alsophila camerooniana* var. *currorii* was preliminarily assessed as VU D2 (Figueiredo 2002), but not published on the IUCN Red List. This variety is a tree fern up to 3 m in height, endemic to Príncipe Island and found in lowland forest from 60 to 350 altitude. It is known from seven collections made between 1919 (Navel 136) and 1957 (Rose 400). Three of these collections do not have precise coordinates and were excluded from this assessment (Strickland s.n., Curror s.n. and Stévar s.n.). Four specimens of *Alsophila camerooniana* were collected in Príncipe from 1998 and 2016 and need further investigation to check if they can be *Alsophila camerooniana* var. *currorii* (Oliveira 98/177, 515, 1796 and Equipa Botanica do Príncipe 56) and were not used for this assessment. The four collections used for this assessment represent three occurrences, none considered as extirpated and all within Príncipe's Natural Park (PNP). Based on a 2 x 2 km cell size, the AOO of this species is estimated as 12 km<sup>2</sup>, below the upper threshold for EN status under subcriterion B2. The EOO is calculated as 5.1 km<sup>2</sup>, below the upper threshold for CR status under subcriterion B1. Since the EOO cannot be less than the AOO, we consider the EOO as 12 km<sup>2</sup> (the same value as AOO), which is below the upper threshold of the CR category under subcriterion B1. The three occurrences (Rio Bambu-Porco, Ôquê Pipi-Morro do Leste and Infante D. Henrique) were threatened by past plantations but are not currently threatened and represent one location and 1-3 subpopulations. *Alsophila camerooniana* var. *currorii* was probably much more widespread in the lowland forests of the South and thus we infer a reduction of the EOO, area of occupancy, and past decline in the extent and quality of its habitat, and a decline in the number of mature individuals. It is thus assessed as CR B1ab(i,ii,iii,iv,v).

## Habitat and ecology

The species occurs in lowland forest, between 60 and 350 in elevation.

## Use and trade

*Alsophila camerooniana* var. *currorii* is included on the checklist of CITIES species (UNEP-WCM 2011).

## Population

Population information is not sufficiently documented for this species, but we suggest the existence of 1-3 subpopulations.



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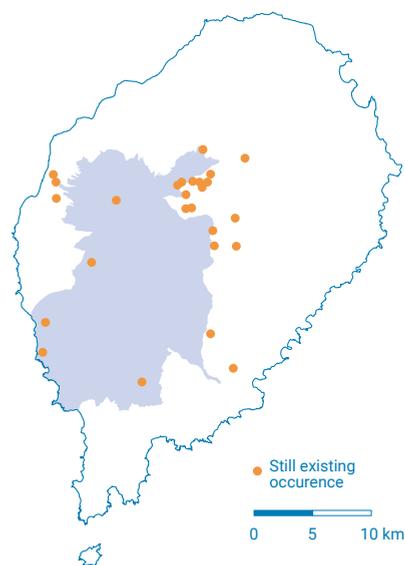
# Alsophila welwitschii (Hook.) R.M.Tryon



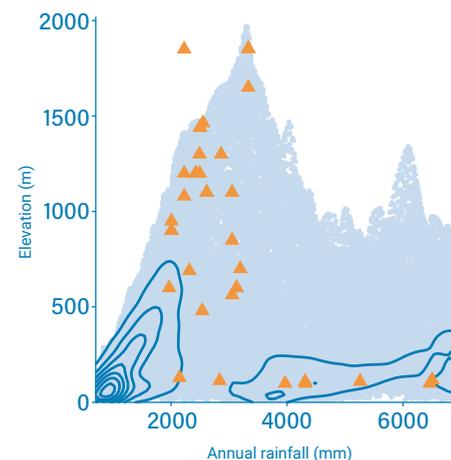
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## Distribution

São Tomé



## Climate



Occurrences of Monte São (Welwitsch 66) and between Bom Sucesso and Lagoa Amélia (Lejoly 300 ; Almeida s.n ; Moller 2) are considered extirpated due to the dates of their collection and the type of activities (small-holder plantations) present around their georeferencing. These four occurrences have also not been taken into account for this assessment. The 25 remaining occurrences represent 1 to 3 subpopulations (the seeds of the species are mainly dispersed by wind). Based on a 2 x 2 km cell size, the AOO is estimated as 76 km<sup>2</sup>, below the upper threshold of the EN status under subcriterion B2. The EOO is calculated as 288.140 km<sup>2</sup>, below the upper threshold of the EN status under subcriterion B1. Two occurrences located outside the PNOT at Rio lo Grande (Ogonovszky 50) and Caminho de Vale Carmo (Figueiredo 157) are threatened by old plantations (cacao) and represent one location. Four occurrences inside PNOT in South (Ogonovszky 125 Between Elmolve and Vila Verde; Paiva 915 Between Juliana de Sousa and S. Miguel; Lachenaud 2986 Hill north of Praia São Miguel; Oliveira 431 Morro Provaz) are threatened by old plantations (cacao) and represent one location. The occurrence in the center of PNOT (Ogonovszky 157) is not threatened and represents one location. The two occurrences to the northwest of the PNOT (Paiva 1355 Diogo Vaz-Sao Manuel; Paiva 1355 Diogo Vaz. Rio Apaga Fogo) are threatened by illegal logging and represent a location. The Cascata Apaga-Foguinh occurrence (Paiva 743) is threatened by small-scale agriculture and represents one location. Occurrences along the tourist trail (Moller 3 and Monod 12010 West slope of Pico; Lejoly 269, 634 Lagoa Amélia; Randrianaivo 1612 Lagoa Amélia) represent one location and are indirectly threatened by ecotourism and invasive species reducing the quality of its habitat. The Formoso Grande (Oliveira 1187), Bombaim-Monte Formoso (Paiva 766), Milagrosa-Bombaim (Figueiredo 181) and Formoso Pequeno (Oliveira 1130) occurrences are threatened by illegal logging, and represents one location. The occurrence of Chamiço (Paiva 1030) is threatened by small-scale agriculture and

represents one location. Four occurrences between Zampalma and Trás-os-Montes (Paiva 1110; Oliveira 1125; Henriques s.n; Gama s.n) are threatened by small-scale agriculture and illegal logging and represent one location. The Macambará (Exell 111) is threatened by small-scale agriculture, and represents one location; we infer a future disappearance of this occurrence. The occurrence between St. Luís and Chamiço (Paiva 456) is threatened by small-scale agriculture and represents one location. Therefore, these 25 occurrences represent 10 locations (*sensu* IUCN, 2019), with regards to the most important threat (small-scale agriculture). We infer a continuing decline in the extent and quality of its habitat. We also infer a decline in its AOO, the number of mature individuals, and the number of subpopulations based on inferred future disappearance of one occurrence situated at Monte Figo. Therefore, *Alsophila welwitschii* is assessed as VU B1ab(ii,iii,iv,v)+2ab(ii,iii,iv,v).

## Habitat and ecology

The species occurs frequently in open forests on wet slopes, and secondary forests, between 100 and 1,850 m in elevation.

## Use and trade

There are no known uses of this species.

## Population

Very widespread in São Tomé, the species seems to be very present in the center of the island.

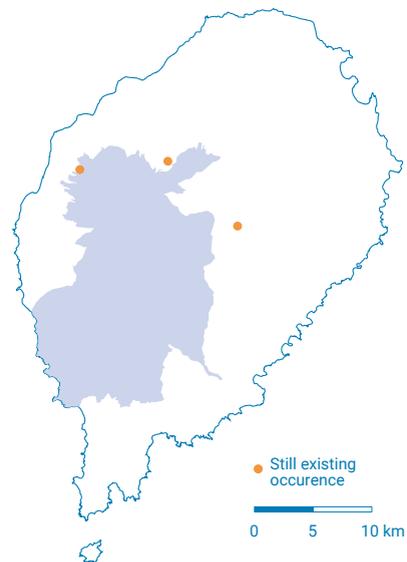
# Dryopteris caperata

## J.P.Roux

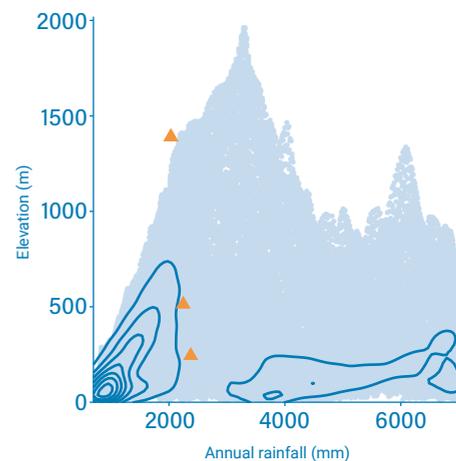


### Distribution

São Tomé



### Climate



### Rationale

*Dryopteris caperata* is a terrestrial plant, with a rhizome up to 90 mm long, and 10 mm in diameter, known from low and montane rain forest. It is known from 16 collections collected between 1885 (Moller 39) and 1998 (Lejoly 244; Oliveira 485, 624, 644). We consider that two occurrences, corresponding to collections made by Moller (39) and Rozeira (4974) are extirpated given that the habitat has been deeply changed in Nova Moca and Monte Café. Two other collections (Oliveira 136; Quintas 10) were not taken into account in this assessment since they are not precisely georeferenced. So, the 12 remaining collections represent twelve occurrences, two of them occurring in PNOST. Based on a 2 x 2 km cell size, the AOO of this species is estimated as 36 km<sup>2</sup>, below the upper threshold for EN status under subcriterion B2. The EOO is calculated as 98 km<sup>2</sup>, below the upper threshold for CR status under subcriterion B1. Two occurrences inside the PNOST, are not threatened and represent one location. The occurrence around Bom Sucesso is threatened by vegetable plantations and represents one location. We infer that this occurrence will disappear in nearly future. Two occurrences at Macambrara and Tras-os-Montes are threatened by agriculture activities and illegal logging and represent one location. Two occurrences made from Bombain and at the base of Pico Formoso were threatened by past coffee plantations and represent one location. The occurrence at Rio Lemba (Santa Catarina) is threatened by human disturbance, and represents one location. The occurrence made at Milagrosa is threatened by human disturbance, and represents one location. The occurrence around Poiso Alto is threatened by agriculture activities and represents one location. The occurrence at Cascata de São Nicolau is not threatened and represents one location. Therefore, these twelve occurrences represent nine locations (*sensu* IUCN, 19) with regard to the most serious plausible threats (small-scale agriculture). Based

on these threats and the disappearance of two occurrences, we infer past, current and future continuing decline in its AOO, the extent and the quality of its habitat, in number of locations, and number of individuals due to agriculture. *D. caperata* is thus assessed as VU B1ab(ii,iii,iv,v)+2ab(ii,iii,iv,v).

### Habitat and ecology

The species occurs in lowland and montane rain forest, between 31 and 1,400 m in elevation.

### Use and trade

There are no known uses of this species.

### Population

Population information is not sufficiently known for this species, but we suggest the existence of one subpopulation.

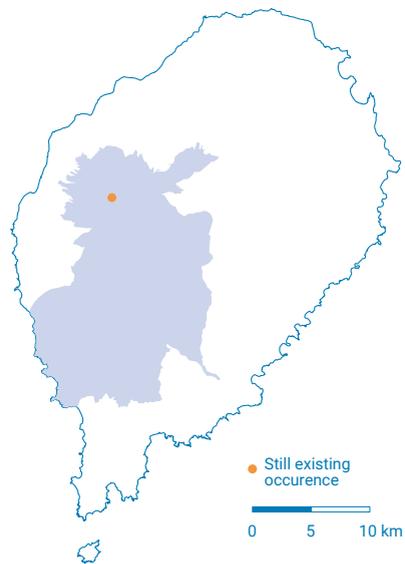
# Dryopteris cicatricata

## J.P.Roux

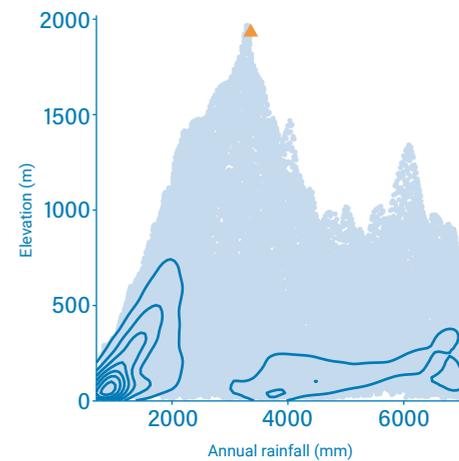


### Distribution

São Tomé



### Climate



### Rationale

*Dryopteris cicatricata* is a herbaceous plant up to 1 m, known from the montane forest, between 1,725 and 1,930m in elevation. The species is endemic to São Tomé and is only known from one collection (Razeira 5136) made in 1958. In the literature, it is said that this taxon is only known from the type collection and that there is no problem with taxonomy. Unfortunately, we could not find this herbarium specimen and, therefore, with the information we have, we considered only the type. This collection would represent an occurrence located in the north of the PNOST assuming it still exists. Based on cell size of 2 x 2 km, the area of occupancy is estimated to be 4 km<sup>2</sup>, below the upper threshold for CR status under criterion B2 (the EOO cannot be calculated). This single occurrence must be threatened by tourism and represent 1 location (*sensu* IUCN, 2019) with regard to the most serious plausible threat (tourism). We infer a past, current and future continuing decline in the extent and habitat quality. *Dryopteris cicatricata* is therefore assessed as CR B2ab(iii).

### Habitat and ecology

The species is known from montane forest, between 1,725 and 1,930 m in elevation.

### Use and trade

There is no known use for this species.

### Population

The species has only been collected in São Tomé. Its current distribution represents 1 subpopulation.

# *Triplophyllum fraternum* var. *elongatum* (Hook.) Holttum

DD



## Distribution

Príncipe



## Rationale

*Triplophyllum fraternum* var. *elongatum* is a fern assumed to be endemic to Príncipe Island. This variety was listed as rare in the 1997 IUCN Red List of Threatened Plants (Walter and Gillett 1998). It was then assessed as CR by Figueiredo & Gascoigne (2001), but not published in the IUCN Red List. *Triplophyllum fraternum* var. *elongatum* is known from three collections. The locality of the collection made by Mann (s.n.) in 1861 is unknown. According to Holttum (1986), additional specimens exist, collected by Barter and by Curror (s.n.) with no information regarding the collection year, habitat, or locality. Klopper & Figueiredo (2013) consider the variety as rare or extinct since no collections were made since the 19th century. No dedicated survey has been conducted to find the variety, so we can't consider it extinct. The taxon is thus known from few specimens with no locality information so that it is not possible to make any further inference about its conservation status, thus this species is assessed as DD.

## Habitat and ecology

Habitat and ecology are unknown. Collected only in Príncipe Island, in an unknown locality described only as «forest».

## Use and trade

No direct uses for the species were identified.

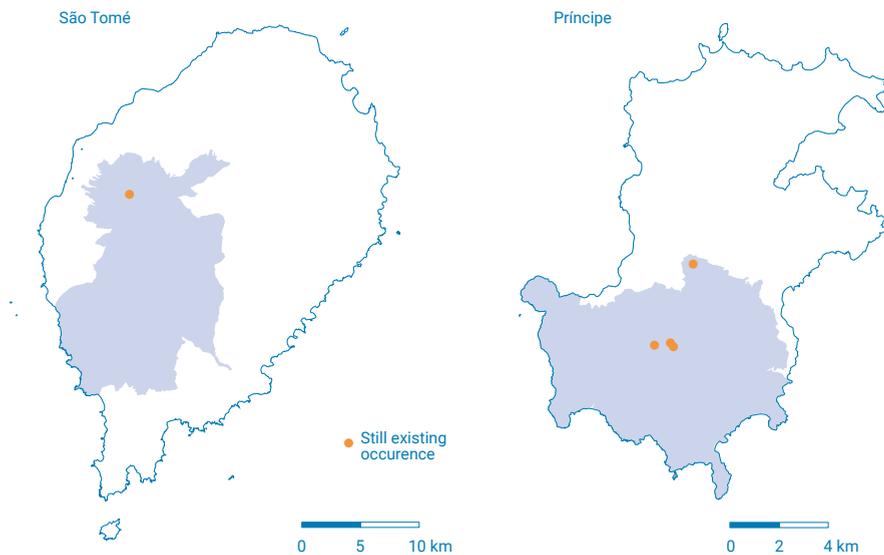
## Population

There is no population information for this species.



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# Grammitis nigrocincta Alston



## Rationale

*Grammitis nigrocincta* is a fern preliminary assessed as VU D2 but not published on the IUCN Red List (Figueiredo 2002). The species is known from 18 collections made between 1956 (Monod 12162 and Thorold 2017) and 2019 (Barberá 2592), in submontane forests, between 450 and 1,852 m altitude. Two collections do not have precise coordinates and were excluded from this assessment (Rozeira s.n. and Wilde 532). The 16 remaining collections represent 15 occurrences (4 in Príncipe, 1 in São Tomé, 1 in Cameroon, 2 in Equatorial Guinea, 6 in Gabon, and 1 in Congo), none are considered as extirpated and representing seven subpopulations. Based on a 2 x 2 km cell size, the AOO of this species is estimated as 56 km<sup>2</sup>, below the upper threshold for EN status under subcriterion B2. The EOO is calculated as 229,315 km<sup>2</sup>, above the upper threshold for VU status under subcriterion B1. In Príncipe three occurrences Pico do Príncipe are not threatened and represent one location, and the occurrence at Pico Papagaio is threatened by tourism causing the decrease of the quality of the habitat and promoting invasive species spread and represents one location. In São Tomé, the only occurrence is at the top of Pico São Tomé and is threatened by tourism causing the decrease of the quality of the habitat and promoting invasive species spread representing one location. In Cameroon, the occurrence is not threatened and represents one location. In Equatorial Guinea, the two occurrences at the Parc National de Monte Alén are not threatened and represent one location. In Gabon, three occurrences around Monts de Cristal are threatened, two by logging and one by small-scale agriculture, each one representing one location. The occurrence in Tchimbélé is threatened by hydroelectric facilities and represents one location. The occurrence on the Komo is threatened by illegal logging and represents one location. In Naguila, the occurrence is not threatened and represents one location. In Congo, the occurrence on Bamba Mountain is not threatened and represents one location. Thus, the 15 occurrences of *Grammitis nigrocincta* represent 11 locations (*sensu* IUCN, 2019), with regard to the most serious plausible threat (logging). Due to these threats, we infer a continuing decline in the extent and quality of its habitat, almost reaching the threshold of VU status, but which cannot currently lead to consider the species under a threatened category according to criterion B. *Grammitis nigrocincta* is therefore assessed as NT.

## Habitat and ecology

The species occurs in submontane forests, between 450 and 1,852 m in elevation.

## Use and trade

There is no known use for this species.

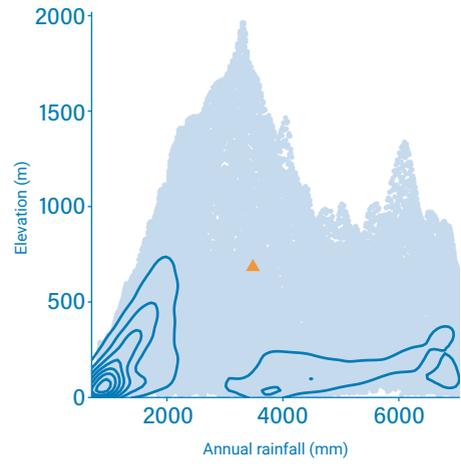
## Population

Population information is not sufficiently known for this species, but we suggest the existence of 9 subpopulations.

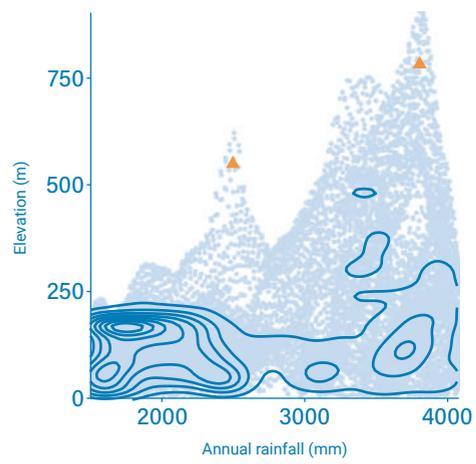


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Climate São Tomé



Climate Príncipe



© Ehoam Bidaut

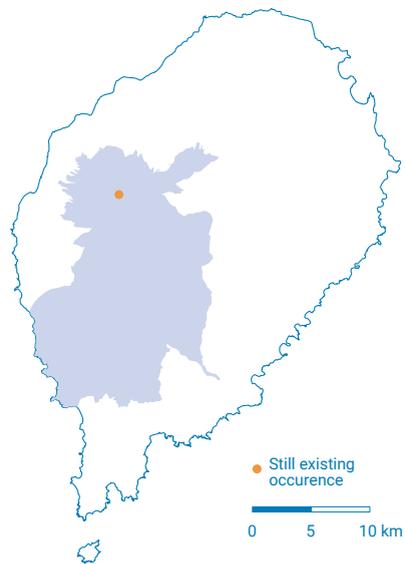
# Stenogrammitis tomensis (Schelpe) Labiak

CR

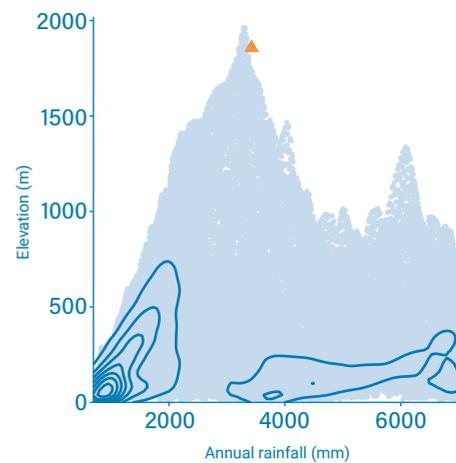


## Distribution

São Tomé



## Climate



## Rationale

*Stenogrammitis tomensis* is an epiphytic fern with rhizome short creeping, scaly, the scales reddish-brown to castaneous (Labiak, 2011). Although two collections (Newton 11; Quintas 11) are often cited, we consider that the attribution of the collection to Newton is a mistake. So, the species is known from only one collection made in 1888 (Quintas 11) around Pico São Tomé. This collection represents one occurrence and one subpopulation. Based on a 2 x 2 km cell size, the AOO of this species is estimated as 4 km<sup>2</sup>, below the upper threshold for CR status under Criterion B2. The EOO is not calculated. The habitat of the species is threatened by ecotourism activities. Ecotourism is the most important threat and this occurrence represents one location (*sensu* IUCN, 2019). Based on this threat, we infer past, current and future continuing decline in the extent and the quality of its habitat. *Stenogrammitis tomensis* is thus assessed as CR B2ab(iii).

## Habitat and ecology

The species occurs in submontane rainforest, at 2,000 m in elevation.

## Use and trade

It is not known if the species is used.

## Population

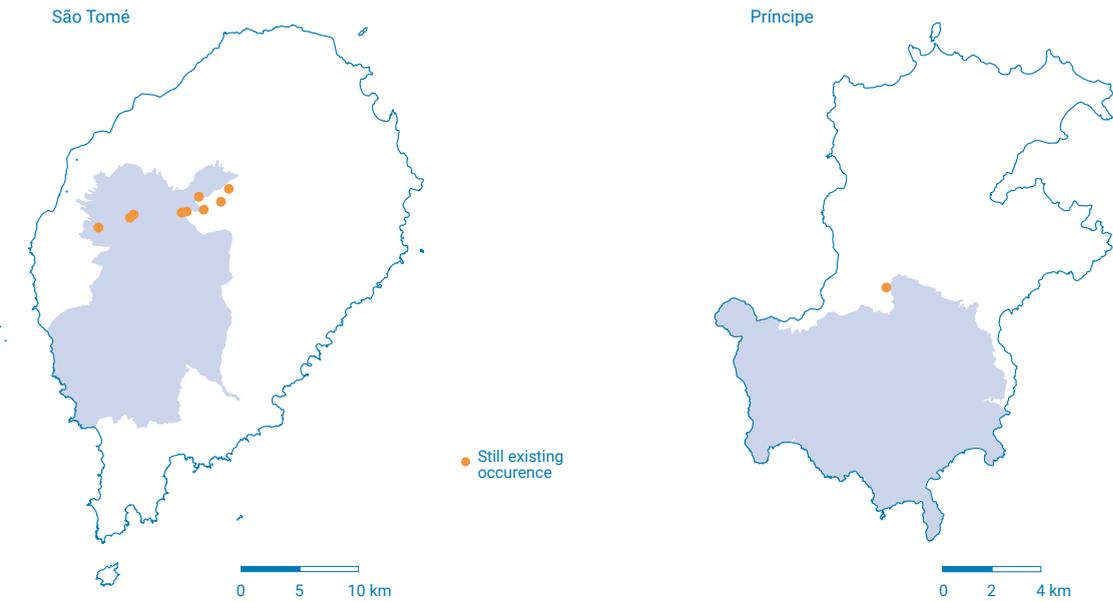
Population information is not precisely known for this species.

# *Selaginella mannii* Baker

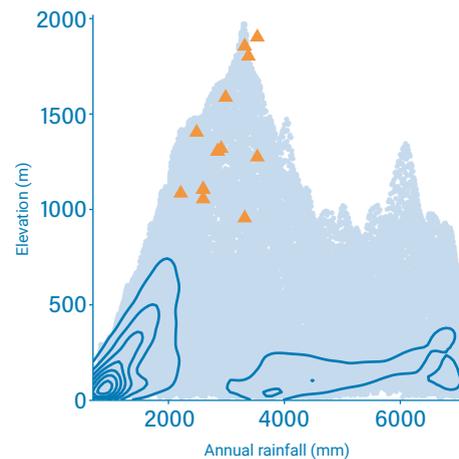


## Distribution

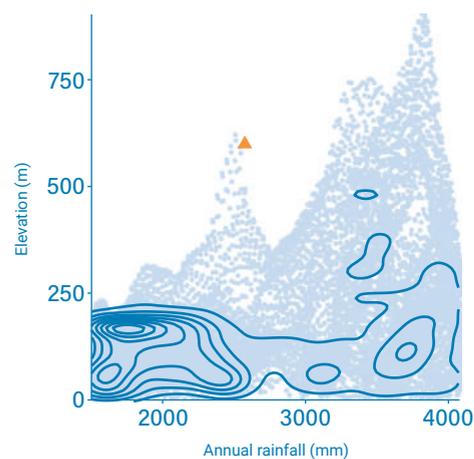
São Tomé and Príncipe



## Climate São Tomé



## Climate Príncipe



## Rationale

*Selaginella mannii* is known from lowland and submontane forests, between 600 and 1,900 m in elevation. It is endemic to São Tomé and Príncipe and is known from 19 collections made between 1885 and 1996. We discarded five collections (Moller 80, s.n., Henriques 4, Chevallier 14552, and Mann 1108) prior to the assessment because their locality of collections is unknown or very imprecise. The 14 remaining collections represent nine occurrences and two subpopulations. Based on a 2 x 2 km cell size, the AOO of this species is estimated to be 24 km<sup>2</sup>, which falls within the limits of the EN category under Criterion B2. The EOO is calculated as 643 km<sup>2</sup>, below the upper threshold of the EN category under Criterion B1.

Five occurrences of *Selaginella mannii* are located within the PNOT and PNOP on both islands. The habitat of only one of them does not appear under threat, whereas the four other occurrences are threatened by invasive plants. Outside the park, the species is threatened by small-scale shifting agriculture and small-holder farming. Indeed, the occurrence Exell 683 is threatened by invasive plants and trampling and represents one location. The collection Moller s.n., Exell 95, 106, 168, all representing the same occurrence, are threatened by the encroachment of carrot crops and represent one location. The occurrence Monod 11784 is threatened by invasive plants and represents one location. The occurrences Rose 151, Paiva 1101, and 1104 (the last two in the same occurrence) are threatened by shifting agriculture and represent two locations. The collections Monod 11904, Paiva 190, and Moller s.n. located within the park in São Tomé are threatened by invasive plants and trampling. We have not found any threat for the occurrence Moller s.n. located within the park. Based on the smallest size of locations in the currently affected areas by small-holder farming, that occurrence represents one location.

Based on the main threat which is small-holder farming, the nine occurrences represent seven locations (*sensu* IUCN 2019), which falls within the limits of the Vulnerable category under the criteria B1 and B2. Shifting agriculture and small-holder farming are leading to a continuing decline in the quality of the species' habitat. The disappearance

of the occurrence from São Nicolau leads us to infer a decline in AOO, number of locations, and mature individuals of the species. For these reasons, *Selaginella mannii* is assessed as VU B1ab(ii,iii,iv,v)+2ab(ii,iii,iv,v).

## Habitat and ecology

The species is known from lowland and submontane forests, between 600 and 1,900 m in elevation.

## Use and trade

There are no known uses for this species.

## Population

*Selaginella mannii* is known from two subpopulations. No quantitative population data are available for the species.

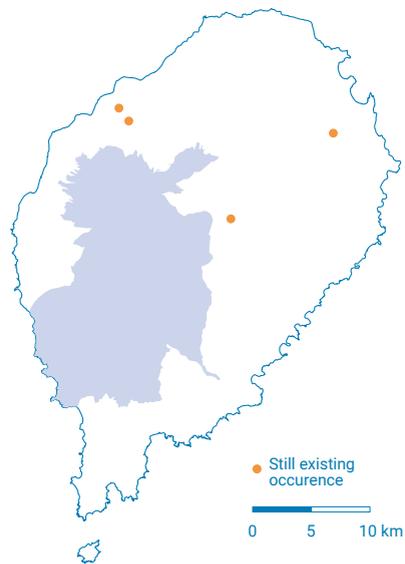
# *Selaginella monodii* Alston

EN

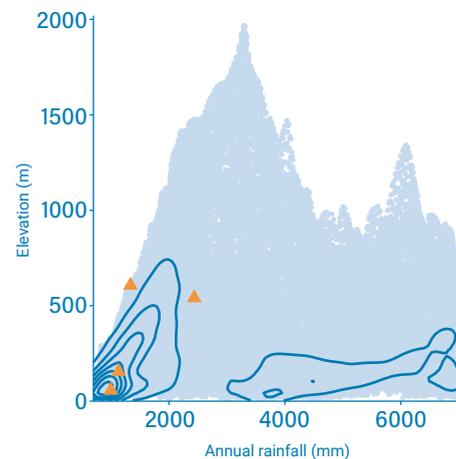


## Distribution

São Tomé



## Climate



## Rationale

*Selaginella monodii* was assessed by Figueiredo et Gascoigne (2001) as CR, but this assessment has not been published by the Red List Unit. It is a fern known from six collections made between 1956 (Monod 11806) and 1999 (Figueiredo 167-169; 174). Although the habitat was very degraded in places of collection, we consider that none of all occurrences has been extirpated. So these six collections represent four occurrences (all located outside PNST), and three subpopulations. Based on a 2 x 2 km cell size, the AOO of this species is estimated as 16 km<sup>2</sup>, below the upper threshold of the EN category under subcriterion B2. The EOO is calculated as 90 km<sup>2</sup>, below the upper threshold of the CR category under subcriterion B1. The occurrence at Bobo Forro (Cascata Blublu) is threatened by urbanization and horticulture activities, and represents one location. The occurrence located at Cascata de Bombaim is not threatened and represents one location. Two occurrences from Generosa and Mendes Leite are threatened by cacao plantations and hydroelectric activities which induce a decline in the number of mature individuals. They represent one location. Therefore, these six occurrences represent three locations (*sensu* IUCN 2019), with regards to the most important threat (hydroelectric activities). We infer a past and a future decline in the number of mature individuals. Moreover, we infer a past, current, and future continuing decline in the extent and the quality of its habitat. *Selaginella monodii* is thus assessed as EN B1ab(iii,v)+2ab(iii,v).

## Habitat and ecology

The species occurs in low altitude rainforest, on the stones of the stream of waterfalls, between 50 and 600 m in elevation.

## Use and trade

It is not known if the species is used.

## Population

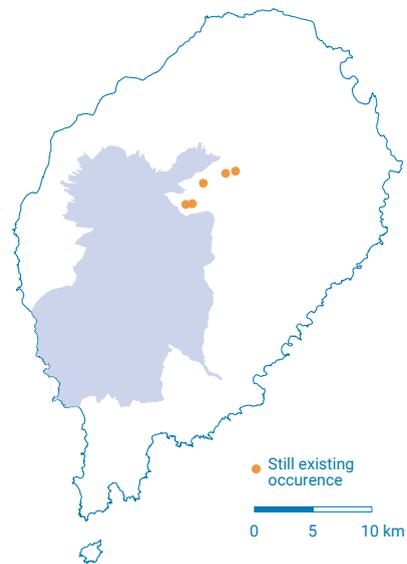
This species appears to be stream-dependent, so the four occurrences (two of which are located on the same stream) represent three subpopulations.

# *Pseudophegopteris henriquesii* (Baker) Holttum

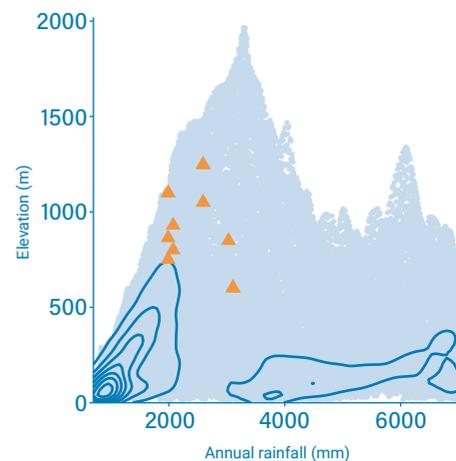


## Distribution

São Tomé



## Climate



## Rationale

*Pseudophegopteris henriquesii* (Holttum, 1969) is an herb up to 1 m, known from dense humid forest, between 600 and 1,250 m in elevation. The species is endemic to São Tomé. It is known from 10 collections made between 1885 (Moller s.n.; 45; 49) and 1998 (Paiva 1317). However, we excluded two collections because no locality information is provided. The eight remaining collections represent five occurrences and one subpopulation. Considering forest cover, which is still significant in areas of collection, we do not regard any of these five remaining occurrences as extirpated. Based on a 2 x 2 km cell size, the AOO of this species is estimated as 16 km<sup>2</sup>, below the upper threshold for EN status under subcriterion B2. The EOO is calculated as 2.5 km<sup>2</sup>, above the upper threshold for CR status under subcriteria B1. Since the EOO is less than the AOO, we consider the EOO equal to the AOO (16 km<sup>2</sup>), below the upper threshold for CR status. Two occurrences located at Nova Moca are threatened by coffee plantations and represent one location. The occurrence at Zampalma is threatened by horticulture and represents one location. We consider that this occurrence will disappear in the near future. Two occurrences at Rosa Calvario are threatened by plantations and represent one location. Therefore, these five occurrences represent three locations (*sensu* IUCN, 2019), with regard to the most serious plausible threats (small-scale agriculture). Based on the future disappearance of the occurrence in Zampalma, we infer a continuing decline in its AOO, EOO, the number of locations, the extent and the quality of its habitat, and the number of mature individuals. *Pseudophegopteris henriquesii* is thus assessed as EN B1 ab(i,ii,iii iv,v)+2ab(i,ii,iii,iv,v).

## Habitat and ecology

The species is known from dense humid forest, between 600 and 1,250 m in elevation.

## Use and trade

There is no known use for this species.

## Population

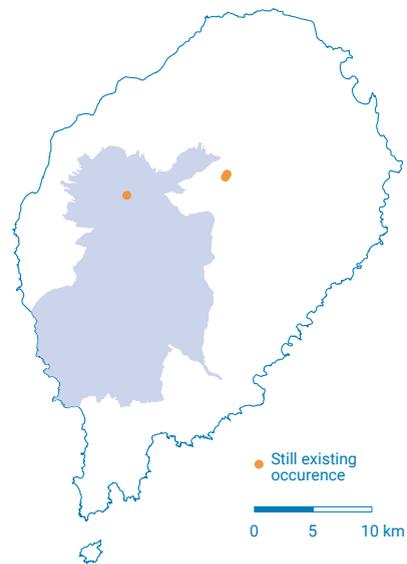
Population information is not very well known for this species.

# *Sphaerostephanos elatus* (Bojer) Holttum subsp. *thomensis* Holttum

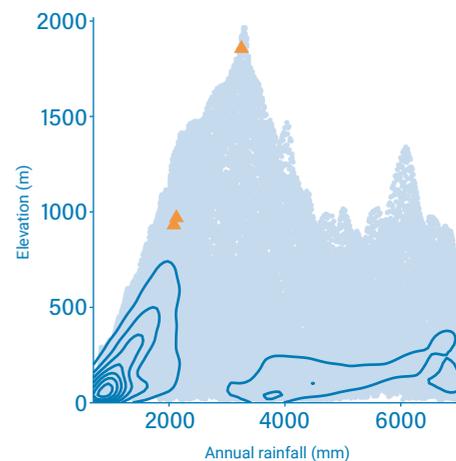


## Distribution

São Tomé



## Climate



## Rationale

*Sphaerostephanos elatus* subsp. *thomensis* is a fern most often found on rocks in secondary forests, between 867 and 1,867 m. It is an endemic subspecies of São Tomé, known from 3 collections made between 1885 (Moller 41) and 1995 (Paiva 844). In 1998, Figueiredo emphasized the fact that this species is very rare. These three collections represent 3 occurrences and 1 or 2 subpopulations (the seeds of the species are mainly dispersed by wind). Based on a 2 x 2 km cell size, the AOO is estimated as 8 km<sup>2</sup>, below the upper threshold of the CR status under subcriterion B2. The EOO is calculated as 0.9 km<sup>2</sup>, below the upper threshold of the CR status under subcriterion B1. Here the EOO is underestimated and therefore it will be equal to the AOO. The pico occurrence (Moller 41) is threatened by invasive plants and ecotourism and represents one location. This can induce degradation of its habitat. The occurrence of São Nicolau (Paiva 304) is threatened by carrot and cabbage fields, which could lead to its future disappearance and represents one location. The Cascata de São Nicolau occurrence (Paiva 844) is not threatened and represents one location. Therefore, these 3 occurrences represent 3 locations (*sensu* IUCN, 2019). We infer a continuing decline in EOO, AOO, habitat extent, and quality, number of locations, and number of mature individuals. *Sphaerostephanos elatus* subsp. *thomensis* is therefore assessed as EN B1ab(i,ii,iii,iv,v)+2 ab(i,ii,iii,iv,v).

## Habitat and ecology

The species is most often found on rocks in secondary forests, between 867 and 1,867 m in elevation.

## Use and trade

There are no known uses of this species.

## Population

Population information is not precisely known for this subspecies.

**Gymnosperm**



© Tariq Stewart

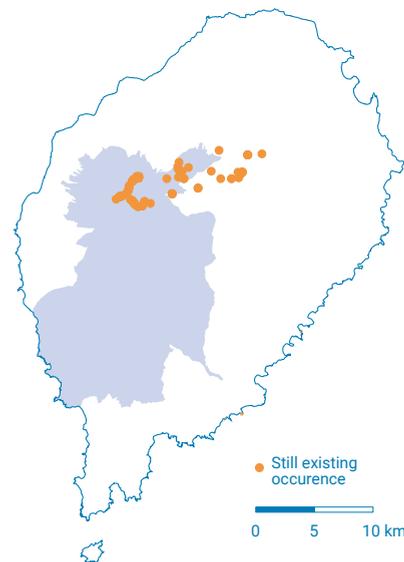
# Afrocarpus mannii (Hook.f.)

## C.N.Page



### Distribution

São Tomé



### Rationale

The species was previously assessed as VUD2 in 2011. However, new data called for its reassessment. *Afrocarpus mannii* is a tree, up to 35 m tall. It is a light demanding species, found in submontane and montane forest, mostly in open habitat such as ridges, between 1216 and 2024 m in elevation. The species is endemic to São Tomé, occurring in the Northwest-center of the island. It is known from 36 collections made between 1861 (Mann 1065) and 2008 (Randrianaivo, R. 1644), 2 observations made on the MBG Transects, 3 in Macambrará, and 57 field observations (GPS points) made on the whole island. Twenty-five specimens were excluded because they are cultivated (mostly around Monte Café and Saudade) or not well georeferenced (between Monte Café and the Pico). Moreover, individuals that were planted along the road of Monte Café were logged, as well as the ones cultivated in São Nicolau and Saudade. Overall, 12 specimens and 53 observations were kept, representing 65 occurrences.

Despite the old age of some collections (Mann 1065 in 1861 for example), we did not exclude any of these 65 occurrences, since the locations are remote and still covered by forest, thus considered as still suitable for the species.

Two large groups of individuals are known in the wild, one around the ridges near Lagoa Amélia, and the other on the ridge from Estação Sousa to the Pico de São Tomé and to Morro Vilela. These two patches of individuals form one subpopulation since they are quite close (3 km) and individuals certainly exist on ridges linking these two areas (track to Escadas). The number of individuals at the top is quite limited, but the species is frequent: 51 observations of mature individuals have been made there, showing that the species is quite common along ridges, but not abundant in the wild. Indeed, we can estimate that the number of mature individuals does not exceed 1000 individuals based on the 51 observations made along the ridge to the Pico which represent around one third or one quarter of its natural habitat. Also worth noting that most tracks in the area where the species can be found are along the ridges, which is a preferential habitat for the species, making it easy to find.

The species is not directly threatened by logging but its habitat, the submontane and montane forests, has been reduced, especially in the area near Bom Sucesso, where many new crop settlements were established starting around 1980. The species was also collected near Macambrará, on the ridge, a place that is also threatened by horticulture.

Most of the about 300-400 individuals recently cultivated in the nursery of Bom Sucesso originated from young seedlings collected at Morro Esperança, near Lagoa Amélia.

Most herbarium specimens and observations were collected in the PNOST. Despite the quality of its timber, none of these places appears to be directly threatened.

The occurrences located near Macambrará are threatened by agricultural expansion and represent one location. Individuals found between Bom Sucesso and Lagoa Amélia are also threatened by agricultural expansion and by the invasive species that it promotes, and they represent one location. Finally, individuals situated at higher elevation within the protected area do not appear to be under any direct or immediate threat and represent one location based on the impacted area of the most important threat, agriculture.

Since the habitat remains unaltered in the places of collection, and most of the occurrences are recent, we consider that the species persists in all places of occurrence. The habitat of the species does not appear to be fragmented. Based on a 2 x 2 km cell size, the AOO of this species is estimated at 28 km<sup>2</sup>, and the EOO is calculated at 14.6 km<sup>2</sup>, both below the upper threshold for EN status under Criterion B. The EOO is estimated to be lower than the AOO, so we consider EOO equal to the AOO (28 km<sup>2</sup>), both below the upper threshold for EN status under Criterion B.

Therefore, these 65 occurrences represent 3 locations (sensu IUCN 2019), with regards to the most important threats (small scale agriculture). Moreover, we infer a past decline of the AOO and mature individuals, and a past, current, and future continuous decline in the extent and habitat quality. Finally, the whole population of the species is situated in 1 subpopulation. This species is thus assessed as EN B1ab(ii,iii,v)+2ab(ii,iii,v); C2a(ii).

### Habitat and ecology

*Afrocarpus mannii* is endemic to the volcanic montane of Pico de São Tomé from ca 1,216 m to the summit at 2,024 m asl. It is nowhere a large tree and at the summit it is reduced to dwarfed krumholz. It is frequent in the high montane cloud forest, which has remained almost undisturbed, especially above ca 1,500 m.

The habitat of the species is the submontane and montane rainforest, along ridges, open montane forest, and along tracks. The species is cultivated at lower altitude in plantations or as ornamental (Porto Alegre in São Tomé, Libreville).



# Angiosperum



© João Farminhão

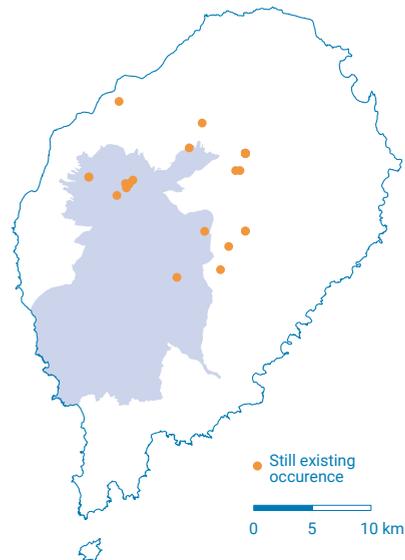
# Brachystephanus occidentalis Lindau



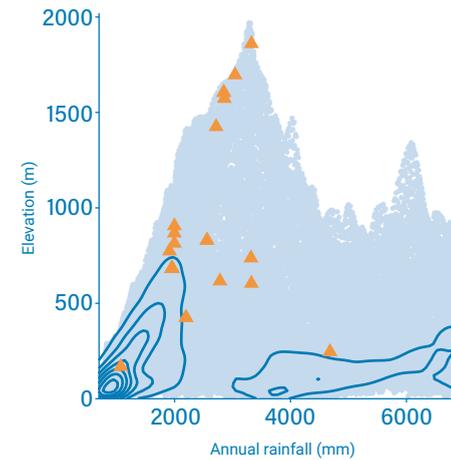
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## Distribution

São Tomé



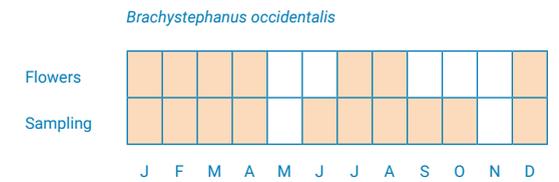
## Climate



## Rationale

*Brachystephanus occidentalis* is a perennial herb or shrub up to 2 m tall. The species is endemic to the island of São Tomé. It occurs frequently, especially along streams, in old-growth or secondary montane forests and cacao plantations at elevations from 110 to 1,630 m. This endemic species has a limited distribution but does not seem particularly rare. The species is known from 31 collections made between 1860 (Welwitsch 5208) and 2020 (Lachenaud 3003). Five collections (Seabra s.n., s.n.; Oliveira 1699; Mann 1096; Welwitsch 5208) do not have precise coordinates and were not taken into account for estimating the assessment parameters. The 26 remaining collections represent 17 occurrences, including nine within the Parc Natural de Obô de São Tomé (PNOST) and eight outside the protected area. These 17 current occurrences represent 2-4 subpopulations (the dissemination type is not known). Based on a 2 x 2 km cell size, the AOO is estimated as 48 km<sup>2</sup>, below the upper threshold of the EN status under subcriterion B2. The EOO is calculated as 124 km<sup>2</sup>, below the upper threshold of the EN status under subcriterion B1. Three occurrences were made outside the south of PNOST at Formosso Grande (Farminhão 108), near Cruzeiro (Farminhão 118), and on the way to Bombaim (Joffroy 53). They are threatened by illegal logging and represent one location. Two occurrences inside PNOST in the West (Lachenaud 3003 West of Bombaim; Ogonovszky 328 Rio Ana Chaves) are not threatened and represent one location. The occurrences that are in the buffer zone of the PNOST (Monod 11907, 12005 West slope of Pico; Rose 307 Pico; Ogonovszky 271 Pico way down to Manuel Moraes; Joffroy 176, Lejoly 12 between Pico of São Tomé and Monte Castro; Matos 7572 between Pico and Morro Vilela; Matos 7390 between Pico and Roça Ponta Figo; Joffroy 184 Rio do Ouro) represent one location, indirectly threatened by tourism that reduces the quality of its habitat. The oc-

## Phenology



currence in the North West of PNOST (Joffroy 184) is threatened by illegal logging and represents one location. The occurrence of Chamiço (Paiva 1030) is threatened by small-scale agriculture and represents one location. The occurrence of Monte Figo (Paiva 208) is threatened by small-scale agriculture, and represents one location; we infer a future disappearance of this occurrence. The Nova Moca (Moller 128), Saudade (Paiva 338), and Monte Café (Moller 281; Quintas 91) occurrences are threatened by small-holder plantations (Cacao) and represent one location. Therefore, these 17 occurrences represent 7 locations (sensu IUCN, 2019), with regards to the most important threat (small-scale agriculture). We infer a continuing decline in the extent and quality of its habitat. We also infer a decline in its AOO, EOO, the number of mature individuals, and the number of subpopulations based on inferred future disappearance of one occurrence situated at Monte Figo. Therefore, *B. occidentalis* is assessed as VU B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v).

## Habitat and ecology

The species occur frequently (especially along streams) in montane old-growth or secondary forests and in cacao plantations at elevations from 400 to 1,630 m.

## Use and trade

It is not known if the species is used.

## Population

Even widespread in São Tomé, the species appears locally rare.



© Rémy Poncet

# Heteradelphía paulowilhelmia Lindau

**VU** 1-6m



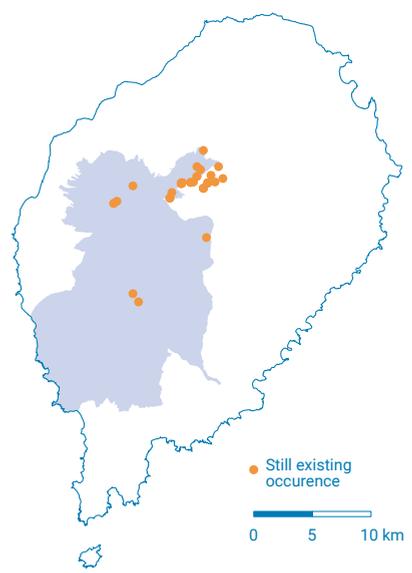
© Rémy Poncet



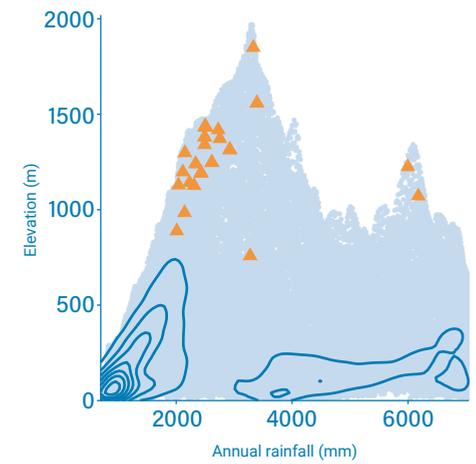
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## Distribution

São Tomé



## Climate



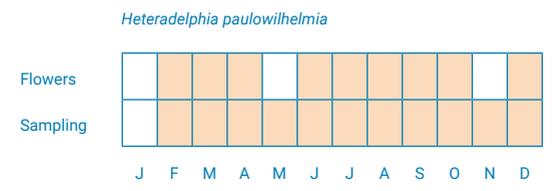
## Rationale

*Heteradelphía paulowilhelmia* is a small shrub, glabrescent, more rarely up to 1 m high. It is found in open places on secondary submontane rainforest around the Lago Amélia crater, open montane forest, along roads and tracks, plantations, between 600 and 1,700 m in elevation. The species is endemic to São Tomé Island and is known from 47 collections made between 1861 (Mann 1094) and 2020 (Lachenaud 3008) in the North-center and south of the island. Six occurrences (Mann 1094, Moller 198, Campos 6, Paiva 45, Chevalier 13681 and Chevalier 14577) were excluded because they are not precisely located. These 47 specimens represent 19 occurrences. Despite the old age of some collections, we consider that only one of the 19 occurrences represent individuals that are extirpated (Moller 162 at Bom Sucesso).

The habitat of the species does not appear as fragmented, so the 18 occurrences represent 1 subpopulation. Based on a 2 x 2 km cell size, the AOO of this species is estimated as 44 km<sup>2</sup>, and the EOO is calculated as 66 km<sup>2</sup>, both below the upper threshold for EN status under Criterion B.

Of the 10 occurrences located within the PNST, 8 are located along the tourist path from Bom Sucesso to Pico São Tomé, and Lago Amélia and 2 were collected in the south part of the park. The occurrences around Lago Amélia and along the path to the Pico are threatened by invasive species, and represent one location, while the two other occurrences are not threatened, representing another location. The seven occurrences located around Bom Sucesso are threatened by field establishment. However, such open space is also profitable for this sunny lover species. The occurrence collected between S. Luís and Chamiço was threatened by former plantations; it represents one location. The occurrence at Macambara is threatened by logging

## Phenology



but the ridge is still covered by forest, it represents one location. Overall, we can infer that the habitat of this species in this area is threatened by the invasive species that are planted to delineate the fields, and they represent one location. Finally, one occurrence collected near Bombaim (Formoso Pequeno) was threatened by past large plantations and current logging, representing one location.

Therefore, these 18 occurrences represent 6 locations (sensu IUCN 2019), with regards to the most important threat (agriculture). Moreover, we infer a past, current, and future continuing decline in the extent and habitat quality and population based on the extirpation of one occurrence at Bom Sucesso. This species is thus assessed as VU B1 ab(iii,v)+2ab(iii,v).

## Habitat and ecology

The species is known from open submontane rainforest around crater, open montane forest, along roads and tracks, plantations, between 600 and 1,700 m in elevation.

## Use and trade

The species is not utilized.

## Population

The population of this species is unknown, but it is confined to a single mountain. The species appears as locally abundant, especially in open habitat.

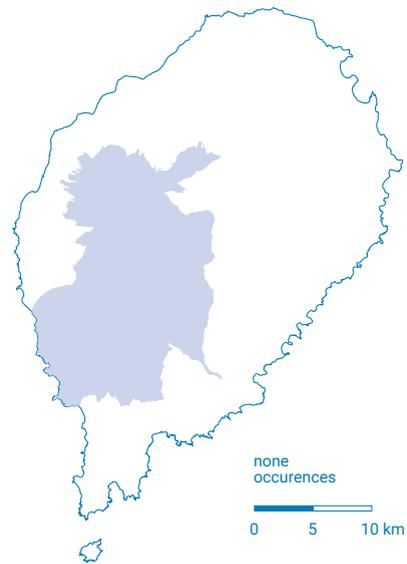
# Justicia thomensis Lindau

DD



## Distribution

São Tomé



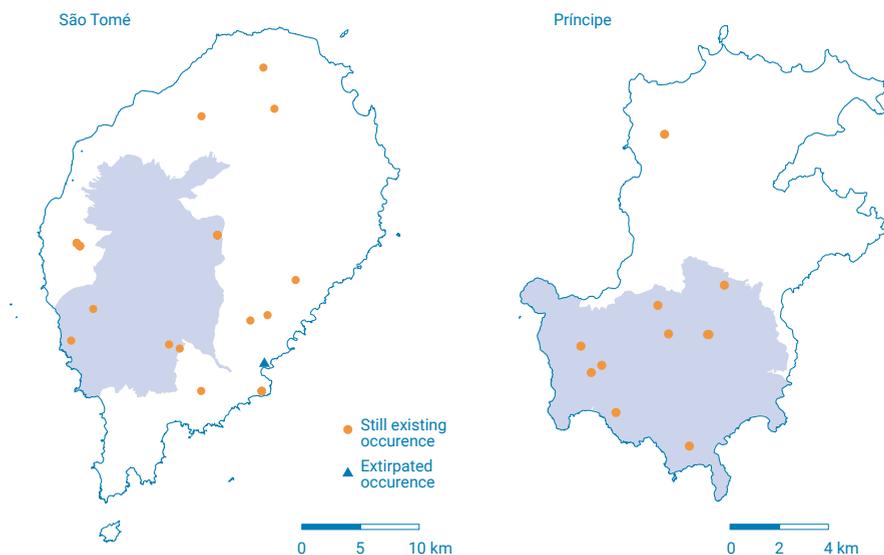
## Rationale

*Justicia thomensis* is endemic to São Tomé, perennials at least 2 m tall, inflorescence of axillary or terminal subspicate axes of solitary flowers, immature capsule glabrous or with a few glandular trichomes (to 0.2 mm long) at apex (Thomas & Figueiredo, 2009). It is known from a single collection from the 19th century [Sousa s.n. (COI)]. The putative holotype, from the only known collection of *J. thomensis*, is fragmentary. Moreover, Lindau did not cite any herbarium in the protologue, and it is possible that he worked on another specimen of de Sousa's collection (e.g., at B) that no longer exists. Therefore, locality, habitat, and elevation for this species remain unknown, which means that none of the IUCN criteria can be applied to this species. It thus qualifies for the DD category.



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# Anisophyllea cabole Henriq



## Distribution

São Tomé and Príncipe

## Rationale

*Anisophyllea cabole* is a tree species 35–40 m tall, endemic of São Tomé and Príncipe, recorded in São Tomé Island and recently in Príncipe (consistently since 2018, but with one previous collection made in 1980). The species was assessed in 1998 as VU D2 by the World Conservation Monitoring Centre. The new information gathered in the last years justifies a new assessment. *Anisophyllea cabole* occurs in lowland forests, on low and middle elevation (77–740 m). The collection made in Angolares (Curado s.n.) does not have precise coordinates and was excluded from this assessment. *Anisophyllea cabole* is known from 30 collections and 113 observations. The 12 collections and 92 observations in Príncipe represent 28 occurrences, none of which is considered extirpated. In Príncipe, *Anisophyllea cabole* occurs in secondary forests, including on the North of the Island (two occurrences on Ôque Daniel). However, the majority of the individuals are currently concentrated in the mature forests in the South, especially around Pico do Príncipe, the valley between Pico Mesa and Barriga Branca, and the valley of Papagaio River behind Morro de Leste. All the 28 occurrences are restricted to the PNOP, representing one subpopulation, but the species was likely widespread on the lowland forests of Príncipe. In São Tomé, *Anisophyllea cabole* is known from 26 collections and 21 observations, representing 16 occurrences. The occurrence of Angolares (Curado s.n.) is considered extirpated due to palm oil plantations and the one from Roça Potó (A. J. d'Almeida s.n.) due to urban expansion. These two collections were not considered for this evaluation. The 14 remaining occurrences represent one subpopulation. Five occurrences are located within the PNOST. Based on a 2 x 2 km cell size, the AOO is estimated as 96 km<sup>2</sup>, above the upper threshold EN status under subcriterion B2. The EOO is calculated to be 2,769 km<sup>2</sup>, above the upper threshold for EN status under subcriterion B1. In Príncipe, the two occurrences on Azeitona forest are threatened by charcoal production and represent one location. We suggest that these two occurrences will disappear in the near future because of the high human pressure within this part of the PNP. Two occurrences located around Morro de Leste are threatened by human disturbance and represent one location. Three occurrences behind Praia Seca and the one adjacent to Rio Porco are threatened by illegal logging and represent one location. The four occurrences on the valley between Pico Mesa and Barriga Branca and the three around Rio São Tomé were threatened by large plantations during colonial times. The thirteen other occurrences are not threatened and represent one location. Therefore, these 28 occurrences represent five locations in Príncipe (*sensu* IUCN, 2019). In São Tomé, the occurrence on Morro Muquiqui is threatened by small-scale agriculture and represents one location, which we suggest will disappear in near future. The occurrence in Lobata is threatened by illegal logging and represents one location. The occurrence at São Miguel, although

within the PNOST, was threatened by former plantations and represents one location. The occurrence in the palm plantation is threatened by palm plantation and represents one location. We suggest that this occurrence will disappear in the near future. The occurrence at Pico Macuru was threatened by logging and represents one location. The occurrence at the base of Pico Maria Fernandes was threatened by logging and represents one location. The occurrence between Pico Maria Fernandes and Zagaia was threatened by logging and represents one location. The two occurrences (Lima 18 and 67) were threatened by large plantations during colonial times and represent one location. The other seven occurrences are not threatened and represent one location. Therefore, these 14 occurrences represent eight locations in São Tomé. In summary, These 42 occurrences represent 13 locations (*sensu* IUCN, 2019), with regards to the most important threats (illegal logging). We thus infer a future decline in its AOO, the number of locations, and the number of mature individuals. Moreover, we infer a current and a future continuous decline in the extent and habitat quality. The species is not severely fragmented and does not meet the threshold of any threatened categories under criterion B. Additionally, although three occurrences of the species are expected to disappear in the near future (due to small-scale agriculture, charcoal and palm plantations), this cannot lead to consider the species under a threatened category according to criterion B. *Anisophyllea cabole* is therefore assessed as NT since it could belong to a threatened category in a near future.

## Habitat and ecology

The species is known from the lowland forest, on low and middle elevation (77–740 m).

## Use and trade

There is no known use for this species.

## Population

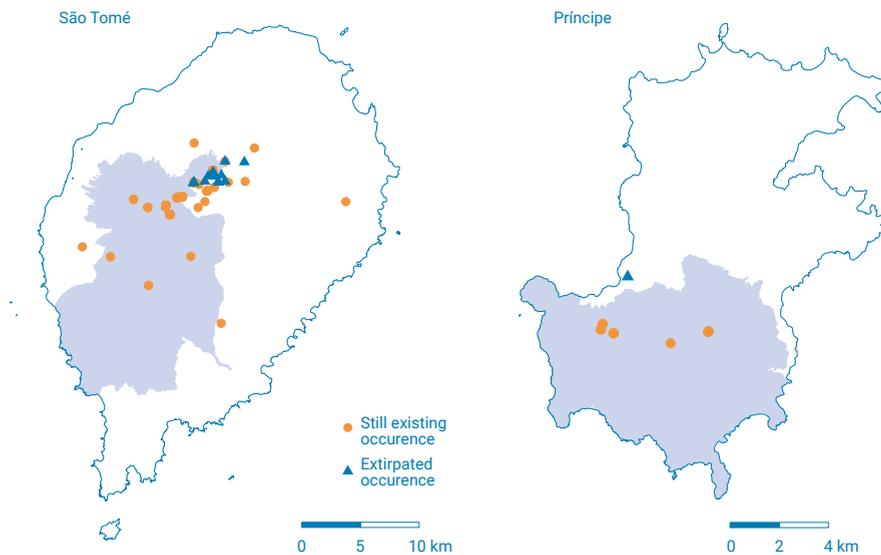
The species is widespread in the lowland forest of São Tomé and Príncipe where aggregated individuals are often found.





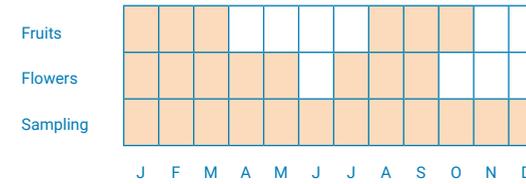
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# Tabernaemontana stenosiphon Stapf



## Phenology

*Tabernaemontana stenosiphon*



## Rationale

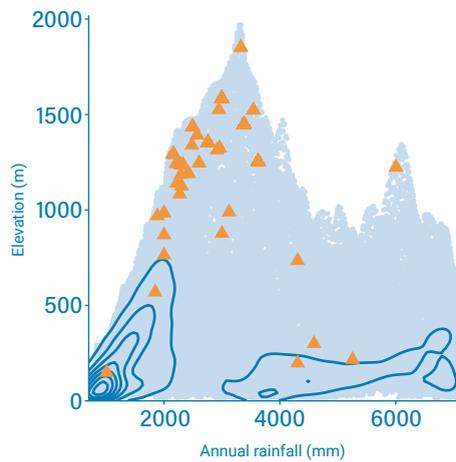
*Tabernaemontana stenosiphon* was assessed as NT in 1998. The collection of new information and changes on Red List methodology in 2001, justifies a new assessment. This tree species is endemic to São Tomé and Príncipe, found between 86 and 1867 m altitude, but mainly in the submontane and montane forest. The species can be easily mistaken for other *Tabernaemontana* species. The genus also presents at least five collections (Davide Dias 86; Príncipe Transects 787,898 and 1042, and F. de Oliveira 146) and 92 observations in Príncipe; and 14 collections and 92 observations in São Tomé, not identified at species level since only sterile material was collected. Overall, *Tabernaemontana stenosiphon* is known from 74 collections and 359 observations made between 1885 (Moller 220, 439) and 2020. We excluded nine collections because no locality information is provided (Henriques 4,28,29,30 and 31; Moller s.n. and 97, Campos 3; Welwitsch 5988) and seven with imprecise coordinates (Wilde 119, 155, 171; Oliveira 1456, 166; Matos 7304, 7579). In Príncipe, *Tabernaemontana stenosiphon* is known from 15 collections representing six occurrences, being three around Pico Mesa, one at the top of Pico do Príncipe, one behind Morro de Leste and one occurrence between Praia Lapa and Morro Caixão. All occurrences are within PNOP and none is considered extirpated. In São Tomé, it is known from 37 occurrences. We consider that eight occurrences around Bom Sucesso and Monte Café, corresponding to collections made by Espírito Santo (4493, 4609, 5040), Lejoly (67, 219), Moller (439), Matos (7313), and Randrianaivo (1593), as extirpated due to of habitat conversion for small-scale agriculture. Therefore, *Tabernaemontana stenosiphon* is known from 35 occurrences, 29 in São Tomé and six in Príncipe. Based on a 2 x 2 km cell size, its EOO is calculated to be 2,168 km<sup>2</sup>, and its AOO is estimated to be 84 km<sup>2</sup>, both within the limits for EN status under subcriteria B1 and B2. In Príncipe, the occurrence at the top of Pico do Príncipe is threatened by ecotourism activities and represents one location. The occurrence between Praia Lapa and Morro Caixão was threatened by past plantations and represents one location. The other three

occurrences are not threatened and represent one location. These occurrences represent 1-3 subpopulations. In São Tomé 14 occurrences are found within the PNOP. Two occurrences between Nova Ceilão and Calvario (Matos 7343 and Joffroy 114) are threatened by illegal logging and represent one location, which we suggest will disappear in near future. The 12 other occurrences are not threatened and represent one location. Outside PNOP, the 15 occurrences represent nine locations (*sensu* IUCN, 2019). Four occurrences are threatened by illegal logging: one occurrence between Santa Clotilde and Sao Jose, one occurrence between Chamico Caminho Maya, and two occurrences at Zampalma and Tras dos Montes, representing three locations. Three occurrences (Binda to Juliana Sousa, Vale Carmo and Sao Francisco) were threatened by past plantations, representing one location each. Two occurrences at Calvario are not threatened and represent one location. One occurrence at Caminho antenna will be threatened in the near future by small-scale agriculture and logging, representing one location. Five occurrences are threatened by small-scale agriculture (Clareira de Santa Maria, Macambara, Macambara to São Nicolau, and Wilde 330 and 155) representing one location. These occurrences represent 7 populations. In summary, these 37 occurrences correspond to 14 locations (*sensu* IUCN, 2019), with regards to the most important threats (small-scale agriculture), and 8-10 subpopulations, within the limits of LC status. We infer a future decline in its AOO, the number of locations, and the number of mature individuals. Moreover, we infer a current and a future continuous decline in the extent and habitat quality. Although two occurrences of the species are expected to disappear in the near future due to illegal logging, which cannot lead to consider the species under a threatened category according to criterion B. *Tabernaemontana stenosiphon* is therefore assessed as LC.

## Habitat and ecology

In São Tomé this species was described to be the most important in the near environment of the Pico Carvalho (Decock, 2013). *T. stenosphon* has a gregarious behavior, it can reach 84 stems/ha (Lejoly, 2000) in the PNST (São Tomé). This common upland endemic tree (Oldfield et al., 1998) form part of the characterization of the northern mist forest of São Tomé, from 1350 to 1600 m (Llopart, 2005). This species is present in montane forest, rainforest (between 800 and 1400 m of elevation) and in the cloud-forest (above 1400 m) (Christy, 2001). More generally, this species is widely distributed over the island of São Tomé between 500 to 1600 m (Oldfield et al., 1998). This species is recorded in São Tomé and Príncipe between 86 to 1867 m altitude, mostly present at high altitude, in old-growth and secondary forest.

## Climate São Tomé



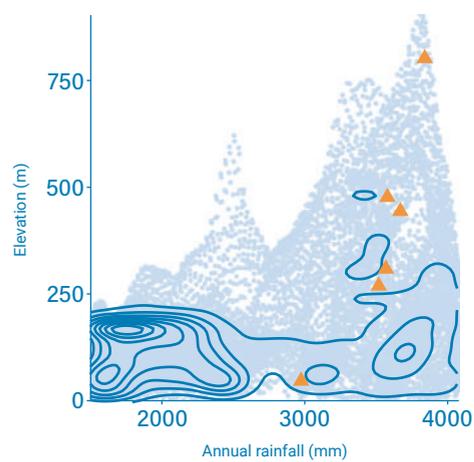
## Use and trade

The bark of this species is used in São Tomé, but not in Príncipe, as traditional medicine (hypotensor) and as witchcraft protection, but this use is really limited. *T. stenosphon* can also be used for production of lumber and firewood (Carvalho et al., 2004), but this was not mentioned during a workshop in Príncipe in June 2019. Apparently the species yields rubber of good quality but in small quantity (Moller, cited by Exell, 1944), but no mention of this use could be found.

## Population

Widespread and abundant on submontane and montane forest, mentioned as one of the most frequent tree species near to the Pico Carvalho (within PNST) (Decock, 2013). Preliminary data indicates that the population is stable and with good regeneration capacity. Nine to ten subpopulations can be found in São Tomé and Príncipe.

## Climate Príncipe





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# Impatiens buccinalis Hook.f.

EN



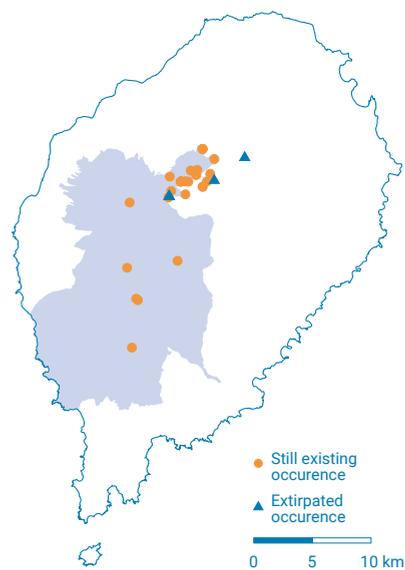
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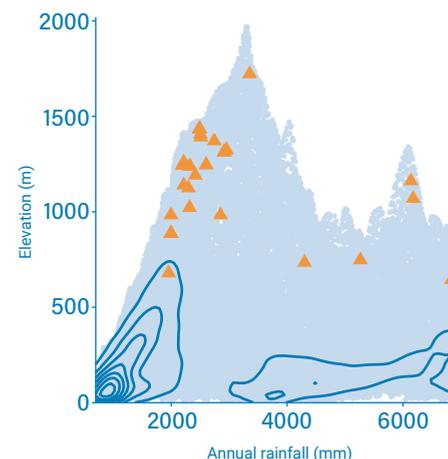
© Diósiado Nguema

## Distribution

São Tomé



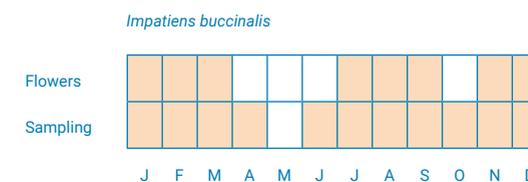
## Climate



## Rationale

*Impatiens buccinalis* is a herb up to 1 m, sometimes forming dense subpopulations, known from dense sub-montane rainforest, close to stream; runway edge, disturbed forest, among wet rocks; between 700 and 1,700 m in elevation. The species is endemic to São Tomé island and is known from 39 collections made between 1861 (Mann 1089) and 2020 (Ikabanga 1155, Nguema 3343) in the centre and south-centre of the island. Eight collections were made in the PNOST, and two of them were recently collected (Ikabanga 1155, Nguema 3343 made in 2020). Six collections made around Monte Café (342, 367 made in 1885; Chevalier 13656, 14305; 14287 made in 1905; Espírito Santo 168 made in 1949) and three other collections made in Bom Sucesso (Moller 291 made in 1885; Oliveira 98 made in 1998; Joffroy 110 made in 1999) are excluded from estimated parameters. These 30 specimens represent 20 occurrences. Based on a 2 x 2 km cell size, the AOO of this species is estimated as 48 km<sup>2</sup>, below the upper threshold for EN status under criterion B2. The EOO is calculated as 74 km<sup>2</sup>, below the upper threshold for CR status under criteria B1. These 20 occurrences represent one subpopulation. Given the older date of eight collections around Monte Café and Bom Sucesso, and the recent reconversion of part of the Bom Sucesso forest into plantations which affected three collections, we consider these three occurrences (represented by all of the 11 excluded collections) as extirpated. Eight occurrences are located within the PNOST and represent three locations because the northern part of the park is actually used for agriculture. Twelve occurrences are located outside of the protected area and are threatened by agricultural activities that cause the degradation of the quality of the habitat of this species. These 12 occurrences represent two locations. Therefore, these 20 occurrences represent five locations (*sensu* IUCN 2019), with regards to the most impor-

## Phenology



tant threat (agriculture: plantations). Based on the disappearance of the occurrences around Monte Café and Bom Sucesso, we inferred a decline in its AOO, its EOO, the quality of its habitat, the number of locations, and the number of mature individuals. We infer a past, current and future continuing decline in the extent and the habitat quality. This species is thus assessed as EN B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v).

## Habitat and ecology

The species occurs in dense sub-montane rainforest, close to a stream; runway edge, disturbed forest; from 600 to 1,700 m in elevation.

## Use and trade

It is not known if the species is used.

## Population

Population information is not known for this species.



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# Impatiens manteroana Exell

EN



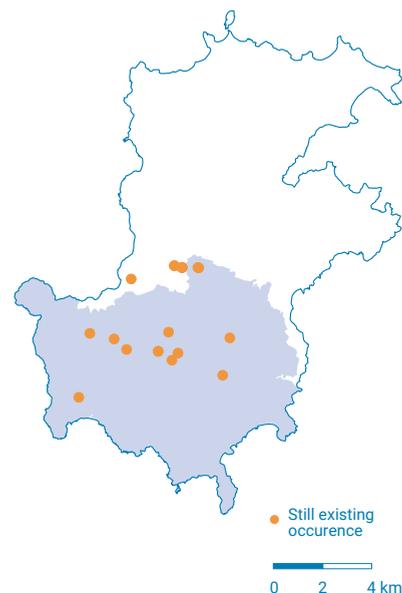
© Tania D'Hajjère



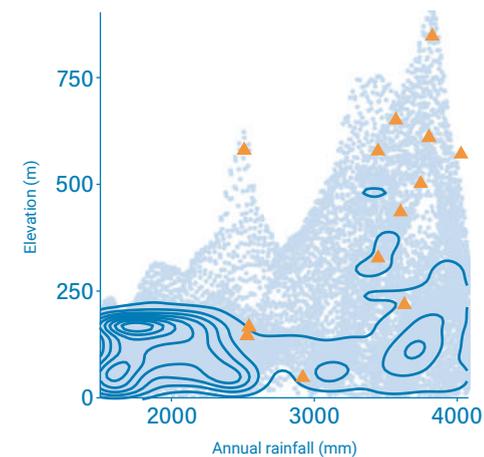
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## Distribution

Príncipe



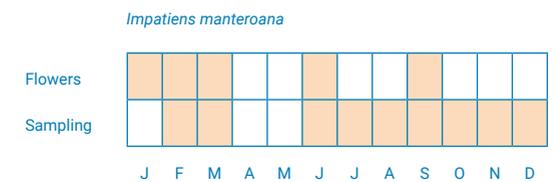
## Climate



## Rationale

*Impatiens manteroana* is a herb up to 0.5 m high, sometimes forming dense mats of individuals. It is known from dense rainforest, among wet rocks in shaded humid places; between 100 and 1,200 m in elevation. The species is endemic to Príncipe island and is known by 26 collections made between 1932 (Exell 682) and 2019 (Equipa Botanica do Príncipe 390) in the south-center of the island. Two collections (Oliveira 871, 977) were made in 2004 in the Botanical Garden of Bom Sucesso, so they were not considered for this evaluation. In Príncipe, 23 collections were made inside the protected area (Príncipe Natural Park or PNP) and one (Oliveira 98) outside, at Rio Banzù. Overall, these 24 specimens represent 15 occurrences, and one or two subpopulations. Considering the forest coverage, which is still important in these areas, we consider that none of the 15 occurrences has been extirpated. Based on a 2 x 2 km cell size, the AOO of this species is estimated as 28 km<sup>2</sup>, below the upper threshold of the EN category under subcriterion B2. The EOO is calculated as 21.5 km<sup>2</sup>, below the upper threshold of the CR category under subcriterion B1. Based on criterion B, the EOO value is less than the AOO, so we consider the AOO equal to the EOO (28 km<sup>2</sup>). Concerning the 14 occurrences located within the PNP, three of them located at Pico Papagaio are threatened by ecotourism and represent one location. The occurrence located in the Southern part (around Maria Correia) was threatened by past coffee plantations and represents one location. The occurrence at Pico Mesa was threatened by small-scale agriculture and represents one location. The nine other occurrences are not clearly threatened and represent one location. These 14 occurrences, therefore, represent four locations. The occurrence of Rio Banzù is threatened by palm oil and cacao plantations (large-scale agriculture) that will induce degradation of the quality of the habitat of this species. This occurrence represents one lo-

## Phenology



cation. As a consequence, these 15 occurrences represent five locations (*sensu* IUCN, 2019), with regards to the most important threat (large-scale agriculture). Based on the past, current and future threats on the occurrences around Rio Banzù, Pico A Mesa and Pico Papagaio, we inferred a decline in the quality of its habitat. We could infer a future continuing decline in the extent and the quality of its habitat. *Impatiens manteroana* is thus assessed as EN B1ab(iii)+2ab(iii).

## Habitat and ecology

The species is known from dense rainforest, among wet rocks, between 100 and 1,200 m in elevation.

## Use and trade

It is not known if the species is used.

## Population

Population information is not known for this species.



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# Impatiens thomensis Exell



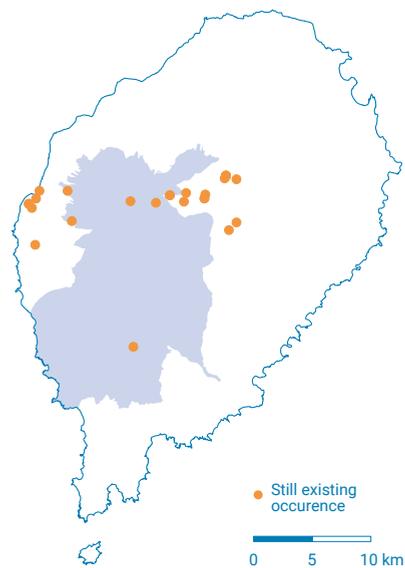
© Olivier Lachenaud



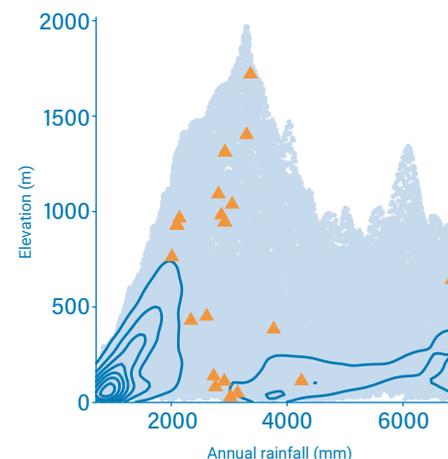
© Olivier Lachenaud

## Distribution

São Tomé



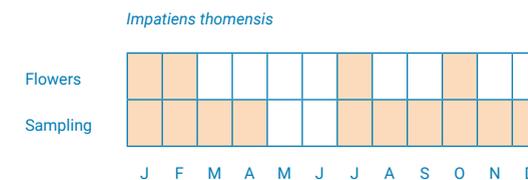
## Climate



## Rationale

*Impatiens thomensis* (Exell, 1944) is an herb, shrublet, or shrub (Soares, 2007) up to 1 m, known from lowland and submontane rainforest, close to stream; runway edge, disturbed forest, among wet rocks; between 10 and 1,700 m in elevation. The species is endemic to São Tomé island and is known from 29 collections made between 1932 (Exell 433) and 2019 (D'Haijère 277) mostly in the Center and South-center of the island. Although the habitat was very degraded in places of collection, we consider that none of all occurrences has been extirpated. These 29 specimens represent 21 occurrences (five of them located within Park Natural de Obô de São Tomé or PNOST) and one or two subpopulations. Based on a 2 x 2 km cell size, the AOO of this species is estimated as 68 km<sup>2</sup>, below the upper threshold of the EN category under subcriterion B2. The EOO is calculated as 236 km<sup>2</sup>, below the upper threshold of the EN category under subcriterion B1. Inside PNOST, two occurrences located along tourism paths are threatened by ecotourism activities and represent one location. The three other locations are not threatened and represent one location. Outside PNOST, two occurrences at São Nicolau are threatened by horticulture and represent one location. We consider that these three occurrences will disappear in near future. However, the occurrence located at Cascata de São Nicolau is not threatened and represents one location. Five occurrences at Trás-os-Montes are threatened by plantations and illegal logging and represent one location. Two occurrences located at Formosa are threatened by plantations and represent one location. The occurrence at São João da Vargem is threatened by urbanization and represents one location. Although this occurrence corresponds to a collection made in 2005 (documented by Oliveira 995), we consider that these three occurrences will disappear in near future. Four occurrences located at Santa Catarina are threatened by housing and

## Phenology



small-scale agriculture activities and represent one location. The occurrence at Formiga is threatened by cacao plantations and represents one location. Therefore, these 29 occurrences represent nine locations (*sensu* IUCN 2019), with regards to the most important threat (small-scale agriculture). We infer a past, and a future continuing decline in its EOO, AOO, the number of locations, and the number of mature individuals. Moreover, we infer a past, current, and future continuing decline in the extent and the quality of its habitat. *Impatiens thomeana* is thus assessed as VU B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v).

## Habitat and ecology

The species occurs in dense lowland and submontane rainforest, near the waterfall, on a very wet rock wall, edge of runway; between 10 and 1,700 m in elevation.

## Use and trade

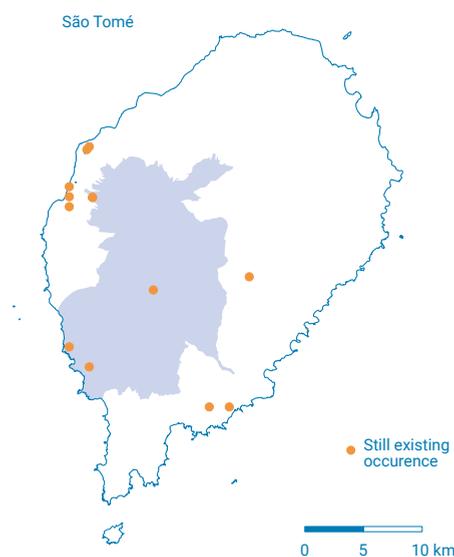
It is not known if the species is used.

## Population

Population information is not precisely known for this species, but we consider the existence of one or two subpopulations.

# Begonia annobonensis A. DC.

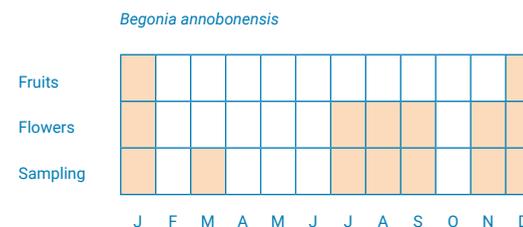
NT 



## Distribution

Annobón (Equatorial Guinea), Cameroon, and São Tomé and Príncipe

## Phenology



## Rationale

*Begonia annobonensis* is a herb, 50 cm high, known from volcanic rock near the coast, old fallow, cocoa plantation, and old buildings; below 1,000 m in elevation. The species is known from 26 collections made between 1841 (Curror 9) and 2014 (Berthold & Gardner 49) in São Tomé and Príncipe, Annobón (Equatorial Guinea), and Cameroon. The preferential habitat is rocky cliffs, which is little or not impacted in the area where the species occurs. We consider that none of the occurrences is extirpated. One collection (Quintas 143) is not precisely located, so it is not considered for this evaluation. These 25 collections represent 24 occurrences and 4 or 5 subpopulations. Based on a 2 x 2 km cell size, the AOO of this species is estimated as 76 km<sup>2</sup>, below the upper threshold for EN status under subcriterion B2. The EOO is calculated as 35,214 km<sup>2</sup>, above the upper threshold for VU status under subcriteria B1. In Annobón, the two occurrences located around San Antonio are threatened by urbanization, and represent one location; the three other occurrences located outside the protected area are threatened by sand extraction, and represent another location; and the two occurrences within Annobón Natural Reserve represent a third location. The occurrence located in the north of Príncipe island is threatened by coconut plantation and represents one location. In Cameroon, the occurrence located at Limbé is threatened by urbanization and agriculture activities, and the one of Batoké is threatened by oil palm plantations. No threat is known for the occurrence in Rio del Rey. So, these three occurrences represent three locations. In São Tomé, the five occurrences located between Santa Catarina and Ponta Figo (outside PNOTS) are threatened by small-scale agriculture and represent one location. The two occurrences located around São Miguel are threatened by past large-scale agriculture and represent one location. The occurrence located around Binda is threatened by large-scale agriculture. The occurrence located at Vila Clothilde is threatened by oil palm plantations. These two occurrences represent two locations. The two occurrences located at Monte Cabumbé and Rio Fugo (within PNOTS) are not threatened and represent together one loca-

tion. The two other occurrences located within the PNOTS are also threatened by small-scale agriculture, and represent one location. Therefore, these 24 occurrences represent 12 locations (*sensu* IUCN, 2019), with regard to the most serious plausible threats (large-scale agriculture and urbanization). Based on urbanization at Limbé and San Antonio de Palé, we expect that two occurrences will disappear in a near future, and the species would become threatened. We thus infer a future decline in its AOO, its EOO, the number of locations, and the number of mature individuals. Moreover, we infer a current and a future continuing decline in the extent and habitat quality. *B. annobonensis* is thus assessed as NT as it nearly qualifies for listing as VU B2ab(i,ii,iii,iv,v).

## Habitat and ecology

The species grows mostly on volcanic rocks near the coast, sometimes also on old buildings, old fallow, and cocoa plantation; below 1,000 m in elevation.

## Use and trade

It is not known if the species is used.

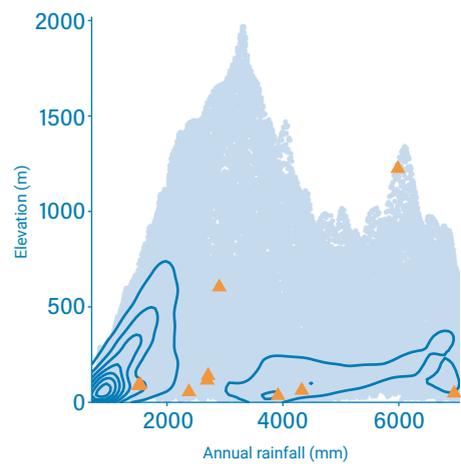
## Population

Population information is not known for this species.

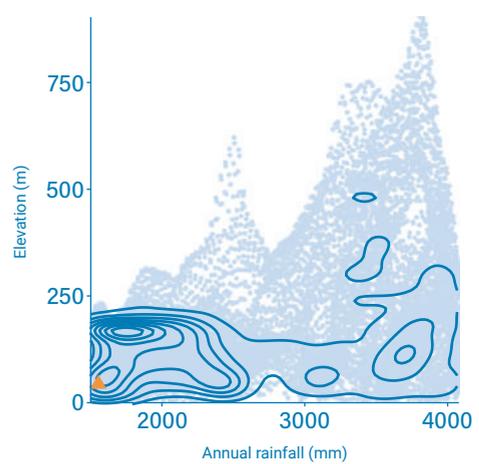


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Climate São Tomé



Climate Príncipe



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# Begonia baccata Hook.f.



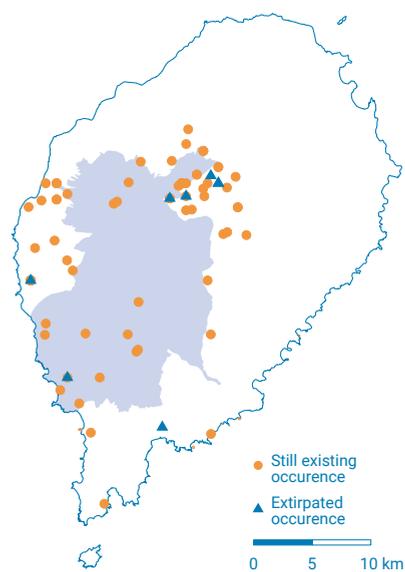
© Diosdado Nguema



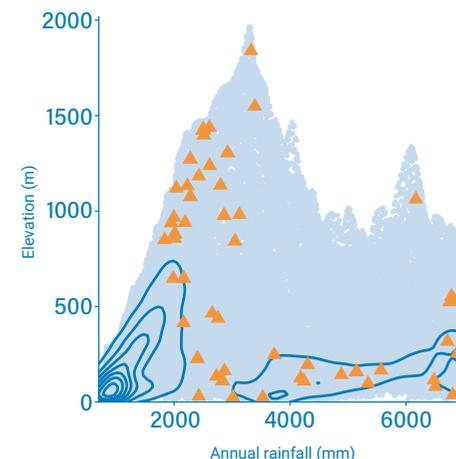
© Olivier Lachenaud

## Distribution

São Tomé



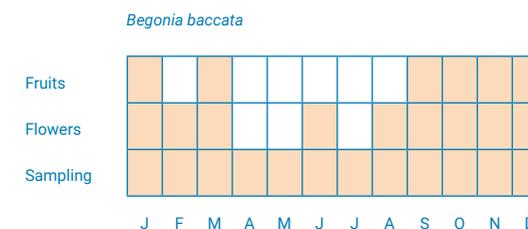
## Climate



## Rationale

*Begonia baccata* grows in open areas in rainforest (often secondary), usually on steep wet slopes, and it is found mostly below 1,500 m in elevation, rarely down to sea level. The species is endemic to São Tomé and is known from 78 collections made between 1861 (Mann 1087) and 2020 (Ikabanga 1031, Lima 23, Nguema 3318) in the north-center and south of the island. Two collections (Moller 146, Mann 1087) were not taken into account in this assessment since they are not precisely georeferenced. Seven occurrences located around Bom Sucesso are considered as extirpated given the intensity of agricultural activities (vegetable plantations) present in this locality. The occurrence (Chevalier 14208) at Porto Alegre is extirpated. These ten collections were not considered for this evaluation. The 66 remaining collections represent 44 occurrences. The dispersal is assumed to be by birds (Plana 2002). We, therefore, consider these 49 occurrences as one subpopulation. Twenty-seven occurrences of them are located outside of PNST. Based on a 2 x 2 km cell size, the AOO of this species is estimated as 152 km<sup>2</sup>, and the EOO is calculated as 399 km<sup>2</sup>, both below the upper threshold for EN status under criterion B. Among the 17 occurrences within PNST, seven occurrences of them (along the tourist path) and one (at the camp near Morro Vilela) are threatened by ecotourism activity and represent one location. The occurrence located at Bom Sucesso (within PNST) is threatened by agricultural activities (vegetable plantations) and represents one location. The three occurrences at Monte Cabumbé are not threatened and represent one location. The occurrence located at Lembà and the four last occurrences in the south of part PNST could be threatened by agriculture and represent one location. Therefore these 17 occurrences represent three locations. Among the 32 occurrences outside PNST, four are located in the south of the island, two threatened by small-scale agricultural activities and two are not threatened; these four occurrences represent two locations, among which two will probably disappear. The ten occurrences located in the west of the island

## Phenology



are threatened by urbanization at Santa Catarina, by small-scale agriculture (near limit west of PNST) and by past and current large-scale agriculture (Binda region), so they represent three locations. The five occurrences located in the north (outside protected areas) were threatened by past large-scale agriculture (Chamiço region) and represent one location. The occurrence located around Bom Sucesso is threatened by agricultural activities (vegetable plantations) and represents one location. We infer that they will disappear in near future. The three last occurrences located at the southwestern of Macambrarà near PNST are threatened by illegal logging. So, these three occurrences represent one location. Therefore, these 44 occurrences represent 17 locations (*sensu* IUCN, 2019), with regards to the most serious plausible threats (small-scale agriculture and urbanization). Despite the disappearance of seven occurrences in the south part of island, this species occurs mostly on wet slopes that are usually too steep for agriculture and is, therefore, able to survive even within quite degraded areas. The species is not severely fragmented and does not meet the threshold of any threatened categories under criterion B. We cannot apply criterion A because less than 10% and 8% of respectively EOO and AOO are expected to disappear (calculated by GeoCAT). *Begonia baccata* species is therefore assessed as LC.

## Habitat and ecology

The species is known from open areas in rainforest (often secondary), usually on steep wet slopes, mostly between 800 and 1,500 m in elevation but sometimes down to sea level.

## Use and trade

It is grown as an ornamental plant.

## Population

Population information is not known for this species.



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# Begonia crateris

## Exell



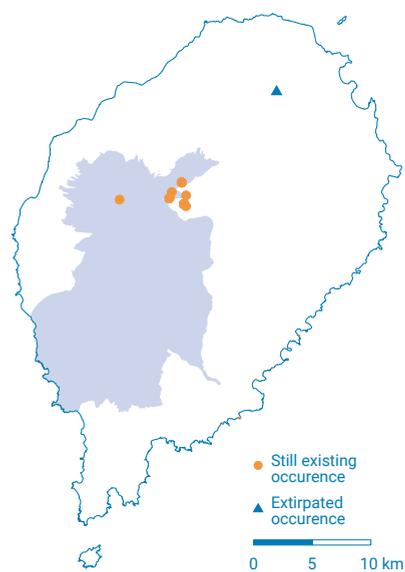
© Olivier Lachenaud



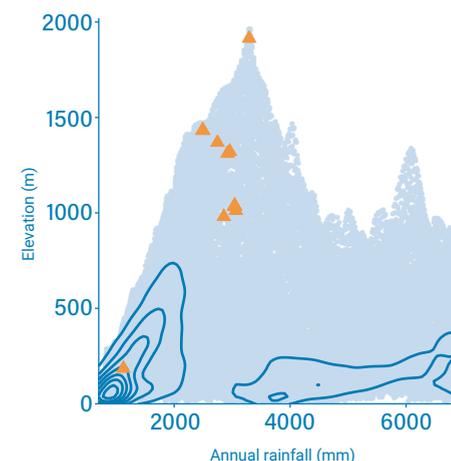
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### Distribution

São Tomé



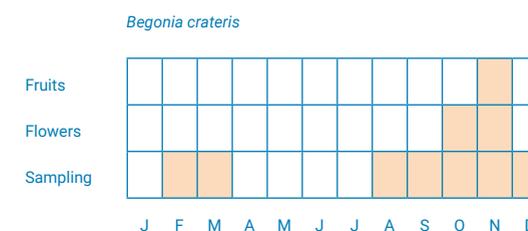
### Climate



### Rationale

*Begonia crateris* is a shrub up to 4 m high. It has been suggested that it might be synonymous with *B. baccata* (Ferreira, 1965) but Reitsma (1985) and Plana (2002) considered it as a distinct species, a view supported by recent fieldwork. One collection (Chevalier 13748) was made around Boa Entrada (300 m in elevation). Based on lower elevation and degradation of habitat at Boa Entrada, we consider that this collection probably represents a cultivated subpopulation, and whether the occurrence still exists is not clear. So, this collection was excluded from this assessment. The 20 remaining collections represent 11 occurrences, none of which are considered as extirpated. Three occurrences are located in the area of Roça Calvário, outside of the PNOT. The seeds are dispersed by birds (Plana, 2002), so these 11 occurrences represent 1 or 2 subpopulations. Based on a 2 x 2 km cell size, the AOO of this species is estimated to be 24 km<sup>2</sup>, below the upper threshold for EN status under sub-criterion B2. The EOO is calculated as 34.5 km<sup>2</sup>, below the upper threshold for CR status under sub-criterion B1. The five occurrences along the tourist path are threatened by ecotourism, and represent one location. Two occurrences around Lagoa Amelia (within PNOT), and three others around Macambará (outside of the protected area), are both threatened for traditional medicinal use, especially at Lagoa Amelia. Indeed, leaves of this species are used to make a tea to prevent abortion and local people often cut leafy stems from adult individuals. The three occurrences located around Macambará are also threatened by illegal forest logging that affects the species' habitat. Despite occurring within and outside PNOT, the five occurrences (Macambará and Lagoa Amelia) are affected simultaneously by a given and represent one location. The occurrence of Monte Cabumbé is not threatened and represents one location. Consequently, these 11 occurrences represent three locations (*sensu* IUCN, 2019), with regard to the most important threat (traditional medicinal use) which induces a continuing

### Phenology



decline in the number of mature individuals by cutting adult individuals. We also infer a past, current and future continuing decline in the extent and habitat quality. This species is thus assessed as EN B1ab(iii,v)+2ab(iii,v).

### Habitat and ecology

The species occurs in submontane and montane rainforest, usually in half-open areas, between 800 and 2,020 m in elevation.

### Use and trade

The leaves of the species are used to make a tea to prevent abortion.

### Population

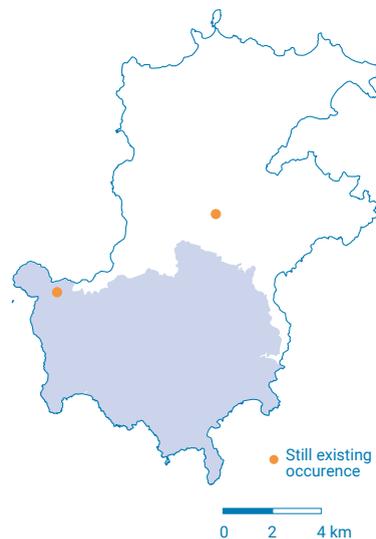
Population information is not precisely known for this species.

# *Begonia fusialata* Warb. var. *príncipensis* J.J.de Wilde

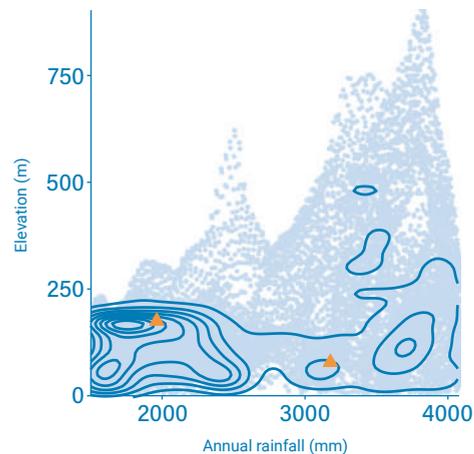


## Distribution

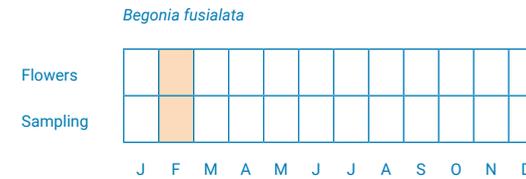
Príncipe



## Climate



## Phenology



## Rationale

*Begonia fusialata* var. *príncipensis* is an herb up to 3 m long and is found on wet rocks in half shade; below 200 m in elevation. The taxon is endemic to Príncipe island, and is known from 9 collections made probably between 1857 (Barter 2037) and 1986 (de Wilde 8819). The first collection (Barter 2037) is not precisely located. One collection (Van Veldhuizen 1035) was made from Wageningen greenhouse (Netherlands) without clear locality of collection. Both collections (Barter 2037; Van Veldhuizen 1035) have been excluded from estimated parameters. Four collections (Rose 443; 464; 474; 475) were made in 1956 from Porto Real in the northern center part of Príncipe. Three collections were made from the south part of the island, two of them (de Wilde 399; 8819) from Pico Mesa and the last collection (Rozeira 2566) was made from Caminho de Macoia. Considering the rock coverage, which is still important in places of other collections, we consider that none of all occurrences are extirpated. These seven specimens represent three occurrences. The dispersal ability is conferred by bird vectors (Plana, 2002), so these three occurrences represent one subpopulation. Based on a 2 x 2 km grid cell size, the AOO and the EOO of this species are respectively estimated as 8 km<sup>2</sup> and 5.3 km<sup>2</sup>, both below the upper threshold for CR status under Criterion B. The estimated EOO is lower than the AOO, we thus consider EOO equal to AOO (8 km<sup>2</sup>), which is below the upper threshold for CR status under Criterion B1. The occurrence from Porto Real is threatened by stone quarries, house constructions and cacao agriculture. This occurrence represents one location. Two occurrences are located within the protected area, the PNOP, but the occurrence located at Pico Mesa was threatened by old plantation for subsistence and represents one location. The occurrence of Caminho de Macoia is not clearly threatened and represents one location. We infer that the presence of stone quarries induces a decline in the number of mature individuals. All of the

three occurrences represent three locations (*sensu* IUCN, 2019) with the most important threat (stone quarries). Based on the past, current and future threats to these occurrences, we inferred a decline in the quality of its habitat. We could infer a future continuing decline in the extent and habitat quality, and the number of mature individuals. This species is thus assessed as EN B1ab(iii,v)+2ab(iii,v).

## Habitat and ecology

The species is found on wet rocks in half shade; below 200 m in elevation.

## Use and trade

There are no known uses of this species.

## Population

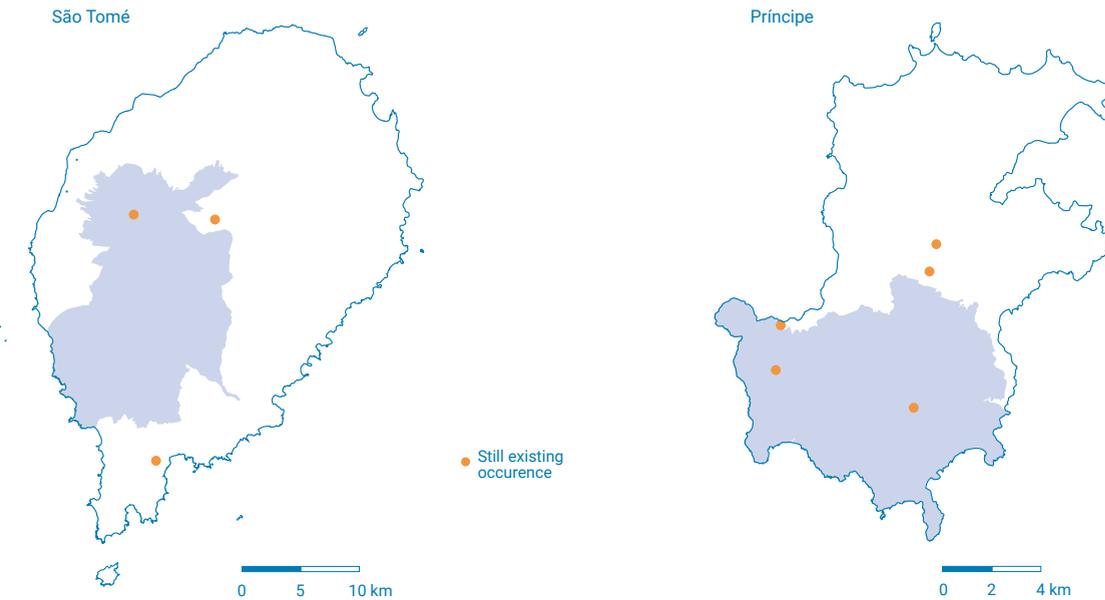
Population information is not known for this species.

# *Begonia loranthoides* Hook.f. subsp. *loranthoides*

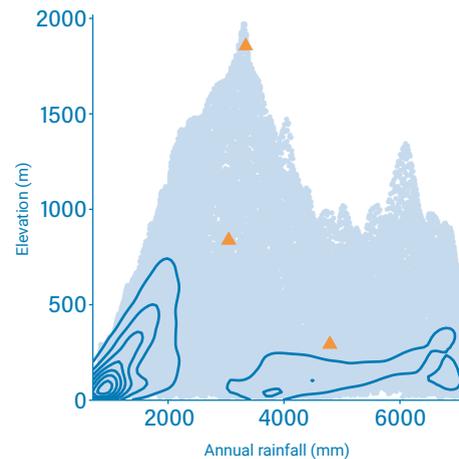


## Distribution

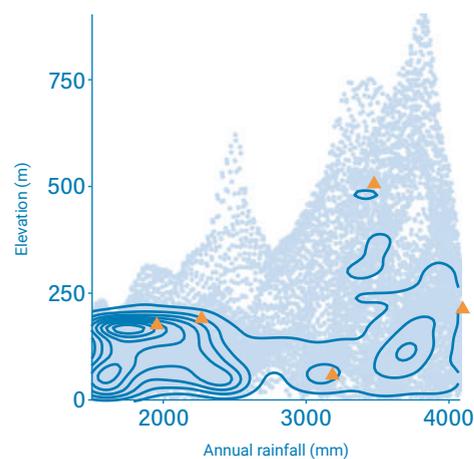
São Tomé and Príncipe



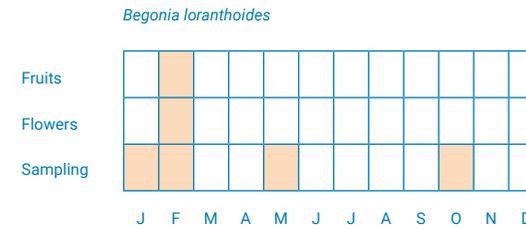
## Climate São Tomé



## Climate Príncipe



## Phenology



## Rationale

*Begonia loranthoides* subsp. *loranthoides* is known from 23 collections made between 1858 (Barter) and 1980 (de Wilde 437). The first collections were made in Príncipe island (Barter 1940, 1946, 2010) but they are not precisely located. Two other collections (Moller 7 in 1885 and Mason 3109) are without localities. There are five collections (Van Veldhuizen 443, 625, 1000; de Wilde 8762 8776) made from Wageningen greenhouse (Netherlands), from a specimen brought from São Tomé. All of these 10 collections have been excluded from estimated parameters because of lack of precision. The 13 remaining specimens represent ten occurrences, seven in Príncipe island and three in São Tomé. The dispersal is assumed to be by birds (Plana, 2002). We, therefore, consider these eleven occurrences as 2-4 subpopulations. Based on a 2 x 2 km grid cell size, the AOO and the EOO of this subspecies are respectively estimated as 36 km<sup>2</sup> and 1720 km<sup>2</sup>, both below the upper threshold for EN status under Criterion B. Considering the rocky habitat, which is still important in places of these collections, we consider that none of the occurrences are extirpated. The occurrence at Príncipe island near Porto Real is threatened by stone quarries, house constructions and cacao agriculture. This occurrence represents one location, and we infer that presence of stone quarries induces a strong decline in habitat quality and the number of mature individuals. We also consider that this occurrence will disappear in a near future. Five occurrences are located within the protected area of Príncipe Natural Park, one of them with no threats (Pico Mesa) representing one location. The occurrence located at Praia Rei (Cachocho) -Maria Fernandes was threatened by old plantation and animal breeding, and thus represents one location. The three occurrences located between Infante D. Henrique - Picos Menconne - Neves Ferreira were threatened by old plantations and represent one location. The occurrence of Sta Trindade - Pico Papagaio is threatened by touristic activities and represents one location. On SãoTomé island, the occurrence from Trás-os-Montes is threatened by illegal logging and small-scale agriculture, and represents one location. The occurrence from Novo Brasil is threatened for subsistence agriculture and represents one location, and the only occurrence that is located within the protected area of Obô Natural Park, with no threats

(Pico de SãoTomé) represents one location. All of the 10 occurrences represent 8-9 locations (*sensu* IUCN, 2019) with the most important threats (stone quarries and small-scale agriculture). Based on the past, current and future threats to these occurrences, we could infer a past, present and future continuing decline in the extent and the quality of its habitat, and the number of mature individuals. The future disappearance of occurrence from Porto Real will also induce a decline in its AOO, EOO, and the number of locations. In fact, this variety is thus assessed as VU B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v).

## Habitat and ecology

The species usually growing as an epiphytic in the crown of tall forest trees, sometimes rupes-tral among rocks, in places exposed to the light; between 0 and 1,800 m in elevation.

## Use and trade

It is not known if the species is used.

## Population

Population information is not known for this subspecies, but the dispersal is assumed to be by birds (Plana, 2002).

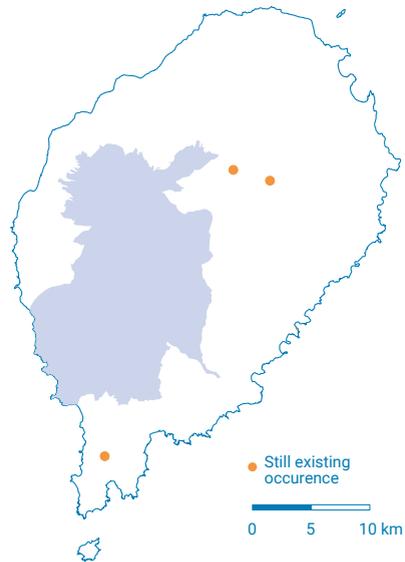
# *Begonia molleri* (C.DC.) Warb.

EN

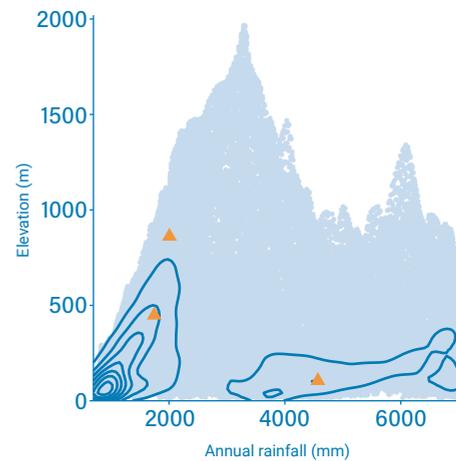


## Distribution

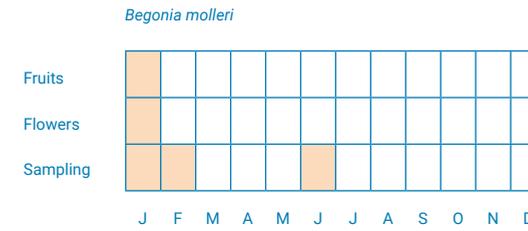
São Tomé



## Climate



## Phenology



## Rationale

*Begonia molleri* is an epiphytic herb up to 1.3 m high. The species is endemic to São Tomé island and it is known from four collections made between 1885 (Moller 3; 177) and 1980 (de Wilde 256). One collection (Moller 3) is not considered for this evaluation because it is not precisely located. The three remaining collections represent three occurrences. Although the habitat was very degraded in places of collection, we consider that none of all occurrences has been extirpated because not all trees are cut in coffee plantations. The dispersal ability is conferred by bird vectors (Plana, 2002), so these three occurrences (all located outside the PNST) represent one or two subpopulations. Based on a 2 x 2 km cell size, the AOO of this species is estimated as 12 km<sup>2</sup>, below the upper threshold of the EN category under subcriterion B2. The EOO is calculated as 40 km<sup>2</sup>, below the upper threshold of the CR category under subcriterion B1. The two occurrences at Nova Moca and Milagrosa are threatened by coffee plantation activities and represent two locations. The occurrence located around Praia Grande is threatened by cacao plantation activities, and probably by palm oil plantations. This occurrence represents one location. Therefore, these three occurrences represent three locations (*sensu* IUCN 2019), with regards to the most important threat (large-scale agriculture). We infer a past and a future decline in the number of mature individuals. Moreover, we infer a past, current, and future continuing decline in the extent and the quality of its habitat. *Begonia molleri* is thus assessed as EN B1ab(iii,v)+2ab(iii,v).

## Habitat and ecology

The species is an epiphytic plant that occurs in lowland and submontane forests, between 100 and 1,100 m in elevation.

## Use and trade

There are no known uses of this species.

## Population

*Begonia molleri* appears to be rare, so population information is little known for this species.



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# Begonia subalpestris A.Chev.

EN



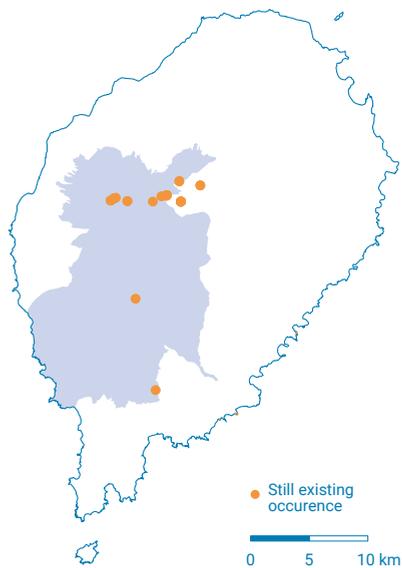
© Rémy Poncet



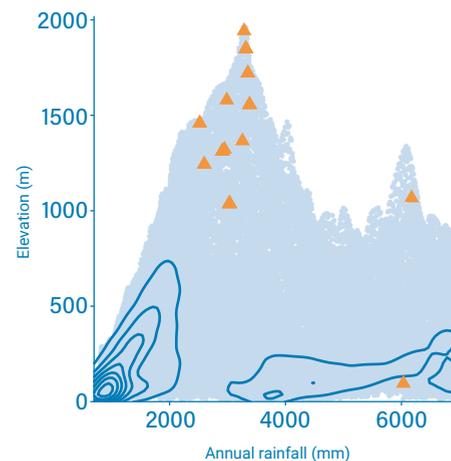
© Olivier Lachenaud

## Distribution

São Tomé



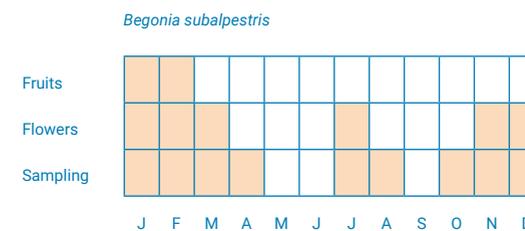
## Climate



## Rationale

*Begonia subalpestris* is an epiphyte herb up to 2 m high. The species is endemic to São Tomé island and is known from 28 collections made between 1905 (Chevalier 13752) and 2019 (Lachenaud 2873). Two collections (Chevalier 13752, Groenendijk 137) are not considered for this evaluation because they are not precisely located. The remaining 26 specimens represent 16 occurrences. Considering the habitat, which is still relatively intact where the species has been collected, we consider that none of these occurrences has been extirpated. The dispersal ability is conferred by bird vectors (Plana 2002), so these 16 occurrences represent one or two subpopulations. Based on a 2 x 2 km cell size, the AOO of this species is estimated as 40 km<sup>2</sup>, below the upper threshold of the EN category under subcriterion B2. The EOO is calculated as 58.8 km<sup>2</sup>, below the upper threshold of the CR status under subcriterion B1. The nine occurrences located along the tourist path within the PNOT are threatened by ecotourism activity and represent one location. The occurrence located at Monte Cabumbé is not threatened and represents one location. The two occurrences located at Macambarà and Campo Grande (outside of protected area) are threatened by agricultural activities (plantations of vegetables) that induce degradation of the quality of the habitat of this species. These two occurrences will probably disappear in a near future and represent one location. The occurrence located at Monte Café is threatened by agricultural activities (coffee plantations) and represents one location. The three last occurrences located at the southwestern of Macambarà near PNOT are not currently under any threat, but they could be threatened in the near future by ecotourism. So, these three occurrences represent one location. Therefore, these 16 occurrences represent five locations (*sensu* IUCN 2019), with regards to the most important threat (shifting agriculture). Based on the disappearance of the occurrences in the surroundings of Macambarà and Campo Grande, we infer a past, and a future decline

## Phenology



in its AOO, EOO, the number of locations, and the number of mature individuals. Moreover, we infer a past, current and future continuing decline in the extent and the quality of its habitat. This species is thus assessed as EN B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v).

## Habitat and ecology

The species occurs in submontane and montane rainforest, between 800 and 2,000 m in elevation.

## Use and trade

This species is in cultivation as an ornamental.

## Population

Population information is not known for this species.



# Begonia thomeana C. DC.

VU



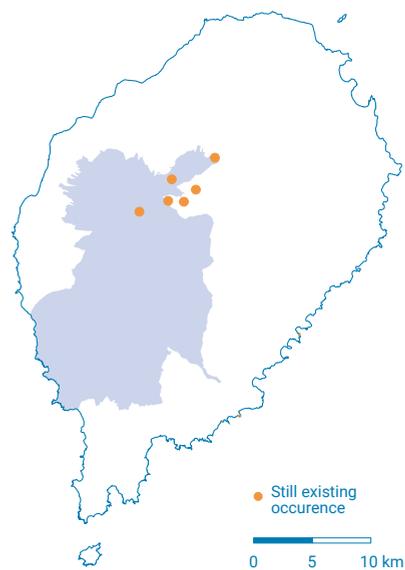
© Miguel Leal



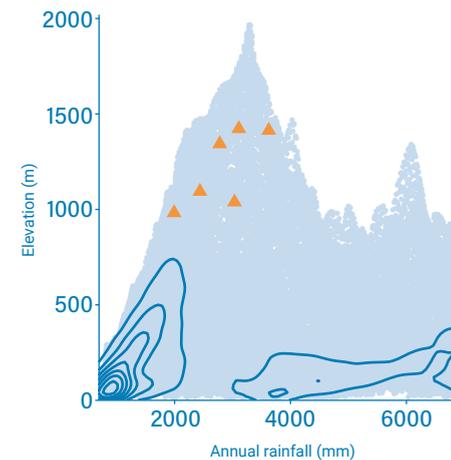
© Miguel Leal

## Distribution

Gabon, and São Tomé



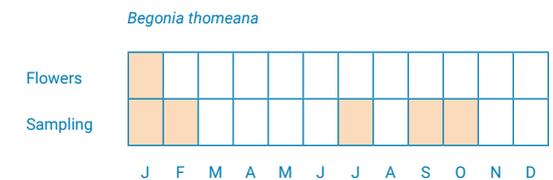
## Climate



## Rationale

*Begonia thomeana* is an epiphyte climber herb. The species occurs in São Tomé and Gabon (Plana 2002). It is known from 17 collections and 7 observations made between 1888 (Quintas 5; 147;1273; 1339) and 2019 (Eduardo 2). Three collections (Quintas 5; 147; 1339) are not considered for this evaluation because they are not precisely located. The 14 remaining specimens and all observations represent 17 occurrences, four of them located in Gabon. Although the habitat was very degraded in places of collection, we consider that none of all occurrences has been extirpated. The dispersal ability is conferred by bird vectors (Plana, 2002), so these 17 occurrences (four of them located within PNOT) represent two subpopulations. Based on a 2 x 2 km cell size, the AOO of this species is estimated as 44 km<sup>2</sup>, below the upper threshold of the EN category under subcriterion B2. The EOO is calculated as 3541 km<sup>2</sup>, below the upper threshold of the EN category under subcriterion B1. In Gabon, the three occurrences located on Mont Songo are not threatened, but the collection around (in lower elevation) is threatened by logging. So, these four occurrences represent two locations. In São Tomé, the four occurrences within the PNOT are not threatened and represent one location. Two occurrences around Bom Sucesso are threatened by horticulture activities and represent one location. We consider that these two occurrences will disappear in near future. Three occurrences at Trás-os-Montes and Calvário are threatened by plantation activities and logging, and represent one location. The occurrence around Bombaim is threatened by plantation activities and represents one location. Therefore, these 17 occurrences represent six locations (*sensu* IUCN 2019), with regards to the most important threat (small-scale agriculture). We infer a past, and a future decline in its EOO, AOO, the number of locations, and the number of mature individuals. Moreover, we infer a past, current, and future continuing decline in the extent and the quality of its habitat.

## Phenology



*Begonia thomeana* is thus assessed as VU B1ab(i, ii,iii,iv,v)+2ab(i,ii,iii,iv,v).

## Habitat and ecology

The species occurs in submontane forests, between 690 and 1,700 m in elevation.

## Use and trade

There are no known uses of this species.

## Population

The species appears to be common but very localized, so we considered the existence of two subpopulations.

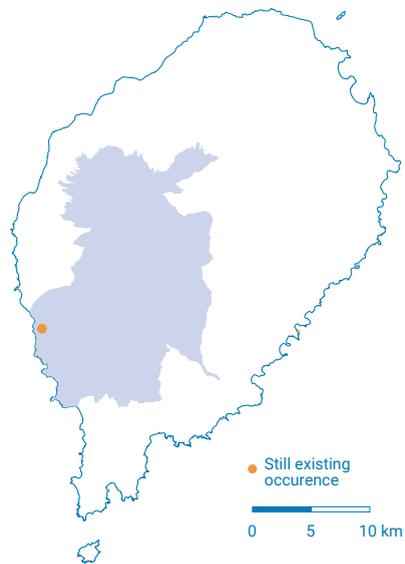
# Ehretia scrobiculata Hiern

CR

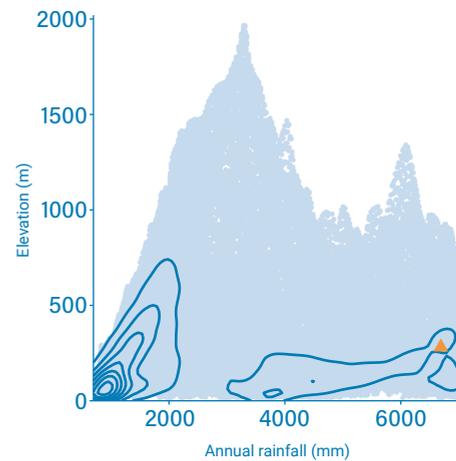


## Distribution

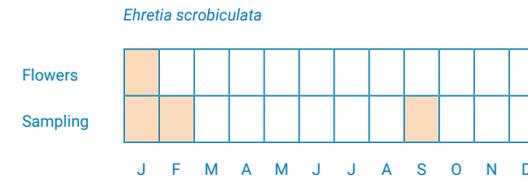
São Tomé and Príncipe



## Climate



## Phenology



## Rationale

*Ehretia scrobiculata* is a small tree with whitish flowers, which is endemic to the islands of São Tomé and Príncipe. The species is known from three collections made between 1853 (Welwitsch 5465) and 1980 (de Wilde 275). The collection of Welwitsch 5465 was made in a forest of low altitude near the sea in Príncipe but without a precise locality description. The collection of Mann 1124 was made in an unrecorded locality with no coordinates. Thus, these two collections were not considered for this evaluation. The remaining specimen (Wilde 275) was made in 1980 and represents one occurrence located within the PNOT and one subpopulation. No collection or observation of this species was done after 1980 despite intensive fieldwork carried out on both islands in the last five years. Based on a 2 x 2 km cell size, the AOO of this species is estimated as 4 km<sup>2</sup>, below the upper threshold of the CR category under subcriterion B2. With only one occurrence, it was not possible to calculate the EOO. This single occurrence was threatened by plantations but does not present current threats, and represents one location (*sensu* IUCN, 2019). Based on the probable extinction of the species in Príncipe Island, since no records of the species were found since 1853, we infer a reduction of the extent of occurrence, area of occupancy, mature individuals and locations, and a future decline in the extent and quality of its habitat. This species is therefore assessed as CR B2ab(i,ii,iii,iv,v).

## Habitat and ecology

The species occurs in lowland forests.

## Use and trade

There are no known use for the species.

## Population

Information on population is lacking, but data suggest the existence of only one subpopulation.



# Lobelia barnsii Exell



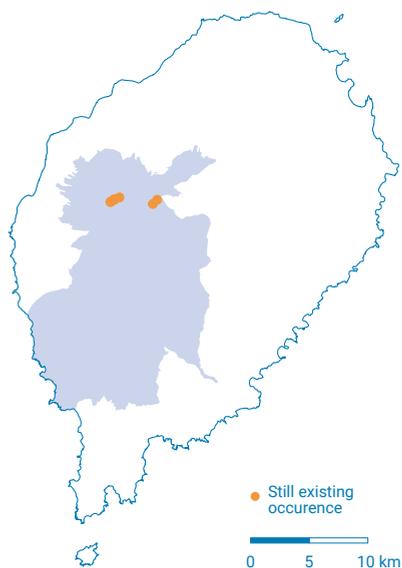
© Davy Ikabanga



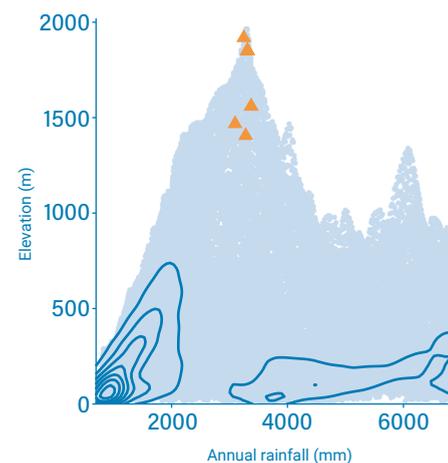
© Davy Ikabanga

## Distribution

São Tomé



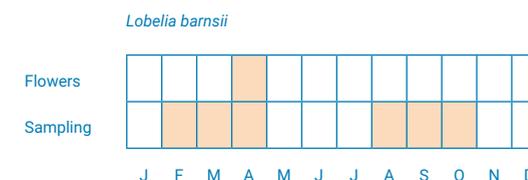
## Climate



## Rationale

*Lobelia barnsii* is a monocaule shrub reaching 1 to 2 m in height (Exell, 1944), grouped in small stand. It is endemic to São Tomé and found mostly on low shrubby vegetation with *Erica* or *Afrocarpus*; between 1,400 et 1,900 m in elevation. The species is known from twelve collections made between 1956 (Monod 12241) and 2021 (Ikabanga 1593), around and in Pico São Tomé, Pico Pequeno, and Calvario. Considering vegetation, which is still important in places of collections, we consider that none of all occurrences is extirpated. These twelve collections represent seven occurrences and one subpopulation. Based on a 2 x 2 km cell size, the AOO of this species is estimated as 16 km<sup>2</sup>, below the upper threshold for EN status under Criterion B2. The EOO is calculated as 1.4 km<sup>2</sup>, below the AOO, so we consider the EOO as 16 km<sup>2</sup> below the upper threshold for CR status under Criterion B1. The habitat of the species was threatened by *Cinchona* spp. agriculture activities (as indicated by the presence of invasive species *Cinchona pubescens*). This activity is now finished but *Cinchona* spp. has invaded its habitat, especially at the top of the Pico. This invasive species is the most important threat and these seven occurrences represent one location (*sensu* IUCN, 2019). Based on this threat, we infer past, current and future continuing decline in the extent and the quality of its habitat. *Lobelia barnsii* is thus assessed as CR B1ab(iii,v).

## Phenology



## Habitat and ecology

The species is known from low and open montane forest with *Erica* or *Afrocarpus*, between 1,400 and 2,024 m in elevation.

## Use and trade

It is not known if the species is used.

## Population

*Lobelia barnsii* occurs grouped in small stands, 5-20 twigs.



© Olivier Lachenaud

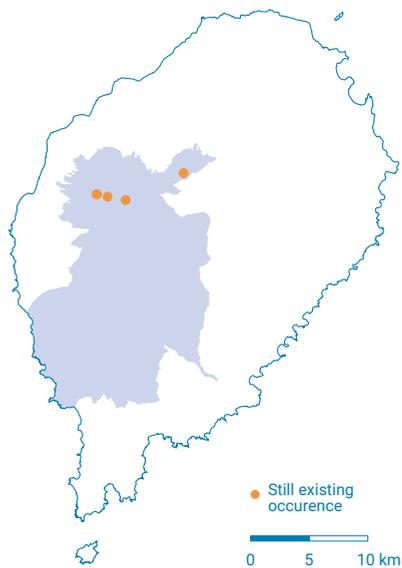
# Maytenus monodii Exell



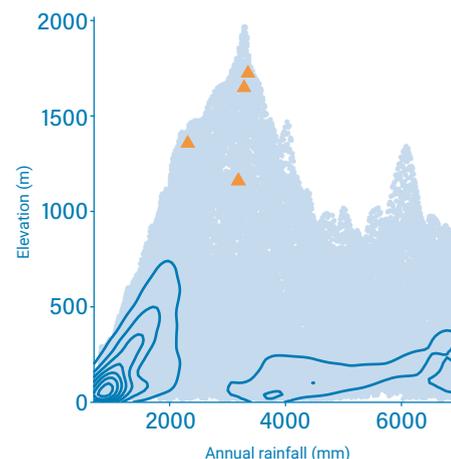
© Olivier Lachenaud

## Distribution

São Tomé



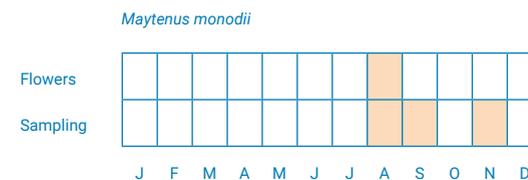
## Climate



## Rationale

*Maytenus monodii* is a liana with divaricated branches with white flowers. The species is rare and endemic to São Tomé island. It is known from five collections made in 1956 (Monod 11914; 11982; 12234 in Western of Pico São Tomé), 1999 (Joffroy 177 between Mesa de Pico São Tomé and Ponta Figo) and 2019 (Lachenaud 2832 along path from Bom Sucesso to Morro Santana) in the North of PNOT. Despite the old age of collections made by Monod, we consider that none of these occurrences are extirpated. These five collections represent four occurrences, all of them located in the protected area. The dispersal vector is assumed to be birds (Groppo et al, 2014). We therefore consider these four occurrences as one subpopulation. Based on a 2 x 2 km cell size, the AOO of this species is estimated as 16 km<sup>2</sup>, below the upper threshold for EN status under Criterion B2. The EOO is calculated as 3.5 km<sup>2</sup>, below the upper threshold for CR status under Criteria B1. Based on Criterion B, the EOO is less than the AOO, so we changed the EOO to reflect the AOO (16 km<sup>2</sup>), which corresponds to status CR. Three occurrences around Pico São Tomé (within the PNOT) are threatened by ecotourism which induces a degradation of the quality of the habitat. The occurrence along the path from Bom Sucesso to Morro Santana is threatened by small scale agriculture which induces reduction of the number of mature individuals of this species. Therefore, these four occurrences represent two locations (*sensu* IUCN, 2019), with regards to the most important threat (small-scale agriculture). We infer a past, current and future continuing decline in the extent and the quality of its habitat and number of mature individuals. This species is thus assessed as EN B1ab(iii,v)+2ab(iii,v).

## Phenology



## Habitat and ecology

The species is known from submontane and montane rainforest, between 1,300 and 1,700 m in elevation.

## Use and trade

It is not known if the species is used.

## Population

Population information is not known for this species.



© Taric Stévant

# Strephonema sp. nov.

EN



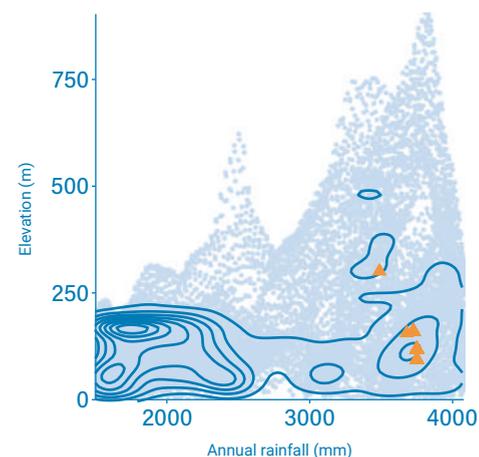
## Distribution

Príncipe



Angiosperm - Combretaceae

## Climate



## Rationale

*Strephonema* sp. nov. occurs in lowland forest in Príncipe. Since 2020 a project lead by Fauna & Flora International and Fundação Príncipe (Taking action for Príncipe's threatened trees) is conducting awareness, surveys, and monitoring of this species, and more information is expected in the near future, thus this assessment should be considered as preliminary. The IUCN status will also depend on the publication of the species, but it is currently considered as an endemic species to Príncipe. The distribution of *Strephonema* sp. nov. appears very restricted, limited to coastal forest near Rio Porco, on the track to Pico Mesa from Maria Correia, and near Barriga Branca, on mature lowland forest inside PNOP. A recent account of the population gives a number of 400 mature individuals. In fact, this species should have had a larger distribution in the lowland forest where it was probably cut for timber during the colonial period from the 15th century. This species appears to be locally abundant but its density is difficult to assess because it is misidentified with *Carapa gogo*. The species is known from 12 collections and 75 observations representing 16 occurrences and three subpopulations. Its extent of occurrence is calculated to be 5.432 km<sup>2</sup>, within the limit for CR status under subcriterion B1, while its area of occupancy is estimated to be 12 km<sup>2</sup>, also within the limit for EN status under subcriterion B2. However, since the AOO cannot be larger than the EOO, the AOO should be considered as equal to the EOO, meaning 5,432 km<sup>2</sup>, within the limit for CR status under subcriterion B2. All of its subpopulations occur in a protected area but one is close to the border of it (Maria Correia) and its habitat is threatened by farming activities. Former subpopulation was threatened by habitat destruction for plantations in areas near Praia Seca, and between Rio Porco and Rio São Tomé, and in the South of Pico Mesa. A decline in habitat extent and quality is therefore observed, and a past decline of

Angiosperm - Combretaceae

about 80% in AOO and EOO is inferred which could lead to CR status. However, this number still needs to be confirmed by GIS analysis and could not be used in this assessment. The three groups of occurrences represent three locations in the sense of IUCN which qualifies for EN status. The population of each subpopulation is less than 250 mature individuals. Therefore, the species is assessed as EN under the conditions B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v); C2(i). This species could be considered as a flagship species for biodiversity conservation since it is a good indicator of highly diverse mature forest and important for bird nesting. The sites of occurrence should be protected in priority.

## Habitat and ecology

The species appears very restricted, limited to coastal forest near Rio Porco, and near Barriga Branca, on mature lowland forest.

## Use and trade

The species was probably cut for timber during the colonial period from the 15th century.

## Population

A recent account of the population gives a number of 400 mature individuals. In fact, this species should have had a larger distribution in the lowland forest where it was probably cut for timber during the colonial period from the 15th century. This species appears to be locally abundant but its density is difficult to assess because it is misidentified with *Carapa gogo*.



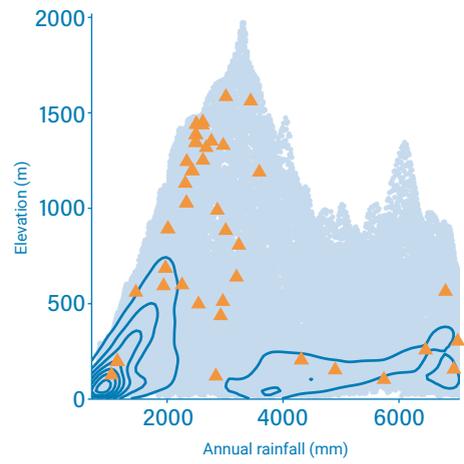


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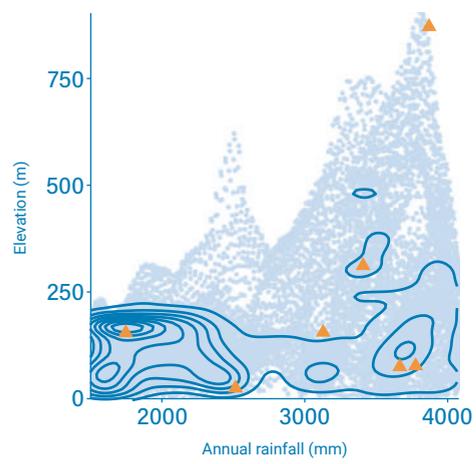


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Climate São Tomé



Climate Príncipe

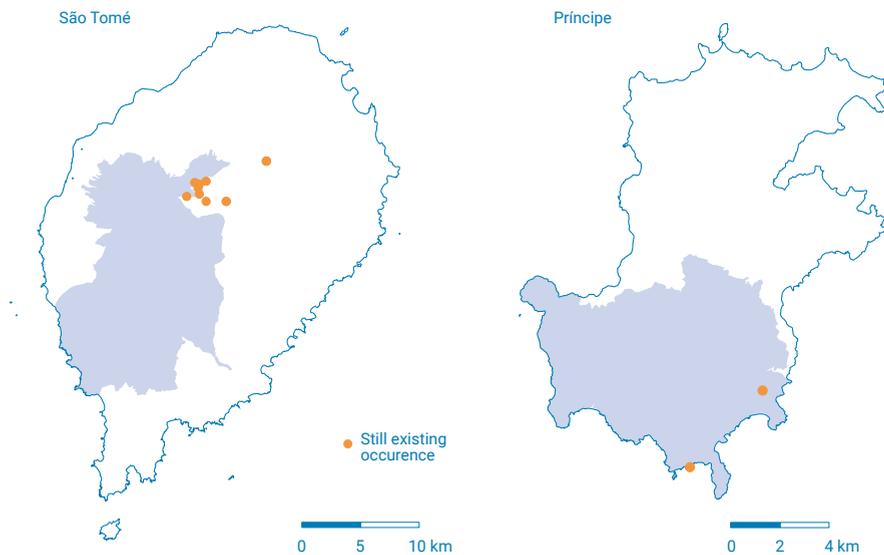




© Briec Fertard

# Costus giganteus Welw. ex Ridl.

NT 

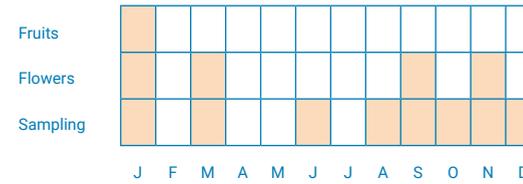


## Distribution

Annobón (Equatorial Guinea),  
and São Tomé and Príncipe

## Phenology

*Costus giganteus*



## Rationale

*Costus giganteus* was assessed by Contu (2013) as LC, and this assessment has been published by the Red List Unit in 2013. It is an herbaceous up to 8 m high, known from rainforest between 0 to 1,450 m in elevation. This species occurs in São Tomé, Príncipe and Annobón. It is known from 22 collections made between 1860 (Welwitsch 6465) and 2017 (Equipa botanica do Príncipe 97). These 22 collections represent 18 occurrences and three subpopulations. *Costus giganteus* occurs within three protected areas: PNOP, PNST and Annobón Natural Reserve. Considering forest cover, which is still significant in the areas of collection, we do not regard any of these 18 occurrences as extirpated. Based on a 2 x 2 km cell size, the AOO of this species is estimated as 52 km<sup>2</sup>, below the upper threshold for EN status under subcriterion B2. The EOO is calculated as 4,876 km<sup>2</sup>, above the upper threshold for EN status under subcriteria B1. Two occurrences located within Annobón Natural reserve are threatened by cassava plantations and represent one location. Two occurrences located outside of the Annobón Natural Reserve (in the north part) are threatened by land carry and represent one location. We consider that these two occurrences will disappear in near future. In São Tomé, one occurrence located between Santa Maria and Jamar is not threatened and represents one location. The occurrence located around Batepa is threatened by coffee plantations and represents one location. Three occurrences located around rosa Calvario are threatened by agriculture, illegal logging and stem cutting. They represent one location. Three occurrences located at Macambrara are threatened by horticulture activities and represent one location. Two occurrences at Formiga and Ribeira Palma are threatened by cocoa plantations and represent two locations. The occurrence made within PNST is threatened by tourism and represents one location. In Príncipe, two occurrences located within PNP are not threatened and represent one location. The occurrence outside of the PNP is not threatened and represents one location. Therefore, these 18 occurrences represent eleven locations (*sensu* IUCN, 2019), with regard

to the most serious plausible threats (small-scale agriculture). Based on the future disappearance of two occurrences in Annobón, we infer a continuing decline in its AOO, EOO, the number of locations, the extent and the quality of its habitat and the number of mature individuals. *Costus giganteus* is thus assessed as NT because it nearly meets criterion VU B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v).

### Habitat and ecology

The species grows in shade, wet places, in old-growth or secondary forests, on montane slopes and along streams, between 100 and 1,500 m in elevation.

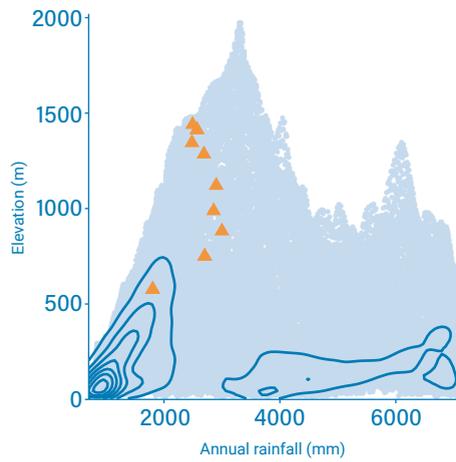
### Use and trade

The caul has been used for renal infection and rheumatism.

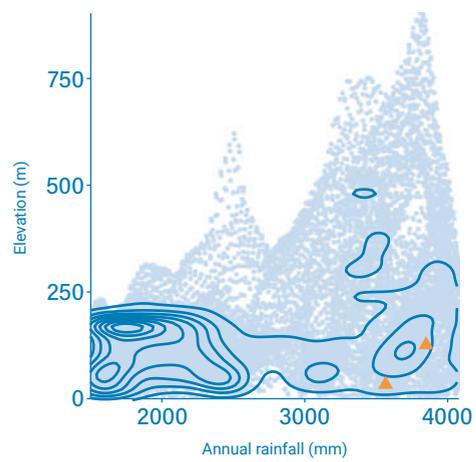
### Population

*Costus giganteus* is very common in São Tomé, so we consider that these 18 occurrences represent three subpopulations.

Climate São Tomé



Climate Príncipe

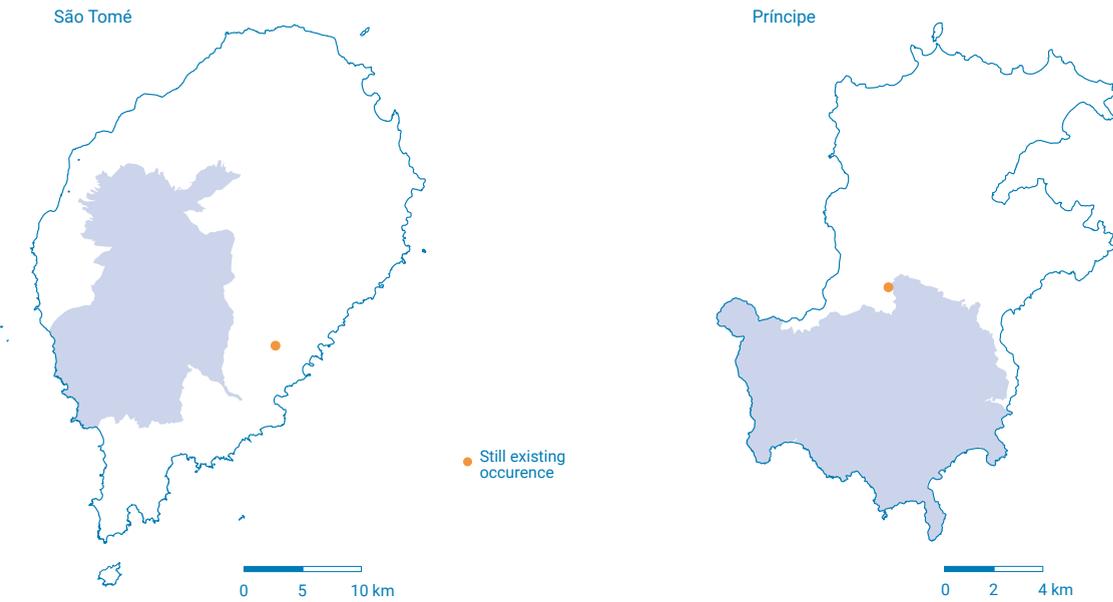


# Principina grandis Uitt.

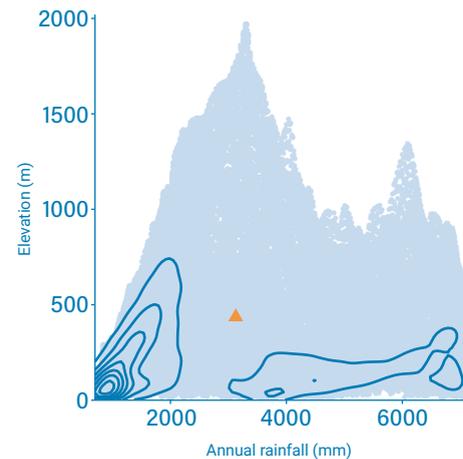


## Distribution

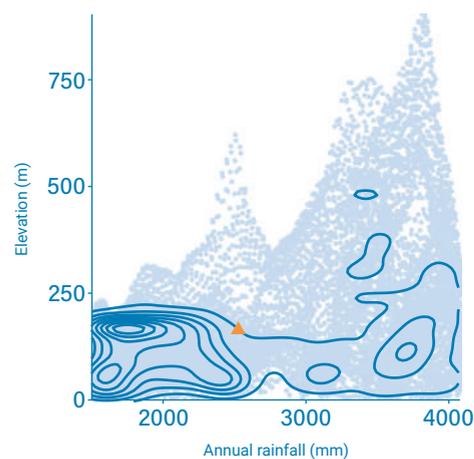
Gabon, and São Tomé and Príncipe



## Climate São Tomé



## Climate Príncipe



## Rationale

*Principina grandis* is a grass-like herb, known from old-growth vegetation on trachyte inselbergs, between 670 and 760 m in elevation. This species was supposed to be endemic to São Tomé and Príncipe until it was recently collected in Gabon. The species is known from two collections, one in Príncipe Island, in 1932 (Excell 703 at the summit of Pico Papagaio) and one in São Tomé Island in 2007 (Mesterházy 173 at the South West part of Pico Maria Fernandes, Angolares), and one observation in Gabon (at Milobo inselberg). None of these three occurrences is considered extirpated and they represent three subpopulations. *Principina grandis* seems to be locally abundant on these sites. Several similar inselbergs can be found around Milobo's region in Gabon, in Equatorial Guinea, and on São Tomé and Príncipe. The species is probably more abundant but currently underrepresented due to the difficult access to its habitat. Based on a 2 x 2 km cell size, the AOO of this species is estimated as 12 km<sup>2</sup>, below the upper threshold for EN status under Criterion B2. The EOO is calculated as 31,040 km<sup>2</sup>, above the upper threshold for VU status under Criteria B1. The occurrence at Pico Papagaio in Príncipe is within PNOP but is threatened by ecotourism which induces degradation of the quality of the habitat and represents one location. The occurrence located on Pico Maria Fernandes is threatened by intensive use of the area for palm wine extraction, which induces degradation of the quality of the habitat and potentially reduction of the number of mature individuals and represents one location. The occurrence in Milobo is not threatened and represents one location. Thus, these three occurrences represent three locations (*sensu* IUCN 2019) with regards to the most important threats (tourism and palm wine harvest). We infer a past, current and future continuing decline in the extent and the quality of its habitat and number of mature individuals. This species is thus assessed as EN B2ab(iii,v).

## Habitat and ecology

The species is known from old-growth vegetation on inselbergs, between 670 and 760 m in elevation. Mesterházy & Browning (2014) correlate the distribution of this species with trachyte mounts.

## Use and trade

There is no known use for this species.

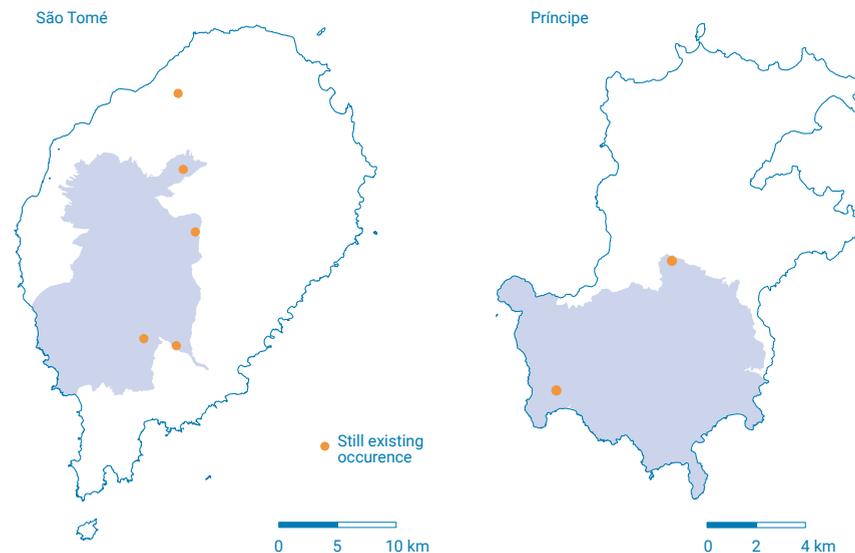
## Population

Population information is not sufficiently known for this species, but we suggest existence of three subpopulations.



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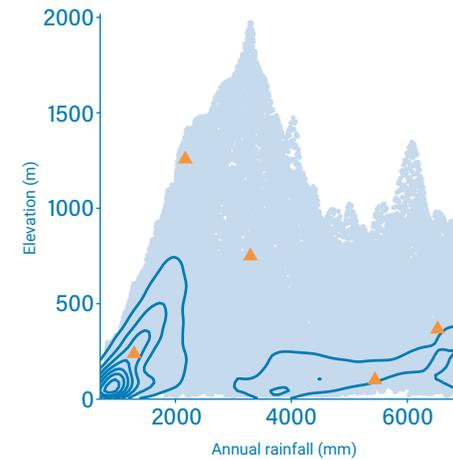
# Dichapetalum bocageanum (Henriq.) Engl.



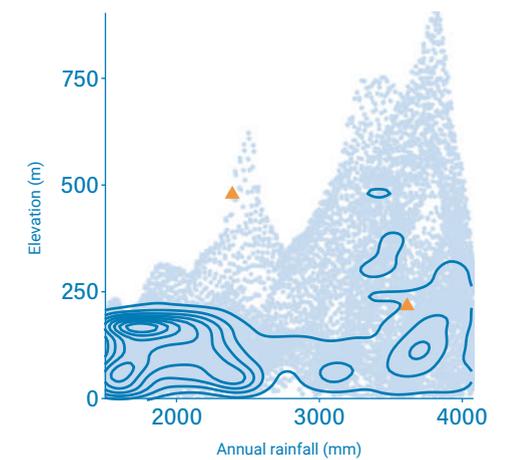
## Distribution

São Tomé and Príncipe

## Climate São Tomé



## Climate Príncipe



## Rationale

*Dichapetalum bocageanum* was assessed in 1998 as VU D2 by Word Conservation Monitoring Centre. This assessment was based on two collections, which lead the authors to consider the species as poorly known. Since then, many collections have been made, allowing a reassessment.

*Dichapetalum bocageanum* is liana or lianescent shrub up to 5 m tall, known from riverine and terra firme forests, between 50 and 1,264 m in elevation. The species is endemic to São Tomé and Príncipe. It is now known from 10 collections, of which eight were made in São Tomé and two in Príncipe. It has been collected for the first time by Mann (s.n.) in São Tomé in 1861. The last collection was made by Lachenaud (3010), in 2020. We excluded the two collections made by Mann because no locality information is provided. Therefore, the eight remaining collections represent eight occurrences and 2 to 4 subpopulations. Considering the forest coverage, which is still important in these areas, we consider that none of the eight occurrences are extirpated. Based on a 2 x 2 km cell size, the AOO of this species is estimated as 32 km<sup>2</sup>, below the upper threshold for EN status under subcriterion B2. The EOO is calculated as 1,806 km<sup>2</sup>, below the upper threshold for EN status under subcriterion B1. Five occurrences are located within two protected areas: four in PNST and one in PNOP. In São Tomé, two of the four occurrences within PNST are threatened by vicinity to plantations in the north part, and by possible future extension of palm oil plantations around Dona Eugenia; they represent two locations. The two other occurrences within PNST are not threatened and represent one location. The two occurrences outside the PNST

are threatened by agriculture activities (small-scale agriculture) and represent two locations. In Príncipe, the occurrence within PNOP is not threatened. However, the occurrence outside the PNOP is threatened by plantations (small-scale agriculture). These two occurrences represent two locations. As a consequence, these eight occurrences represent seven locations (*sensu* IUCN 2019), with regards to the most important threat (small-scale agriculture). We infer a current and future continuing decline in the extent and the quality of its habitat. This species is thus assessed as VU B1ab(iii)+2ab(iii).

## Habitat and ecology

The species has a wide ecological range but is mainly known from mature and secondary forests, between 50 and 1,264 m in elevation.

## Use and trade

There are no known uses of this species.

## Population

Population information is not known for this species.

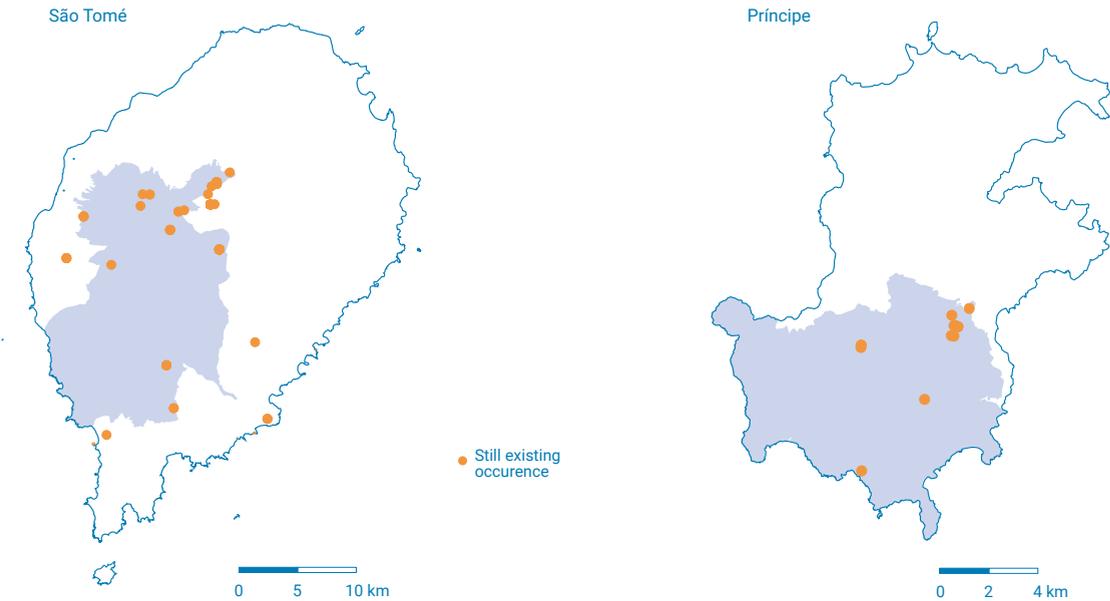


# Croton stellulifer Hutch.

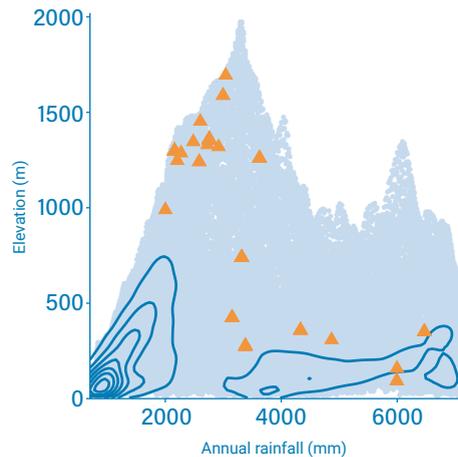


## Distribution

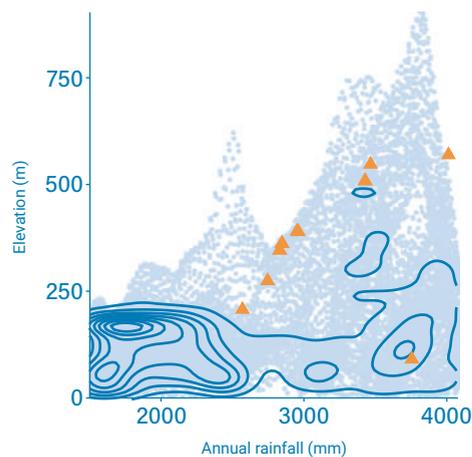
São Tomé and Príncipe



## Climate São Tomé



## Climate Príncipe



## Rationale

The species has been assessed as VU but without any information on threats. The collection of new information justify its reassessment. *Croton stellulifer* is a tree endemic to São Tomé and Príncipe islands. It is found in mature and, mostly, in secondary lowland and montane forests, from 77 to 1,694 m in elevation. It is known from 33 collections and 92 observations, made between 1932 (Exell 547, type) and 2020. The collection of Madureira & Martins 483 was made in an unrecorded locality in São Tomé, thus was not considered for this evaluation. In Príncipe, *Croton stellulifer* is found in low to middle elevated forests of the South, and known from 11 occurrences and 1-4 populations, none considered extirpated and all within PNOP. This species probably has a larger distribution in Príncipe, especially in the North, since it occurs in secondary or degraded forests, and a population probably occurs in Sundy, but additional fieldwork needs to be conducted to confirm this information. In São Tomé, *Croton stellulifer* is quite widespread, occurring in the lowland to montane forest and known from 24 occurrences and 4-5 subpopulations, none considered extirpated. Thus, this species is known from 35 occurrences and 5-8 subpopulations. Based on a 2 x 2 km cell size, the AOO of this species is estimated as 84 km<sup>2</sup>, below the upper threshold for EN status under subcriterion B2. The EOO is calculated as 2,424 km<sup>2</sup>, below the upper threshold for EN status under subcriterion B1. In Príncipe, the occurrences around Rio Porco, and Pico Menorne are not threatened and represent one location. Nine occurrences were threatened by past plantations and are currently threatened by the unsustainable bark collection for traditional medicine due to its proximity to accessible places through touristic tracks (two occurrences on the Track to Pico do Príncipe and seven around Oquê Pipi), representing one location. In São Tomé, seven occurrences located near Bom Sucesso and Macambará are threatened by agricultural activities (vegetable plantations) and represent one location. Five occurrences situated along touristic tracks within the PNOT, near Morro Vilela and Lagoa Amélia, are threatened by tourism activities, and invasive species, they represent one location.

Four occurrences (Pico ana Chaves, Monte Carmo, Rio Lemba, Rio Ave) situated in the PNOT are not threatened and represent one location. The occurrence near Sta. Clotilde - S. José is threatened by illegal logging and represents one location. The occurrences situated near Cao Pequeno and Cão Grande are threatened by palm plantations and represent one location. The ones near the top of Pico Macuru and near Monta Maru/ bombaim were previously threatened by plantations and represent two locations. Finally, the occurrences collected near Pico Maria Fernandez are threatened by current plantations, and the one near Morro Claudina is threatened by illegal logging. The species is thus known from 8 locations in São Tomé.

Therefore, these occurrences represent 10 locations (*sensu* IUCN, 2019), with regards to the most serious plausible threats (small-scale agriculture). In São Tomé, its distribution probably strongly declined when large shade plantations covered most of the island. The subpopulation situation in the north-center of the island is currently exposed to high human pressure for logging and we can suspect a decline in the quality of its habitat.

A decline in habitat extent and quality is therefore observed, and a past decline in the number of individuals, number of subpopulations, AOO, and EOO could have occurred but since the species occur in secondary vegetation, it is impossible to assess it properly. The 8 subpopulations represent 10 locations, therefore, the species is assessed as VU under the conditions B1ab(iii)+2ab(iii).

## Habitat and ecology

The species is principally occurring in secondary forest (World Conservation Monitoring Centre, 1998), but exists also in old-growth forest (Carvalho et al., 2004). This species has a wide altitudinal range (World Conservation Monitoring Centre, 1998): *C. stellulifer* is present at low altitude in the valley of the rivers, but it is also recorded in montane rainforest between 800 and 1,400m of elevation and in cloudy-forest above 1400m (Christy, 2001). The studies of Toelen (1995) on the montane forests of São Tomé show that this tree is frequent in old secondary forests and rare in old-growth forests. In Príncipe, the species is quite abundant in old secondary forest, but also occurs in disturbed forest on the Pico of Príncipe.

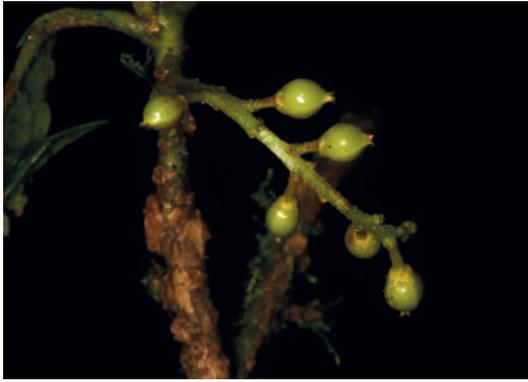
## Use and trade

The dry and pulverized bark is burned as incense, on charcoal, to flavor and disinfect the house environment and to ward off «bad looks».

## Population

This species probably has a larger distribution in Príncipe, especially in the North.



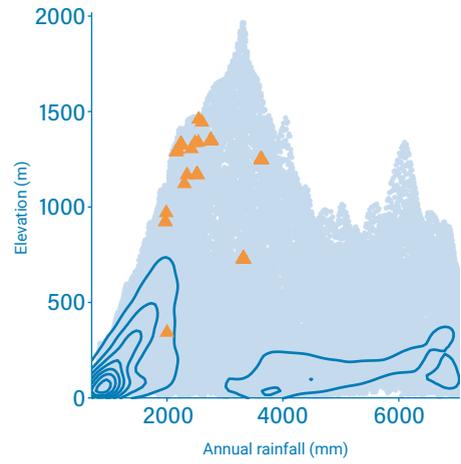


© Tariq Stévant

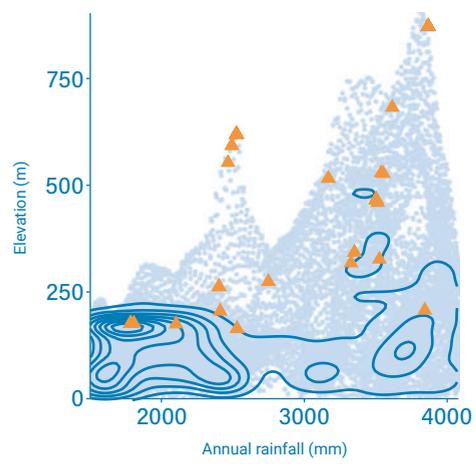


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Climate São Tomé



Climate Príncipe

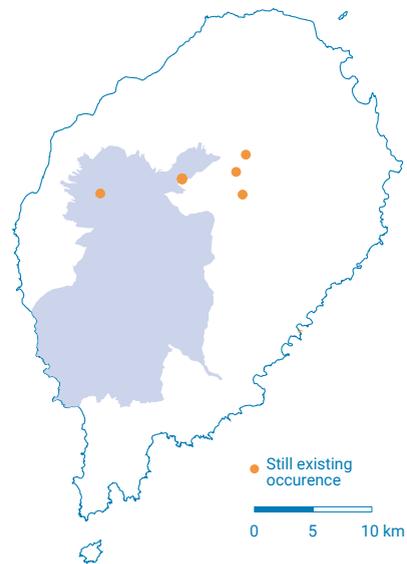


# *Tristemma mauritianum* J.F.Gmel. var. *rozeiranum* Jacq.-Fél.

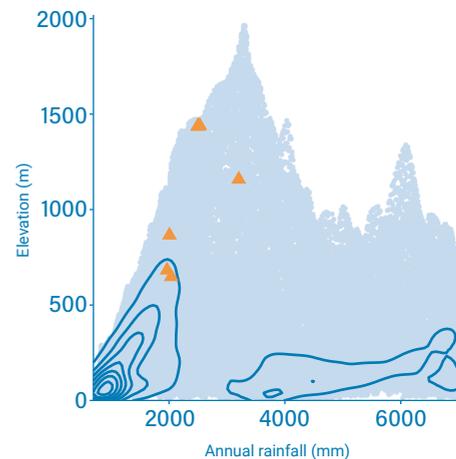


## Distribution

São Tomé



## Climate



## Rationale

*Tristemma mauritianum* var. *rozeiranum* is an erect succulent perennial herb or a small shrub, found between 600 m and 1,430 m in elevation, mainly in the submontane and montane forests. The species is endemic to São Tomé and is known from 8 collections made between 1905 (Chevalier, 14524) and 1999 (Joffroy, 75), of which five are located within PNOT. The 8 collections represent 6 occurrences and 1 or 2 subpopulations, and none of the occurrences is considered extirpated. Based on a 2 x 2 km cell size, its AOO is estimated to be 20 km<sup>2</sup>, and its EOO is calculated to be 21 km<sup>2</sup>, within the limits for EN (AOO) and CR (EOO) status under subcriteria B2 and B1. The occurrences at Monte Café and Nova Moca were threatened by plantations (past) and currently threatened by small-scale agriculture and represent one location. The occurrence at Água Parada-Santa Elvira (road Bombain-São Nicolau) is threatened by wine palm extraction and illegal logging and represents one location. The two occurrences at Lagoa Amélia are threatened by tourism activities and represent one location. The occurrence at the west of Pico, within the PNOT, is not threatened and represents one location. As a consequence, these six occurrences represent 4 locations (*sensu* IUCN, 2021), with regards to the most important threat (small-scale agriculture). Moreover, we infer a past, current and future continuing decline in the extent and habitat quality and the number of mature individuals. *Tristemma mauritianum* var. *rozeiranum* is therefore assessed EN B1ab(iii,v)+2ab(iii,v).

## Habitat and ecology

The species is found between 600 m and 1,430 m in elevation, mainly in the submontane and montane forests.

## Use and trade

Species utilized in traditional medicine (leaves) and the fruits are used as food (Madureira et al., 2002).

## Population

Population information is not known for this species.

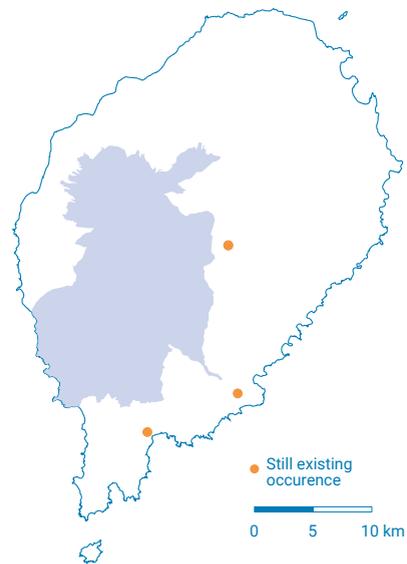
# *Tristemma mauritianum* J.F.Gmel. var. *thomense* (J.H.P.B.Ferreira) Jacq.-Fél.

EN

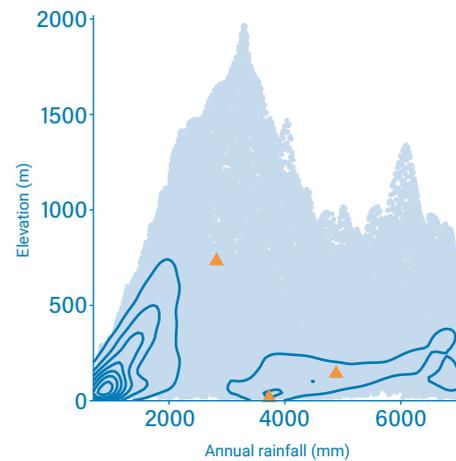


## Distribution

São Tomé



## Climate



## Rationale

*Tristemma mauritianum* var. *thomense* is an erect perennial herb or a small shrub, found from sea level (39 m) to highlands (557 m), concentrated in the litoral south forests. The species is endemic to São Tomé, and is known from 9 collections made between 1957 (Rozeira, A.D.F., 3413) and 2020 (Ikabanga, 1043). These 9 collections represent 9 occurrences and 2 or 3 subpopulations. None of the occurrences are located within the PNOST and none are considered to be extirpated. Based on a 2 x 2 km cell size, its EOO is calculated to be 220 km<sup>2</sup>, and its AOO is estimated to be 32 km<sup>2</sup>, both within the limits for EN status under subcriteria B1 and B2. The two occurrences located near the Pico Formoso are threatened by old plantations and the extraction of palm wine and represent 1 location. The occurrence between Santa Clotilde and São José is threatened by illegal logging and represents 1 location. The occurrences of Caridade, São João and Fraternidade are threatened by small-scale agriculture and represent 3 locations. The occurrences of Monte Carmo and Monte Mário are threatened by large-scale agriculture (palm oil plantation) and represent two locations. We infer the future disappearance of the Monte Mario occurrence as oil palm plantations expand towards the littoral. As a consequence, these nine occurrences represent 7 locations (*sensu* IUCN, 2021), with regards to the most serious plausible threat (palm oil plantation). Based on the probable future disappearance of the Monte Mario occurrence, we infer a future decline in its AOO, its EOO, the number of locations, and the number of mature individuals. Moreover, we infer a current and a future continuing decline in the extent and habitat quality. *Tristemma mauritianum* var. *thomense* is therefore assessed as VU B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v).

## Habitat and ecology

The species is found from sea level (39 m) to mid-altitude (557 m), concentrated in the litoral south forests.

## Use and trade

Species utilized in traditional medicine (leaves) and the fruits are used as food (Madureira et al., 2002).

## Population

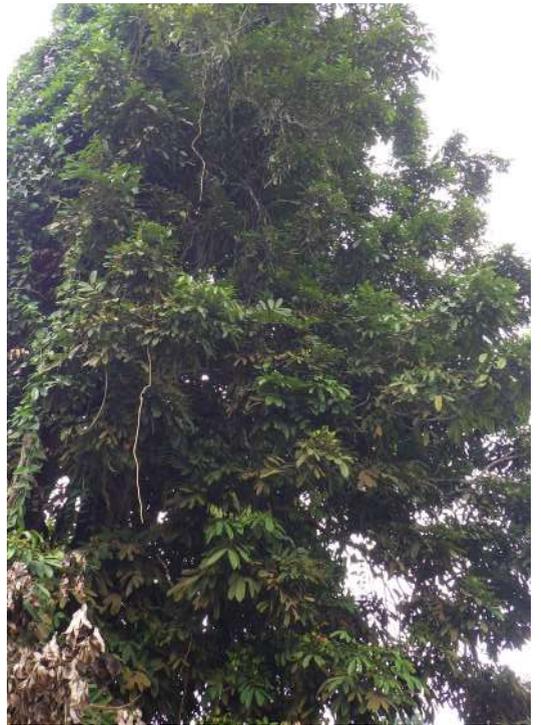
Population information is not known for this species. We assume that the number of subpopulations can be 2 or 3.



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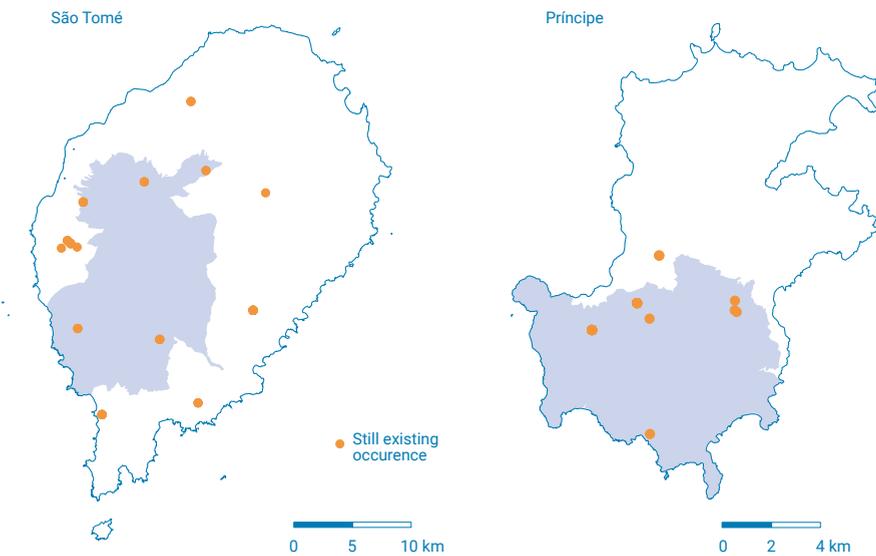


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# Carapa gogo A.Chev. ex Kenfack



## Distribution

São Tomé and Príncipe

## Rationale

*Carapa gogo* occurs mostly in mid elevation forest in São Tomé and Príncipe (300-500 m). The distribution of *C. gogo* appears quite restricted in São Tomé and more widespread in Príncipe. In Príncipe it is limited to PNOP, occurring on the coastal forest near Rio Porco and Maria Correia, but also on the track to Pico Mesa, the area near Barriga Branca and near Pico do Príncipe. Indeed this species has probably a larger distribution on Príncipe and many individuals should have been cut for timber. This rare species appears to be locally abundant but its density is difficult to assess because it is misidentified with *Strephonema sp. nov.* in this island. Moreover, there is no sign of natural regeneration. Since 2020 a project lead by Fauna & Flora International and Fundação Príncipe (Taking action for Príncipe's threatened trees) is conducting awareness, surveys and monitoring of *Carapa gogo*, and more information regarding the species is expected in the near future, this assessment should be considered as preliminary. *C. gogo* is currently known from 11 collections and 21 observations that represent 9 subpopulations. Its extent of occurrence is calculated to be 1718 km<sup>2</sup>, within the limit for EN status under subcriterion B1, while its area of occupancy is estimated to be 36 km<sup>2</sup>, also within the limit for EN status under subcriterion B2. Seven of its subpopulations occur in a protected area but some are close to the border of it (Maria Correia, Oquê Pipi, Lago Amélia). Former subpopulations were threatened

by habitat destruction for plantations in areas near Praia Seca, and between Rio Porco and Rio do São Tomé, and in the South of Pico Mesa, but also everywhere in São Tomé. A decline in habitat extent and quality is therefore observed, and a past decline in number of individuals, number of subpopulations, AOO and EOO is suspected. The 9 occurrences represent 9 locations in the sense of IUCN, therefore, the species is assessed as VU under the conditions B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v). This species could be considered as a flagship species for biodiversity conservation since it's a good indicator of highly diverse mature forest and probably important for bird nesting. Therefore, the places where it occurs need thus to be protected in priority.

### Habitat and ecology

The species occurs mostly in mid elevation forest (300-500 m) but can be found up to 1,300 m in São Tomé.

### Use and trade

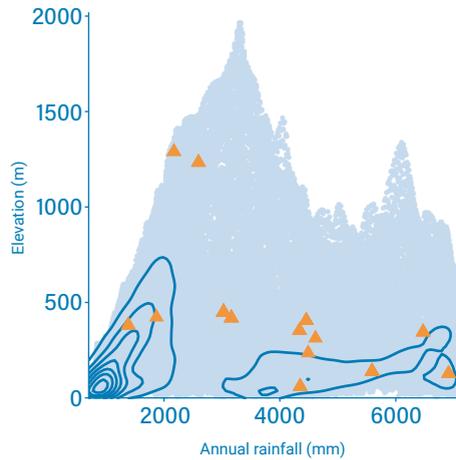
The species is used for massages of displaced or broken bones, for the treatment of venereal diseases (heating), to treat anaemia, and it is used as an aphrodisiac.

Moreover, the wood is used for the manufacture of furniture, being very appreciated and valued by the beautiful veins of the wood and its red color.

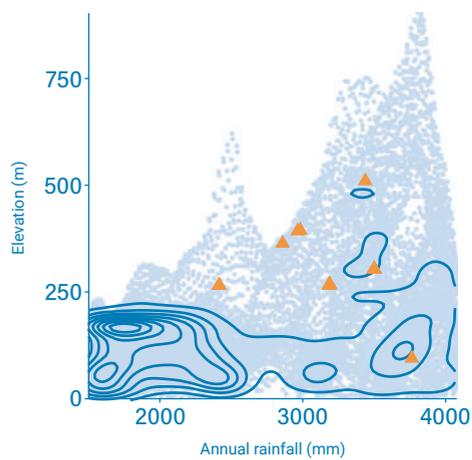
### Population

This species probably has a larger distribution on Príncipe but many individuals should have been cut for timber. This rare species appears to be locally abundant but the density is difficult to assess since it is misidentified with *Strephonema* sp. nov. in these areas. Moreover, there is no sign of natural regeneration.

Climate São Tomé



Climate Príncipe





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# Trichilia grandifolia Oliv.



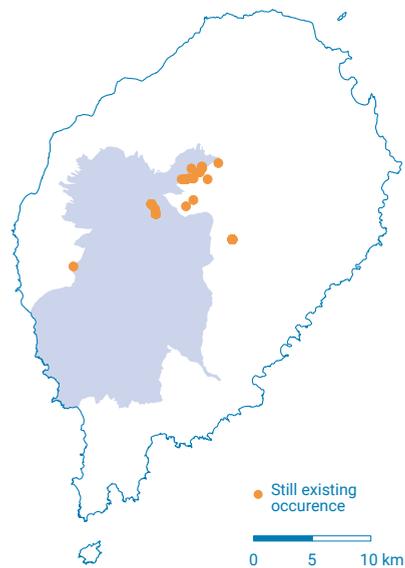
© Olivier Lachenaud



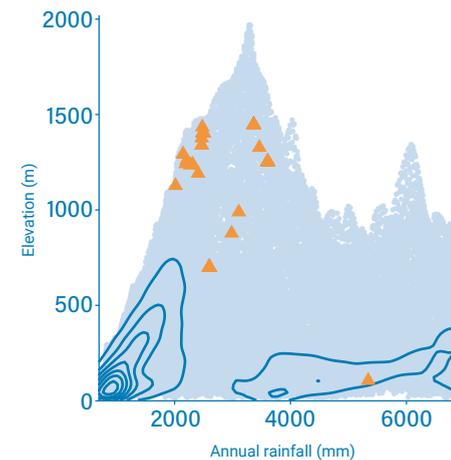
© Olivier Lachenaud

## Distribution

São Tomé



## Climate

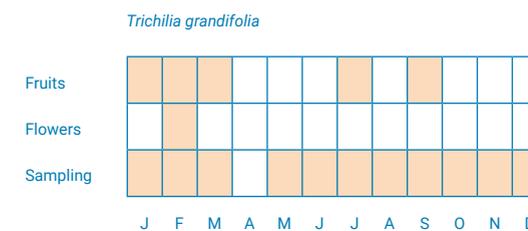


## Rationale

*Trichilia grandifolia* was assessed in 1998 as NT by the World Conservation Monitoring Centre. The new information gathered in the last years justifies a new assessment.

*Trichilia grandifolia* is a tree up to 23 m tall, known from lowland rain forests, and montane forests on slopes, between 100 and 1,500 m in elevation. The species is endemic to São Tomé Island and it is known from 39 collections carried out between 1888 and 2020, representing 23 occurrences. We do not know the dispersal capacity of the species. We consider that none of the occurrences as extirpated. Based on a 2 km x 2 km cell, the AOO for this species is estimated at 40 km<sup>2</sup>, below the upper threshold for EN status under criterion B2. The EOO is calculated as 91 km<sup>2</sup> below the upper threshold for CR status under criterion B1. The 5 occurrences from Nova Moca, the 1 from Esperança, the 3 from Bom Sucesso area, and the 1 from Monte Café, all located outside the protected area, are threatened by intensive horticulture practices and represent, therefore, 1 location. Still, outside the protected area, the occurrences in Trás-Montes and Pico Formoso Grande, are threatened by illegal logging and palm wine extraction and represent one location. The occurrences at Água Cabumbé, Morro Claudina, Cresta de Tomate Musay e Pico Ana Chaves, located within the PNOT, are not threatened and represent one location. Around Lagoa Amélia the 5 occurrences are threatened by touristic activities and represent another location. Therefore, these 23 occurrences represent four locations (*sensu* IUCN 2019), with regards to the most important threat (intensive agriculture - horticulture). We infer a past, current, and future continuing decline in the extent and the quality of its habitat. *Trichilia grandifolia* is thus assessed as EN B1ab(iii)+2ab(iii).

## Phenology



## Habitat and ecology

The species is known from lowland rainforests, sub-montane and montane forests on slopes, between 100 and 1,500 m in elevation. It can be more abundant in some areas of old-growth forest (>1000 m) and it can occur in secondary forests, but it is rare in shade plantations.

## Use and trade

There is no known use for this species.

## Population

Population information is not known for this species.

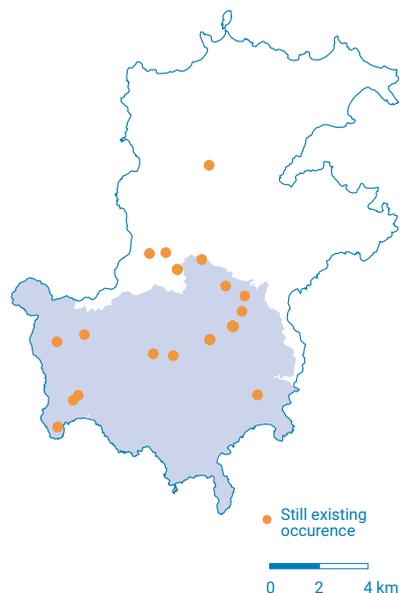


# Campylospermum nutans (Hiern) Biss.

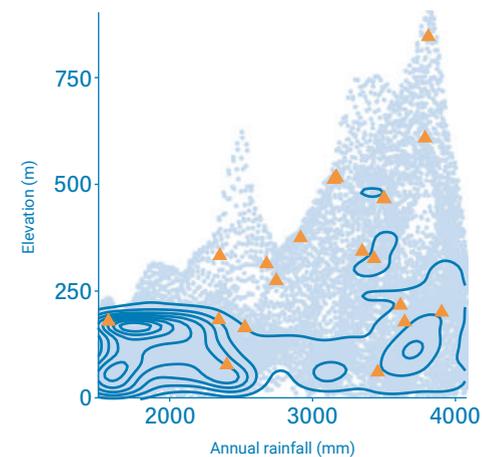


## Distribution

Príncipe



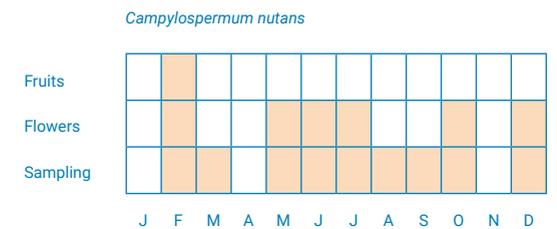
## Climate



## Rationale

*Campylospermum nutans* was preliminary assessed as EN B1/B2(i,ii) based on 11 collections examined (Bissiengou 2014), but it was not published on the Red List. Since then, additional material was collected. The species is a treelet up to 4 m tall, endemic to Príncipe Island and found in old-growth and secondary forest between 9 and 910 m in elevation. It is known from 16 collections and 11 observations made between 1853 (Welwitsch, 4606) and 2021 (Transects Príncipe 755, 872), all within PNP or at least in the buffer zone, with one exception (Terra Prometida, Dias 183). These collections and observations represent 19 occurrences, none considered as extirpated. Based on a 2 x 2 km cell size, the AOO of this species is estimated as 44 km<sup>2</sup>, below the upper threshold for EN status under subcriterion B2. The EOO is calculated as 46 km<sup>2</sup>, below the upper threshold for CR status under subcriterion B1. The five occurrences around Praia Cará, Barriga Branca, (track to) Pico Mesa, Estrada Infante and the one near Santa Trindade were threatened by past plantations and represent one location. The five occurrences around Morro de Leste (behind Morro de Leste, Morro de Leste and between Oquê Pipi and Morro de Leste), Morro Fundão, and the one at Pico Mesa are not threatened and represent one location. The two occurrences at Pico Papagaio, the one at Oquê Pipi and the one at the top of Santa Joaquina are threatened by human disturbances (tourism) leading to a rapid degradation of its habitat and represent one location each. The location near Terra Prometida is threatened by housing expansion and represents one location, inferred to disappear in the near future. Therefore, these 19 occurrences represent six locations (*sensu* IUCN, 2019) with regard to the most serious plausible threats (housing expansion) and 1-7 subpopulations. Based on these threats, we infer past, current and future continuing decline in the extent and the quality of its habitat, and a decline

## Phenology



in the number of mature individuals and disappearance of one location due to housing expansion. *Campylospermum nutans* is thus assessed as VU B1 ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v).

## Habitat and ecology

The species occurs in old-growth and secondary forests, between 9 and 910 m in elevation.

## Use and trade

It is not known if the species is used.

## Population

Population information is not sufficiently documented for this species, but we suggest the existence of 1-7 subpopulations.

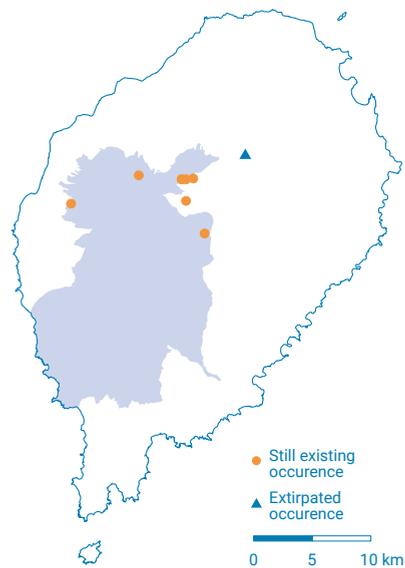
# Jasminum thomense Exell

EN

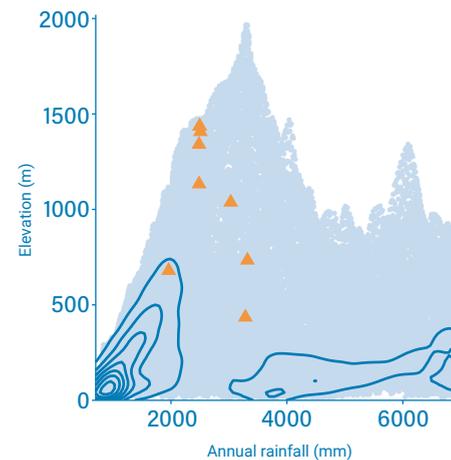


## Distribution

São Tomé



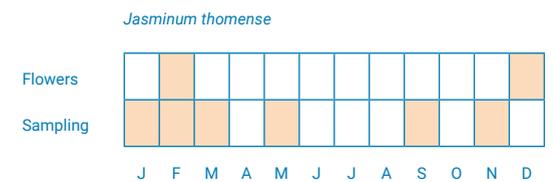
## Climate



## Rationale

*Jasminum thomense* is a liana up to 1 m, known from dense humid forest and river bank, between 18 and 1,420 m in elevation. The species is endemic to São Tomé and is known from 16 collections made between 1905 (Chevalier s.n.) and 2020 (Lachenaud 3004; Eduardo 162). We excluded three collections made by Oliveira (1508; 169) and Chevalier (s.n.) because no locality information is provided. We consider the occurrence of Espírito Santo 176 made in 1949 as extirpated because the habitat of the species in Monté Café has been severely degraded. Therefore, these 12 collections represent ten occurrences and 1-2 subpopulations. Based on a 2 x 2 km cell size, the AOO of this species is estimated as 32 km<sup>2</sup>, below the upper threshold for EN status under subcriterion B2. The EOO is calculated as 114 km<sup>2</sup>, above the upper threshold for EN status under subcriteria B1. Five occurrences are located within the PNOST. Three of them are not threatened and represent one location. Two other occurrences are located along the touristic road. One occurrence near the PNOST is again located along the touristic road. We consider that these three occurrences could be threatened by tourism, and represent one location. Two occurrences located around Zampalma are threatened by small-scale agriculture and illegal logging forest. They represent one location. Two occurrences are located along the river Io Grande, one of which could be threatened by palm oil plantations. We consider that this occurrence will disappear in a near future by extension of palm oil plantation, and represents one location. The last occurrence is threatened by small-scale agriculture and represents one location. Therefore, ten occurrences represent 5 locations (*sensu* IUCN, 2019), with regard to the most serious plausible threat (small-scale agriculture). We thus infer a past, continuous and future decline in its AOO, its EOO, number of locations and mature individuals. Moreover, we infer a current and a future continuous decline in the extent and habitat

## Phenology



quality. *Jasminum thomense* is thus assessed as EN B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v).

## Habitat and ecology

The species is known from dense humid forest and river bank, between 18 and 1,420 m in elevation.

## Use and trade

It is not known if the species is used.

## Population

No quantitative population data are available for this species.



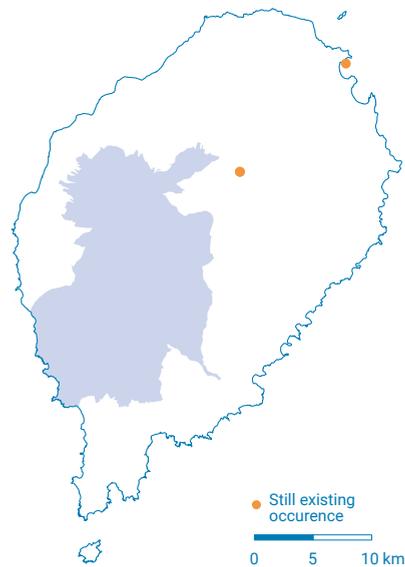
# *Aerangis flexuosa* (Ridl.) Schltr.

EN

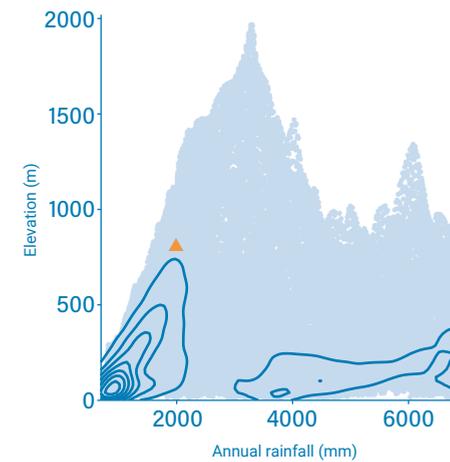


## Distribution

São Tomé



## Climate



## Rationale

The species is assessed as EN. The EOO of *Aerangis flexuosa* cannot be estimated because the species is known from less than three collections. Its AOO is estimated to be 8 km<sup>2</sup>, which falls within the thresholds for CR status under criterion B2. The species is known from two subpopulations on São Tomé Island and these represent two locations, which falls within the limits for EN status under subcriterion B2a. *Aerangis flexuosa* has been collected in the northeastern part of the island, outside of the PNOT. The habitat of *A. flexuosa* is currently impacted by human disturbance since it is accessible to local residents. The main threats to the species are shifting agriculture and small-scale timber exploitation which are gradually transforming this area into secondary forest. We project that this degradation will continue in the future. The projected ongoing loss of its habitat leads us to predict a continuing decline in the number of subpopulations and mature individuals and thus its AOO. Considering all these facts, *A. flexuosa* is assigned a status of EN B2ab(ii,iii,iv,v).

## Habitat and ecology

The species is epiphyte in semi-deciduous forests from the coast to mid elevation. It was recently collected on a fallen tree in lowland semi-dry forests. It is found between sea level to 700 m elevation.

## Use and trade

The species is not known to be used or traded, however, specialist collectors with an interest in collecting and growing epiphytes might be interested in the species.

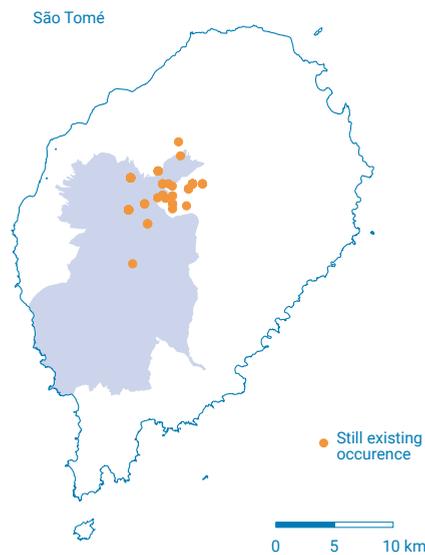
## Population

The population is currently declining because the habitat of one locality has completely disappeared and the other one is currently facing selective logging. The species is currently known from two subpopulations in the northern part of São Tomé Island. *Aerangis flexuosa* might be present in the forest occurring within the PNOT. The number of individuals of the species is not known and cannot be estimated since the species is epiphyte.



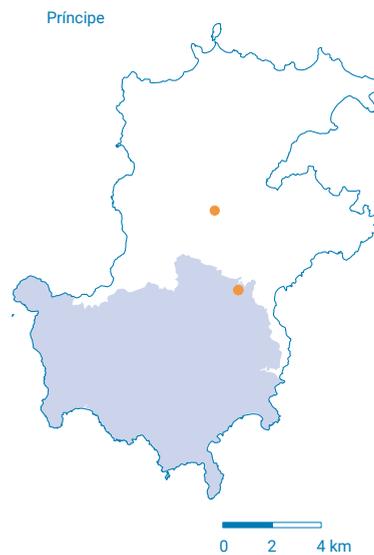
© Taric Stévant

# *Afropectinariella doratophylla* (Summerh.) M.Simo & Stévant



## Distribution

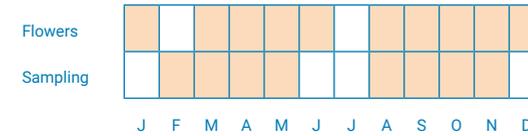
São Tomé and Príncipe



Angiosperm - Orchidaceae

## Phenology

*Afropectinariella doratophylla*



## Rationale

This species is given an IUCN Red List Category of EN (EN B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v)). The EOO of *Afropectinariella doratophylla* is estimated to be 714 km<sup>2</sup> and its AOO is about 90 km<sup>2</sup>, both of which fall within the limits for EN status under criterion B. This species is endemic to the islands of São Tomé and Príncipe and it should be noted that the EOO contains a large area of ocean as the islands are separated from one another by more than 150 km. *Afropectinariella doratophylla* is known from nine subpopulations, one on Príncipe and eight on São Tomé, some of which occur within the protected part of the PNOT, while others are situated in portions of the park that are impacted by human disturbance and in the buffer zone, where there is no protection. These nine subpopulations represent a total of four locations, and thus *A. doratophylla* qualifies for EN status under both criterion B1a and B2a. The main threats to the species are deforestation for agriculture and logging. The latter results from a strong demand for timber used in the construction of houses, including from species on which it grows as an epiphyte. We anticipate that this pressure will continue in the future. The projected ongoing loss of its habitat leads us to predict a continuous decline in the number of subpopulations and mature individuals and thus, also of its EOO and AOO. In particular, the northern part of PNOT is accessible to local residents, and shifting agriculture and small-scale timber exploitation are gradually transforming this area into secondary forest. Some previously recorded subpopulations may have already disappeared due to increasing human pressure observed in the area since 1997 (Stévant pers. obs.).

Angiosperm - Orchidaceae

## Habitat and ecology

On São Tomé, *A. doratophylla* is found between 850 and 1,600 m, where it grows with *Syzygium guineense*, on the trunks and branches of trees in submontane and montane old-growth rain forests. The species is also found on isolated shade trees in old plantations or often growing together with *Bulbophyllum lizae* J. J. Verm. On Príncipe, *A. doratophylla* is found in old-growth shrubby vegetation on shallow soil, at around 300 m elevation.

## Use and trade

The species is not known to be used or traded, however, specialist collectors with an interest in collecting and growing epiphytes might be interested in the species.

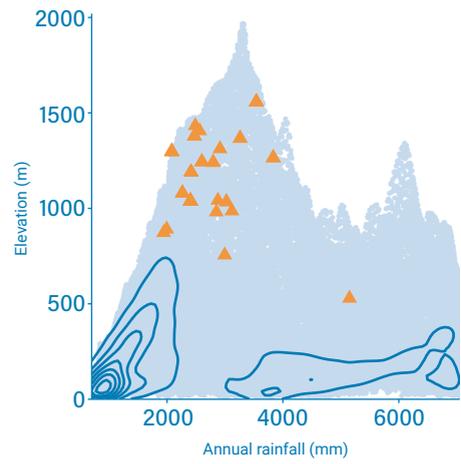
## Population

The species is known from nine subpopulations, 1 on Príncipe and 8 on São Tomé. The current population trend is decreasing.

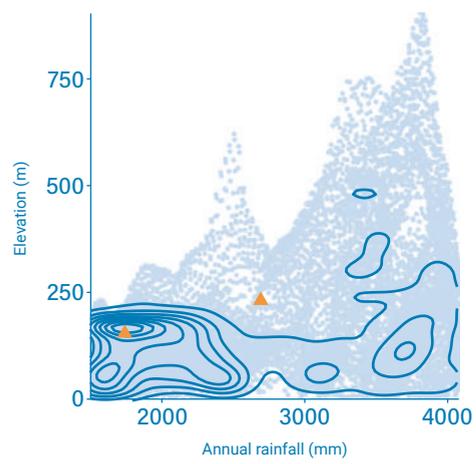


© Tariq Stévant

Climate São Tomé



Climate Príncipe



# Angraecopsis dolabriformis (Rolfe) Schltr.

EX



## Distribution

São Tomé

## Rationale

The species is presumed EX according to the IUCN Red List Guidelines (IUCN Standards and Petitions Subcommittee 2016). The EOO of *Angraecopsis dolabriformis* cannot be estimated because the species is only known from one collection. The species is thus known from one subpopulation and one location. No details of the preferred habitat of *A. dolabriformis* are available on the sheet of the specimen. A large part of the natural vegetation of the island was destroyed in the 19th and 20th centuries. Moreover, all remaining habitat on the island is now experiencing significant threats from industrial plantations, shifting agriculture, selective logging and wood cutting for small-scale subsistence use. Despite 18 months of intensive fieldwork on the island, collecting and growing orchids, no specimens were found that could be assigned to this species. Based on the information available, *A. dolabriformis* is assessed as EX.

## Habitat and ecology

No details about the preferred habitat/ecology of *Angraecopsis dolabriformis* are available on the sheet of its only known specimen. Its precise elevation range is also unknown, but was presumably somewhere between 100 and 800 m.

## Use and trade

The species is not known to be used or traded, however, specialist collectors with an interest in collecting and growing epiphytes might be interested in the species.

## Population

The species was known only from the type specimen which represents one subpopulation.



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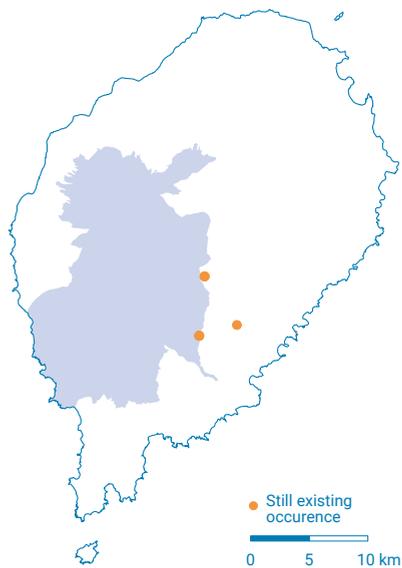
# Angraecops is thomensis Stévant & P.J.Cribb



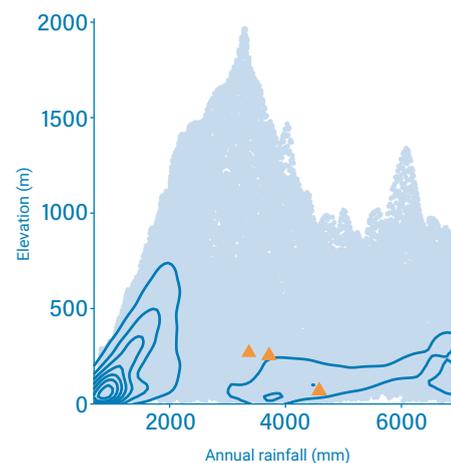
© Tariq Stévant

## Distribution

São Tomé



## Climate



## Rationale

The species is assessed as CR. The EOO of *Angraecopsis thomensis* cannot be estimated because the species is only known from two collection sites. Its AOO is estimated to be 8 km<sup>2</sup>, which falls within the thresholds for CR under criterion B2. The species is known from five specimens, representing two subpopulations in the southern part of the São Tomé Island, around the PNOTS, where there is no protection. The two subpopulations represent one location, the requirement for CR status under subcriterion B2a. The species is epiphyte on old secondary forests with no current threats known, and its AOO is very restricted. However, the secondary forest where the species is recorded is planned to be transformed into industrial palm plantations, a situation that will threaten the species' habitat. It is anticipated that this predictable degradation in the quality of its habitat will lead to a decline in the AOO, number of locations and mature individuals of the species. For that reason *A. thomensis* is assessed as CR B2ab(ii,iii,iv,v).

## Habitat and ecology

The species is epiphyte in old secondary lowland forests located in the southern part of the São Tomé Island, around the PNOTS, between 200 and 500 m in elevation. The species was collected on *Bridelia micrantha* (Hochst.) Baill.

## Use and trade

The species is not known to be used or traded, however, specialist collectors with an interest in collecting and growing epiphytes might be interested in the species.

## Population

The current population trend is stable. Its number of individuals is not known and cannot be estimated since the species is epiphyte.

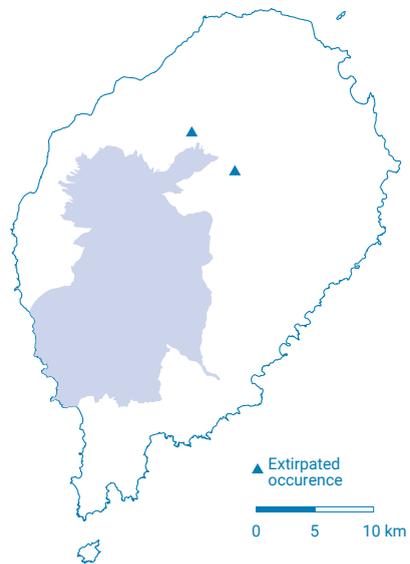
# Angraecum astroarche Ridl.

EX

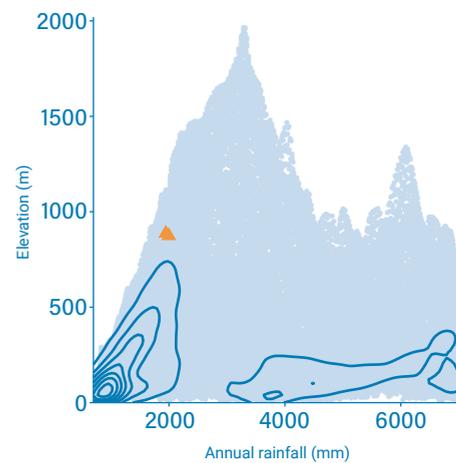


## Distribution

São Tomé



## Climate



## Phenology

Angraecum astroarche



## Rationale

The species is presumed EX according to the IUCN Red List Guidelines (IUCN Standards and Petitions Subcommittee 2016). The EOO of *Angraecum astroarche* cannot be estimated because the species is only known from the type collection. The species was known from one subpopulation in the northern part of the São Tomé Island, outside the PNOT. The part of the island where the species occurred is experiencing significant threats from shifting agriculture, selective logging and wood cutting for small-scale subsistence. This human pressure is projected to continue and will intensify in the foreseeable future. Despite 18 months of fieldwork on the island, collecting and growing orchids, no specimens that could be attributed to this species were found. Based on the information available, *A. astroarche* is assessed as EX.

## Habitat and ecology

There are no details about the preferred habitat/ecology of *Angraecum astroarche*. However, it was found at 900 m elevations, and it is inferred that this epiphytic species grew on trees in lowland forests on the island.

## Use and trade

The species is not known to be used or traded, however, specialist collectors with an interest in collecting and growing epiphytes might be interested in the species.

## Population

The population of *Angraecum astroarche* is thought to have declined because the species habitat has been degraded by selective logging. *Angraecum astroarche* was known from one subpopulation in the northern part of São Tomé Island. The species is presumed to be extinct.





# *Bulbophyllum lizae* J.J. Verm.

EN



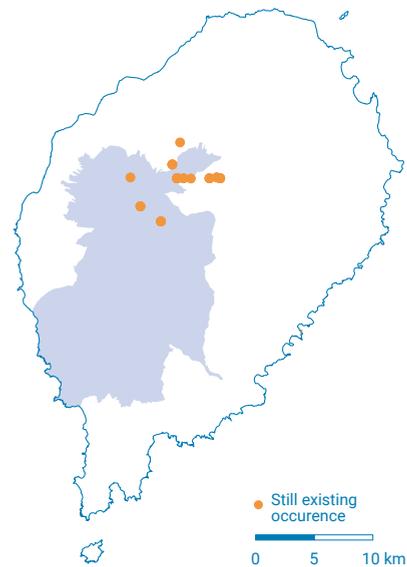
© Tariq Stévant



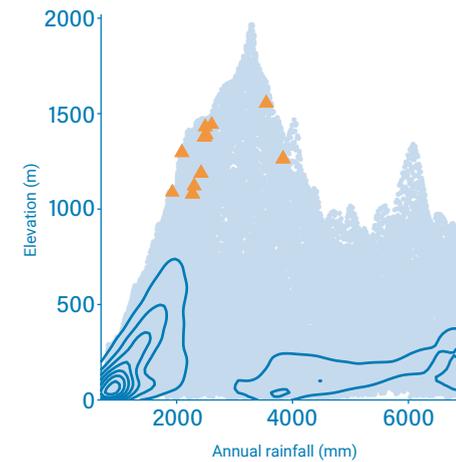
© Tariq Stévant

## Distribution

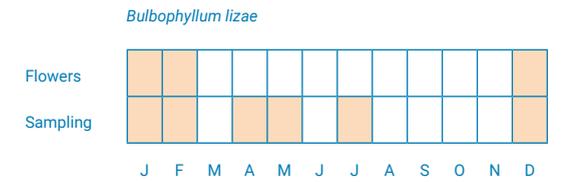
Bioko (Equatorial Guinea) and São Tomé



## Climate



## Phenology



## Rationale

The species is assessed as EN. The EOO of *Bulbophyllum lizae* is estimated to be 1,622 km<sup>2</sup>, whereas its AOO is estimated to be 32 km<sup>2</sup>, both fall within the thresholds for EN under criterion B. The species is known from eight subpopulations in São Tomé Island (São Tomé and Príncipe) and Bioko (Equatorial Guinea). These eight subpopulations represent four different locations, which falls within the thresholds for EN under subcriterion B1a+2a. *Bulbophyllum lizae* is an epiphyte in dense old-growth and secondary lowland, submontane and montane forests between 800–1,610 m elevation. At least seven of the 13 collections of *Bulbophyllum lizae* known in São Tomé occurred inside the PNST while one collection in Equatorial Guinea occurs inside the Pico Basile National Park, both being not under threat and appearing well managed. In São Tomé, some collections of the species occur outside the park such as wasteland and tree fallow, with some of these sites being accessible by local residents. The species habitat is threatened there and in its lower altitudinal range due to logging activities at small scale and shifting agriculture for subsistence. The ongoing loss of the species habitat will lead to a continuing decline in mature individuals of the species. For these reasons, *B. lizae* is assessed as EN B1ab(iii,v)+2ab(iii,v).

## Habitat and ecology

The species is found in dense old-growth and secondary submontane and montane forests, in the northern part of the São Tomé island and inside the Pico Basile National Park in Bioko (Equatorial Guinea). The species also occurs on tree fallow, on large horizontal branches of isolated trees inside wasteland.

## Use and trade

The species is not known to be used or traded, however, specialist collectors with an interest in collecting and growing epiphytes might be interested in the species. It is found between 800 and 1,610 m in elevation.

## Population

*Bulbophyllum lizae* is very frequent in its natural range. However, its current population trend is decreasing since the species also occurs in secondary forests where its habitat is threatened. The number of individuals of the species is not known and cannot be estimated since the species is epiphyte.

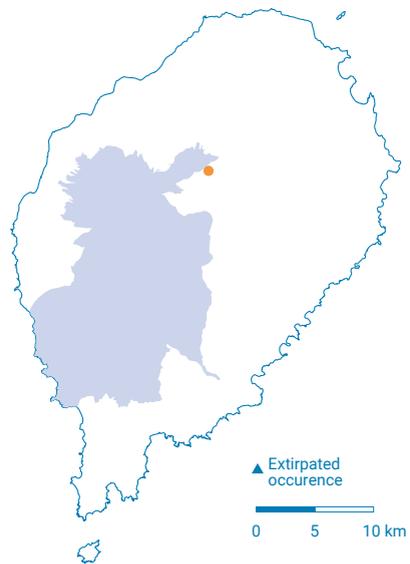
# *Bulbophyllum luciphilum* Stévant

EN

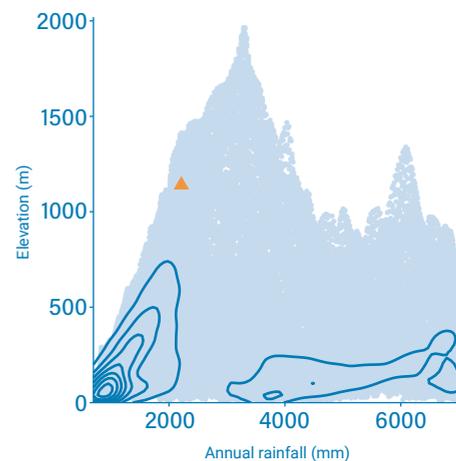


## Distribution

Rio Muni (Equatorial Guinea)  
and São Tomé



## Climate



## Phenology

*Bulbophyllum luciphilum*

Flowers														
Sampling														
	J	F	M	A	M	J	J	A	S	O	N	D		

## Rationale

The species is assessed as EN. The EOO of *Bulbophyllum luciphilum* cannot be estimated because the species is known only from two collections, whereas its AOO is estimated to be 8 km<sup>2</sup>, which falls within the thresholds for CR under criterion B2. The species is known from two subpopulations: one in São Tomé Island (São Tomé and Príncipe) and the other in Rio Muni (Equatorial Guinea). These two subpopulations represent two different locations, which fall within the thresholds for EN under subcriterion B2a. *Bulbophyllum luciphilum* was found in lowland and submontane forests, on high and sunny branches of an isolated tree along the edge of the road, around 1,150 m elevation, in São Tomé. The habitat of the species there is threatened by forest clearance for shifting agriculture and selective logging for domestic uses. The species also occurs on the highest branches of the canopy in Bom Sucesso, and this habitat is also threatened. The second collection made in Rio Muni occurs inside the Monte Alén National Park which is not under threat and appears well managed. The ongoing loss of the habitat of the species in São Tomé will lead to a continuing decline in the near future of its number of mature individuals. Considering these facts, *B. luciphilum* is assessed as EN B2ab(iii,v).

## Habitat and ecology

In São Tomé, the species was found on very sunny high branches of an isolated tree along the edge of roads. At Engon, the species was collected inside the Monte Alén National Park, with no details about its preferred habitat/ecology. It is found at around 1,150 m elevation.

## Use and trade

The species is not known to be used or traded, however, specialist collectors with an interest in collecting and growing epiphytes might be interested in the species.

## Population

The current population trend of *Bulbophyllum luciphilum* is decreasing. The Bom Sucesso subpopulation is under threat by forest clearance. The number of individuals of *B. luciphilum* is not known and cannot be estimated because the species is epiphyte.



© Tariq Stévant

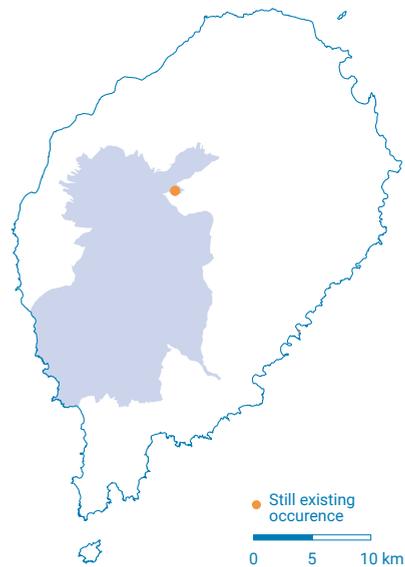
# Calanthe sylvatica (Thouars) Lindl. var. geerinckiana Stévant

CR

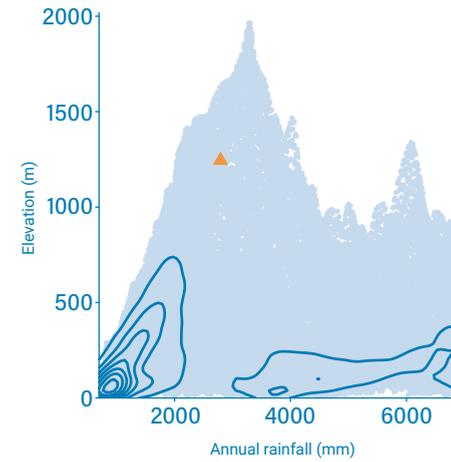


## Distribution

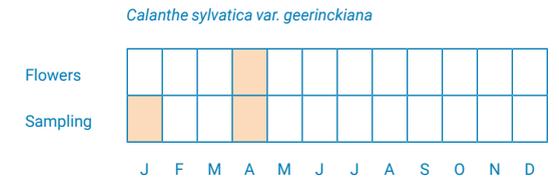
São Tomé



## Climate



## Phenology



## Rationale

The species is given a Red List status of CR. The EOO of *Calanthe sylvatica* var. *geerinckiana* cannot be estimated because the species is only known from the type collection. Its AOO is estimated to be 4 km<sup>2</sup>, which falls within the limits for CR category under criterion B2. The species is known from one subpopulation and one location (*sensu* IUCN 2016), which is the upper limit for CR category under the subcriterion 'a' of criterion B2. There are very few available details of the ecology/preferred habitat of *Calanthe sylvatica* var. *geerinckiana*. The species was collected in a crop area, in secondary forests, around Nova Ceilao. This situation is leading to a decline in the quality of the habitat. Intensive fieldwork in that area must be performed to search for *C. sylvatica* var. *geerinckiana*, and if found, the species should be at least introduced into cultivation. The estimated loss of the habitat of *C. sylvatica* var. *geerinckiana* leads us to predict a continuing decline in its mature individuals. Considering these facts, we then assigned to *Calanthe sylvatica* var. *geerinckiana* a preliminary status of CR B2ab(iii,v).

## Habitat and ecology

The species is known from secondary forest around Nova Ceilao, at 1,090 m elevation. There is very little information about its ecology/preferred habitat.

## Use and trade

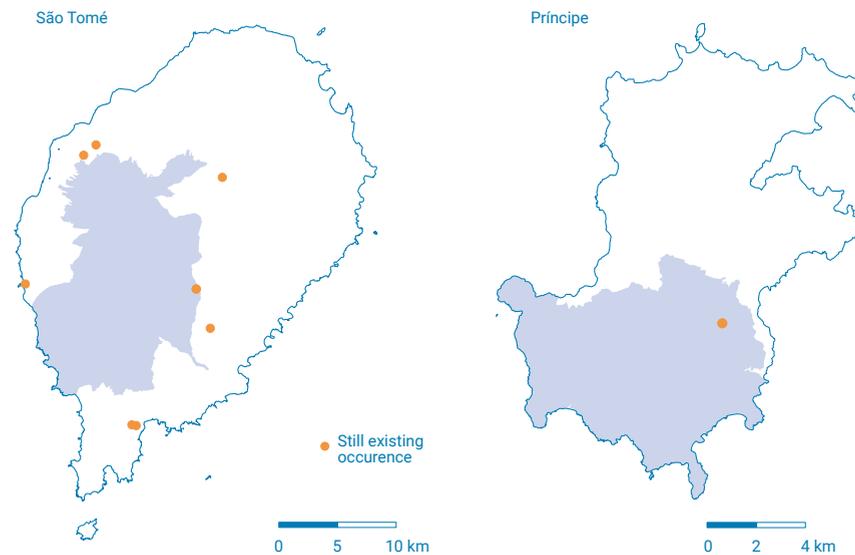
There are no known uses for this species.

## Population

*Calanthe sylvatica* var. *geerinckiana* is known only from the type collection. Its population is currently thought to decrease because the species habitat is a crop area in secondary vegetation.

# *Diaphanante acuta* (Ridl.) Schltr.

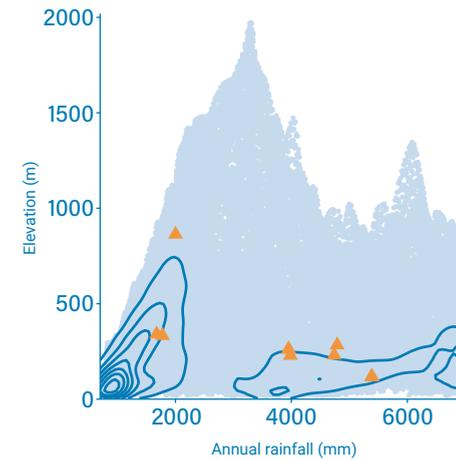
EN



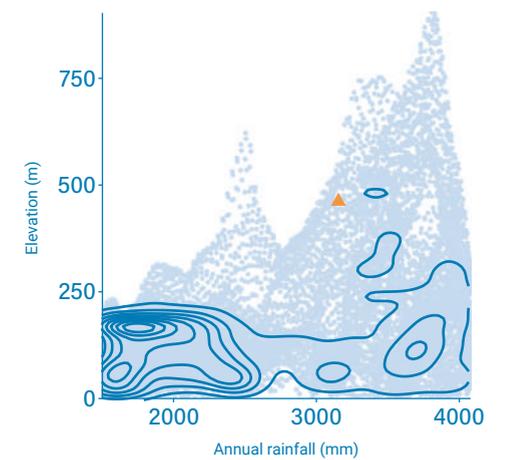
## Distribution

São Tomé and Príncipe

## Climate São Tomé

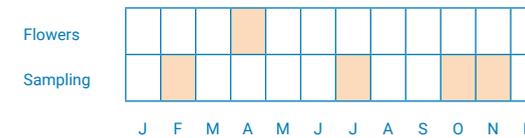


## Climate Príncipe



## Phenology

*Diaphanante acuta*



## Rationale

The species is given a Red List status of EN. The EOO of *Diaphanante acuta* is estimated to be 98.4 km<sup>2</sup>, which falls within the thresholds for CR under sub-criterion B1, whereas its AOO is estimated to be 12 km<sup>2</sup>, which falls within the thresholds for EN under sub-criterion B2. The species is known from six occurrences on São Tomé Island, of which three have already disappeared. The three remaining occurrences represent three subpopulations.

*Diaphanante acuta* has been collected in low altitude forests surrounding the PNOT, between 250 to 700 m elevation. The species is found alone and prefers the top of the trunks and especially the branches of very big trees like *Ficus* sp. It has been found on fallen trees because it remains there long enough after their fall. The habitat of *Diaphanante acuta* is currently impacted by human disturbance since it is accessible to local residents. The threats to the species' habitat are forest clearance for shifting agriculture, logging activities and the encroachment of industrial palm oil plantations in the southwestern part of the island.

Based on the most serious plausible threats which are industrial oil palm plantations, the three occurrences represent three locations (*sensu* IUCN 2019), which fall within the thresholds of the EN category under sub-criterion B2a. We infer a continuing decline in the area, extent and quality of the species habi-

tat. The disappearance of three occurrences led us to infer a continuing decline in EOO, AOO, number of locations, number of subpopulations and mature individuals of the species. *Diaphanante acuta* is thus assessed as EN B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v).

## Habitat and ecology

The species is known from lowland forests surrounding the PNOT. It is found alone and prefers the top of the trunks and especially the branches of very large trees like *Ficus* sp. It has been found on fallen trees because it remains there long enough after their fall.

## Use and trade

There are no known uses for this species.

## Population

The population of *Diaphanante acuta* is currently thought to be decreasing because the habitat of three occurrences has completely disappeared. The habitat of the three remaining occurrences in low altitude forests surrounding the PNOT, is currently facing forest clearance for shifting agriculture. The number of mature individuals of the species is not known and cannot be estimated since the species is epiphyte.

# *Diaphananthe papagayi* (Rchb.f.) Schltr.

CR

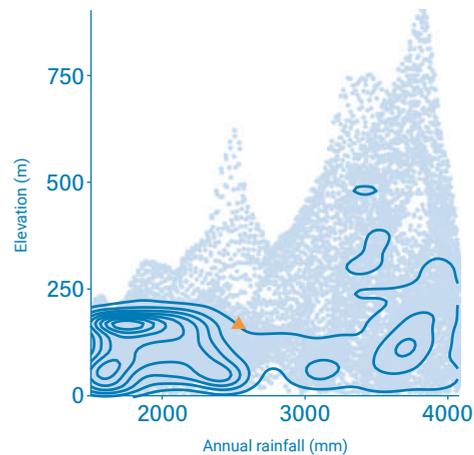


## Distribution

Príncipe



## Climate



## Rationale

The species is given a Red List status of CR. The EOO of *Diaphananthe papagayi* cannot be estimated because the species is only known from the type subpopulation. Its AOO is estimated to be 4 km<sup>2</sup>, which falls within the thresholds for CR under subcriterion B2. The species is known from one subpopulation and one location (*sensu* IUCN 2019), which is within the thresholds for CR under subcriterion B2a.

*Diaphananthe papagayi* occurs inside the Pico Papagaio, a protected area that is experiencing increased ecotourism with the construction of an hotel. The species was collected more than a century and half ago, and despite several botanical surveys in that region, has not been recollected again. It could be considered as possibly extinct. The projected loss of the habitat of *D. papagayi* indicates that if still extant there would be continuing decline in the species' habitat. Considering these facts, we assigned *D. papagayi* an IUCN status of CR(PE) B2ab(iii).

## Habitat and ecology

The species occurs on the shady rocky heights of Pico Papagaio. The species is found around 560 m elevation.

## Use and trade

There are no known uses for this species.

## Population

*Diaphananthe papagayi* is known from the Pico Papagaio which is experiencing increased ecotourism. The population trend of the species is decreasing. The number of mature individuals is not known and cannot be estimated since the species is epiphyte.

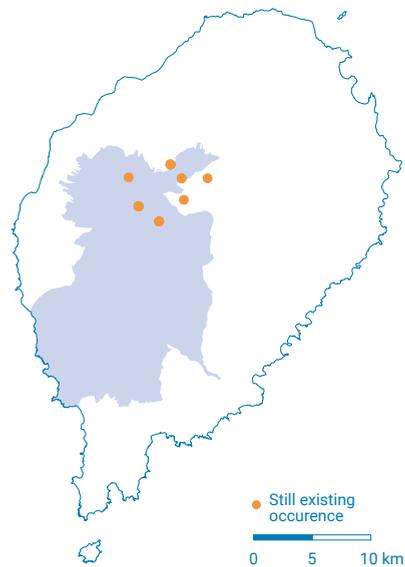
# *Diaphananthe thomensis* (Rolfe) P.J.Cribb & Carlsward

EN

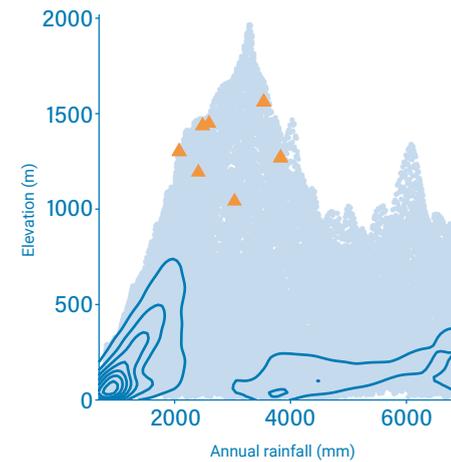


## Distribution

São Tomé



## Climate



## Phenology

*Diaphananthe thomensis*

	J	F	M	A	M	J	J	A	S	O	N	D
Flowers												
Sampling												

## Rationale

The EOO of *Diaphananthe thomensis* is estimated to be 32 km<sup>2</sup>, which falls within the thresholds for CR status under criterion B1, whereas its AOO is estimated to be 32 km<sup>2</sup>, which falls within the thresholds for EN status under criterion B2. The species is known from eight subpopulations on São Tomé Island (São Tomé and Príncipe). These eight subpopulations represent two different locations (*sensu* IUCN 2016), which falls within the thresholds for EN under subcriterion B1a+2a. *Diaphananthe thomensis* occurs in submontane and montane forests in the northern part of the island. The species has been collected mostly inside the PNOT, where its habitat is not under threat. However, the species has been collected outside the park, at Bom Sucesso, where its habitat is easily accessible by local residents. The main threats to the species are selective logging and shifting agriculture at small-scale. These activities will lead to the loss in the quality of the species habitat, as well as its mature individuals in the near future. For these reasons, *D. thomensis* is assessed as EN B1ab(iii,v)+2ab(iii,v).

## Habitat and ecology

The species is epiphyte in cloud forests, in submontane to montane vegetation. It is found between 900 and 1,600 m in elevation.

## Use and trade

The species is not known to be used or traded, however, specialist collectors with an interest in collecting and growing epiphytes might be interested in the species.

## Population

*Diaphananthe thomensis* is known from eight subpopulations representing two locations. The current population trend is decreasing since the species habitat is currently threatened by human activities such as selective logging and shifting agriculture. Its number of individuals is not known and cannot be estimated since the species is epiphyte.

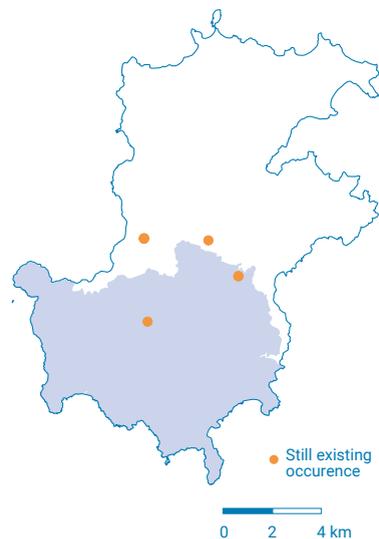
# *Diaphanante vagans* (Lindl.) P.J.Cribb & Carlswald

EN

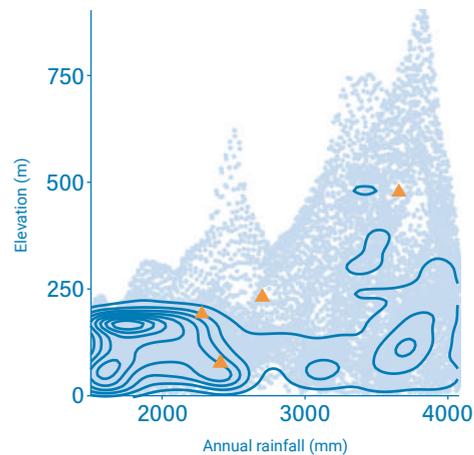


## Distribution

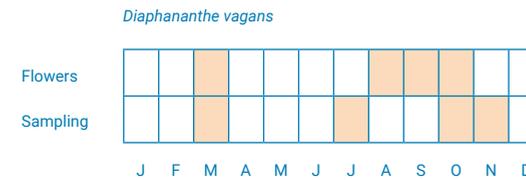
Príncipe



## Climate



## Phenology



## Rationale

The EOO of *Diaphanante vagans* cannot be estimated because the species is known only from two subpopulations, while the AOO is estimated to be 8 km<sup>2</sup>, which falls within the thresholds for CR status under criterion B2. The species is known from two subpopulations on Príncipe Island (São Tomé and Príncipe). These two subpopulations represent two different locations (*sensu* IUCN 2016), which falls within the thresholds for EN under subcriterion B2a. *Diaphanante vagans* occurs in dense old-growth forest of mid-altitude, and on primary thicket of 2 to 3 m on a basaltic plate. The species has been collected in the PNOP, a protected area that is not under threat. However, the species also occurs outside the park and its habitat there is threatened by human activities such as selective logging and forest clearance for shifting agriculture. The ongoing loss of the species habitat is leading and will lead to the decline in its mature individuals in the near future. For that reason, *D. vagans* is assessed as EN B2ab(iii,v).

## Habitat and ecology

The species occurred in dense old-growth forest of mid-altitude, and on primary thicket of 2 to 3 m on a basaltic plate. It is found between 370 and 400 m in elevation.

## Use and trade

The species is not known to be used or traded, however, specialist collectors with an interest in collecting and growing epiphytes might be interested in the species.

## Population

*Diaphanante vagans* is known from two subpopulations representing two locations. The current population trend is decreasing, since the species habitat is threatened by selective logging and forest clearance for shifting agriculture. Its number of individuals is not known and cannot be estimated since the species is epiphyte.



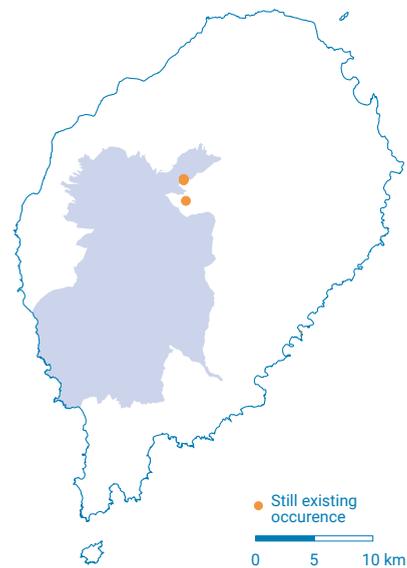
© Jean Lejoly

# Dinklageella scandens Stévant & P.J.Cribb

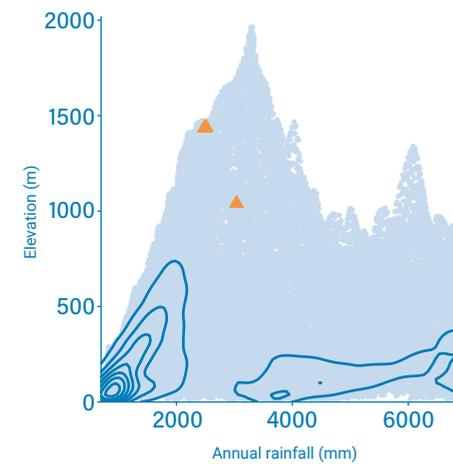


## Distribution

São Tomé



## Climate



## Rationale

The EOO of *Dinklageella scandens* cannot be estimated since the species is only known from two collections, whereas its AOO is estimated to be 8 km<sup>2</sup>, which falls within the thresholds for CR under criterion B2 (*sensu* IUCN 2019). The species is known from two subpopulations on São Tomé Island, and these two subpopulations represent two locations (*sensu* IUCN 2019), which falls within the thresholds for EN under criterion B2.

The habitat of *Dinklageella scandens* is currently impacted on São Tomé by shrubs and invasive plants that are replacing the natural vegetation, and by human disturbance due to tourism activity in the crater lake. We project that this degradation will continue in the future. Considering these facts, *D. scandens* is assigned an IUCN status of EN B2ab(iii).

## Habitat and ecology

The species is a climbing chamaephyte that grows in swamp meadows, amongst the vegetation of Lagoa Amelia (an ancient volcanic crater, now filled in). The species occurs in areas covered by open vegetation characterized by *Heteradelphina paulowilhemii* and *Rapanea melanophloea*. In this habitat, the taxon is terrestrial and forms dense populations, individuals above the herbaceous stratum kept together by long aerial roots (Stévant and Cribb 2004). *Dinklageella scandens* has also been collected in crest forest at Calvario (São Tomé). It is found between 510 and 1,450 m in elevation.

## Use and trade

There are no known uses for this species.

## Population

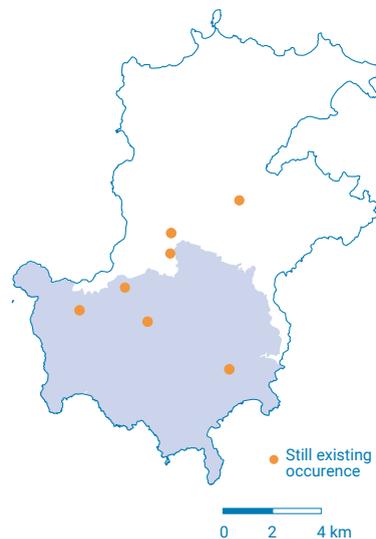
The population of *Dinklageella scandens* is currently thought to be decreasing because the species' habitat is threatened in São Tomé such as shrubs and invasive plants replacing the natural vegetation, and tourists degrading the crater lake. The species is terrestrial. The number of individuals is not known and cannot be estimated.

# Habenaria letouzeyana (Szlach. & Olsz.) P.J.Cribb & Stévant

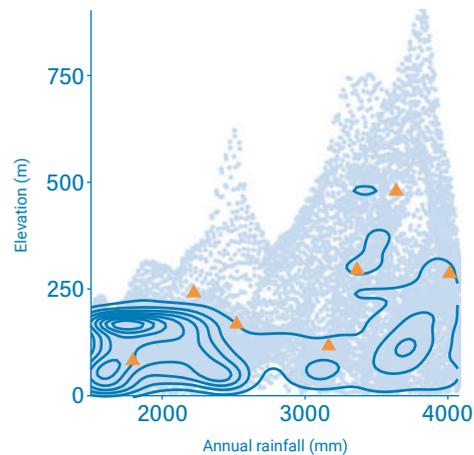


## Distribution

Príncipe



## Climate



## Rationale

The EOO of *Habenaria letouzeyana* is estimated to be 23.8 km<sup>2</sup>, which falls within the thresholds for CR under criterion B1, whereas its AOO is estimated to be 20 km<sup>2</sup>, which falls within the thresholds for EN under criterion B2. The species is known from five subpopulations in Príncipe Island and these five subpopulations represent four locations (*sensu* IUCN 2019), which falls within the thresholds for EN under criterion B2. *Habenaria letouzeyana* has been collected inside and outside of the PNST, a protected area that appears well managed. The habitat of *H. letouzeyana* outside the park is currently impacted by human disturbance since it is accessible to local residents. The main threats to the species are small-scale shifting agriculture, selective logging, urbanization and tourism activities. We project that this degradation will continue in the future. Considering these facts, *H. letouzeyana* is assigned an IUCN status of EN B1ab(iii)+2ab(iii).

## Habitat and ecology

The species is a terrestrial herb found in dense old-growth montane forest and in secondary forest in an old plantation. The species occurs between 150 and 600 m in elevation.

## Use and trade

The species is not known to be used.

## Population

The population of *Habenaria letouzeyana* is currently thought to be decreasing because the species occurs in secondary forest in an old plantation. *Habenaria letouzeyana* is a terrestrial herb. The number of individuals is not known and cannot be estimated.



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# Polystachya albescens Ridl. subsp. príncipensis Stévant



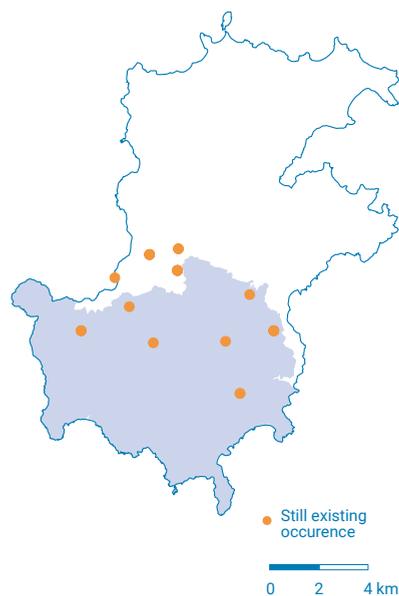
© Tariq Stévant



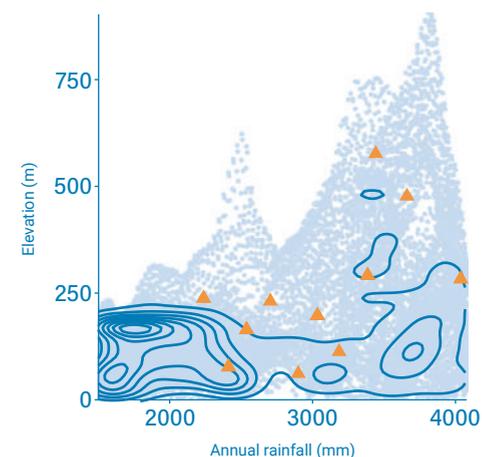
© Tariq Stévant

## Distribution

Príncipe



## Climate



## Rationale

The EOO of *Polystachya albescens* subsp. *príncipensis* is estimated to be 29.2 km<sup>2</sup>, which falls within the limits for CR category under criterion B1, whereas its AOO is estimated to be 20 km<sup>2</sup>, which falls within the limits for EN category under criterion B2. The species is known from five subpopulations in Príncipe Island (São Tomé and Príncipe). These five subpopulations represent two different locations (*sensu* IUCN 2016), which falls within the limits for EN category under subcriterion 'a' of criterion B2. *Polystachya albescens* subsp. *Príncipensis* occurs in low and mid altitude crests, in dense high forest, in secondary forest on old plantation, on isolated trees inside cocoa plantation, near roadsides and on thickets of 2 to 3 m on a basalt plate. The species is found between 100 to 680 m elevation. The species has been collected inside the PNOT, and its habitat inside the park is not under threat. Despite the EOO and AOO values of the species, the species does not appear to qualify as threatened under the IUCN red list criteria (2016). We do not project a significant decline of its AOO, EOO, in the number of its subpopulations or mature individuals within the near future. *Polystachya albescens* subsp. *príncipensis* is therefore assigned a preliminary status of LC.

## Habitat and ecology

The species occurs in low and mid-altitude crests, in dense high forest, in secondary forest on old plantation, on isolated trees inside cocoa plantation, near roadsides, and on primary thicket of 2 to 3 m on a basalt plate. It is found between 100 and 680 m in elevation.

## Use and trade

Unknown uses.

## Population

The current population trend of *P. albescens* subsp. *Príncipensis* is thought to decrease. Indeed, some subpopulations occur in unprotected areas that are under human pressure. *Polystachya albescens* subsp. *príncipensis* is either epiphyte, terrestrial or lithophyte. Its number of individuals is not known and cannot be estimated.



# *Polystachya biteaui* P.J.Cribb, la Croix & Stévant

EN



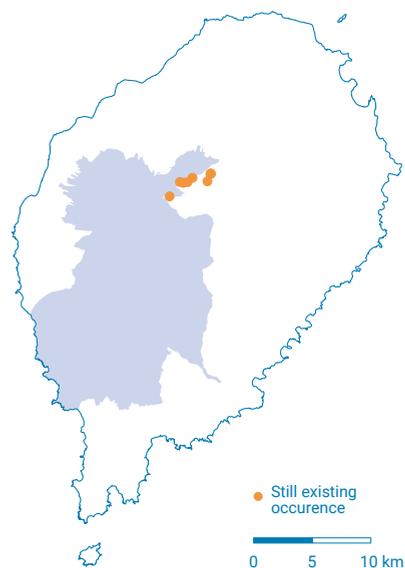
© Tariq Stévant



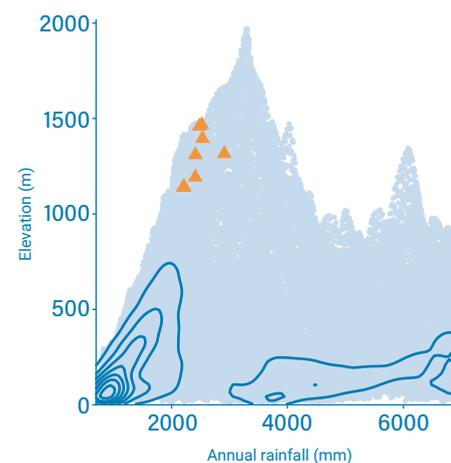
© Tariq Stévant

## Distribution

São Tomé



## Climate



© Tariq Stévant



## Rationale

The EOO and the AOO of *Polystachya biteaui* are estimated to be each 4 km<sup>2</sup>, both fall within the thresholds for CR under criterion B. The species is known from one subpopulation in São Tomé island but that subpopulation represents two locations (*sensu* IUCN 2019), which falls within the thresholds for EN under criterion B2. The habitat of *Polystachya biteaui* around the Bom Sucesso area is currently impacted by human disturbance since it is accessible to local residents. The species was growing on a tree in a cabbage and carrot plantation. The main threats to the species are forest clearance for shifting agriculture, small-holder farming and plantations, and timber exploitation at small and large scale. We project that this degradation will continue in the future. The projected ongoing loss of its habitat leads us to predict a continuous decline in mature individuals of the species since the host tree of the species has been felled. Considering all these facts, *Polystachya biteaui* is assigned an IUCN status of EN B1ab(iii,v)+2ab(iii,v).

## Habitat and ecology

The species occurs in dense old-growth montane forests. The species was collected on avocado trees in a plantation, and in leafy fallow, between 1,050 and 1,200 m in elevation.

## Use and trade

The species is not known to be used.

## Population

The population trend of *Polystachya biteaui* is thought to be decreasing since the species occurs mostly around the Bom Sucesso area, where the habitat has been largely destroyed. The species was growing on a tree in a cabbage and carrot plantation; this tree was cut down. *Polystachya biteaui* is an epiphyte. The number of individuals is not known and cannot be estimated.



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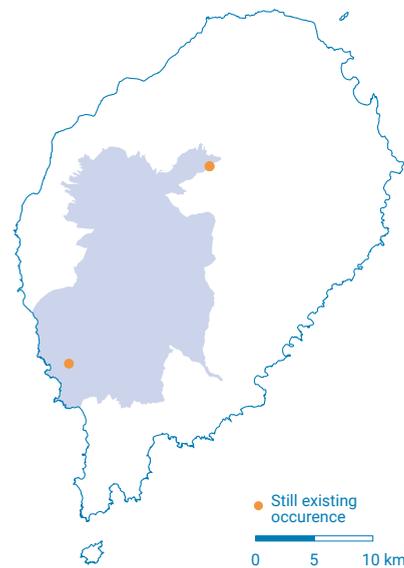
# Polystachya expansa Ridl.



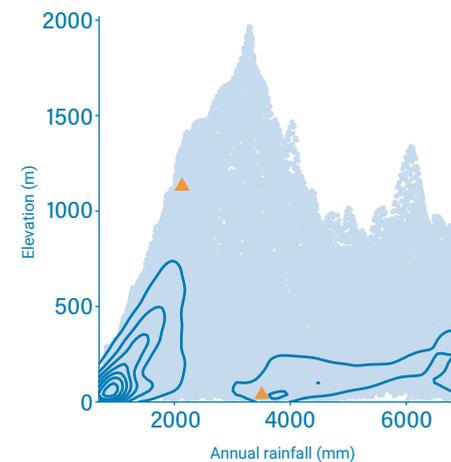
© Tariq Stévant

## Distribution

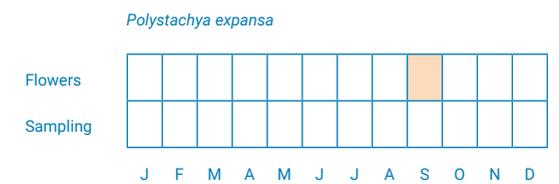
São Tomé



## Climate



## Phenology



## Rationale

The EOO and the AOO of *Polystachya expansa* are estimated to be 139 km<sup>2</sup> and 12 km<sup>2</sup> respectively, both fall within the thresholds for EN under criterion B. The species is known from three subpopulations on São Tomé Island and these three subpopulations represent three locations (*sensu* IUCN 2019), which falls within the thresholds for EN under criterion B2. Two of the subpopulations are located in unprotected areas where their habitat is threatened by human activities, such as shifting agriculture, small-holder farming and plantations, and selective logging. We project that the degradation of the species habitat will continue in the future. The projected ongoing loss of its habitat leads us to predict a continuous decline in mature individuals of the species. Considering all these facts, *Polystachya expansa* is assigned an IUCN status of EN B1ab(iii,v)+2ab(iii,v).

## Habitat and ecology

The species occurs in secondary forests in the southwest and in submontane forests in the northern part of the island. The species was found on a branch near the canopy, at a half-shade location. It occurs between 60 and 1,200 m in elevation.

## Use and trade

The species is not known to be used.

## Population

The population trend of *Polystachya expansa* is currently thought to be decreasing because the habitat of two of the three known subpopulations is currently facing shifting agriculture, small-holder farming and plantations, and selective logging. The number of individuals of the species is not known and cannot be estimated since the species is epiphyte.



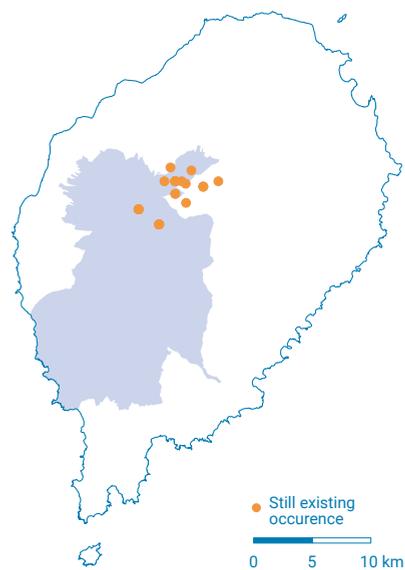
# Polystachya parviflora Summerh.

EN

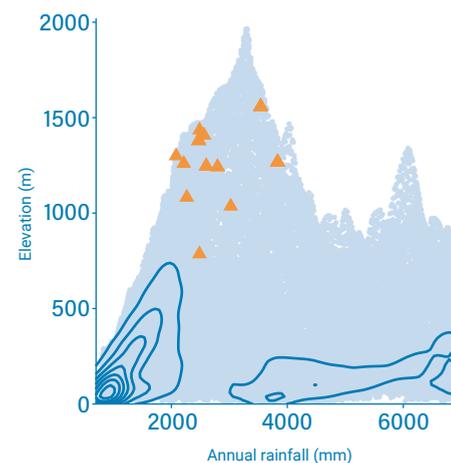


## Distribution

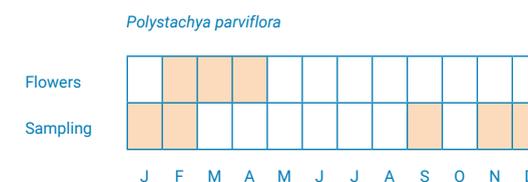
São Tomé



## Climate



## Phenology



## Rationale

The EOO of *Polystachya parviflora* is estimated to be 24 km<sup>2</sup>, which falls within the thresholds for CR category under criterion B1, whereas its AOO is estimated to be 24 km<sup>2</sup>, which falls within the thresholds for EN under criterion B2. The species is known from six subpopulations in São Tomé Island and these six subpopulations represent three locations (*sensu* IUCN 2019), which falls within the thresholds for EN under criterion B2. Some collection sites of the species are located in unprotected areas such as São Nicolau where the habitat is threatened by shifting agriculture, small-holder farming, and plantations of carrots, cabbages, and cocoa, selective logging at small and large scales. We project that this degradation will continue in the future. The projected ongoing loss of its habitat leads us to predict a continuous decline in mature individuals of the species. Considering all these facts, *P. parviflora* is assigned an IUCN status of EN B1ab(iii,v)+2ab(iii,v).

## Habitat and ecology

The species occurs on secondary or old-growth submontane forests, sometimes on old plantations, and in montane forests of the island. It has been collected on branches of medium to large diameter in a highly sunny situation. Although quite frequent in São Tomé, the species remains difficult to spot, especially in dense forests. *Polystachya parviflora* is found between 800 and 1,600 m in elevation.

## Use and trade

The species is not known to be used.

## Population

The current population trend of *Polystachya parviflora* is thought to be decreasing because the habitat of some subpopulations occurring in unprotected areas is facing a great deal of human pressure. The number of individuals of the species is not known and cannot be estimated since the species is epiphyte.



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# Polystachya principia Stévant & P.J.Cribb



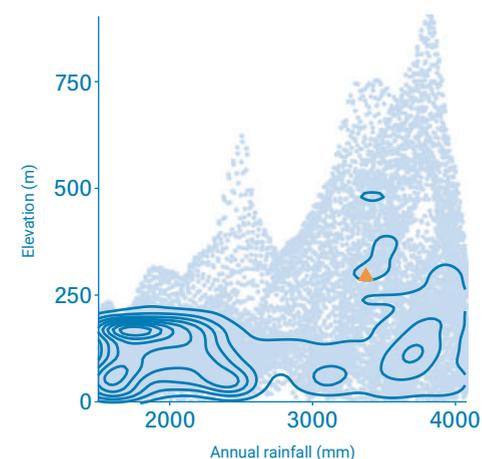
© Tariq Stévant

## Distribution

Cameroon, and Príncipe



## Climate



## Rationale

The EOO and the AOO of *Polystachya principia* are estimated to be 601 and 12 km<sup>2</sup> respectively, which fall within the thresholds for the EN category under subcriteria B1 and B2. The species is known from three occurrences, one in Cameroon and two on Príncipe Island, which represent two subpopulations.

*Polystachya principia* occurs in dense and high forest and in secondary forest in an old plantation, between 350–1,100 m elevation. It was collected within the PNOP, an area where most forests are intact and well managed. However, in Cameroon, the species habitat is threatened in the Kupe-Manengouba area by forest clearance for shifting agriculture at small-scale.

Based on the most serious plausible threat which is shifting agriculture, the three occurrences represent two locations (*sensu* IUCN 2019), which falls within the thresholds for EN under subcriteria B1a and B2a. We project that this degradation will continue in the future. We infer a continuing decline in the area, extent and quality of the species habitat, as well as in mature individuals of the species. *Polystachya principia* is thus assessed as EN B1ab(iii,v)+2ab(iii,v).

## Habitat and ecology

The species occurs in dense and high forest and in secondary forest in an old plantation, between 350 and 1,100 m in elevation.

## Use and trade

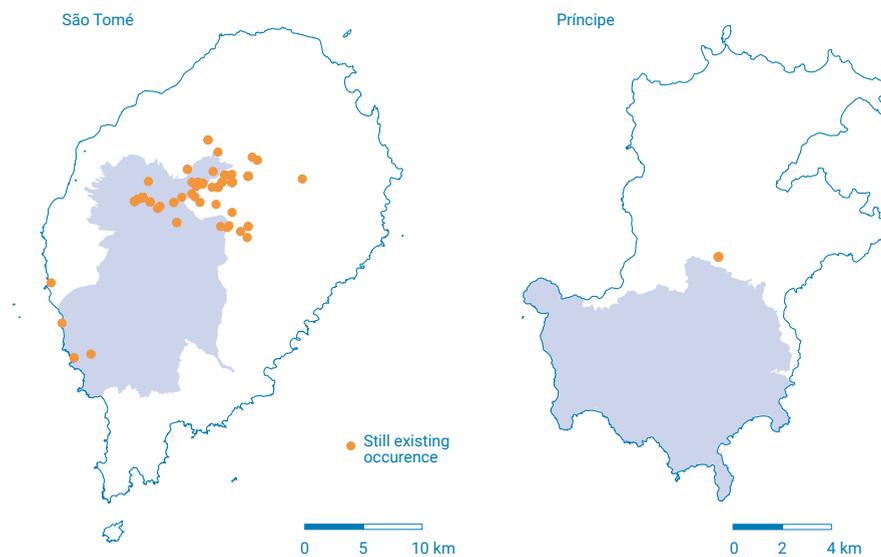
There are no known uses for this species.

## Population

The population trend of *Polystachya principia* is currently thought to be decreasing since the species' habitat in Cameroon is threatened by shifting agriculture. The number of mature individuals of the species is not known and cannot be estimated since the species is epiphyte.



# *Polystachya ridleyi* Rolfe



## Phenology

*Polystachya ridleyi*

	J	F	M	A	M	J	J	A	S	O	N	D
Flowers	■	■	■	■	■	■	■	■	■	■	■	■
Sampling	■	■	■	■	■	■	■	■	■	■	■	■



## Distribution

Annobón (Equatorial Guinea),  
and São Tomé and Príncipe

## Rationale

The EOO and the AOO of *Polystachya ridleyi* are estimated to be 1,498 and 48 km<sup>2</sup> respectively, both fall within the limits for EN category under the criterion B. The species is known from 12 subpopulations in Annobón and São Tomé Islands and these 12 subpopulations represent five locations (*sensu* IUCN 2016), the upper limit for EN category under the criterion B2. *Polystachya ridleyi* is an epiphyte in dense old-growth montane forest and in thicket. The species was also collected in secondary forest on ancient plantations and on coffee trees. It occurs between 400 to 2,030 m elevation. The species occurs within two protected areas: the Annobón Natural Reserve in Annobón Island and the PNOT. Its habitat within these protected areas does not appear under threat. *Polystachya ridleyi* was also found outside protected areas, where its habitat is currently impacted by human disturbance. In fact, in São Tomé Island, the vegetation of Bom Sucesso and São Nicolau sites has been considerably destroyed due to anthropogenic activities. The main threats to the species are shifting agriculture, small-holder farming and plantations, industrial coffee plantations and timber exploitation at small and large scale. These activities are gradually transforming the species habitat. We project that this degradation will continue in the future. The projected ongoing loss of its habitat leads us to predict a continuous decline in AOO, EOO, number of locations and mature individuals

of the species. Considering all these facts, *Polystachya ridleyi* is assigned a preliminary status of EN B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v).

### Habitat and ecology

The species is known from dense old-growth montane forest and in primary thicket. It was also collected in secondary forest on ancient plantations and on coffee trees. It occurs between 400 and 2,030 m in elevation.

### Use and trade

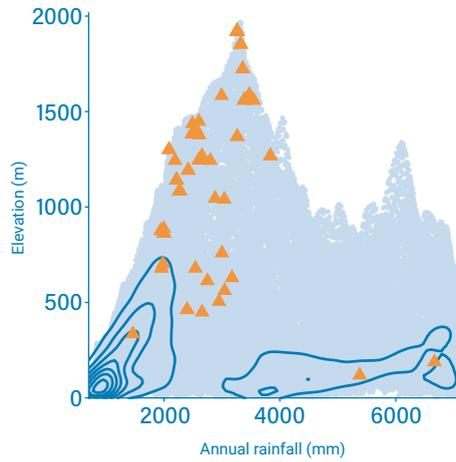
The species is not known to be used.

### Population

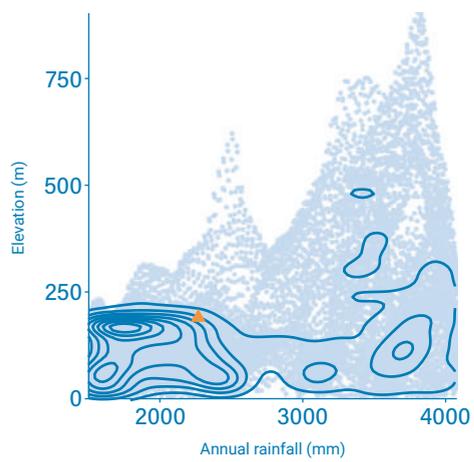
The population of *Polystachya ridleyi* is currently thought to decrease because the habitat of some subpopulations is under human pressure, for domestic needs. The number of individuals of the species is not known and cannot be estimated since the species is epiphyte.



Climate São Tomé



Climate Príncipe





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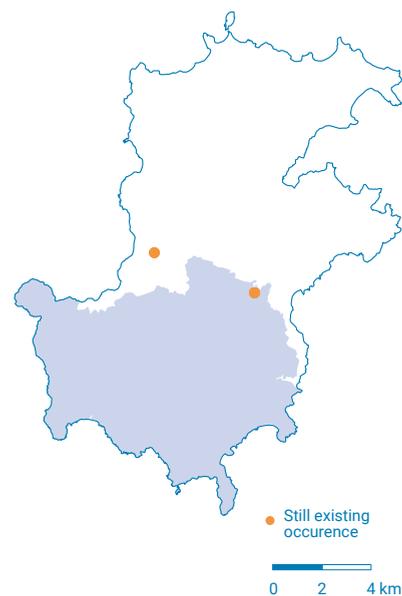
# Polystachya setifera Lindl.



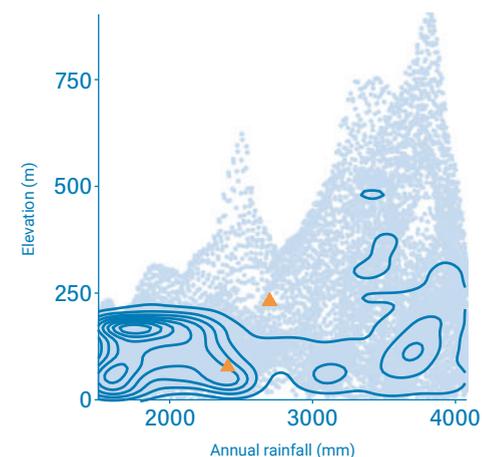
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## Distribution

Príncipe



## Climate



## Rationale

The EOO of *Polystachya setifera* cannot be estimated since the species is known from two unique occurrences, whereas its AOO is estimated to be 8 km<sup>2</sup>, which falls within the thresholds for the CR category under subcriterion B2. The species is known from two occurrences on Príncipe Island and these occurrences represent one subpopulation.

*Polystachya setifera* is common on low altitude ridges of the island, in half-shaded situations. The species is found on primary thicket from 2 to 3 m on a basalt plate, or 4 to 6 m on shallow soil. It has been collected in the center of the island, inside and outside of the PNOP, a protected area that appears well managed. Outside that protected area, the habitat of *Polystachya setifera* will be impacted by the construction of a hotel.

Based on the most serious plausible threat which is tourism and recreation areas, the two occurrences represent two locations (*sensu* IUCN 2019), which falls within the thresholds for the EN category under subcriterion B2a. We infer a continuing decline in the area, extent, and quality of the species habitat in the near future. In addition, the species is currently known from less than 250 mature individuals. *Polystachya setifera* is thus assessed as EN B2ab(iii)+D.

## Habitat and ecology

The species is common on low altitude ridges of the island, in half-shaded situations. It is found on primary thicket from 2 to 3 m on a basalt plate, or 4 to 6 m on shallow soil. It is found between 260 and 360 m in elevation.

## Use and trade

There are no known uses for this species.

## Population

On Príncipe Island, a large proportion of the forest was destroyed two centuries ago. Nowadays, almost all the vegetation located outside protected areas is threatened. The current population trend of *Polystachya setifera* is decreasing since the species' habitat outside the protected area is threatened. The number of mature individuals of *P. setifera* is not known and cannot be estimated since the species is epiphyte.



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# Polystachya thomensis Summerh.

LC



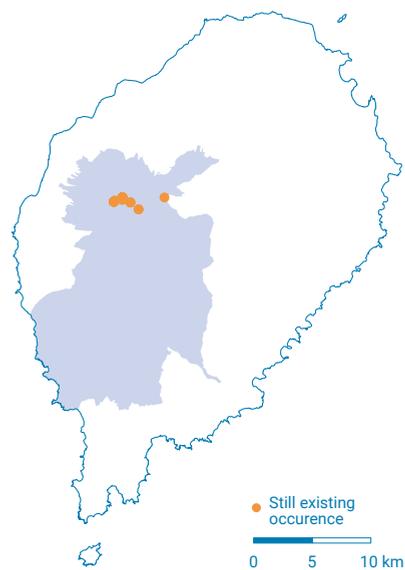
© Tariq Stévant



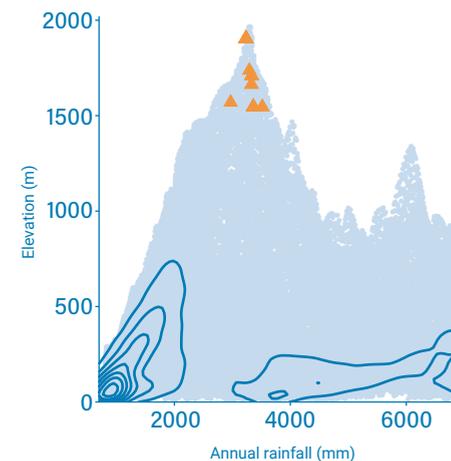
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## Distribution

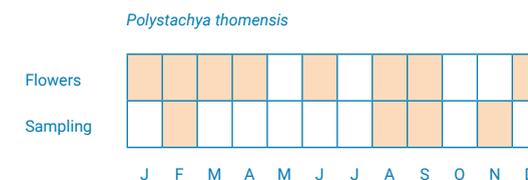
São Tomé



## Climate



## Phenology



## Rationale

The EOO and the AOO of *Polystachya thomensis* are estimated to be 8 km<sup>2</sup> each, both fall within the limits for CR category under criterion B1 and B2 respectively. The species is known from two subpopulations in São Tomé Island (São Tomé and Príncipe). These two subpopulations represent one location (*sensu* IUCN 2016), which falls within the limits for CR category under subcriterion 'a' of criterion B. *Polystachya thomensis* occurs on denuded slopes or in the lower plant formations that cover the top of the Pico de São Tomé, on branches of varying diameter. The species appreciates both shady habitats and those receiving a high luminous intensity. *Polystachya thomensis* has been collected inside the PNOT, and its habitat inside the park is not under threat. Despite the EOO and AOO values of the species, the species does not appear to qualify as threatened under the IUCN red list criteria (2016). We do not project a significant decline of its AOO, EOO, in the number of its subpopulations or mature individuals within the near future. *Polystachya thomensis* is therefore assigned a preliminary status of LC.

## Habitat and ecology

The species is found on denuded slopes or in the lower plant formations that cover the top of the Pico de São Tomé, on branches of varying diameter. The species appreciates both shady habitats and those receiving a high luminous intensity. It is found between 1,550 and 2,000 m in elevation.

## Use and trade

Unknown uses.

## Population

The current population trend of *Polystachya thomensis* is assumed to be stable since all the known collections of the species occur within a protected area which is well managed. Its number of individuals is not known and cannot be estimated since the species is epiphyte.



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# Rhipidoglossum brevifolium Summerh.

EN



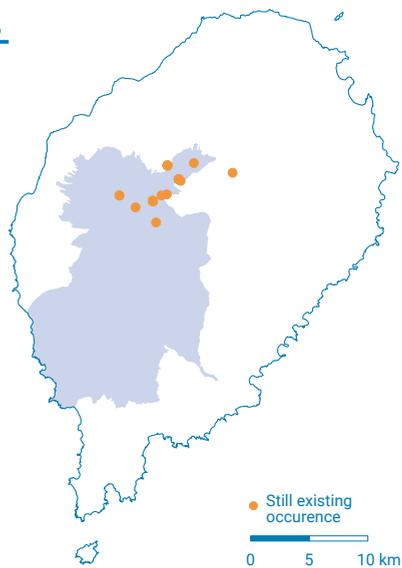
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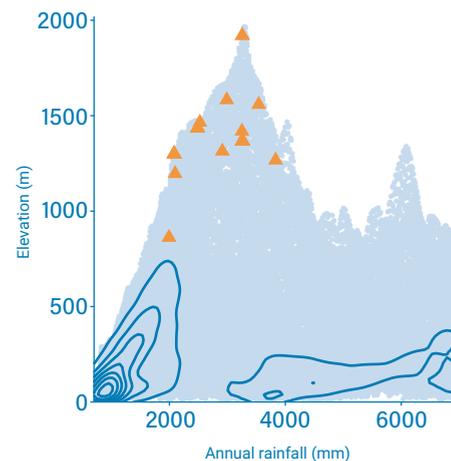
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## Distribution

São Tomé



## Climate



## Rationale

We were able to georeference subpopulations in Lagoa Amelia and Morro Provaz; it was not the case for those collected in «West side of Pico», «between Monte Café and the Pico», and «São Tomé Island». Considering only the six georeferenced specimens, the EOO is estimated to be 6.7 km<sup>2</sup>, which falls within the limits of the CR category under subcriterion B1, whereas the AOO is estimated to be 16 km<sup>2</sup>, which falls within the limits of the EN category under subcriterion B2. The EOO value was considered equal to the AOO value. The species is known from six occurrences in São Tomé Island (São Tomé and Príncipe) and these occurrences represent three different locations (*sensu* IUCN 2019), which falls within the thresholds for EN under subcriterion B2a.

*Rhipidoglossum brevifolium* occurs in dense montane rainforest as an epiphyte, a few metres high on shrubs and bushes. The species is found as terrestrial in the vegetation covering the peaks around 1,400 m elevation. *Rhipidoglossum brevifolium* also prefers open areas like the Lagoa Amelia Crater Lake and roadsides. The species has been collected inside the PNOST, and its habitat inside the park is not under threat. *Rhipidoglossum brevifolium* has also been recorded outside the PNOST, where its habitat is threatened by shifting agriculture, selective logging and farmer activities by local residents. Considering these facts, *R. brevifolium* is assigned a status of EN B1ab(iii,v)+2ab(iii,v).

## Habitat and ecology

The species occurs in dense montane rainforest, as an epiphyte, a few meters high on shrubs and bushes. The species is found as terrestrial in the vegetation covering the peaks around 1,400 m elevation. *Rhipidoglossum brevifolium* also prefers open areas like the Lagoa Amelia Crater Lake and roadsides. It is found between 1,260 to 1,440 m elevation.

## Use and trade

There are no known uses for this species.

## Population

The population trend of *Rhipidoglossum brevifolium* is currently thought to be decreasing because the habitat of subpopulations is threatened by shifting agriculture, selective logging and farmer activities. The number of mature individuals of the species is not known and cannot be estimated since the species is either epiphyte or terrestrial.



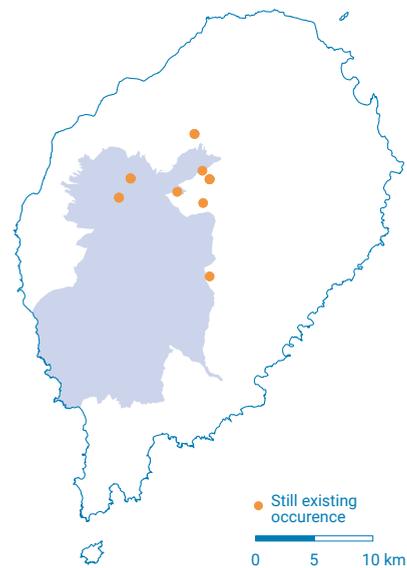
© Tariq Stévant

**Rhipidoglossum pendulum (la Croix & P.J.Cribb)**  
**Farminhão & Stévant**  
**Syn: Cribbia pendula**  
**la Croix & P.J.Cribb**

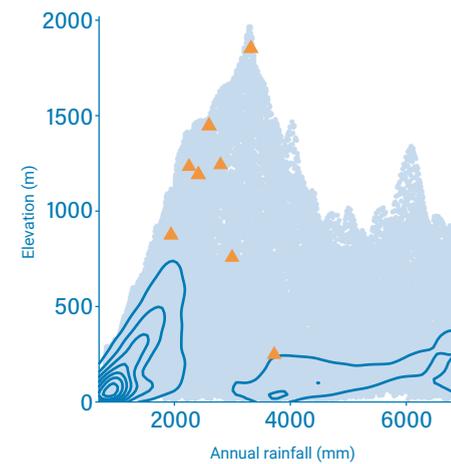


**Distribution**

São Tomé



**Climate**



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**Rationale**

The species is assessed as EN. The EOO of *Rhipidoglossum pendulum* is estimated to be 52.4 km<sup>2</sup>, which falls within the thresholds for CR under criterion B1 whereas its AOO is estimated to be 20 km<sup>2</sup>, which falls within the thresholds for EN under criterion B2. The species is known from five subpopulations on São Tomé Island and these five subpopulations represent three different locations (*sensu* IUCN 2016), which falls within the thresholds for EN under subcriterion B1a+2a. *Rhipidoglossum pendulum* has been collected on high branches of trees in high altitude forests of the north of the island, lowland forests of the south of the island, and secondary submontane forests. The species occurs inside and outside of the PNOT. At mid- to low-altitude forests outside the park, the habitat of *Rhipidoglossum pendulum* is currently impacted by industrial palm oil plantations and illegal selective logging. These activities are gradually leading to the ongoing loss of the species habitat. The ongoing loss of the species habitat will lead to the continuous decline in mature individuals of the species. For these reasons, *Cribbia pendula* is assessed as EN B1ab(iii,v)+2ab(iii,v).

**Habitat and ecology**

The species is epiphyte on high branches of trees in montane forests of the north of the island, lowland forests of the south of the island and secondary submontane forests. It is found between 230 to 2,000 m elevation.

**Use and trade**

The species is not known to be used or traded, however, specialist collectors with an interest in collecting and growing epiphytes might be interested in the species.

**Population**

The population of *Rhipidoglossum pendulum* is currently thought to decrease because in mid and low-altitude, forests are threatened by industrial palm oil plantations and illegal selective logging. The number of individuals of the species is not known and cannot be estimated since the species is epiphyte.



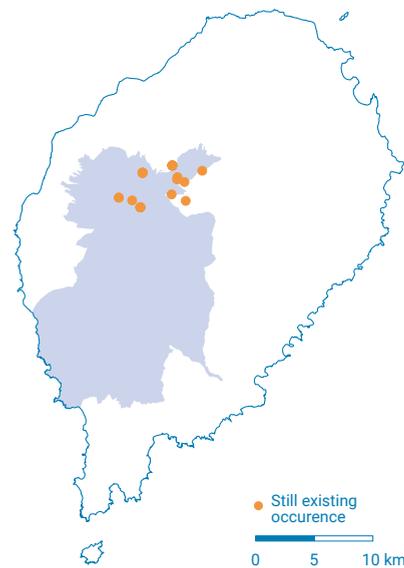
© Tariq Stévant

**Rhipidoglossum**  
**thomense**  
**(la Croix & P.J.Cribb)**  
**Farminhão & Stévant**  
**Syn: Cribbia**  
**thomensis la Croix**  
**& P.J.Cribb**

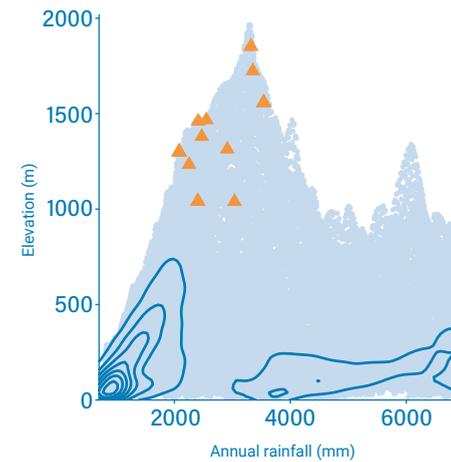


**Distribution**

São Tomé

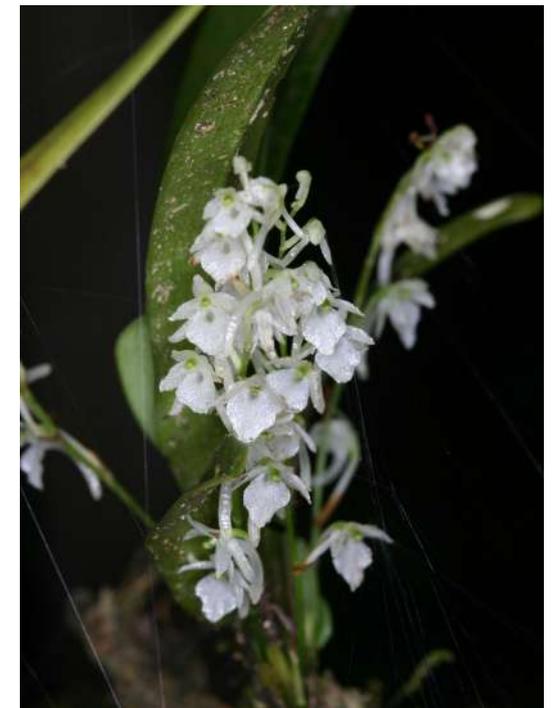


**Climate**



**Rationale**

The species is assessed as EN. The EOO of *Rhipidoglossum thomense* is estimated to be 28 km<sup>2</sup>, which falls within the thresholds for CR under criterion B1, whereas its AOO is estimated to be 28 km<sup>2</sup>, which falls within the thresholds for EN under criterion B2. The species is known from seven subpopulations in São Tomé Island. These seven subpopulations represent two different locations (*sensu* IUCN 2016), which falls within the thresholds for EN under subcriterion B1a+2a. *Rhipidoglossum thomense* occurs in old-growth montane and dense forests of the northern part of the island. The species has been collected mostly inside the PNOST, and its habitat inside the park is not under threat. However, the species is also recorded outside the park, at Bom Sucesso, where its habitat is easily accessible by local residents. The main threats to the species are selective logging and forest clearance for shifting agriculture at small-scale and farmer activities. The ongoing loss of the species habitat will lead to a continuing decline in mature individuals of the species. For these reasons, *Rhipidoglossum thomense* is assessed as EN B1ab(iii,v)+2ab(iii,v).



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**Habitat and ecology**

The species is restricted to old-growth montane forests of the northern part of the island. It was collected on branches of low diameter, in a shady position. It is found between 1,350 and 2,000 m in elevation.

**Use and trade**

The species is not known to be used or traded, however, specialist collectors with an interest in collecting and growing epiphytes might be interested in the species.

**Population**

The current population trend of *Rhipidoglossum thomense* is decreasing because the species habitat is currently threatened by human activities such as selective logging and shifting agriculture. Its number of individuals is not known and cannot be estimated since the species is epiphyte.



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**Stolzia**  
**peperomioides**  
**(Kraenzl.) Summerh.**  
**subsp. *thomensis***  
**(Stévant & P.J.Cribb)**  
**Stévant, Droissart**  
**& Simo**

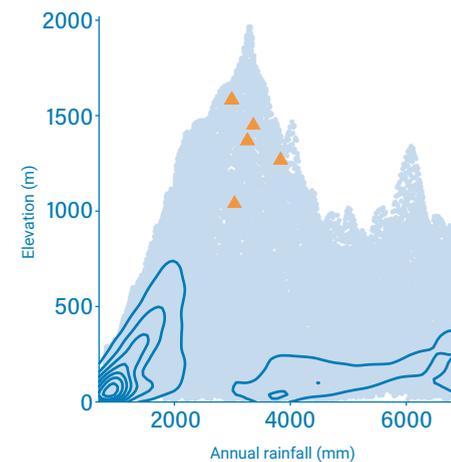


**Distribution**

São Tomé



**Climate**



**Rationale**

The EOO and the AOO of *Stolzia peperomioides* subsp. *thomensis* are estimated to be 8 km<sup>2</sup> each, both fall within the limits for CR category under the criterion B1 and B2 respectively. The species is known from two subpopulations in São Tomé Island and these two subpopulations represent two locations (*sensu* IUCN 2016), which falls within the limits for EN category under the criterion B2. *Stolzia peperomioides* subsp. *thomensis* has been collected in dense old-growth montane forest in the northern part of the island, inside and outside of the PNOT. The habitat of *Stolzia peperomioides* subsp. *thomensis* outside the park is currently impacted by human disturbance since it is accessible to local residents. The main threats to the species are shifting agriculture, small-holder farming and plantations, and illegal selective logging. We project that this degradation will continue in the future. The projected ongoing loss of its habitat leads us to predict a continuous decline in mature individuals of the species. Considering these facts, *Stolzia peperomioides* subsp. *thomensis* is assigned a status of EN B1ab(iii,v)+2ab(iii,v).



© João Farnimão



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**Habitat and ecology**

The species occurs in dense old-growth montane forest. It is found between 1,350 to 2,000 m elevation.

**Use and trade**

Unknown uses.

**Population**

The current population trend of *Stolzia peperomioides* subsp. *thomensis* is thought to decrease since some collections were made in habitats that are currently under threat. The number of individuals of the species is not known and cannot be estimated since the species is epiphyte.



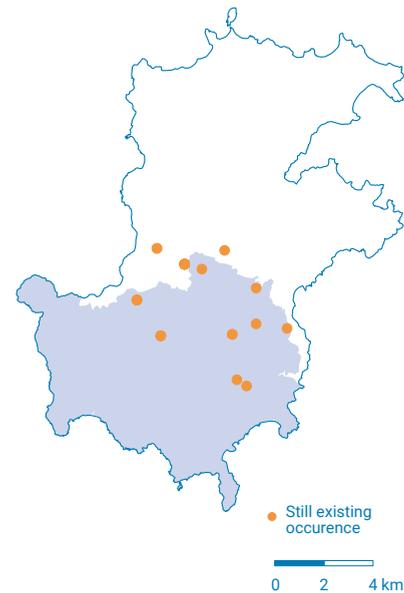
# Tridactyle aurantiopunctata P.J.Cribb & Stévant

EN

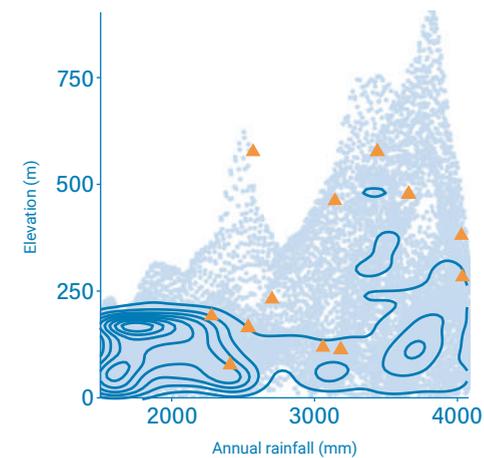


## Distribution

Príncipe

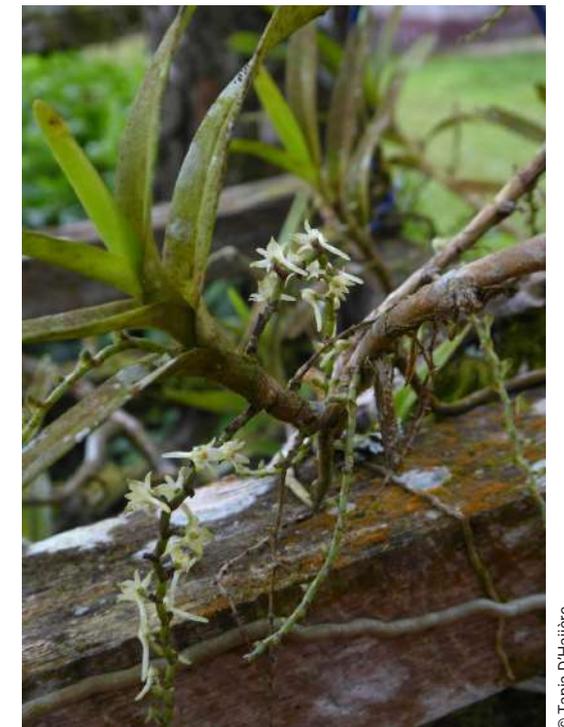


## Climate



## Rationale

The 13 occurrences of *Tridactyle aurantiopunctata* represent two subpopulations. Its EOO is estimated to be 754 km<sup>2</sup> and its AOO is estimated to be 28 km<sup>2</sup>, both fall within the limits of the EN category under the criteria B1 and B2 respectively. Outside the protected areas where the species occurs, its habitat is facing forest clearance for shifting agriculture. With regards to that most serious plausible threat, the 13 occurrences represent three locations (*sensu* IUCN 2019), which falls within the limits of the EN category under the criteria B1 and B2. We project that shifting agriculture will continue in the near future, a situation that is already leading to a continuous decline in mature individuals of the species. Considering these facts, *Tridactyle aurantiopunctata* is assessed as EN B1ab(iii,v)+2ab(iii,v).



## Habitat and ecology

The species is found in old-growth or old secondary forest, between 100 to 680 m elevation. The species is epiphyte in 5 to 30 m tall trees. It was found growing in small clumps on medium-size branches and it prefers shady places in the canopy or at 2-3 m above the ground.

## Use and trade

There are no known uses for this species.

## Population

*Tridactyle aurantiopunctata* is known from two subpopulations. Its population trend is thought to be decreasing because the species habitat in some collecting sites is currently facing human activities.



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# *Tridactyle thomensis* P.J.Cribb & Stévant

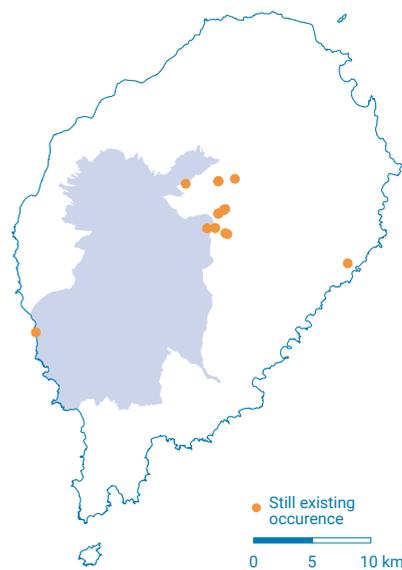
EN



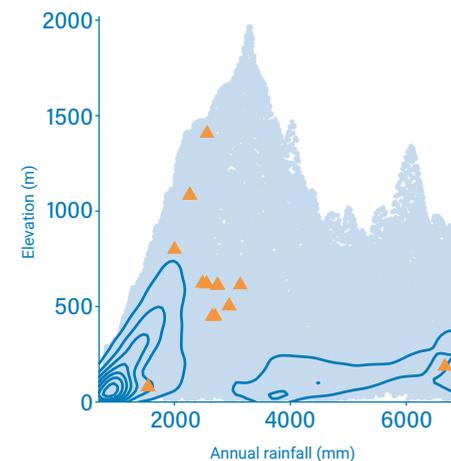
© João Faminhão

## Distribution

São Tomé



## Climate



© Tania D'Hajjère

## Rationale

The EOO and the AOO of *Tridactyle thomensis* are estimated to be 284 and 20 km<sup>2</sup> respectively, both fall within the limits for EN category under the criteria B1 and B2 respectively. The species is known from five subpopulations in São Tomé Island and these five subpopulations represent four locations (*sensu* IUCN 2016), which falls within the limits for EN category under the criterion B2. *Tridactyle thomensis* has been collected on old plantations and secondary forest. The species is epiphyte on branches and trunks of trees, in particular on *Dracaena arborea* K. Koch. It was found between 0 to 830 m elevation. One of the five known subpopulations of the species occurs within the PNOT, a protected area well managed. However, the other populations of *Tridactyle thomensis* such as those occurring at Agua Belas and São Nicolau are highly threatened by forest clearance for shifting agriculture, small-holder plantations and farmers, agro-industry plantations and timber exploitation. We project that this habitat degradation will continue in the future. The projected ongoing loss of its habitat leads us to predict a continuous decline in the number of subpopulations, mature individuals and thus its AOO and EOO. Considering all these facts, *Tridactyle thomensis* is assigned a preliminary status of EN B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v).

## Habitat and ecology

The species is found on old plantations and secondary forest. It is epiphyte on branches and trunks of trees, in particular on *Dracaena arborea* K. Koch. It was found between 0 and 830 m in elevation.

## Use and trade

Unknown uses.

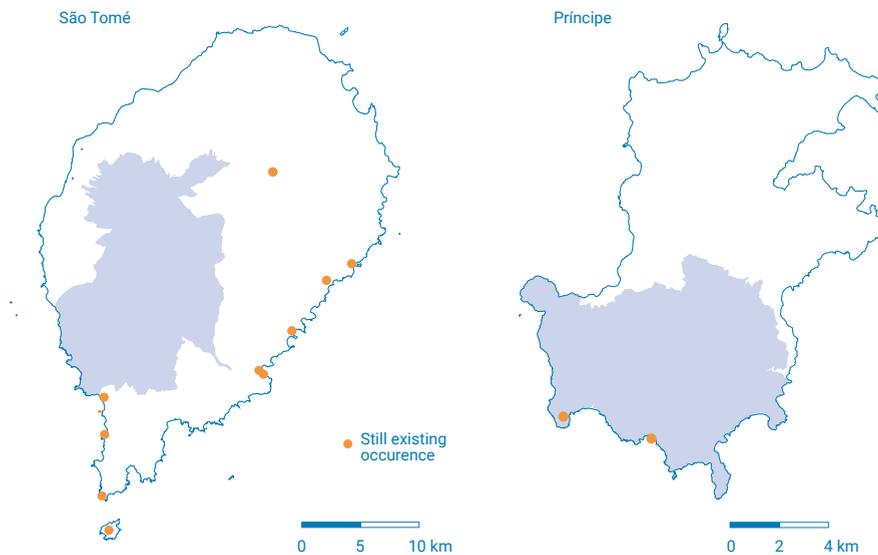
## Population

The current population trend of *Tridactyle thomensis* is thought to decrease since some subpopulations occurring outside the protected area are highly threatened by human activities. The number of individuals of *Tridactyle thomensis* is not known and cannot be estimated since the species is epiphyte.



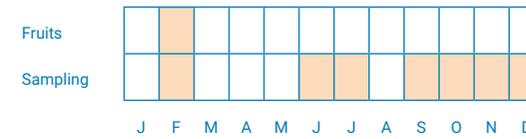
© Tariq Stévant

# Pandanus thomensis Henriq.



## Phenology

*Pandanus thomensis*



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## Distribution

São Tomé and Príncipe

## Rationale

The species has been assessed as VU D2 in 1998 but without any information on threat. The collection of new information justify its reassessment. *Pandanus thomensis* occurs in coastal forest of São Tomé and Príncipe but its distribution is limited to patches of coastal forest almost all around São Tomé and Príncipe (the species is known only by 12 occurrences but many unpublished observations assess the presence of the species all around Príncipe and on the south coast of São Tomé). It is a medium size tree (10-15 m), and the species has no value as a timber, but leaves are used to prepare local carpets. However, this impact is quite limited since the harvesting is sustainable. The species is known from 15 collections but two of them were probably cultivated and are not taken into account for the assessment. The 13 remaining collections represent 12 occurrences and 4-5 subpopulations (1-2 in Príncipe and 3 in São Tomé). Its extent of occurrence is calculated to be 2813.402 km<sup>2</sup>, within the limit for EN status under subcriterion B1, while its area of occupancy is estimated to be 48 km<sup>2</sup>, also within the limit for EN status under subcriterion B2. All of its occurrences occur around protected areas in São Tomé (except the one at Praia Bindá) and the subpopulations that occur in Príncipe are in the PNOP and around. There is no evidence that former subpopulations were threatened by habitat destruction, but we can suspect that a decline in habitat extent and

quality will occur in São Tomé due to tourism development near beaches (Anna Tordo for example). The 12 occurrences represent 9 locations based on the main threat which is tourism development (1 in Príncipe, 8 in São Tomé), therefore, the species is assessed as Vulnerable under B1ab(iii)+2ab(iii).

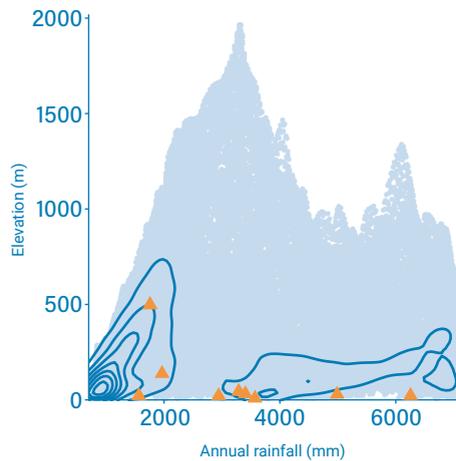
## Habitat and ecology

The species is a tree up to 15 m tall, described in São Tomé mangroves (Figueiredo, 2011; Lebigre, 2003), in streamside forests (CJB) and in shade forests (Carvalho et al., 2004), at altitudes below 500 m (CJB; Stone, 1973).

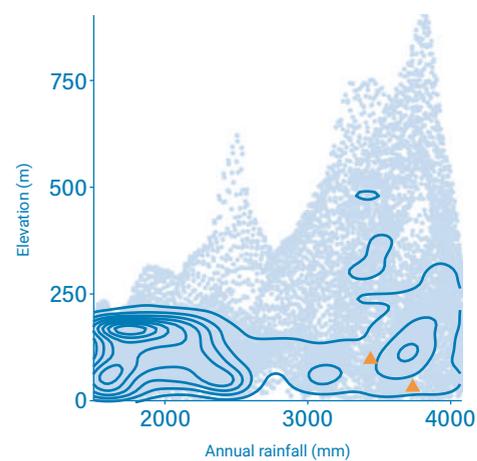
## Use and trade

The species is frequently used. In Príncipe, it is used for the manufacture of mats with dry leaves. In São Tomé, it is used for: 1. Increase the size of the penis - When the child is born with a very small penis, it is believed that this can be altered by preparing a bottle with a drink and in which one macerates a piece of the root with the measurement of the penis of adult desired (white wine is used to give babies and brandy for ages between 5 and 20 years at most). 2. Swollen glands and abscesses - Dry leaf with stone oil is used for treatment of swollen glands and abscesses. 3. Kidney pains. - For the relief of kidney pains the patient is placed on a mat made with leaves of this plant.

## Climate São Tomé



## Climate Príncipe





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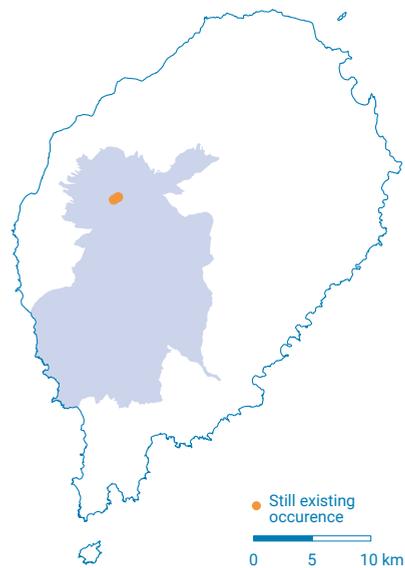
# Balthasaria mannii (Oliv.) Verdc.



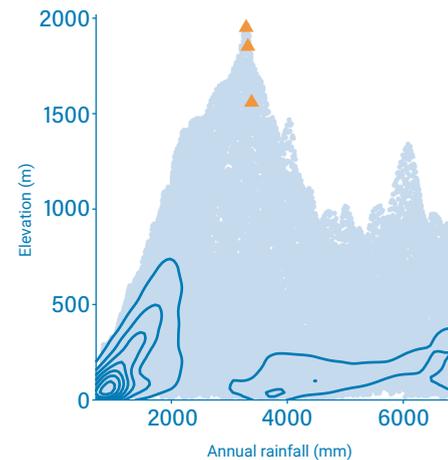
© Gilles Dauby

## Distribution

São Tomé



## Climate



## Rationale

*Balthasaria mannii* is a tree up to 15 m high, and 1 m in diameter; known from open montane forest between 1,600 and 2,000 m in elevation. The species is endemic to São Tomé island and is known from six collections made between 1861 (Mann 1066) and 2019 (Lachenaud 2871) at or around the top of the Pico de São Tomé. The four other collections were made in 1907 (Campos 38, without precisely locality), and in 1956 (Monod 11922 at Western face of Pico de São Tomé, Monod 11973 at Pico Pequeno, and Monod 12228bis at Pico, western slope) (Exell 1959). Because of the inaccurate geographical information the occurrence represented by the collection Campos (38) is not considered for this evaluation. The five collections represent four distinct occurrences. Considering the forest cover, which has not been disturbed or reduced in the area, we consider none of those occurrences as extirpated. Despite recent sampling specifically conducted to search for that species, only one mature individual was found. However, a large part of the montane forest on the Pico de São Tomé is inaccessible because of the steep slopes. The western slopes of the Pico de São Tomé have also not been surveyed and more individuals may occur here. This species is a long-lived species with a generation time likely over 60-years. Its habitat could be directly threatened by tourist activities (e.g. accidental fires from campers), and be indirectly threatened by the expansion of invasive species. In particular, we infer native tree populations to be replaced by populations of *Cinchona* tree species. *Cinchona* spp. was largely planted at the end of the 19th century, and observations on its dynamics (locally high frequency in both upper canopy and lower strata highlighting its regeneration capacity) support the hypothesis it could be invasive and threaten native plant populations (e.g., *Erica* and *Lobelia*) in this ecosystem. This invasion has not ceased. Based on a 2 x 2 km cell size, the AOO of this species is estimated as 8 km<sup>2</sup>, below the up-



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per threshold for CR status under subcriterion B2. The EOO is estimated as 0.12 km<sup>2</sup>, below the AOO, so we consider the EOO as 8 km<sup>2</sup> below the upper threshold for CR status under subcriterion B1. These three occurrences represent one subpopulation. All are located within the PNOT and are threatened by *Cinchona* invasion that will degrade the quality of the habitat. Consequently, they represent one location (*sensu* IUCN 2019), with regards to the most serious current threat (invasive species). Based on the past, and current threat of the occurrences at the Pico São Tomé and at Pico Pequeno, we infer a past, present, and future continuing decline in the extent and habitat quality. In fact, we do not know how many individuals exist. We can say the occurrence documented by Lachenaud 2871 consists of a single tree, but we did not survey the west slopes of the Pico de São Tomé, where more individuals are likely to occur (based on Monod's historical collections). Still, there is a good probability the number of individuals is < 50, so subcriteria C2 and D also apply. Therefore, we infer a continuing decline in the number of mature individuals (90% of its mature individuals). *Balthasaria mannii* is thus assessed as CR B1ab(iii,v)+2ab(iii,v); C2a(i,ii); D.

## Habitat and ecology

The species occurs in open montane forest; between 1,600 and 2,000 m in altitude.

## Use and trade

The species is not known to be used.

## Population

The species has a very restricted population. We consider the number of mature individuals to be less than 50. Only one adult individual was found in the field in 2019.



### Habitat and ecology

The species is known from secondary forest, forest on ridge, rocky forest, between 44 and 950 m in elevation.

### Use and trade

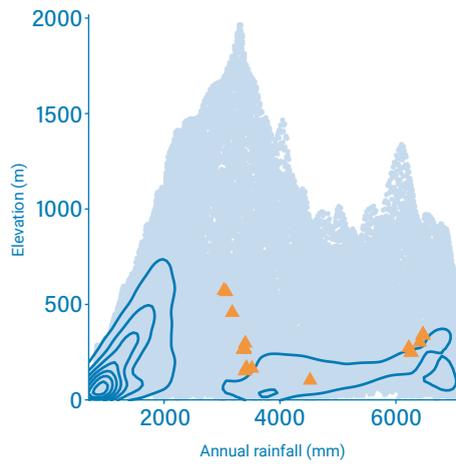
There is no known use for the species.

### Population

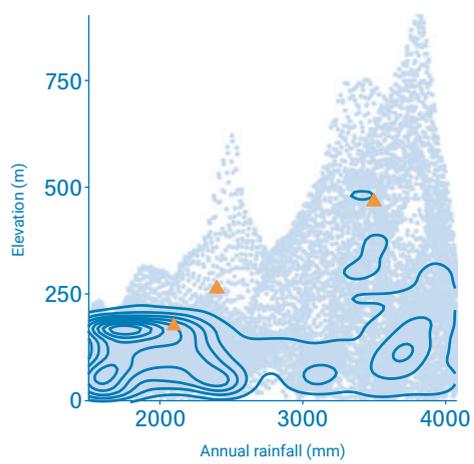
No quantitative population data are available for this species.



Climate São Tomé



Climate Príncipe





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# Cassipourea glomerata Alston

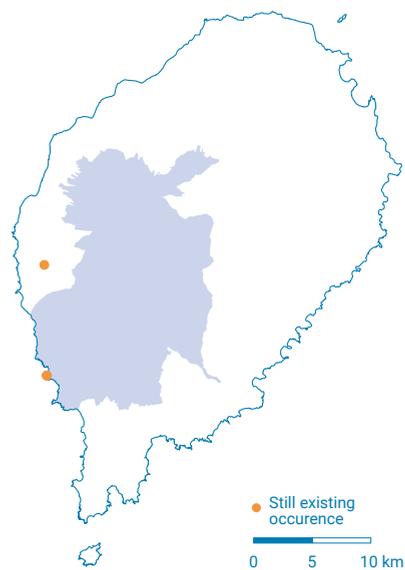
EN



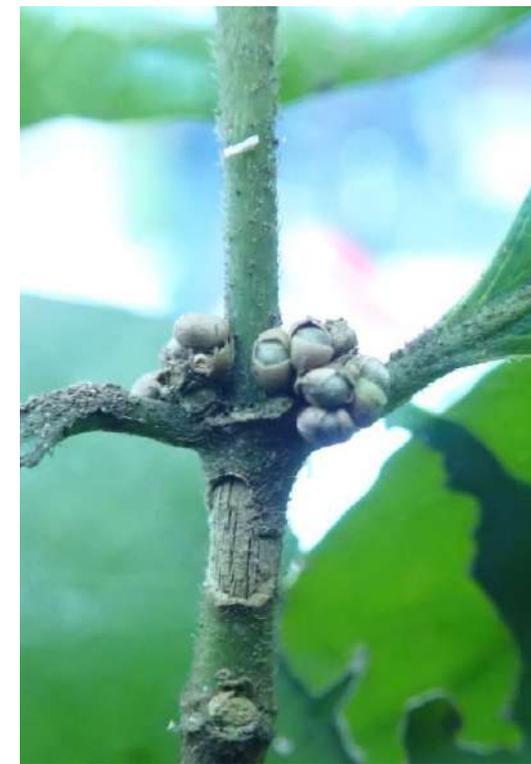
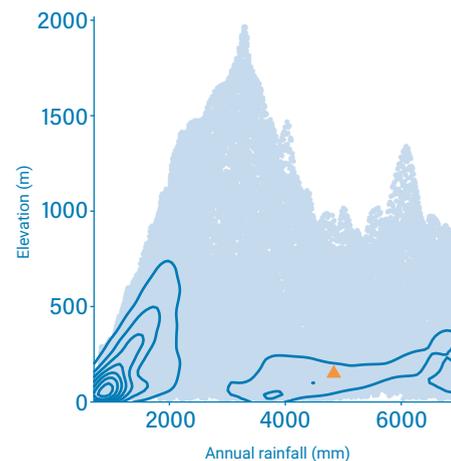
© Olivier Lachenaud

## Distribution

São Tomé



## Climate



© Davy Ikabanga

## Rationale

*Cassipourea glomerata* is a shrub or small tree up to 6 m tall. The species is endemic to São Tomé, known from wet rainforest, both old-growth and secondary, on ridge on rocky places; between 50 and 245 m in elevation. It is known from six collections made between 1905 (Chevalier 14271, 14512) and 2020 (Ikabanga 1058; Lachenaud & Lima 2958). We consider the occurrence in Angolares-Rio Salgado (Quintas 1086) as extirpated because of the intensive oil palm plantations in this region that has induced the disappearance of the natural habitats. This occurrence is not taken into account in the AOO and EOO calculations. Therefore, the five remaining collections represent four occurrences, and one or two subpopulations (the dissemination type is not known). Two of them occur within the PNOST. Based on a 2 x 2 km cell size, the AOO is estimated as 12 km<sup>2</sup>, below the upper threshold for EN status under subcriterion B2. The EOO is calculated as 1.4 km<sup>2</sup>, below the upper threshold for CR status under subcriterion B1. The EOO value is less than the AOO, so we set it to equal the AOO. Former occurrences were probably extirpated by habitat destruction for plantations in São Tomé. We thus inferred that the distribution of the species has strongly declined in the past due to the intensive clearing for cacao plantations, explaining the current distribution. The occurrences at the east of Praia São Miguel and Lheebroeker Esch (within PNOST) were threatened by old cacao plantations, and represent one location. The occur-

rences between Santa Clautide, Santa Claudine and San José, and the one at Santa Clotilde-Bindá Lembá are threatened by small-scale agriculture and represent one location. Therefore, these four occurrences represent two locations (*sensu* IUCN, 2019), with regards to the most important threat (small-scale agriculture). We infer a continuing decline in the extent and quality of habitat. We also infer a past decline in its AOO, EOO in the number of mature individuals, and the number of subpopulations based on the disappearance of the occurrence in Angolares-Rio Salgado (Quintas 1086). We cannot apply criterion A since three regeneration times of the species are estimated at 90 years, and knowing that the extirpated occurrence dates from a collection of 1886, thus more than 150 years. Therefore, the species is assessed as EN B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v).

## Habitat and ecology

The species occurs in secondary forest, 50 to 245 m in elevation, often on slope.

## Use and trade

It is not known if the species is used.

## Population

Even widespread at low elevations in São Tomé, the species appear as rare.



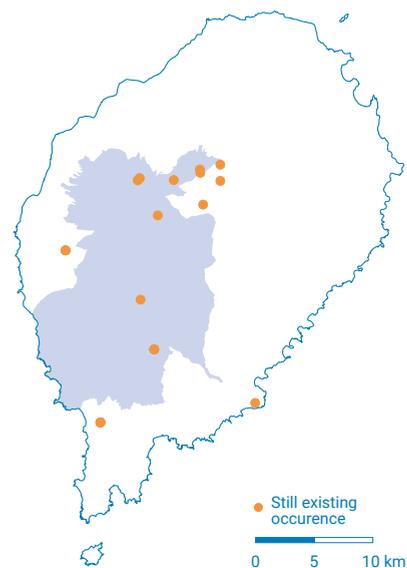
© Olivier Lachenaud

# *Aulacocalyx pallens* (Hiern) Bridson & Figueiredo subsp. *pallens*

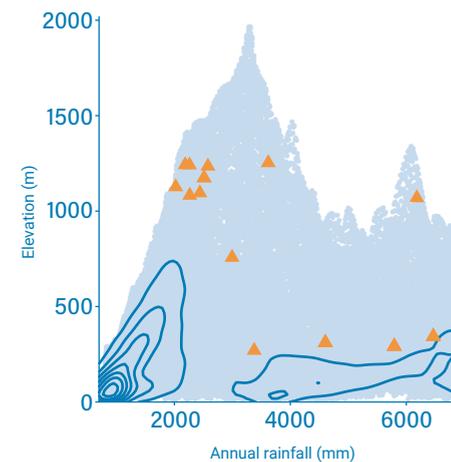


## Distribution

São Tomé



## Climate



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## Rationale

*Aulacocalyx pallens* subsp. *pallens* is a tree up to 18 m tall, known from mature and secondary forest, between 300 and 1,100 m in elevation. The subspecies is endemic to São Tomé and known from 21 collections made between the beginning of the 20th century and 2020. However, we excluded two collections (Mann 1066 and Seabra s.n) because no locality information was provided, and one (Joffroy 112) due to imprecise locality information (between Pico Calvário and Bom Sucesso). Moreover, we excluded another collection (Dauby 1583) corresponding to an individual in cultivation at the Botanical Garden of Bom Sucesso.

We consider two occurrences as extirpated due to the degradation of the quality of the habitat by the intense cocoa and coffee plantations in this part of the island: the one at Monté Café (Espírito Santo 4487), and the one at São Nicolau (Espírito Santo 4664). Considering the forest coverage, which is still significant in the other areas, we consider that none of the other occurrences are extirpated. The 18 available collections represent 14 occurrences and 1 to 4 subpopulations. Based on a 2 x 2 km cell size, the AOO of this species is estimated as 44 km<sup>2</sup>, below the upper threshold for EN status under subcriterion B2. The EOO is calculated as 170 km<sup>2</sup>, below the upper threshold for EN status under subcriterion B1.

Five occurrences, located within the PNST, to date seem to not be under threat. These 5 occurrences represent 1 location. However, 4 other occurrences (Lejoly 97/355, Lachenaud 2849, MBG Transect 6, 14, and 191, Lima 49) located within the PNST,

between Bom Sucesso and Lagoa Amélia, are threatened by small-scale agriculture and represent the same location. The two occurrences located in the west part of the island (Lima 83 and MBG Transect 672) are threatened by old plantations and represent the same location. Finally, one located in the South part of the island (MBG Transect 739) is threatened by palm plantations and represents another location. All activities induce a decline in the quality and the extent of the habitat of the species. As a consequence, these 14 occurrences represent 4 locations (*sensu* IUCN 2019) with regard to the most serious plausible threats (small-scale agriculture and plantations). Based on the disappearance of two occurrences, we infer a decline in its AOO, its EOO, the number of locations, and the number of mature individuals. Moreover, we infer a current and a future continuing decline in the extent and the quality of its habitat. This species is thus assessed as EN B1ab(i,ii,iii,iv,v)+B2ab(i,ii,iii,iv,v).

## Habitat and ecology

The species is a tree up to 18 m tall, known from mature and secondary forest, between 300 and 1,100 m in elevation.

## Use and trade

There are no known uses of this subspecies.

## Population

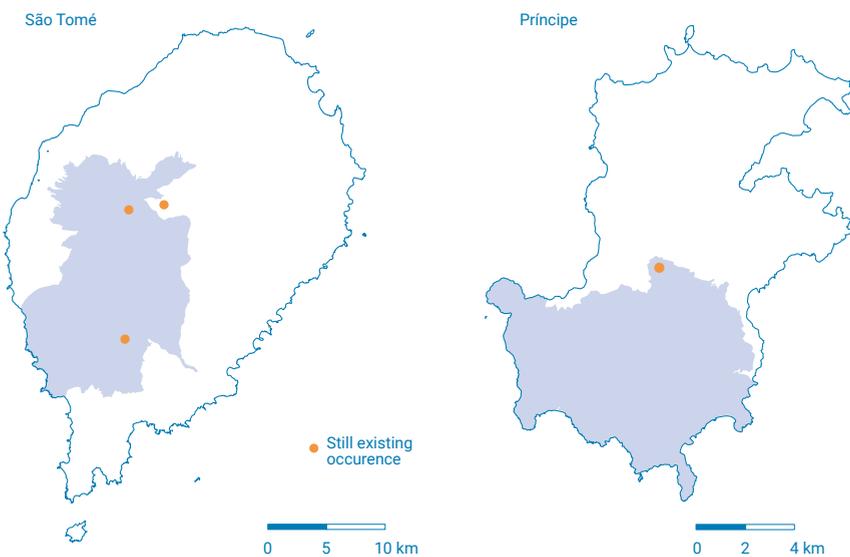
No quantitative population data are available for *Aulacocalyx pallens* subsp. *pallens*.





© Olivier Lachenaud

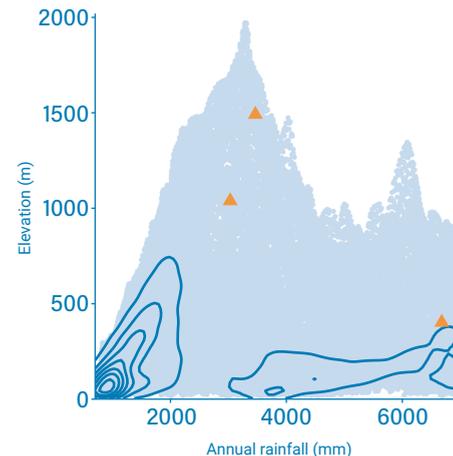
# Chassalia euchlora (K.Schum.) Figueiredo



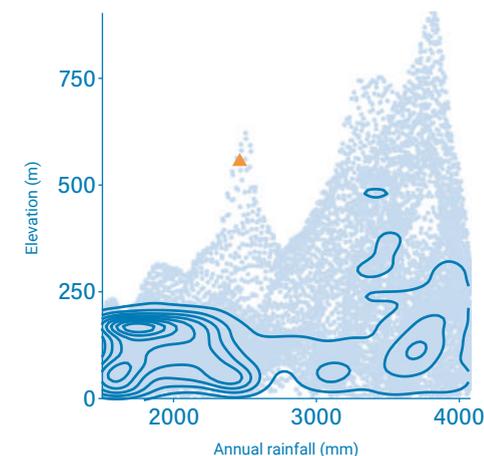
## Distribution

São Tomé and Príncipe

## Climate São Tomé



## Climate Príncipe



## Rationale

The species was assessed as VU D2 by Figueiredo (2005) but this assessment was not submitted for publication on the IUCN Red List. This assessment was based on two known collections (Quintas 33, Oliveira s.n.) which represented a single location in São Tomé. *Chassalia euchlora* is an epiphytic shrub and it occurs in forests between 150 and 1,600 m in elevation. It is known from seven collections, and two of them were made in PNOT (Quintas 33 at Caminho do Pico; Lachenaud 2918 at Monte Carmo) in São Tomé. Two other collections were made within PNOP, one (Oliveira 636) at Pico Papagaio and the last (Joffroy 201) at Pico de Príncipe. One collection (Ogonovszky 14) was made outside the protected area, near Bom Sucesso. The last collection (Oliveira s.n.) has no precise locality, and was not considered for this evaluation. Considering the forest cover, which is still significant in places of collection, we do not regard any of these four occurrences as extirpated. The seeds are dispersed by birds, so the six remaining collections represent six occurrences and two or three subpopulations. Based on a 2 x 2 km cell size, the AOO of this species is estimated as 24 km<sup>2</sup>, below the upper threshold for EN status under subcriterion B2. The EOO is calculated as 783 km<sup>2</sup>, below the upper threshold for EN status under subcriterion B1. The occurrence located near Bom Sucesso is threatened by small-scale agriculture and firewoods, which induces a decline in the quality of the habitat of the species. This occurrence represents one location. Among the three occurrences within PNP, the occurrence at Vila José is threatened by large-scale agriculture. The two others are not threatened, and represent one location. In Príncipe, the two occurrences are not threatened because we

consider ecotourism and invasive species do not affect an epiphytic plant. They are thus considered as one location. Therefore, these six occurrences represent four locations (*sensu* IUCN, 2019) with regard to the most serious plausible threat (small-scale agriculture). Consequently, we infer a past, current and future continuing decline in the extent and habitat quality. *Chassalia euchlora* is thus assessed as EN B1ab(iii)+2ab(iii).

## Habitat and ecology

The species is an epiphytic species, occurring in forests from 150 to 1,600 m in elevation.

## Use and trade

There are no known uses of this species.

## Population

No quantitative population data are available for *Chassalia euchlora*.



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# Chassalia hiernii var. glandulosa

EN



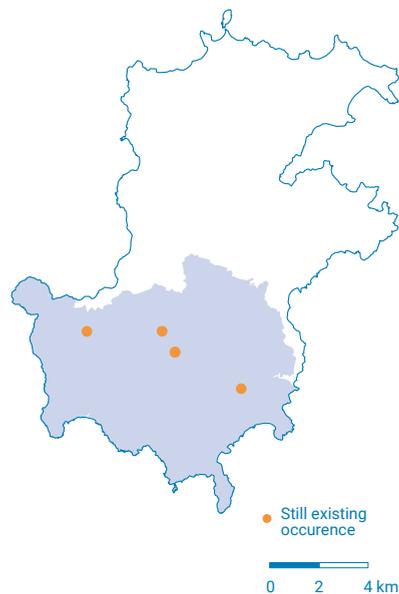
© Tariq Stévant



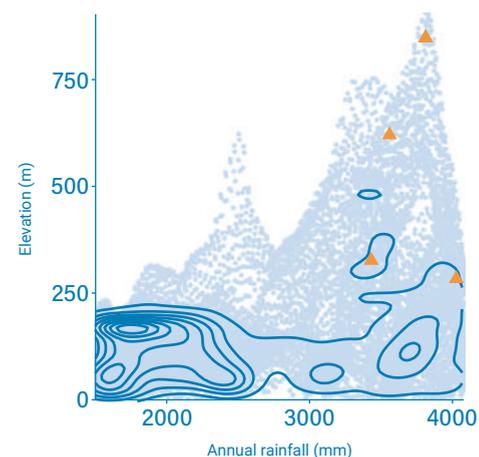
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## Distribution

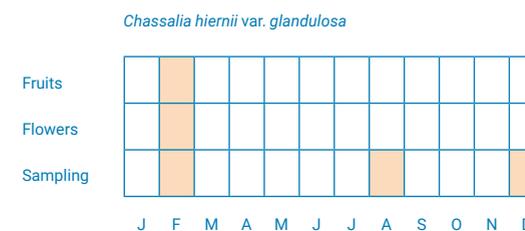
Príncipe



## Climate



## Phenology



## Rationale

*Chassalia hiernii* var. *glandulosa* G.Taylor is a shrub with leaves narrowly elliptic, up to 5 cm wide, brown above and light-green beneath; flowers c. 2 cm long. The species is known from fairly light undergrowth from 230 to 615 m in altitude. This species was assessed as VU D2 by Figueiredo (2005) but not published on the IUCN Red List, based on three collections: Excel 654 (Neves Ferreira, 300 m) in 1932, and Monod 12118 & 12153 (way to Pico Príncipe, 600m), in 1956, which represented two occurrences in Príncipe island. Since then, only two more collections (EBP 238 & 263) were made in 2018 in Príncipe, near Pico Mesa and Pico do Príncipe, from 230 to 615 m in altitude. Considering forest cover, which is still significant in places of collection, we do not regard any of these occurrences as extirpated. So, these five collections represent four occurrences and three subpopulations. Based on a 2 x 2 km grid cell size, the AOO and the EOO of this species are respectively estimated as 16 km<sup>2</sup> and 7.1 km<sup>2</sup>; the EOO estimated is less than AOO, so we consider EOO as same as AOO (16 km<sup>2</sup>), both below the upper threshold for EN status under Criterion B. All the four occurrences are located within the Príncipe National Park and three of them are not threatened. The occurrence located near Neves Ferreira was threatened in the past by intensive agriculture (Coconut plantation). As a consequence, these four occurrences represent three locations (*sensu* IUCN 2019) with regard to the most serious plausible threat (agriculture activities). Based on

threats, we infer a past decline in the extent and the quality of its habitat. This species is thus assessed as EN B1ab(iii)+2ab(iii).

## Habitat and ecology

The species is known from fairly light undergrowth from 230 to 615 m in altitude.

## Use and trade

It is not known if the species is used.

## Population

No quantitative population data are available for this subspecies.



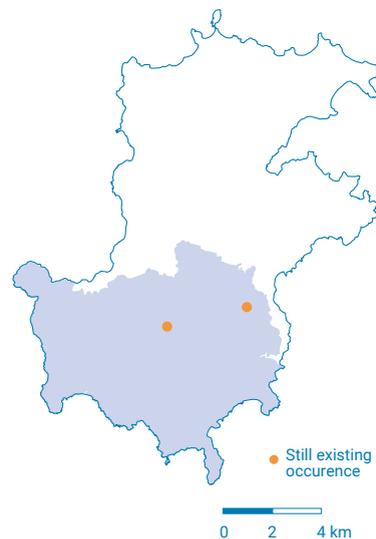
# *Pauridiantha principensis* Ntore & O.Lachenaud

EN

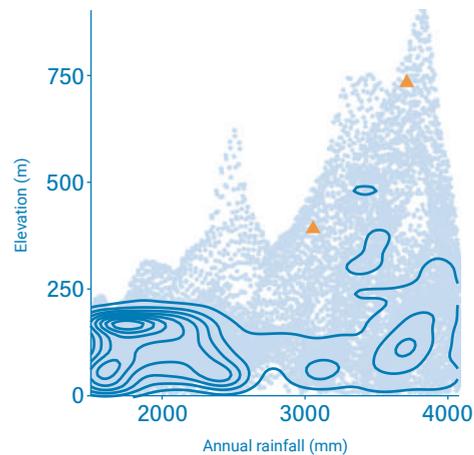


## Distribution

Príncipe



## Climate



## Rationale

*Pauridiantha Príncipeensis* was recently described by Ntore and Lachenaud (2019), and assessed by the authors as VU D2 but not submitted for publication on the IUCN Red List. The species is endemic to Príncipe island, and is known from two collections, made in 1998 on Pico do Príncipe (*Oliveira* 192), and in 1999 on Caminho do Morro de Leste (*Oliveira* 149). These two collections represent two occurrences. Considering the date of collection; the forest coverage, which is still good in this area; and that both are within PNOP, we think that neither of the two occurrences is extirpated. Based on a 2 x 2 km cell size, the AOO of this species is estimated as 8 km<sup>2</sup>, below the upper threshold for CR status under criterion B2. Since this species is known from only two occurrences, its EOO cannot be estimated. Pico do Príncipe is used for tourism activities such as hiking, and these have been increasing in recent years representing a current and future threat for the species through the decrease in the quality of the habitat and potential facilitation of invasive species. Morro de Leste is a known illegal hunting area, representing a threat to the species through a decrease in the quality of the habitat. Therefore, the two occurrences of *P. Príncipeensis* represent two locations (*sensu* IUCN 2019), with regards to the most important threats (tourism). Thus, a decline in habitat quality is inferred. Therefore, *P. principensis* is assessed as EN under criteria B2ab(iii).

## Habitat and ecology

The species is a medium-sized shrub occurring in submontane forests, from 675 to 750 m in altitude.

## Use and trade

There is no information on use of this species.

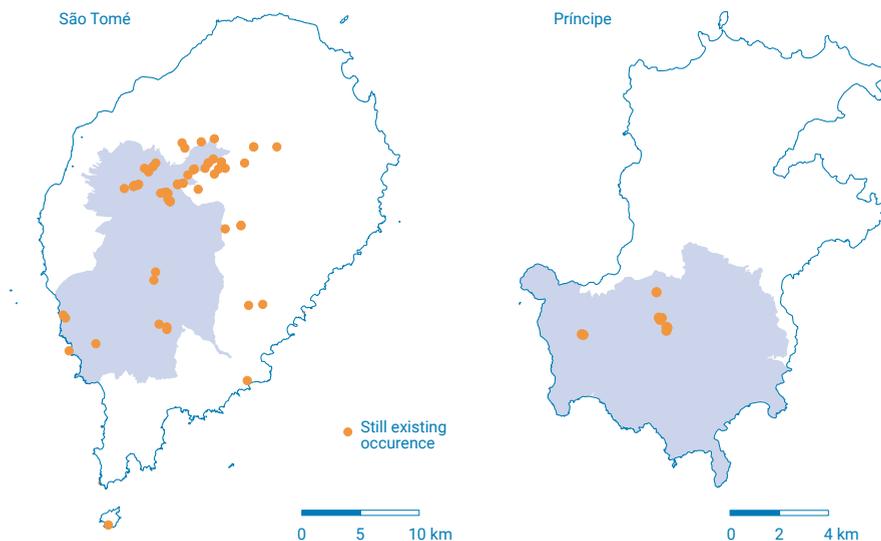
## Population

No quantitative population data are available for this species.



# Pavetta monticola Hiern

NT



## Distribution

Annobón (Equatorial Guinea),  
and São Tomé and Príncipe

## Phenology

*Pavetta monticola*

	J	F	M	A	M	J	J	A	S	O	N	D
Fruits												
Flowers												
Sampling												



## Rationale

*Pavetta monticola* is a shrub or a tree, up to 15 m height; endemic to the islands of São Tomé and Príncipe, and Equatorial Guinea (Annobón). The individuals occur frequently in montane old-growth or secondary forests, on rocky places at elevations from 100 to 2,000 m (Figueiredo, 2005). It was previously assessed as VU D2, but without any information on threat (World Conservation Monitoring Centre, 1998). The date of the assessment and the collection of new information justifies its reassessment. The species is known from 108 collections (78) and observations (30) made between 1861 (Mann 1074) and 2020 (Lachenaud 2982, Icabanga 1097). Five collections (Oliveira 205, 1037, 1050, 1685; Stévant 2914) do not have precise coordinates. The 103 remaining collections (73) and observations (30) represent 59 occurrences of which 50 at São Tomé, eight at Príncipe and one at Annobón. The occurrences of Príncipe are all in the PNOP. The occurrence of Annobón is inside of the park. Of the 50 occurrences in São Tomé, 31 are found in the PNOST and the remaining 19 were collected outside the protected areas. In São Tomé, two occurrences are extirpated due to the disappearance of the vegetation cover (Oliveira 52 between Maia and Chamiço) and the presence of large coconut plantations (Quintas 949 in south of Rolas) where they are located. Six other occurrences (Moller 617, 438; Lejoly 342; Espírito Santo 179, 4613, Quintas 932) are potentially extirpated due to the current state of the vegetation cover where they are located and knowing that their collection date is very old, so they are poorly georeferenced. Around these occurrences, there has been a lot of agriculture activities. These eight occurrences were not taken into account to estimate the Red Listing parameters. Therefore, *P. monticola* is known from 51 occurrences. The 51 current occurrences represent 1-2 subpopulations at São Tomé and one subpopulation at Príncipe and another at Annobón. Based on a 2 x 2 km cell size, the AOO is estimated as 132 km<sup>2</sup>, above the upper threshold EN status under subcriterion B2.

The EOO is calculated to be 3,858.818 km<sup>2</sup>, above the upper threshold for EN status under subcriterion B1. Eight occurrences inside the PNOP are not threatened and represent one location. The occurrence of Annobón (Carvalho 3101) is threatened by small-scale agriculture, may disappear in the future, and represents one location. The occurrence to the South West of São Tomé is threatened by small-scale agriculture and represents a location. The two occurrences at the base and flank of Pico Maria Fernandez are threatened by small-scale agriculture and represent a location. The three occurrences at Bombaim Roça and next to Formosso Grande are threatened by illegal logging and represent a location. The four occurrences in the southeast of the PNOST are threatened by past plantations and represent a location. The three occurrences in Monte Carmo and the two in Cabumbé are not threatened and represent one location. The occurrences in the North of the PNOST, on the ridges at more than 800 m in elevation are indirectly threatened by invasive plants (Quina), representing one location. All other occurrences along the tourist trail in the northeast of the PNOST are not threatened and represent one location. The occurrence of Rio Pinhão is threatened by small-scale agriculture and represents one location. The occurrence of Macambrara is threatened by vegetable plantation, and might disappear in the future, and represents a location. The two occurrences near Santa Ana and in Maya are threatened by small-scale agriculture and represent a location. The occurrence in Monte Café-Saint Louis is also threatened by small-scale agriculture and represents one location. Therefore, these 51 occurrences represent 12 locations (*sensu* IUCN, 2019), with regards to the most important threats (small-scale agriculture). We thus infer a future decline in its AOO, its EOO, the number of locations, and the number of mature individuals. Moreover, we infer a current and a future continuous decline in the extent and habitat quality. *Pavetta monticola* is thus assessed as NT nearly meeting the criterion VU B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v).

### Habitat and ecology

The species occur in *Scytopetalum* high forest on small ridge, in degraded forest, on slopes at elevations from 100 to 2,000 m.

### Use and trade

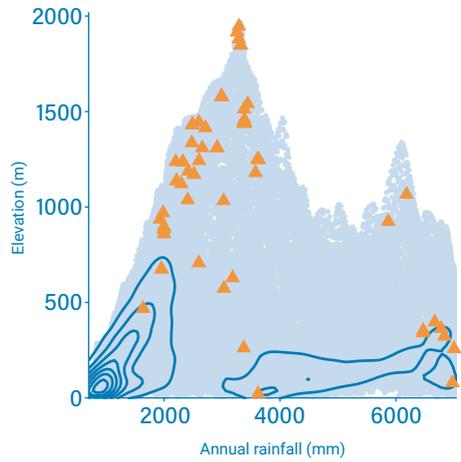
It is not known if the species is used.

### Population

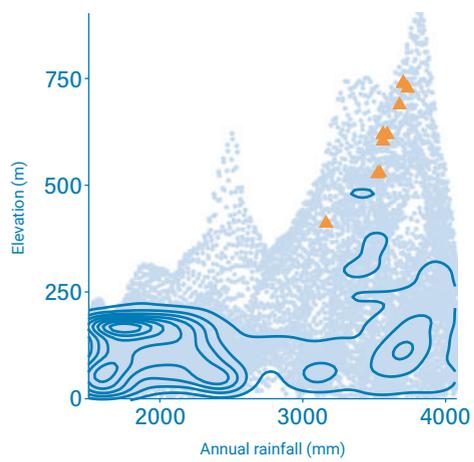
Even widespread in São Tomé, the species appears rare in Príncipe and Equatorial Guinea (Annobón).



Climate São Tomé



Climate Príncipe







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# Psychotria guerkeana K.Schum



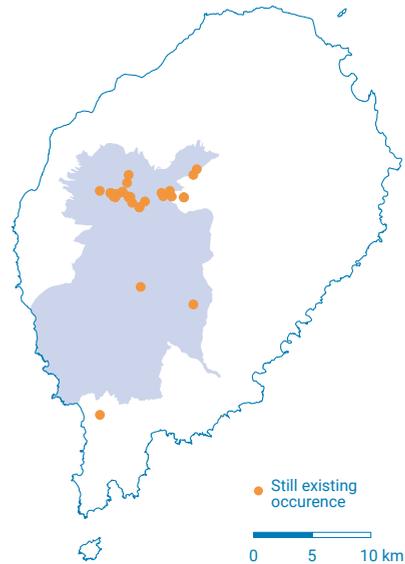
© Tariq Stévant



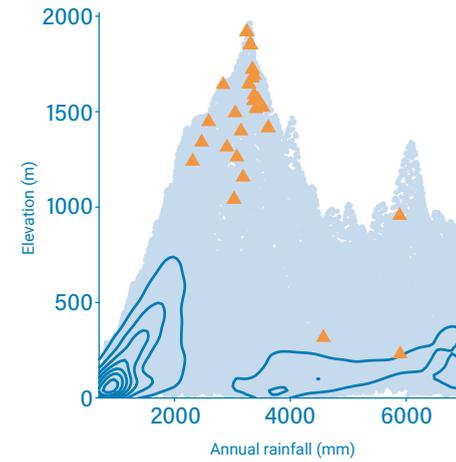
© Davy Ikabanga

## Distribution

São Tomé



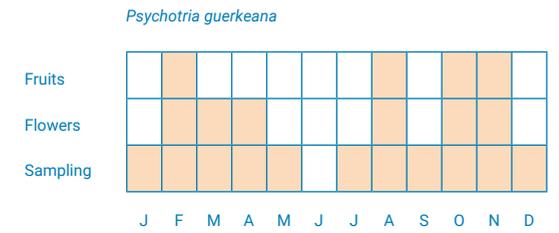
## Climate



## Rationale

*Psychotria guerkeana* is a shrub, up to 4 m high, known from dense humid forest, on rocky places; between 221 and 2,024 m in elevation. It was previously assessed as VU D2, but without any information on threat (World Conservation Monitoring Centre, 1998). The date of the assessment and the collection of new information justify its reassessment. The species is endemic to São Tomé and is known from 50 collections made between 1885 (Moller 728; 734; 1380) and 2020 (Ikabanga 1084). Three collections (Campos 4; 8; s.c.) are not precisely located. One collection (Oliveira 1122) was made at the Botanical Garden of Bom Sucesso. The collection of Espírito Santo (4059) made in 1959 from Monte Café to Lagoa Amélia is considered as extirpated given the intensity of agricultural activity in this locality. Therefore, these five collections are not considered for this evaluation. Seven collections (Exell 332, Matos 7350; Joffroy 158; Lejoly 504; Oliveira 991) were collected between Bom Sucesso and Lagoa Amélia along the PNOT. One collection (Ikabanga 1084) was made in the south of the island near the village of Alexandra. The other 37 collections were from the PNOT. Three collections (Chevalier 4325; Ikabanga 967; Oliveira 471) were collected between Monte Café-Pico and Escadas along the tourist path, two collections (Oliveira 1058; 1398) at Cabumbe and Vale do Rio Grande, and the other 31 collections around on Pico of São Tomé. We consider that none of the 45 collections represent individuals that are extirpated. These 45 collections represent 26 occurrences and 1 or 2 subpopulations. Based on a 2 x 2 km cell size, the AOO of this species is estimated as 44 km<sup>2</sup>, below the upper threshold for EN status under Criterion B2. The EOO is calculated as 120 km<sup>2</sup>, below the upper threshold for EN status under Criterion B1. The two occurrences located around Bom Sucesso are threatened by agricultural activities (vegetable plantations) and represent one location. We expect that these two occurrences will disappear in a near future. The occurrence located at Escadas

## Phenology



(outside the PNOT) is threatened by illegal logging and represents one location. The occurrence located near Alexandra is threatened by small-scale agriculture and represents one location. The occurrences located in the PNOT on tourist paths are threatened by ecotourism activity and represent one location. The occurrences located at the Pico Pequeno and Pico of São Tomé are threatened by invasive plants (*Cinchona*) and represent one location. The two occurrences located south of PNOT are not threatened currently and represent one location. As a consequence, these 26 occurrences represent six locations (*sensu* IUCN, 2019), with regards to the past most important threat (agriculture: vegetable plantations). Based on the past, current and future threats, and the disappearance of the occurrences around Bom Sucesso, we infer a past and future decline in the extent and the quality of its habitat. We also infer a decline in its AOO, EOO, the number of locations, and the number of mature individuals. This species is thus assessed as VU B1ab(i,ii,iii,iv,v)+2 ab(i,ii,iii,iv,v).

## Habitat and ecology

The species often occurs in submontane forests, between 960 and 2,000 m in elevation (Alves *et al.*, 2005). Therefore, one collection (Oliveira 1398) was made at 325 m in elevation.

## Use and trade

It is not known if the species is used.

## Population

No information about population for *Psychotria guerkeana* are available.



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# *Psychotria molleri* K.Schum.

**VU** 



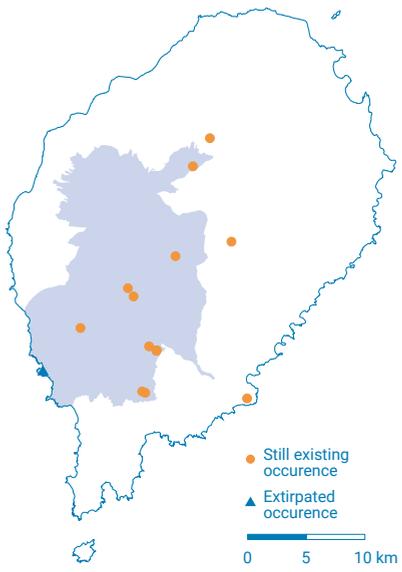
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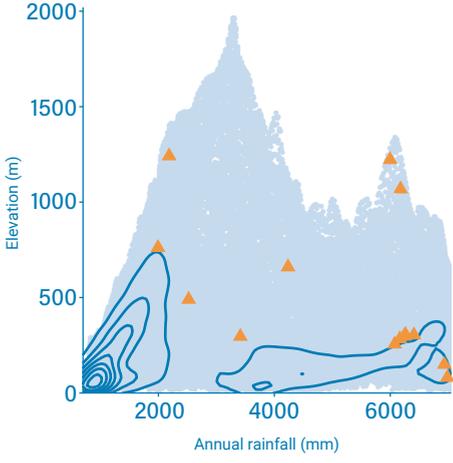
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### Distribution

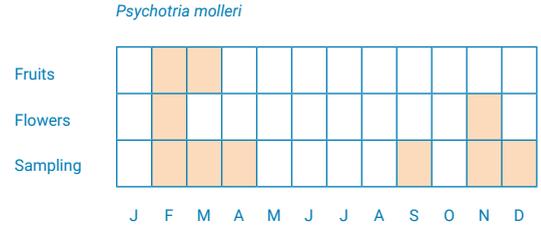
São Tomé



### Climate



### Phenology



### Rationale

*Psychotria molleri* was assessed by Alves et al (2005) as CR, but this assessment has not been published by the Red List Unit. The species is a shrub up to 3 m high, known from 18 collections made between 1886 (Quintas 1024) and 2020 (Ikabanga 1008; Lachenaud 2948) in São Tomé. Three collections (Quintas 1024; Chevalier 14182; 14623bis) located at Angolares (Ponta Baleia) and Porto Alegre are potentially considered as extirpated given the intensity of agricultural activities (palm oil and vegetable plantations) and human constructions present in each locality. These three collections were not considered for this evaluation. The 15 remaining collections represent 13 occurrences and one subpopulation. Based on a 2 x 2 km cell size, the AOO of this species is estimated as 40 km<sup>2</sup>, below the upper threshold of the EN status under subcriterion B2. The EOO is calculated as 243 km<sup>2</sup>, below the upper threshold of the EN status under subcriterion B1. Nine of all occurrences are made inside PNOT. One occurrence around Bom Sucesso is threatened by horticulture activities and represents one location. We consider that this occurrence will disappear in near future. The eight other occurrences are not threatened and represent one location. Outside PNOT, the occurrence at Chamiço is threatened by small-scale agriculture and represents one location. The occurrence around Bombaim is threatened by plantation activities and represents one location. The occurrence located in Pico Macuru is not threatened and represents one location. The occurrence around Santa Clotilde is threatened by cacao plantations and represents one location. Therefore, these 15 occurrences represent six locations (*sensu* IUCN 2019), with regards to the most important threat (small-scale agriculture). We infer a past, and future continuing decline in its EOO, AOO, the number of locations, and the number of mature individuals. Moreover, we infer a past, current, and future

continuing decline in the extent and the quality of its habitat. *Psychotria molleri* is thus assessed as VU B1 ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v).

### Habitat and ecology

The species occurs in low and high altitude forests with trees belonging to genera *Uapaca* and *Scytopetalum*; on terra firme ridge, clear undergrowth with many rocks, up to 1,450 m in elevation.

### Use and trade

It is not known if the species is used.

### Population

Population information is not known for this species.



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# Psychotria nubicola G. Taylor

EN 1-6m



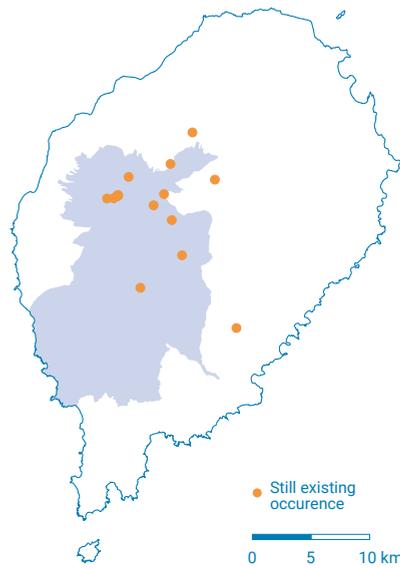
© Olivier Lachenaud



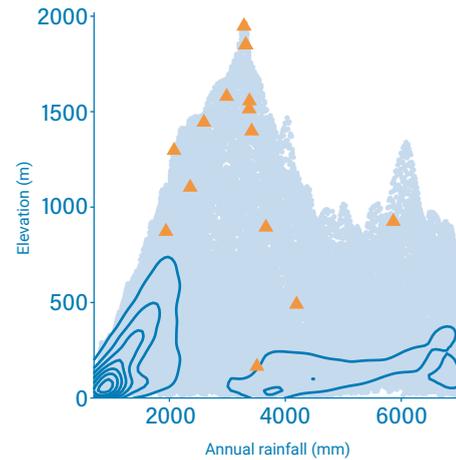
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### Distribution

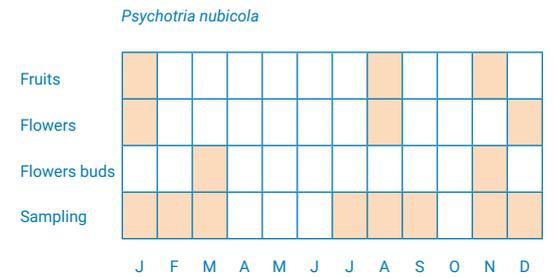
São Tomé



### Climate



### Phenology



### Rationale

*Psychotria nubicola* was assessed as VU D2 (Aves et al, 2005), but it was not published by the Red List Unit. This assessment was based on eight collections (Aves et al, 2005), which led us to consider the species as poorly known at that time. Since then, many collections have been made, allowing a reassessment. *Psychotria nubicola* is a shrub to 5 m tall, known from montane rainforest, between 700 and 1960 m altitude. The species is endemic to São Tomé island and is known from 25 collections made between 1861 (Mann 1062) and 2020 (Ikabanga 1109, 1140, Lima 48, Nguema 3329). Twenty-one collections were made within the PNOT. The last four collections were made outside the PNOT. We excluded two collections made by Campos (2, 66) because no locality information is provided. We consider that the occurrence corresponding to the collection made in 1932 by Espírito Santo at the summit of Mongo as extirpated because the habitat of the species in this place has been severely modified. Therefore, these 22 collections represent 19 occurrences, and at least one or two subpopulations. Based on a 2 x 2 km cell size, the AOO of this species is estimated as 52 km<sup>2</sup>, below the upper threshold for EN status under subcriterion B2. The EOO is calculated as 105 km<sup>2</sup>, below the upper threshold for EN status under subcriterion B1. The occurrence located at track Nova Moca and Calvario is threatened by small-scale agricultural activities (vegetable plantations). We consider that this occurrence will disappear in a near future, and represents one location. The occurrence located at Pico Maria Fernandes is threatened by past cacao plantations and represents one location. The occurrence located at Chamiço is threatened by small-scale agricultural activities and represents one location. Thirteen occurrences in PNOT are located along the touristic road and could be threatened by tourism. The three other occurrences are not threatened and represent

one location. Consequently, these 19 occurrences represent five locations (*sensu* IUCN, 2019), with regard to the past most important threat (small scale agriculture) which induces degradation of the quality of habitat. Based on the disappearance of occurrence from the summit of Mongo, and the threat of the other occurrences located outside PNOT and along the touristic road, we infer past, current, and future continuing decline in its AOO, the number of locations, and the number of mature individuals. Moreover, we infer a past, current, and future continuing decline in the extent and the quality of its habitat. *Psychotria nubicola* is thus assessed as EN B1ab(ii, iii, iv, v)+2ab(ii, iii, iv, v).

### Habitat and ecology

The species is known from montane rainforest; between 700 and 1,960 m altitude.

### Use and trade

It is not known if the species is used.

### Population

No quantitative population data are available for the species.



© Olivier Lachenat

# Psychotria thomensis

## G. Taylor

### Distribution

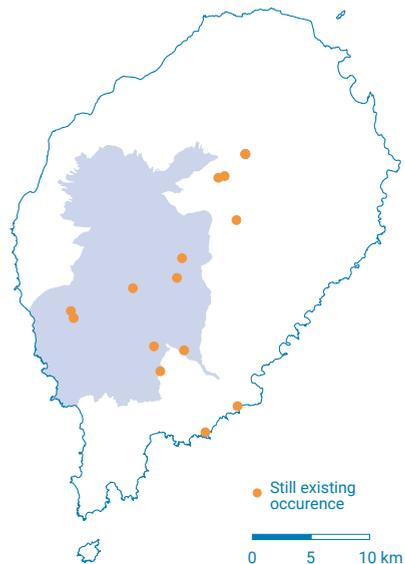
São Tomé



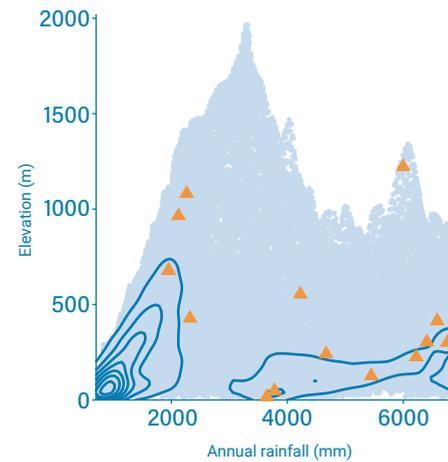
© Davy Ikabanga



© Davy Ikabanga



### Climate

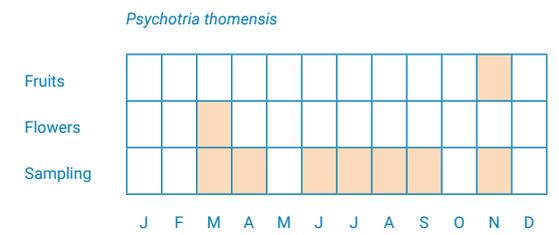


### Rationale

*Psychotria thomensis* is a shrub or small tree, occurring in rainforest; and found between 10 and 1,450 m in elevation. The species is endemic to São Tomé Island and is known from 20 collections made between 1885 and 2019. We discarded two collections of Seabra due to their imprecise locality of collection, and two collections from Moller made at Bom Sucesso because we considered that they have already disappeared due to encroachment of carrot crops. The 16 remaining collections represent 14 occurrences and two or three subpopulations. Based on a 2 x 2 km cell size, the AOO of this species is estimated to be 52 km<sup>2</sup>, which falls within the limits of the EN category under Criterion B2. The EOO is calculated as 216 km<sup>2</sup>, below the upper threshold of the EN category under Criterion B1.

Nine occurrences of *Psychotria thomensis* are located within the PNOT, where the habitat of eight of them does not appear under threat. Outside the park, the species is threatened by small-scale shifting agriculture, invasive plants disseminated during tourism activities and ancient coffee plantations. The collections Espirito Santo 4019A, Moller 343, 368 and Quintas 1303 can be considered as a single occurrence which is threatened by an ancient coffee plantation and represent one location. The occurrence Oliveira 399 is threatened by invasive plants and represents one location. The occurrence Joffroy 47 is threatened by small-scale shifting agriculture and represents one location. The occurrences Espirito Santo 3914 and Joffroy 148 are threatened by small-scale shifting agriculture and represent two locations. We have not found any threat for the occurrences Ikabanga 1003, Lima 45, Eduardo 34, de Matos 7246, de Oliveira 130, 1030 and Ogonovszky 320 located within the park. Based on the smallest size of locations in the currently affected areas by

### Phenology



small-scale shifting agriculture, these occurrences represent one location.

Based on the main threat which is small-scale shifting agriculture, the 14 occurrences of *P. thomensis* represent six locations (*sensu* IUCN 2019), which falls within the limits of the VU category under the criteria B1 and B2. These threats lead us to infer a continuing decline in the quality of the species' habitat. The disappearance of occurrences from Sao Nicolau led us to infer a decline in AOO, number of locations and mature individuals of the species. For all these reasons, *Psychotria thomensis* is assessed as VU B1 ab(ii,iii,iv,v)+2ab(ii,iii,iv,v).

### Habitat and ecology

The species occurs in humid, evergreen forest; and is found between 10 and 1,450 m in elevation.

### Use and trade

There are no known uses for this species.

### Population

*Psychotria thomensis* is known from two or three subpopulations. No quantitative population data are available for the species.



# Sabicea cauliflora

## Hiern



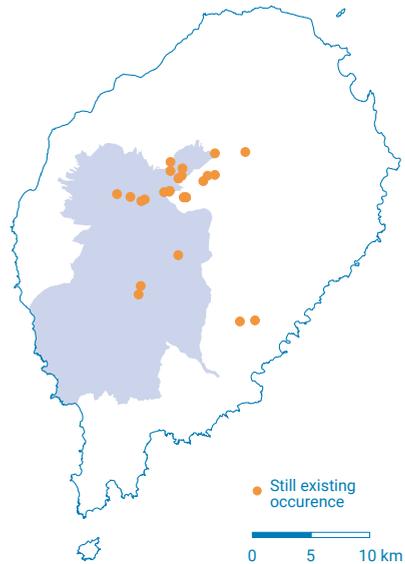
© Davy Ikabanga



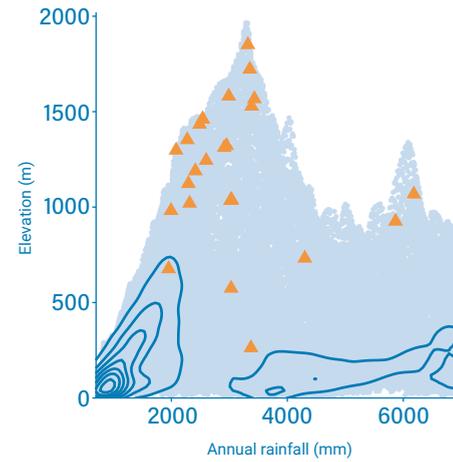
© Davy Ikabanga

### Distribution

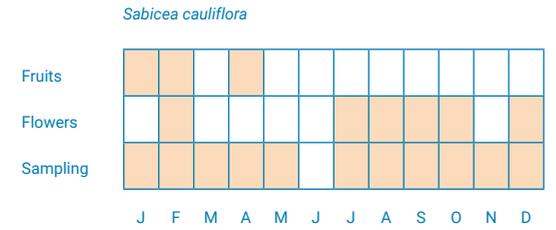
São Tomé and Príncipe



### Climate



### Phenology



### Rationale

*Sabicea cauliflora* is a shrub, up to 3 m tall, known from dense wet forest and old-growth montane wet forest, degraded forest along the roads; between 200 and 1,650 m in elevation. The species is known from 33 collections made between 1885 (Moller 744; Quintas 911) and 2020 (Lima 49) in São Tomé and Príncipe, and in Libreville (Gabon). The only sterile collection (Hallé 931) made in 1961 in Gabon was provisionally identified as *Sabicea cauliflora* (Hallé, 1966), but now this collection is revised as *Sabicea hierniana*. Therefore, we agree, like Figueiredo (2005) and Figueiredo et al (2011), that *Sabicea cauliflora* is endemic to São Tomé and Príncipe. We consider that there are no occurrences extirpated. These 32 collections represent 27 occurrences and two or three subpopulations. Based on a 2 x 2 km cell size, the AOO of this species is estimated as 64 km<sup>2</sup>, below the upper threshold for EN status under subcriterion B2. The EOO is calculated as 1420 km<sup>2</sup>, above the upper threshold for EN status under subcriteria B1. In São Tomé, the 17 occurrences located within the PNOST are not threatened and represent one location. Nine occurrences are located outside the PNOST. Three of them, located around Bom Sucesso, are threatened by vegetable plantations and represent one location. One occurrence located at Monté Café is threatened by coffee plantations and represents one location. We suggest that these four occurrences will disappear in a near future. Three occurrences located at Macambarà are threatened by small-scale agriculture and illegal forest logging and represent one location. Two occurrences located at Pico Maria Fernandes are threatened by past cacao plantations and represent one location. In Príncipe, the only occurrence located at Pico de Príncipe is not threatened and represents one location. Therefore, these 27 occurrences represent six locations (*sensu* IUCN, 2019), with regard

to the most serious plausible threats (small-scale agriculture). Based on the future disappearance of occurrences located around Bom Sucesso and Monté Café, we infer a current and future continuous decline in its AOO, its EOO, number of locations and mature individuals. Moreover, we infer a current and a future continuous decline in the extent and habitat quality. *Sabicea cauliflora* is thus assessed as VU B1 ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v).

### Habitat and ecology

The species is known from dense wet forest and old-growth montane wet forest, degraded forest along the roads; between 200 and 1,650 m in elevation.

### Use and trade

It is not known if the species is used.

### Population

No quantitative population data are available for *Sabicea cauliflora*. However, this species is more widespread in São Tomé.



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# Sabicea exellii

## G. Taylor



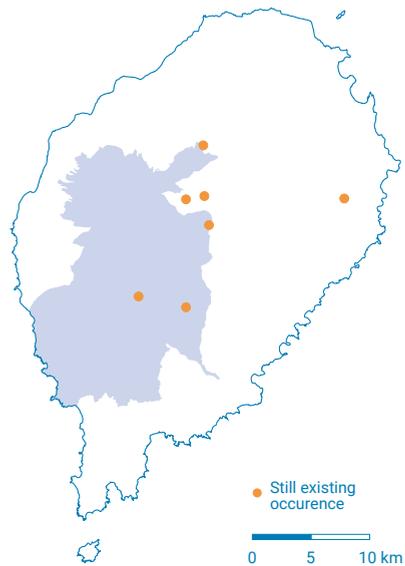
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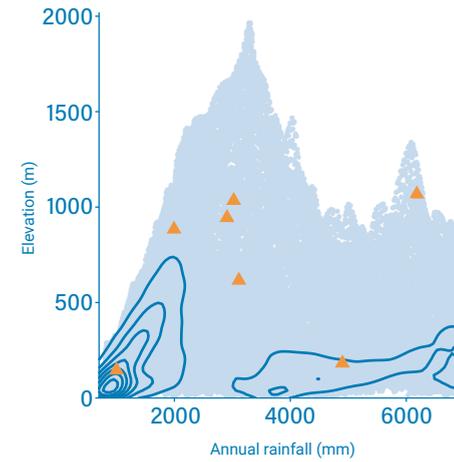
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### Distribution

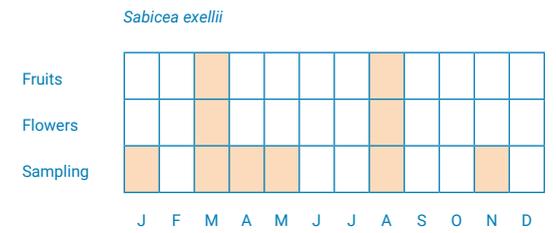
São Tomé



### Climate



### Phenology



### Rationale

*Sabicea exellii* was preliminary assessed as CR B2ab (i,ii,iii,iv) based on two collections examined (Figueredo et al 2005), but additional material was found since. The species is a woody liana up to 3 m high, forming a dense tangle, found in disturbed forest between 200 and 1,787 m in elevation. It is known from nine collections made between 1932 (Exell 284) and 2021 (Lachenaud 3402), four of them made within the PNOST. We consider that none of these occurrences as extirpated because the habitat is still preserved in these localities. The nine collections represent nine occurrences. Based on a 2 x 2 km cell size, the AOO of this species is estimated as 36 km<sup>2</sup>, below the upper threshold for EN status under subcriterion B2. The EOO is calculated as 84 km<sup>2</sup>, below the upper threshold for CR status under subcriterion B1. Three of the four occurrences inside the PNOST, are not threatened and represent one location. The occurrence around Bombain (within PNOST) is threatened by small-scale agriculture and represents one location. Four occurrences located around Zampalma are threatened by small-scale agriculture and illegal logging and represent one location. The occurrence at Chamiço is threatened by small-scale agriculture and represents one location. Therefore, these nine occurrences represent four locations (*sensu* IUCN, 2019) with regard to the most serious plausible threats (small-scale agriculture). Based on these threats, we infer past, current and future continuing decline in the extent and the quality of its habitat and a decline in the number of ma-

ture individuals due to agriculture. *S. exellii* is thus assessed as EN B1ab(iii,v)+2ab(iii,v).

### Habitat and ecology

The species occurs on stream banks, along roadsides, between 200 and 1,787m in elevation.

### Use and trade

It is not known if the species is used.

### Population

Population information is not sufficiently known for this species, but we suggest the existence of one subpopulation.



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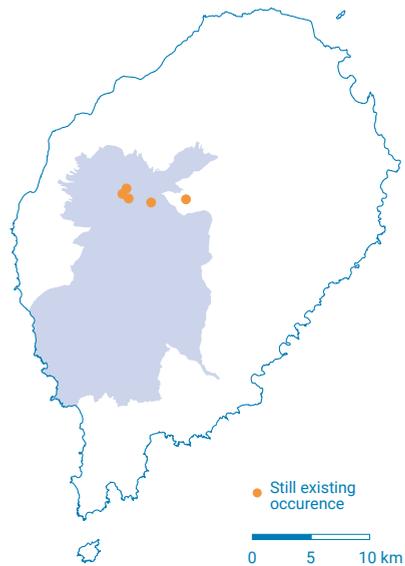
# Sabicea thomensis Joffroy



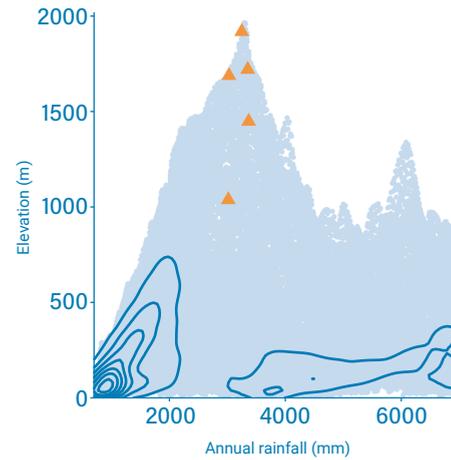
© Davy Ikabanga

## Distribution

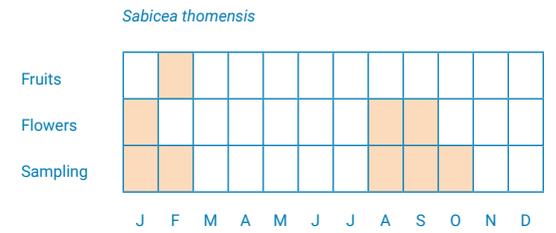
São Tomé



## Climate



## Phenology



## Rationale

*Sabicea thomensis* (Joffroy 2001a,b) was assessed as CR B1ab (i,ii,iii,iv) by Figueiredo (2005) but this was not submitted for publication on the IUCN Red List. This assessment was based on an estimated EOO less than 100 km<sup>2</sup> and a decline in the AOO, EOO, quality of habitat, and the number of locations without any justifications. *Sabicea thomensis* is currently known from six collections made between 1997 (Lejoly 97/330) and 2019 (Ikabanga 960), four of them made in PNST and two in the buffer zone. In the protected area, the four collections represented four occurrences, three occurrences in the area of Pico and Pico Mesa, and one occurrence at Estação Sousa. In the buffer zone, two collections were made between Macambrará - Zampalma and Bom Sucesso - Zampalma representing two occurrences. So, these six collections represent six occurrences and 1-2 subpopulations. Based on a 2 x 2 km cell size, the AOO of this species is estimated as 16 km<sup>2</sup>, below the upper threshold for EN status under criterion B2. The EOO is calculated as 4.1 km<sup>2</sup>, below the upper threshold for CR status under criterion B1. Since the EOO is less than the AOO, we consider the EOO to be the same as the AOO (16 km<sup>2</sup>), both below the upper threshold for EN status. The four occurrences inside the PNST, are not threatened and represent one location. The two occurrences outside the protected area, near Zampalma, are both threatened by illegal logging and small-scale agriculture, which causes a decline in the quality of the habitat of the species. They represent one location.

Therefore, these six occurrences represent two locations (*sensu* IUCN 2019) with regard to the most serious plausible threats (small-scale agriculture). Based on these threats, we infer past, current and future continuing decline in the extent and the quality of its habitat and a decline in the number of mature individuals due to agriculture. *Sabicea thomensis* is therefore assessed as EN B1ab(iii,v)+2ab(iii,v).

## Habitat and ecology

This species is a woody climber found growing in forest at an altitude of c. 920-1,880 m.

## Use and trade

The species is not known to be used.

## Population

No quantitative population data are available for this species.

# Tarenna principensis

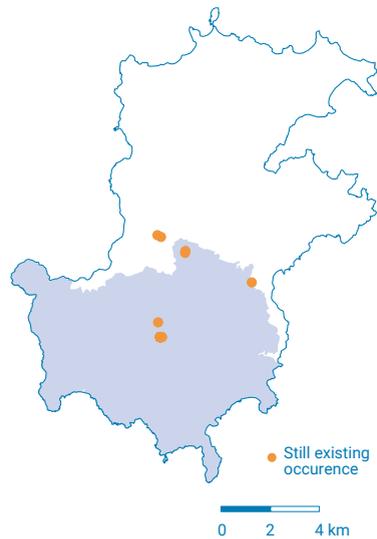
## Degreef

EN

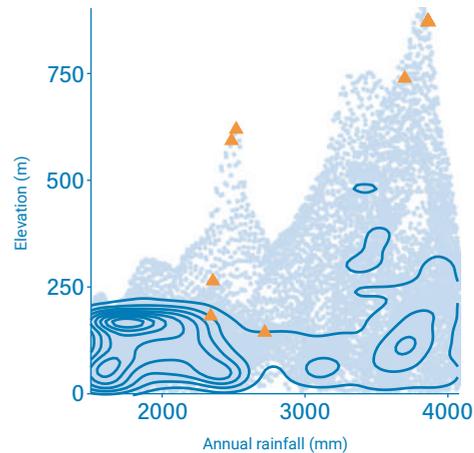


### Distribution

Príncipe

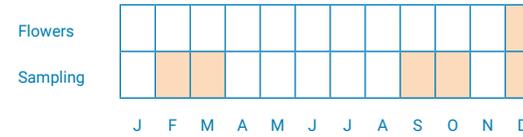


### Climate



### Phenology

*Tarenna principensis*



### Rationale

*Tarenna principensis* is a tree up to 10 m high, and up to 30 cm in diameter. The species is endemic to Príncipe island and is known from seven collections and 30 observations made between 1932 (Exell 544) and 2020 (Equipa Botanica do Príncipe 1028) in the south-center of the island. Six occurrences are found in the PNOP, of which three are located at Pico de Príncipe, one at Ôque Pipi and the other two are on Pico Papagaio. The last two collections (Oliveira 578, Stévert 254) were made at cyme and around Morro Fundão, outside PNOP. We consider that none of the five collections and the 30 observations have been extirpated. These seven collections and the 30 observations represent eight occurrences and one subpopulation. Based on a 2 x 2 km cell size, the AOO of this species is estimated as 24 km<sup>2</sup>, below the upper threshold of the EN status under criterion B2. The EOO is estimated as 8.1 km<sup>2</sup>, below the upper threshold of the CR status under criterion B1. The EOO value is less than the AOO, so we set it to equal the AOO. The two occurrences located at Morro Fundão (outside of a protected area) are threatened by agricultural activities that will induce degradation of the quality of the habitat of this species. These two occurrences represent one location. For the six occurrences located in the protected area, the two occurrences of Pico Papagaio are threatened by ecotourism, the occurrence of Ôque Pipi is threatened by small-scale agriculture and for the three occurrences on Pico de Príncipe, no threat is currently known. As a consequence, these eight occurrences represent four locations (*sensu* IUCN 2019), with regards to the most serious plausible threat (small-scale agriculture). Based on the past, current and future threats, we infer a continuing decline in the quality of its habitat. *Tarenna Príncipeensis* is therefore assessed as EN B1ab(iii)+B2ab(iii).

### Habitat and ecology

The species occurs in humid and dense forests, summit of ridged, rocky scree; between 280 and 944 m in elevation.

### Use and trade

This species is not known to be used.

### Population

Population information is not precisely known for this species.



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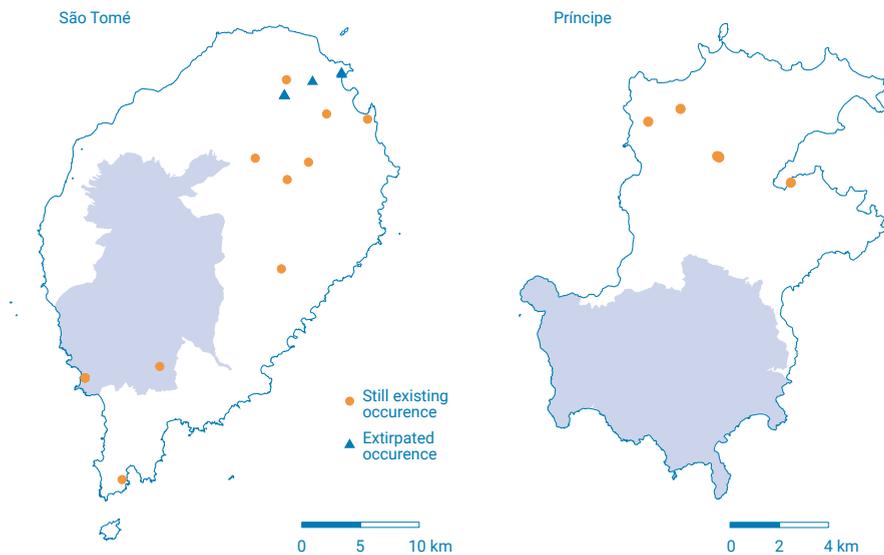
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# *Chytranthus mannii* Hook.f.



## Distribution

São Tomé and Príncipe



## Rationale

*Chytranthus mannii* was assessed as NT in 1998. However, the collection of new information and changes on the Red List criteria (2001) justifies a new assessment. Since 2020, a project lead by Fauna & Flora International and Fundação Príncipe (Taking action for Príncipe's threatened trees) is conducting awareness, surveys and monitoring of *Chytranthus mannii*, and more information regarding the species is expected in the near future, this assessment should be considered as preliminary. This species is a tree with edible fruits, endemic to São Tomé and Príncipe, present in the secondary forests of the North of Príncipe, and in the lowland forest of São Tomé, also in the secondary forest. *C. mannii* is known from 27 collections and four observations, occurring in the lowland forest up to 1,000 m altitude, representing 18 occurrences. Old specimens recorded in urbanized or cultivated areas in São Tomé have been removed from the calculation since they are considered as extirpated (Chevalier specimens and Moller 892). Based on a 2 x 2 km cell size, its extent of occurrence is calculated to be 1,852 km<sup>2</sup>, and its area of occupancy is estimated to be 60 km<sup>2</sup>, both within the threshold for EN status under subcriteria B1 and B2. Two occurrences were recorded within the PNOT in São Tomé, while the other 11 occurrences are outside of protected areas. We infer a decline of the area of occupancy due to urbanization. In addition, in agricultural areas like Boa Entrada, or Monte Café, this species is likely to be extirpated in a

near future. This species is used in traditional medicine, fruits are edible, and toothbrushes are made with seedlings. Nevertheless, these uses are limited and the main threats to this species are plantations and urbanization, which still cause degradation of habitat quality. Therefore, we can suspect a past decline in the quality of habitat. The occurrences of *C. mannii* represent 5 to 7 subpopulations and 7 locations in the sense of IUCN, within the limits of Vulnerable status. This species is therefore assessed as Vulnerable under the conditions B1ab(iii)+2ab(iii).

### Habitat and ecology

The species is present in the secondary forests of the North of Príncipe, and in the lowland forest of São Tomé, also in the secondary forest, up to 1000 m altitudes.

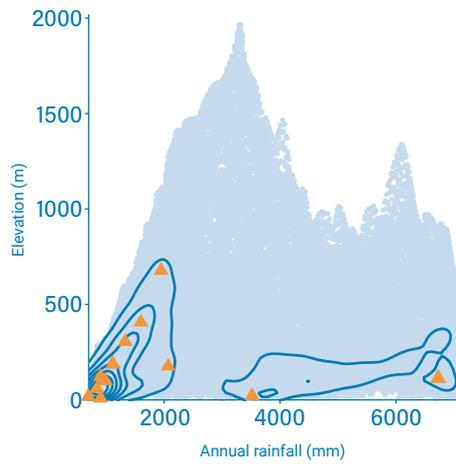
### Use and trade

This species is used in traditional medicine, fruits are edible, and toothbrushes are made with seedlings.

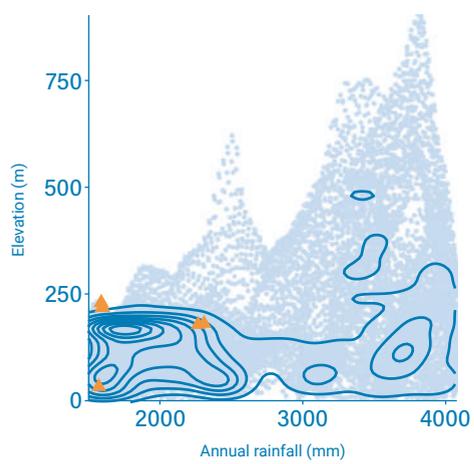
### Population

No population information is known for this species.

### Climate São Tomé



### Climate Príncipe



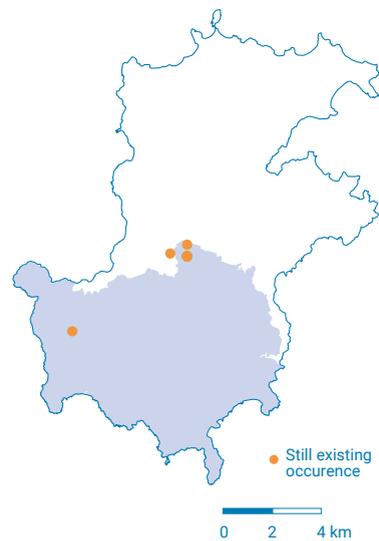
# Chrysophyllum calophyllum Exell

EN

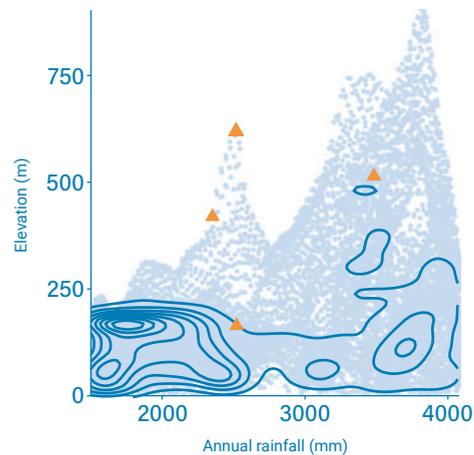


## Distribution

Príncipe

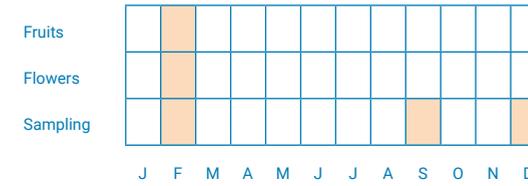


## Climate



## Phenology

*Chrysophyllum calophyllum*



## Rationale

*Chrysophyllum calophyllum* is a shrub endemic to Príncipe Island, found between 404 and 602 m altitude, occurring in low vegetation on ridges. The species is known from three collections and 13 transect observations made between 1932 (Exell 711, *typus*) and 2021 (Príncipe Transects). *Chrysophyllum calophyllum* is known from three occurrences, two around Pico Papagaio, and one at the top of Pico Mesa. All occurrences are within PNOP and none is considered as extirpated. Based on a 2 x 2 km cell size, its EOO is calculated to be 1,116 km<sup>2</sup>, and its AOO is estimated to be 8 km<sup>2</sup>, both within the limits for CR status under subcriteria B1 and B2. Following the IUCN guidelines, the EOO cannot be less than the AOO, thus we consider the EOO as 8 km<sup>2</sup>, the same as the AOO. The two occurrences at Pico Papagaio are threatened by ecotourism activities leading to a rapid degradation of its habitat and represent one location. The occurrence at the top of Pico Mesa is not threatened and represents one location. Thus, these three occurrences represent two locations (*sensu* IUCN, 2019), with regards to the most important threat (tourism), within the limits of EN status. We infer a current and a future continuing decline in the extent and habitat quality. *Chrysophyllum calophyllum* is therefore assessed as EN B1ab(iii)+2ab(iii).

## Habitat and ecology

The species occurs in low vegetation on ridges between 404 and 602 m altitudes.

## Use and trade

This species is not known to be used.

## Population

*Chrysophyllum calophyllum* is known from two subpopulations.



# Thunbergianthus quintasii Engl.

LC



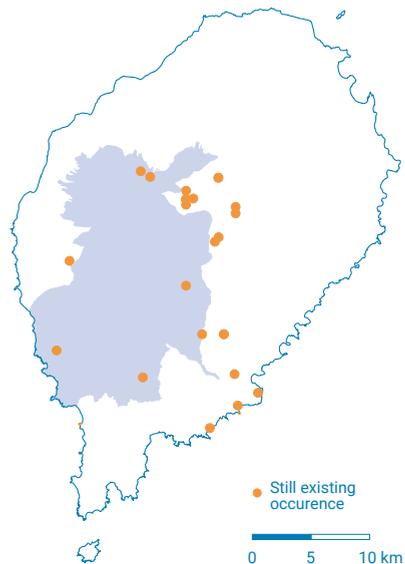
© Tariq Stévant



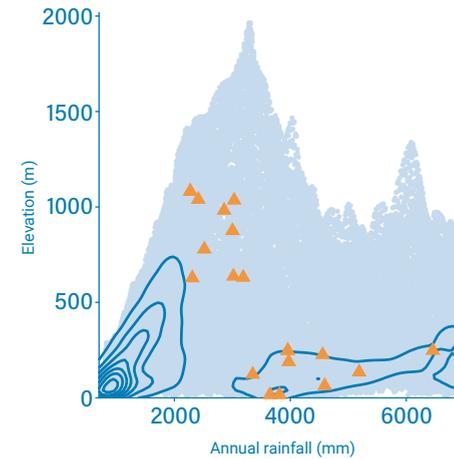
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## Distribution

São Tomé



## Climate



## Rationale

*Thunbergianthus quintasii* is a liana species endemic to São Tomé Island. It occurs mostly in mature and secondary lowland and submontane rainforest, growing in open places, on the edge of secondary vegetation, along roads and rivers. It is found mostly below 1,450 m in elevation, not yet recorded above 50 m.

The species is endemic to São Tomé, but was recorded in Príncipe in 1973 at Esperanza (Espírito Santo 5050). However, this record seems doubtful and was not used for the assessment.

The species is thus known from 32 collections made between 1886 (Quintas 1066) and 2017 (Farminhão 104). Three collections (Oliveira 1191, 1680, Espírito Santo 5050) were not taken into account in this assessment since they are not precisely georeferenced or cultivated. Overall, the species is known from 29 occurrences in São Tomé.

The species appears widespread in São Tomé at low elevation. We therefore consider these 29 occurrences as one subpopulation.

Based on a 2 x 2 km cell size, the AOO of this species is estimated as 76 km<sup>2</sup>, and the EOO is calculated as 274 km<sup>2</sup>, both below the upper threshold for EN status under Criterion B.

One occurrence located near Sao Nicolau is threatened by agricultural activities (vegetable plantations) and represents one location. The occurrences collected near Bombaim and Zampalma are threatened by agriculture and represent two locations. The 8 occurrences situated within the PNOST, are not threatened and represent one location. The occurrences outside the PNOST and situated near Rio Bomba and Formoso Pequeno, Vale Carmo and lo Grande are not threatened but represent two locations. Finally, the occurrences collected along the coast, near Ango-



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lares and in the valley of Rio Ió Grande are threatened by current palm plantations and agriculture. They represent 3 locations.

Therefore, these 23 occurrences represent 9 locations (*sensu* IUCN, 2019), with regards to the most serious plausible threats (palm plantations).

Despite the high threat on the occurrences near the coast, this species occurs almost everywhere on the islands, has a large ecology, including secondary and degraded habitat. The species is not severely fragmented and is not threatened in most of its range (more than 50%). Hence even if it meets the threshold of VU category under criterion B, we cannot use this criterion. We cannot apply criterion A because the population is not expected to decrease. *Thunbergianthus quintasii* is thus assessed as LC.

## Habitat and ecology

The species occurs mostly in mature or secondary lowland and submontane rainforest, growing in open places, on the edge of secondary vegetation, along roads and rivers. It is found mostly below 1450 m in elevation and is not recorded below 50 m.

## Use and trade

There is no known use for the species. The vernacular name is Musa-fria.

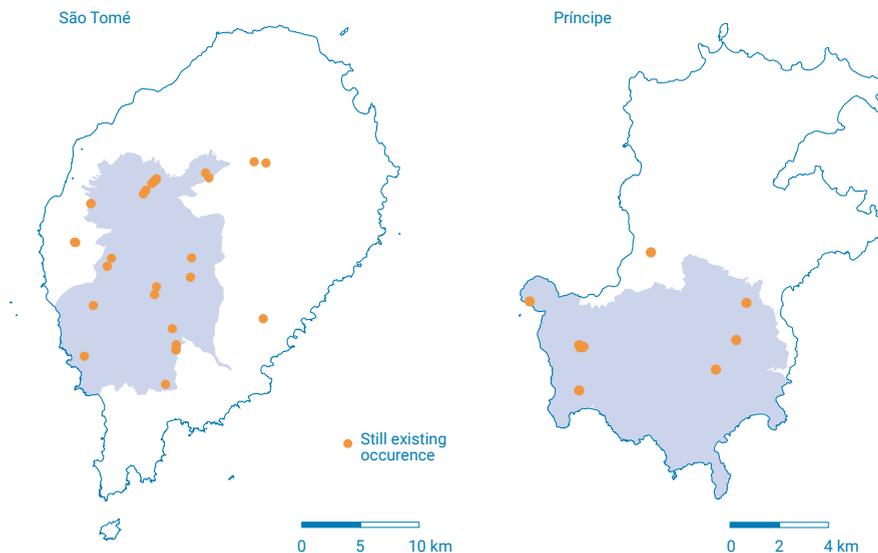
## Population

No information is available, but the species is quite widespread in São Tomé, and we consider only one subpopulation.



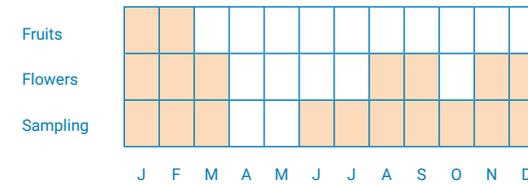
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# Dicranolepis thomensis Engl. & Gilg



## Phenology

*Dicranolepis thomensis*



## Rationale

*Dicranolepis thomensis* is a shrub, up to 4 m high. It occurs in mature and secondary lowland or montane rainforest, growing in forest undergrowth and open places, sometimes on ridges, and it is found mostly below 1,400 m in elevation, rarely down to 50 m.

The species is endemic to São Tomé and Príncipe and is known from 36 collections made between 1885 (Moller 284) and 2020 (Ikabanga 1012, Lima 25, Nguema 3299), and 5 transect observations. Three collections (Oliveira, F. de 98, 1724, Espírito Santo, J.V.G. do 4044) were not taken into account in this assessment since they are not precisely georeferenced. Overall, the species is known from 25 occurrences in São Tomé and 9 occurrences in Príncipe.

The species appears as widespread in each island where it occurs. We, therefore, consider these 34 occurrences as two subpopulations, one on each island.

Based on a 2 x 2 km cell size, the AOO of this species is estimated as 96 km<sup>2</sup>, and the EOO is calculated as 2,625 km<sup>2</sup>, both below the upper threshold for EN status under Criterion B.

One occurrence located near Bom Sucesso is threatened by agricultural activities (vegetable plantations) and represents one location. The occurrences collected near Monte Café are threatened by large plantations and represent one location. Occurrences situated within the PNST, near Morro Vilela, are threatened by tourism activities, and invasive species, they represent

one location. Twelve occurrences located inside PNST are not threatened and represent one location, while the occurrence near São Miguel was previously threatened by plantations. Finally, the occurrences collected near Pico Maria Fernandez are threatened by current plantations, and the one near Morro Claudina is threatened by illegal logging. The species is thus known from 7 locations in São Tomé. In Príncipe, the species was collected mostly within the Park, most of the occurrences not being threatened, but occurrences situated near Focinho Cão and near Barriga Branca were threatened by past plantations, and the collection outside the parc, near Pico Papagaio, is threatened by current plantation. So, these 9 occurrences represent four locations. Therefore, these 34 occurrences represent 11 locations (sensu IUCN, 2019), with regards to the most serious plausible threats (small-scale agriculture). Despite the high threat on the occurrences near Bom Sucesso and near Monte Café, this species occurs almost everywhere on the islands, has a large ecological amplitude, including secondary habitat, and is, therefore, able to survive even within quite degraded forest. The species is not severely fragmented and is not threatened in most of its range (more than 50%). So even, it meets the threshold of the NT category under criterion B, we cannot use this criterion B. We can not apply criterion A because the population is not expected to decrease. *Dicranolepis thomensis* is thus assessed as LC.

### Habitat and ecology

The species occurs in mature and secondary lowland or montane rainforest, growing in forest undergrowth or open places, sometimes on ridges, and it is found mostly below 1,400 m in elevation, rarely down to 50 m.

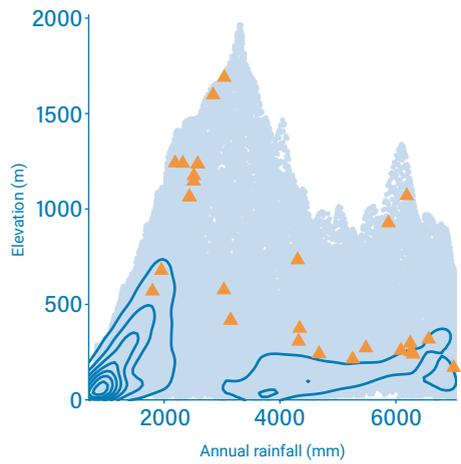
### Use and trade

Not reported, but the species has local names: Catete, Fiá-izé.

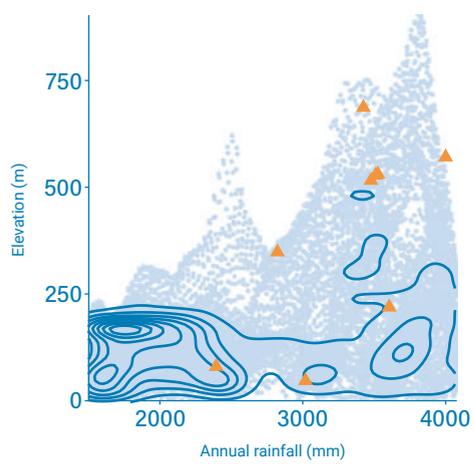
### Population

Population information is not known for this species. The species is quite frequent, but individuals are most often isolated.

Climate São Tomé



Climate Príncipe



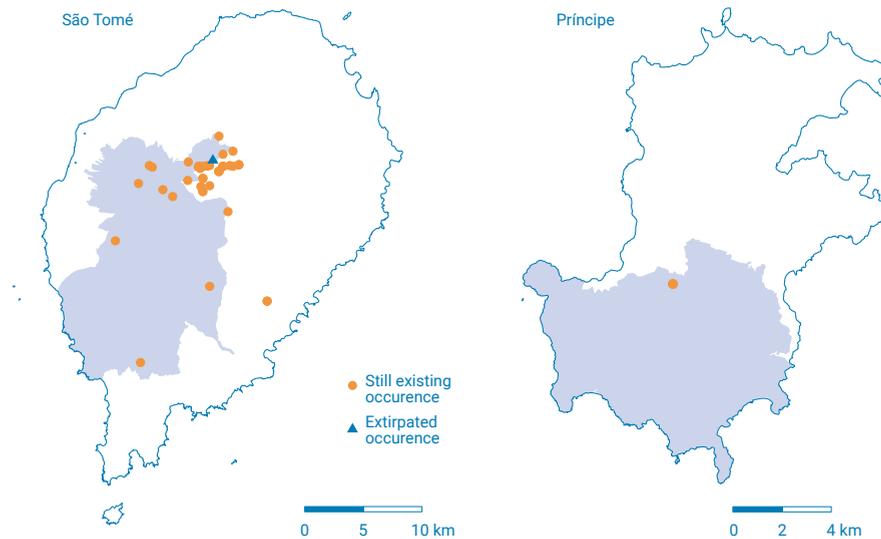
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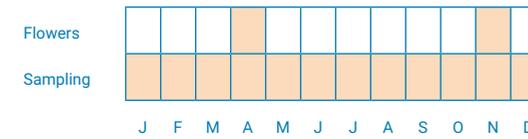


# Elatostema thomense Henriq



## Phenology

*Elatostema thomense*



## Distribution

São Tomé and Príncipe

## Rationale

*Elatostema thomense* is undergrowth herbaceous up to 0.66 m high, sometimes full epiphytes growing on the rather humid place in shade, known from old-growth montane rainforest, sparse forest, between 100 and 1,900 m in elevation. The species is endemic to São Tomé and Príncipe and is known from 52 collections made between 1885 (Moller 221) and 2019 (Ikabanga 952; 953; Lachenaud 2859; Eduardo 17). We excluded two collections made by Henriques (s.n.) because no locality information is provided. We consider that the occurrence corresponding to the collection made in 1885 by Espírito Santo (4617) as extirpated because the habitat of the species in Monté Café has been severely modified. Therefore, these 49 collections represent 34 occurrences and 2-3 subpopulations. Based on a 2 x 2 km cell size, the AOO of this species is estimated as 88 km<sup>2</sup>, below the upper threshold for EN status under subcriterion B2. The EOO is calculated as 1,771 km<sup>2</sup>, above the upper threshold for EN status under subcriteria B1. Twenty-six collections representing eighteen occurrences located between Bom Sucesso in the North and the center of PNOTS are threatened by tourism. They represent one location. Seventeen collections representing five occurrences collected between Bemposta and São Nicolau (around Bom Sucesso) are threatened by small-scale agriculture (vegetable plantations) that induce degradation of the quality of the habitat of this species and represent one location. We consider that most of these occurrences will disappear in a near future. Seven collections representing five

occurrences located in the North-west of Agua Belas are threatened by small-scale agriculture and therefore represent a third location. Two collections (Oliveira 111 made in 1998 and Paiva 778 made in 1995) located between Bombain, Monte Formoso and Moro Miguel Angelo are threatened by old cacao plantations and represent two occurrences, and a fourth location. Two collections representing two occurrences (Ogonovszky 75; 85 made in 2003) located in the flank of Pico Maria Fernandes are threatened by cacao plantation and represent, therefore, a fifth location. The five collections representing five occurrences (Oliveira 1139; 1372; Ogonovszky 156; 355; 135) located in the south, and South-East of the PNOTS are not threatened and represent the sixth location. Two collections (Joffroy 224; Oliveira 585) located within Parc Natural de Príncipe are not threatened and represent two occurrences and the seventh location. Therefore, these 34 occurrences represent seven locations (*sensu* IUCN, 2019), with regard to the most serious plausible threats (small-scale agriculture), which induces degradation of the quality of habitat. Based on the disappearance of occurrence from Monté Café, and the threat of the other occurrences located outside PNOTS and along the touristic road, we infer past, current, and future continuing decline in its AOO, the number of locations, and the number of mature individuals. Moreover, we infer a past, current, and future continuing decline in the extent and the quality of its habitat. *Sabicea cauliflora* is thus assessed as VU B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v).

### Habitat and ecology

The species grows on the rather humid place in shade, known from old-growth montane rainforest, sparse forest, between 100 and 1,900 m in elevation.

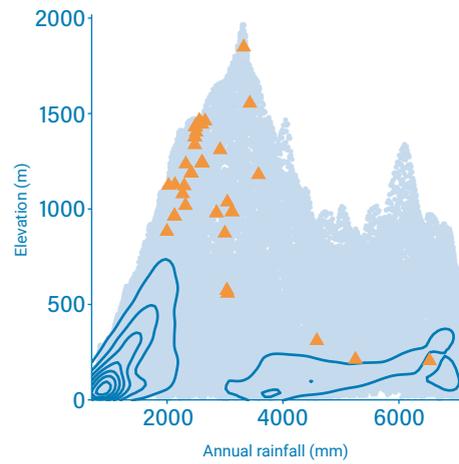
### Use and trade

It is not known if the species is used.

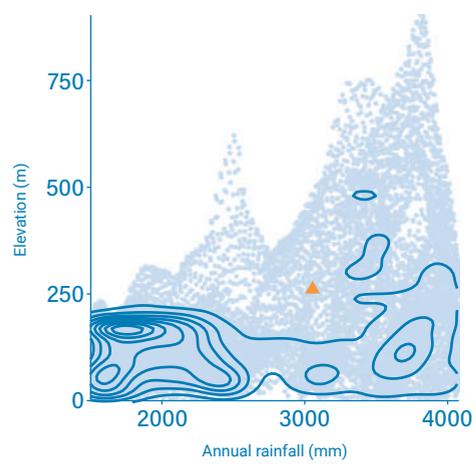
### Population

No quantitative population data are available for this species.

### Climate São Tomé



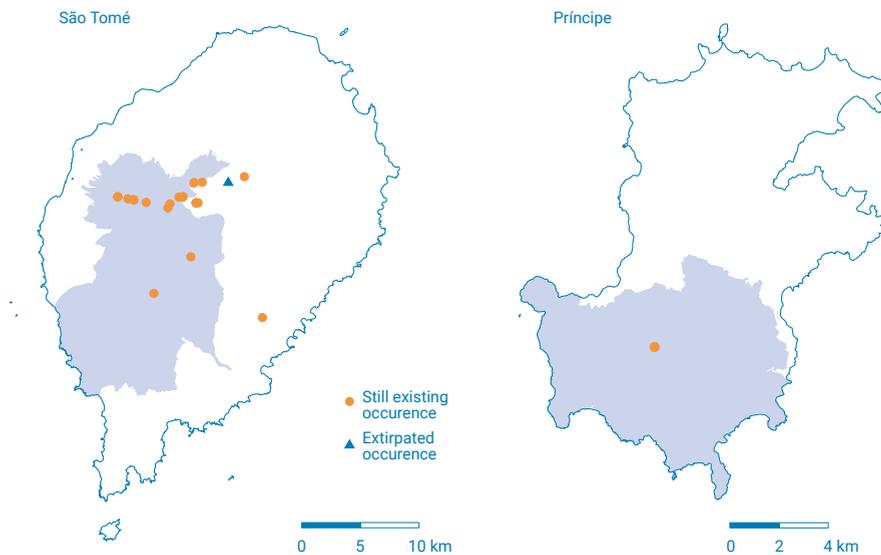
### Climate Príncipe



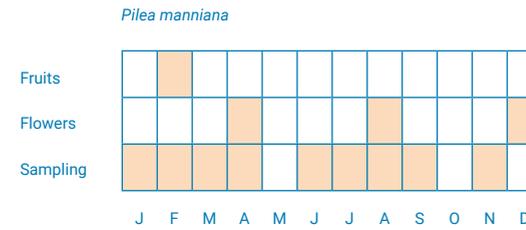


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# Pilea manniana Wedd



## Phenology



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## Distribution

São Tomé and Príncipe

## Rationale

*Pilea manniana* is a shrub up to 2 m, with green-white flowers. It is quite frequent, known from dense humid forest, between 450 and 1,950 m in elevation. The species is endemic to São Tomé and Príncipe. It is known from 33 collections made between 1861 (Mann 1063) and 2020 (Lima 53). Four collections (Mann 1063 made in 1861; Seabra s.n.; Campos 39 made in 1907) were not used for this evaluation because the locality and the geographic coordinates are not precise. We also excluded one collection made by Oliveira (872) at the Botanical Garden of Bom Sucesso. We consider that the occurrences corresponding to collections made in 1885 and 1956 respectively by Moller (36) Monod (12039) at Nova Moca and São Nicolau as extirpated because the habitat of the species in these places has been severely modified. Therefore, the 27 remaining collections represent 16 occurrences, and at list two or three subpopulations. Based on a 2 x 2 km cell size, the AOO of this species is estimated as 48 km<sup>2</sup>, below the upper threshold for EN status under subcriterion B2. The EOO is calculated as 1,542 km<sup>2</sup>, above the upper threshold for EN status under subcriteria B1. Two occurrences located at Macabrara are threatened by small-scale agriculture and illegal forest logging and represent one location. The occurrence (Ogonovszky 87 made in 2003) located in the south of São Tomé (Pico Maria Fernandes) was threatened by past cocoa plantations and represents one location. Twelve occurrences are located within the PNOST. Ten

of them are located along the touristic road and could be threatened by tourism and represent one location. The two other occurrences are not threatened and represent one location. The occurrence (Joffroy 208 made in 1999) located within the PNOP is not threatened and represents one location. Therefore, these 16 occurrences represent five locations (*sensu* IUCN, 2019), with regard to the most serious plausible threat (small scale agriculture) which induces degradation of the quality of habitat. We thus infer a past, current, and future continuing decline in the extent and the quality of its habitat. *Pilea manniana* is thus assessed as EN B1ab(iii)+2ab(iii).

### Habitat and ecology

The species is known from dense humid forest, between 450 and 1,950 m in elevation.

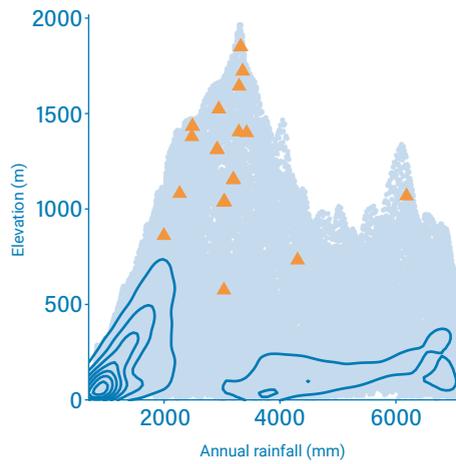
### Use and trade

It is not known if the species is used.

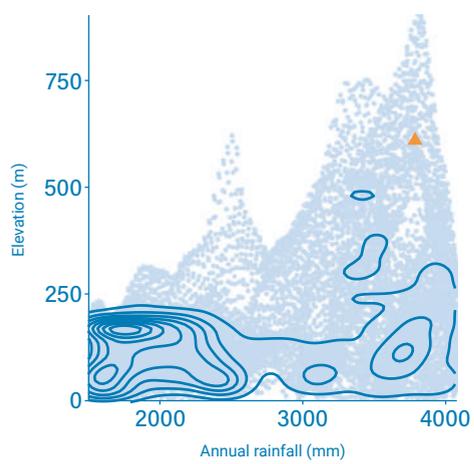
### Population

No quantitative population data are available for this species.

#### Climate São Tomé



#### Climate Príncipe





# Rinorea chevalieri Exell



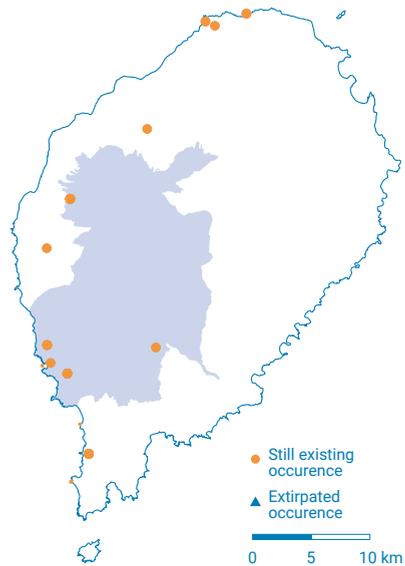
© Gilles Dauby



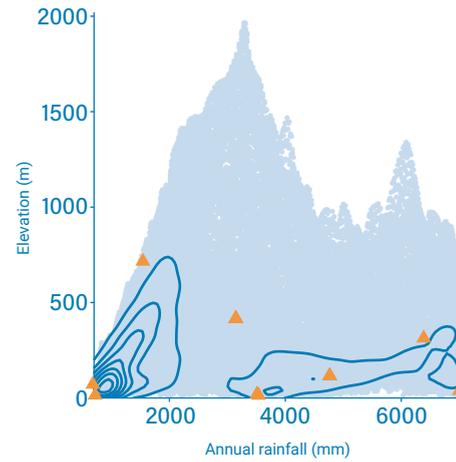
© Olivier Lachenaud

## Distribution

São Tomé



## Climate

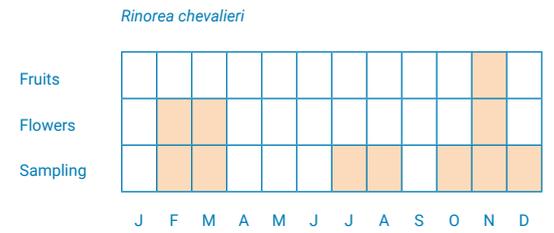


## Rationale

*Rinorea chevalieri* is a shrub or a small tree occurring in rain forest, from the coast to 1,000 m elevation. It is endemic to São Tomé island and is known from 33 collections made between 1905 and 2020. We discarded the collections Chevalier 14202, 14216, and 15865 prior to the assessment because they are old and their occurrences are likely to have disappeared due to urbanization. The 30 remaining collections represent 12 occurrences and one or two subpopulations. Based on a 2 x 2 km cell size, the AOO of this species is estimated to be 44 km<sup>2</sup>, which falls within the limits of the EN status under Criterion B2. The EOO is calculated as 290 km<sup>2</sup>, below the upper threshold of the EN category under Criterion B1.

Six occurrences of *Rinorea chevalieri* are located within the PNST, of which only one is or has not been under threat. Outside the park, the species is threatened by small-scale shifting agriculture, illegal logging, and invasive plants. It has been threatened by cocoa plantations and urbanization. Indeed, the occurrences (Espírito Santo 4682, de Matos 7724, Figueiredo 84, and Figueiredo 88) are threatened by shifting agriculture and represent one location. The occurrence de Oliveira 343 is threatened by illegal logging and represents one location. The occurrence de Oliveira 1214 is threatened by invasive plants and represents one location. The occurrences Ikabanga 1057 and MBG 994 are threatened by shifting agriculture and represent one location. The occurrences Transects Sao Tomé 1031 and 852, Lachenaud 2977 and 2980 located in the southwestern part of the PNST have been threatened by cocoa plantations and represent one location. The occurrence Transects Sao Tomé 684 is threatened by small-scale shifting agriculture and represents one location. We have not found any threat for the occurrences Oliveira 827 and Lachenaud 2910 located in the two parts of the PNST. Based on the smallest size of loca-

## Phenology



tions in the currently affected areas by small-scale shifting agriculture, these occurrences represent two locations.

Based on the main threat which is small-scale shifting agriculture, the 12 occurrences represent eight locations (*sensu* IUCN 2019), which falls within the limits of the VU category under the criteria B1 and B2. The threats *R. chevalieri* is currently facing are leading us to infer a continuing decline in the quality of the species' habitat. Because some occurrences have already disappeared, we infer a continuing decline in the EOO, AOO, number of locations, and mature individuals of the species. For all these reasons, *Rinorea chevalieri* is assessed as VU B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v).

## Habitat and ecology

The species is known in rain forest, from the coast to 1,000 m elevation.

## Use and trade

There are no known uses for this species.

## Population

*Rinorea chevalieri* is known from one or two subpopulations. No quantitative population data are available for the species.

# Rinorea insularis Engl

EN

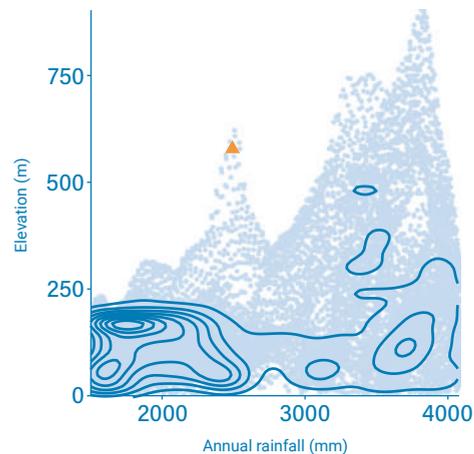


## Distribution

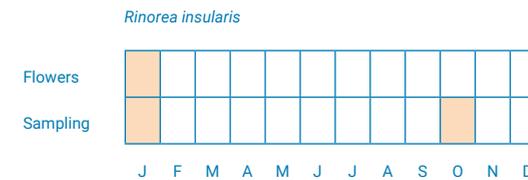
Príncipe



## Climate



## Phenology



## Rationale

*Rinorea insularis* is a shrub with yellow flowers which is endemic to Príncipe Island (Figueiredo et al. 2011). The species is known from four collections made between 1858 (Barter s.n.) and 1992 (Paiva 580 and 618). Two collections (Sousa s.n. and Barter s.n.) were made in unrecorded localities with no coordinates, and thus were not considered for this evaluation. The two remaining specimens (Paiva 580 and 618) represent one occurrence and one subpopulation located within PNOP. The genus is known from one species in the island and is also known from five collections (Oliveira 589, Dias 126bis, Príncipe Transects 987 and 1022 and Releve Príncipe 90), not identified at species level since only sterile material were collected. These specimens could represent that species, but we can't use them for these assessments in absence of formal identification. Based on a 2 x 2 km cell size, the AOO of this species is thus estimated as 4 km<sup>2</sup>, below the upper threshold of the CR status under subcriterion B2. With only one occurrence it was not possible to calculate the EOO. The species habitat, the lowland forest, was highly impacted by plantations in the colonial times. Moreover, the occurrence at Pico Papagaio is threatened by human disturbances (tourism activities) leading to a rapid degradation of its habitat and represents one location (sensu IUCN, 2019) with regard to the most serious plausible threat (tourism). This occurrence is not considered as extirpated. Based on this threat, we infer past, current and future continuing decline in the area, extent and the quality of its habitat. *Rinorea insularis* is thus assessed as CR B2ab(iii).

## Habitat and ecology

The species occurs in lowland forest at 500 m altitude.

## Use and trade

There is no known use for the species.

## Population

Population information is not sufficiently known for this species, but data suggest the existence of only one subpopulation.



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# Rinorea molleri

## M. Brandt



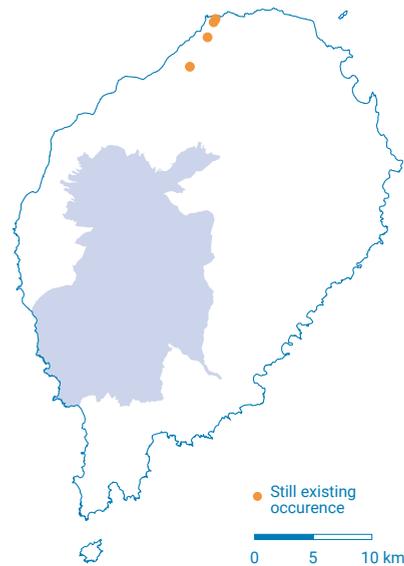
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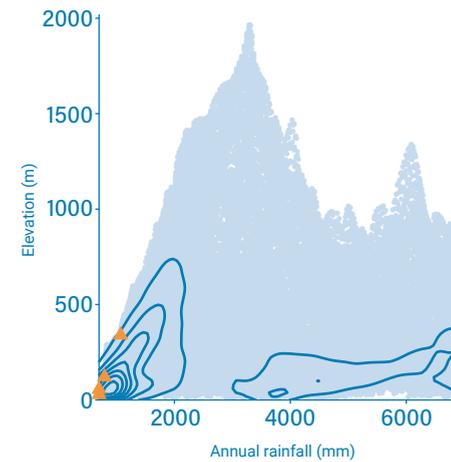
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### Distribution

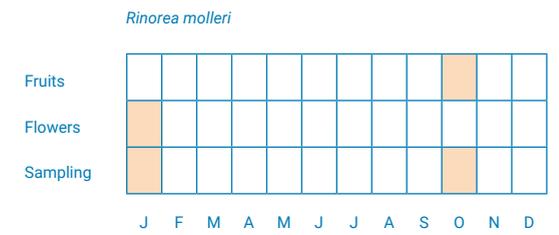
São Tomé



### Climate



### Phenology



### Rationale

*Rinorea molleri* is a shrub or small tree up to 3 m high, known from very degraded dry forests at the top of the slope, between 10 and 350 m in elevation. The species is endemic to São Tomé and is known from seven collections made between 1885 (Moller 12) and 2020 (Eduardo 89; 92). One collection (Moller 12) made from Vila Sta Ana (Santana) is not precisely located and considered as extirpated due to degradation of habitat by urbanization. So, this collection is not considered for this evaluation. The six remaining collections represent six occurrences (one of them located within PNST), and one subpopulation. Based on a 2 x 2 km cell size, the AOO of this species is estimated as 16 km<sup>2</sup>, below the upper threshold of the EN status under subcriterion B2. The EOO is calculated as 64 km<sup>2</sup>, below the upper threshold of the CR category under subcriterion B1. The occurrence within PNST is threatened by shifting agriculture and represents one location. Outside PNST, the occurrence at Planças 1 village is threatened by cacao plantations and represents one location. Two occurrences around Lagoa Azul are threatened by land quarried and represent one location. We consider that these two occurrences will disappear in near future. The occurrence at Morro Peixe is threatened by horticulture activities and represents one location. The occurrence from the south of the island (between Praia Xixi and Praia Portinho) could be threatened by the expansion of palm oil activities and represents one location. Therefore, these six occurrences represent five locations (*sensu* IUCN, 2019), with regards to the most

important threat (land quarrying). We infer a future decline in its EOO, AOO, the number of locations, and the number of mature individuals. Moreover, we infer a current and future continuing decline in the extent and habitat quality. *Rinorea molleri* is therefore assessed as EN B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v).

### Habitat and ecology

The species occurs in very degraded dry forest in upper slope, between 10 and 350 m in elevation.

### Use and trade

It is not known if the species is used.

### Population

Very restricted population. We consider the existence of one subpopulation.





