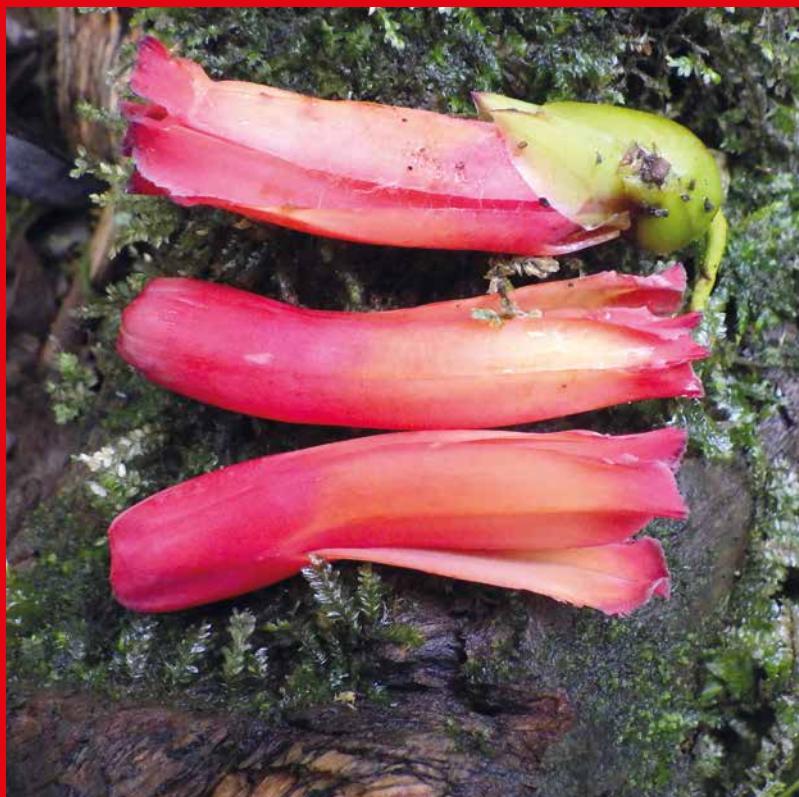


RED DATA BOOK of the Plant Species Endemic to São Tomé and Príncipe



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Ameaçada team

CRITICAL ECOSYSTEM
PARTNERSHIP FUND



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GARDEN



RED DATA BOOK

of the Plant Species Endemic to São Tomé and Príncipe

Second Edition

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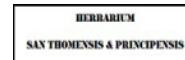
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Pascoal Neto de Sousa, unfortunately, left us suddenly and far too early (16/05/1977 - 21/12/2022). He was a Forestry Technician at Direcção das Florestas e da Biodiversidade de São Tomé and Príncipe, working from 2011-2022 at Departamento de Fiscalização e Monitorização, where he was a tireless defender of trees and forests that he knew so well. Pascoal had a huge desire to learn and a passion for botany, and quickly became one of the greatest parataxonomists of the country, and played an essential role in the study of the conservation status of saotomean trees. He was a good man and an excellent colleague, always available to everyone, and we will always remember his good mood and his contagious smile.

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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 have been recorded on these islands, among which a little more than 800 are native and about one hundred are strictly endemic to the archipelago.

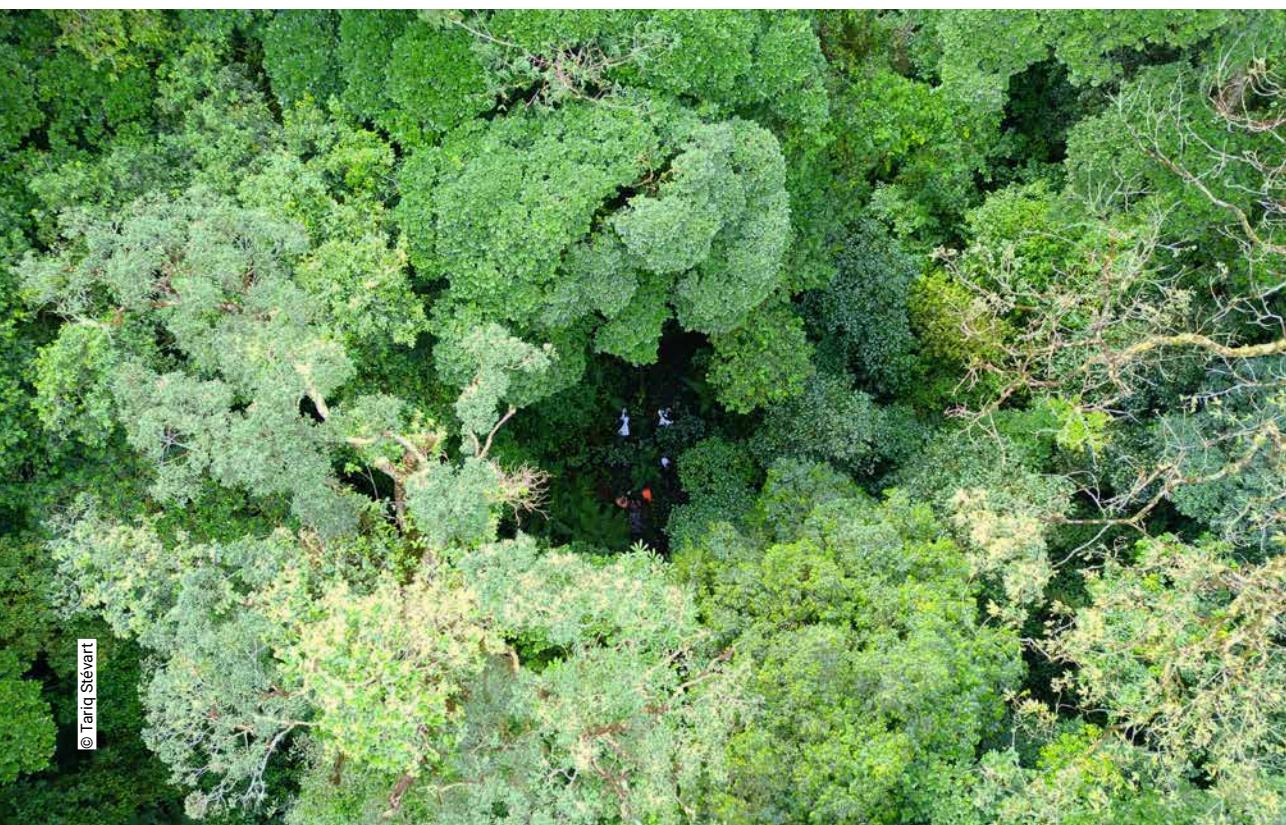
Unfortunately, native plant populations and vegetation of STP have been strongly impacted since the discovery of the islands and are increasingly threatened today by human pressures linked to the development of agro-industrial plantations, demand for timbers, and activities related to tourism. Implementing effective conservation measures for protecting the native flora and vegetation of STP has been difficult partly because of a lack of a unified database documenting species distributions and unknown and/or outdated evaluations of their risk of extinction based on the Red List 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 the 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 made by governments and civil society. Currently, the network of KBAs on STP comprises 7 terrestrial areas that

cover 512 km² (i.e. around 50% of the land area). However, their original delimitation did not take into account plant biodiversity and vegetation distribution.

Limited resources have also hampered the characterization of plant diversity in STP and understanding its dynamics. The archipelago has two herbaria, one on each island, but they remain underused because of a lack of logistics, appropriate materials, and most importantly, trained botanists/field technicians with skills in specimen collection, plant identification, and herbarium management.

Based on this assessment, a multi-partner project was funded by the CEPF that aims to identify threatened plant species using the IUCN Red List categories and criteria, and characterize their distribution, habitat, and the threats they are facing. Then, based on these data, the project aimed to reassess the network of KBAs STP while concurrently training local botanists and technicians and equipping the two herbaria (whose acronyms are STPH and P, respectively). This will result in the publication of a Red List data book that aims to provide the first overview ever of the endemic species whose conservation status was assessed during this project and present key data that can be used for targeting conservation actions and attracting attention to the most threatened species.



Introduction

To improve documentation of the floristic diversity of São Tomé & Príncipe and to help identify conservation priorities, several botanical expeditions were undertaken between 2019 and 2021 (Flora Ameaçada 2021). Various localities across the archipelago 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, which together covered most vegetation types. A book chapter dedicated to the vascular plants was recently published (Stévert et al. 2022), summarizing most of the current statistics on the flora.

São Tomé and Príncipe

São Tomé Island is located 300 km off the West African coast and has an overall length of 43.6 km (north to south) and width of 33.4 km (east to west), with a total land area of approximately 855 km². The maximum elevation is 2,024 m at the summit of Pico de São Tomé, situated to the northwest of the center of the island, and surrounded by a multitude of smaller peaks, ridges, and steep slopes. Overall, the island is divided by a North-oriented South ridge extending from Pico de São Tomé to Pico Cabumbé (1,400 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 primarily occurred in the flat lowlands of the drier north, where fire maintains large extents of open vegetation.

The mainland of Príncipe Island has an overall length of 18.5 km (north to south) and width of 11 km (east to west), with a total land area of approximately 139 km². It is located 220 km off the West African coast and 146 km north of São Tomé. The north of the island is relatively flat, whereas the south-center has the largest elevated area (> 500 m), including Pico do Príncipe, which reaches 942 m, and multiple surrounding peaks along with steep slopes and ridges.

Nearly all lowland forests in Príncipe have been disturbed by human activities, creating a mosaic of native and secondary forest vegetation 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 established in 2006 that covers around 21% of Príncipe's land area. These human activities are also taking place in the São Tomé Natural Park (PNOST), a protected area created in 2006 that covers about 23% of São Tomé's land area.



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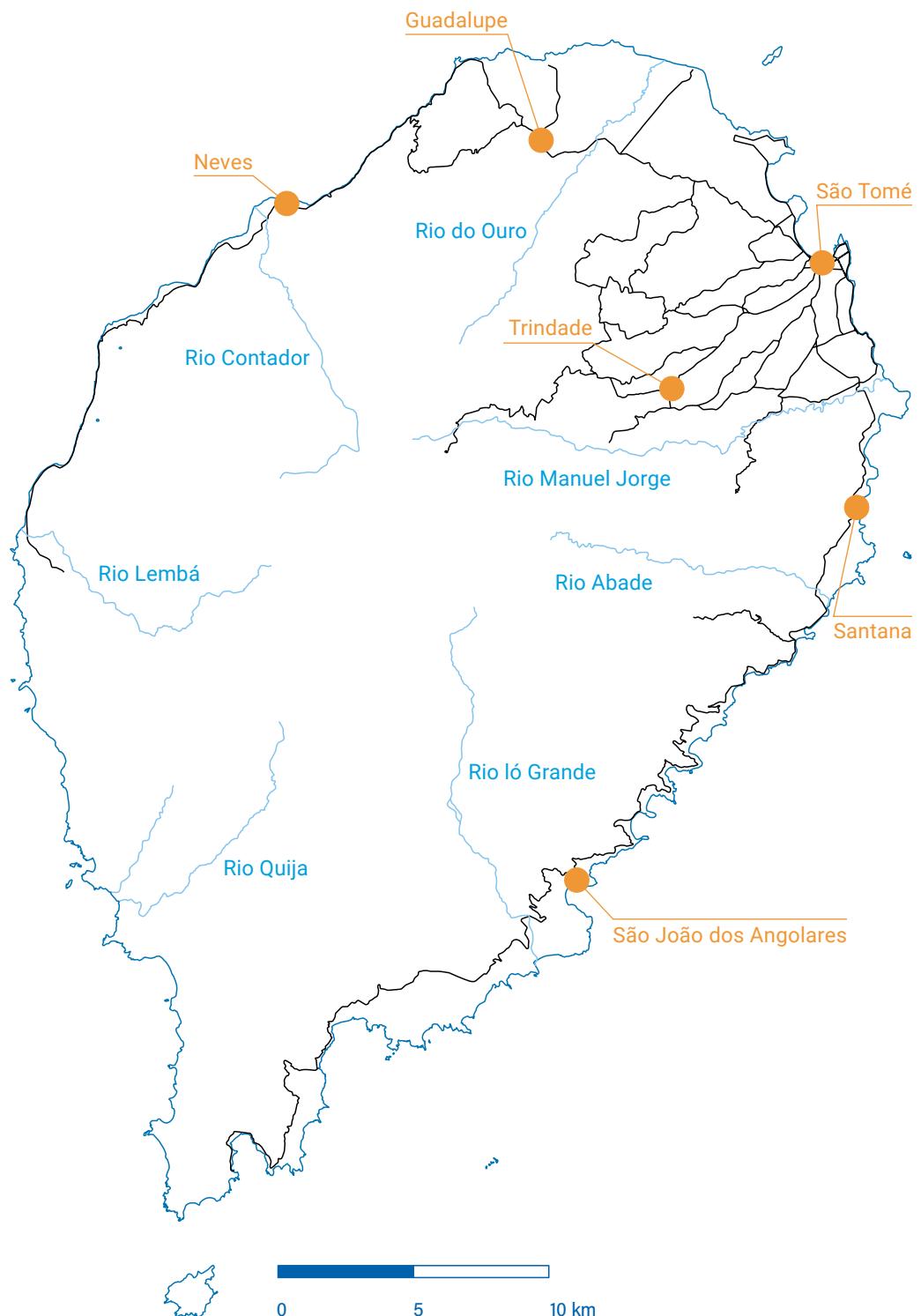


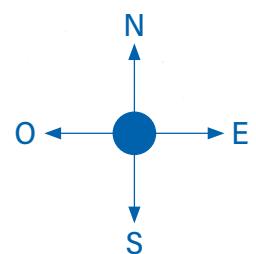
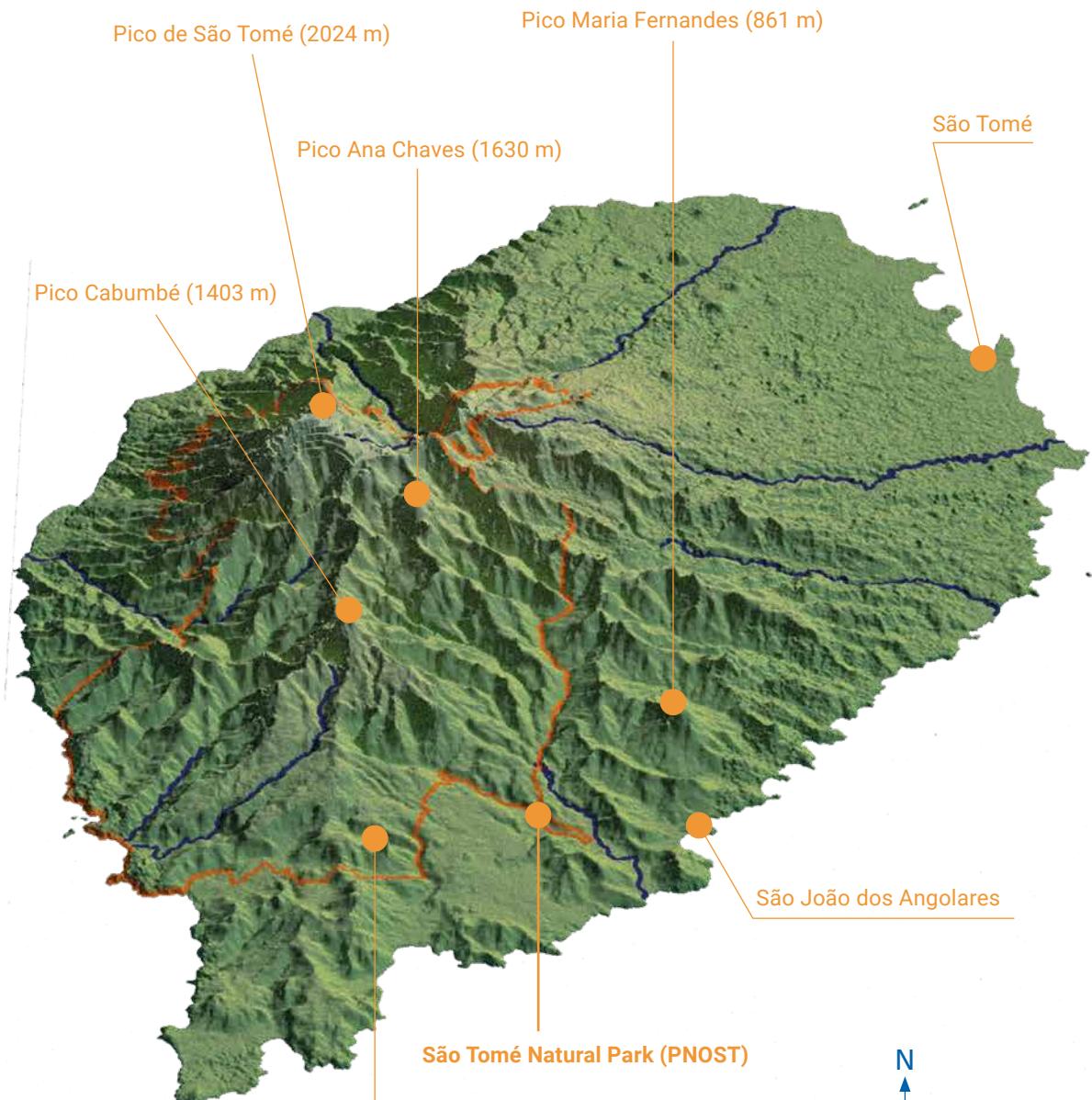
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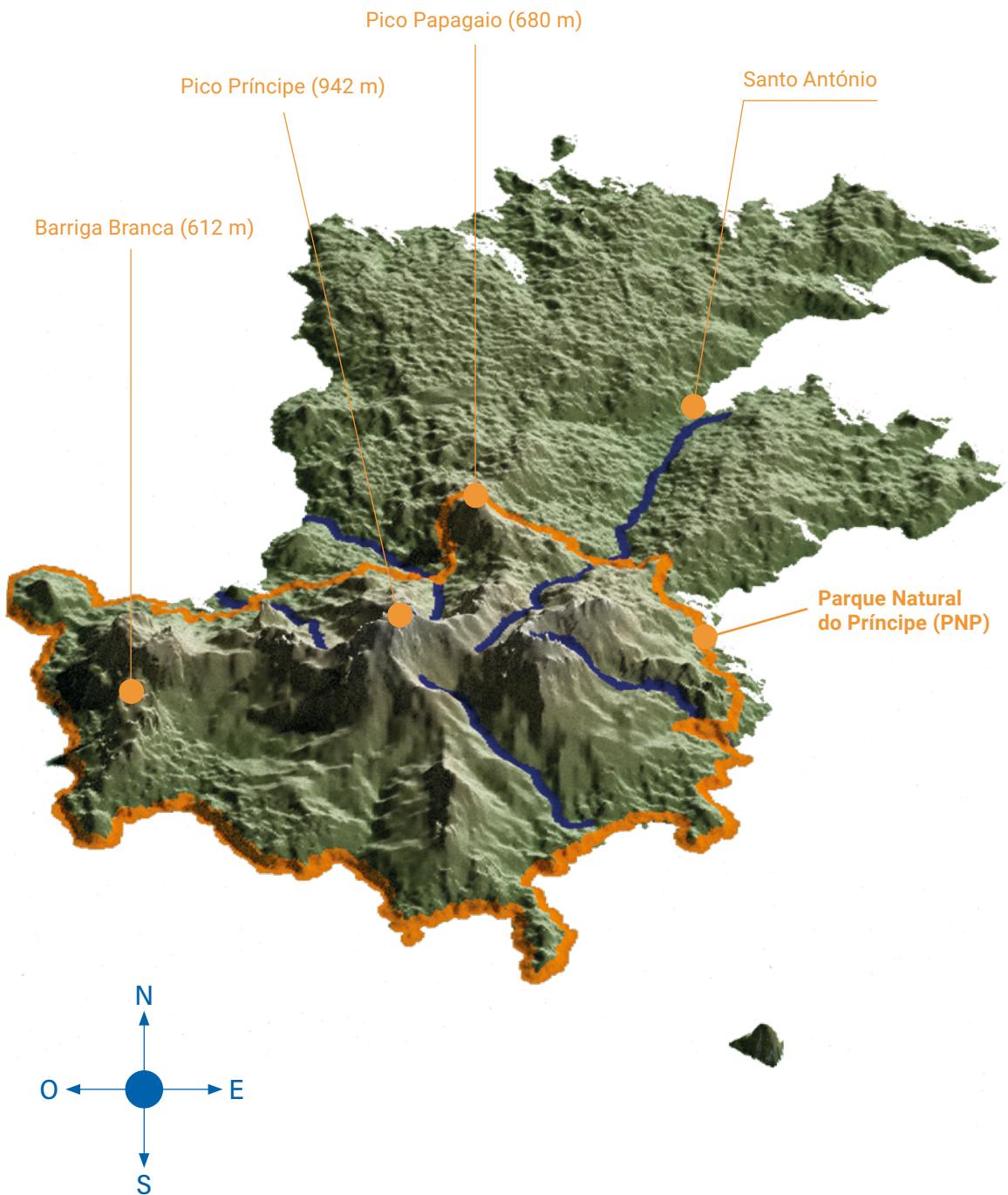
São Tomé





Príncipe





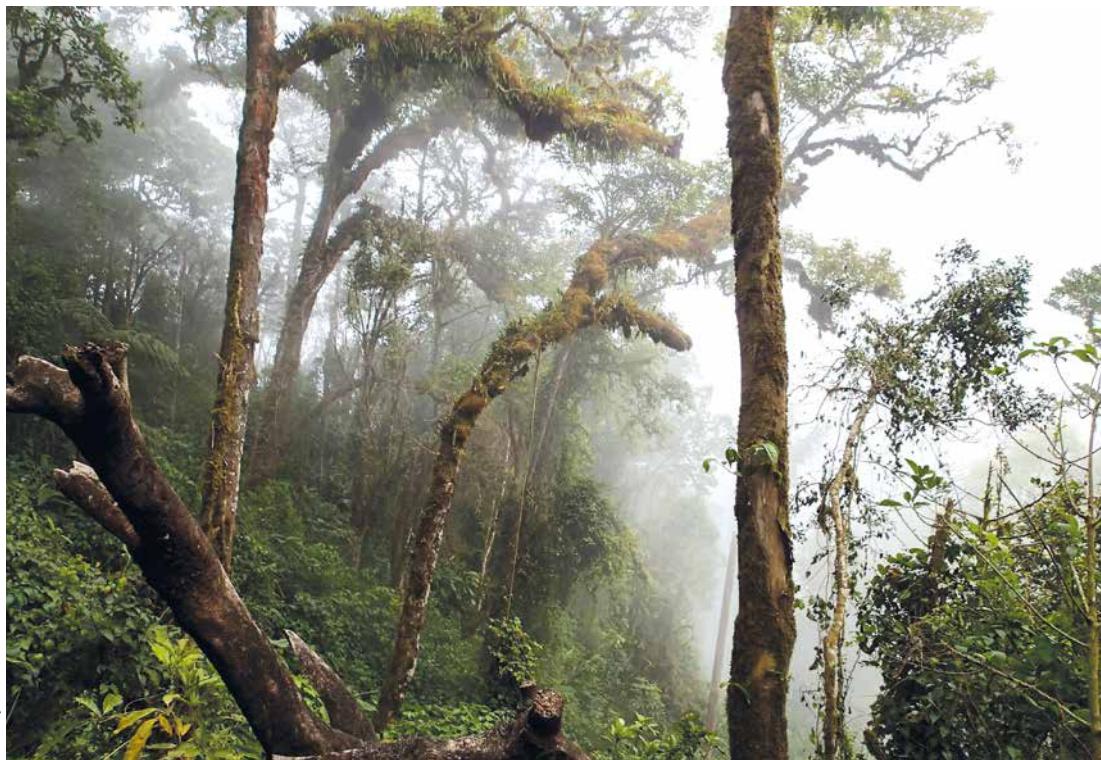
Floristic diversity

The number of vascular plant taxa recorded from São Tomé and Príncipe was indicated in a recent account (Stévert et al. 2022): 135 families (of which 29 are introduced), 624 genera (172 introduced), and 1,104 species (301 introduced), along with 12 infraspecific taxa, which including 119 endemic taxa (107 species and 12 infraspecific taxa). However, these figures are still moving since results from our extensive inventories conducted on Príncipe (Benitez et al 2018) and on São Tomé (Flora Ameaçada 2021) are still providing additional results. Príncipe has the highest proportion of archipelago's native flora (88.5%), followed by São Tomé (80.7%).

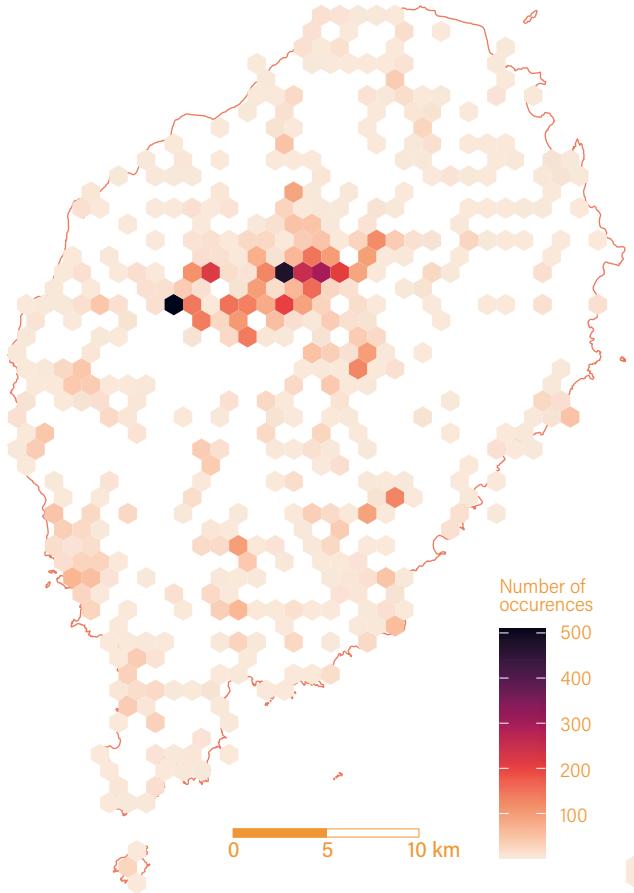
One of the main findings of the botanical expeditions conducted on São Tomé and Príncipe in 2019-2021 was that more than 90% of the endemic woody species were seen during this field work. This included the rediscovery of some very rare species, including *Balthasaria mannii* (Oliv.) Verdc. (Pentaphylacaceae) and *Psychotria exellii* R. Alves, Figueiredo and A.P. Davis (Rubiaceae), both restricted to the summit of the Pico de São Tomé and not seen for more than 50 years. Even more interesting was the discovery of at least 17 species new to science – a number likely to increase as ongoing identification of specimens continues. The most remarkable of these is a new species of *Cleistanthus* (Phyllanthaceae), which is the dominant tree

in dry forest remnants in the North of the island. Several earlier collections had been deposited in herbaria, but they had not previously been identified. Although locally abundant, this new species is highly threatened by exploitation for wood and charcoal production, and its habitat is in need of protection. In addition, 42 species represent new country records for São Tomé and Príncipe, most of which are widespread on mainland Africa.

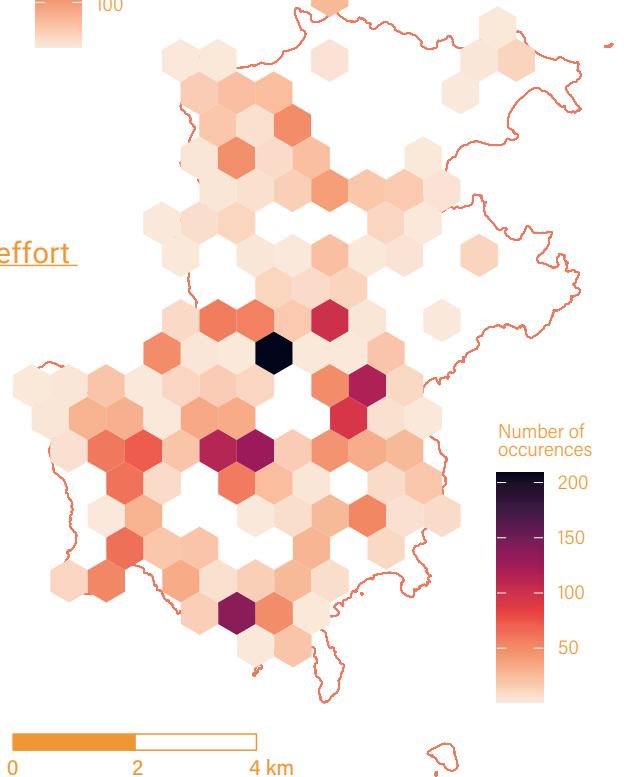
Complementing the efforts undertaken since 2016 to understand tree diversity in the southern forests of Príncipe (Benitez et al. 2018), several botanical expeditions conducted since 2019 have focused on the drier northern (Flora Ameaçada 2021). This work included areas of secondary or presumably degraded forest, extending from coastal and lowland forests to the northern plateau of the island, but it also involved collecting in areas in the south that had not been assessed during previous years, such as the summit of Pico do Príncipe. These inventories resulted in the discovery of 12 species putatively new to science, seven of which are only known from Príncipe.



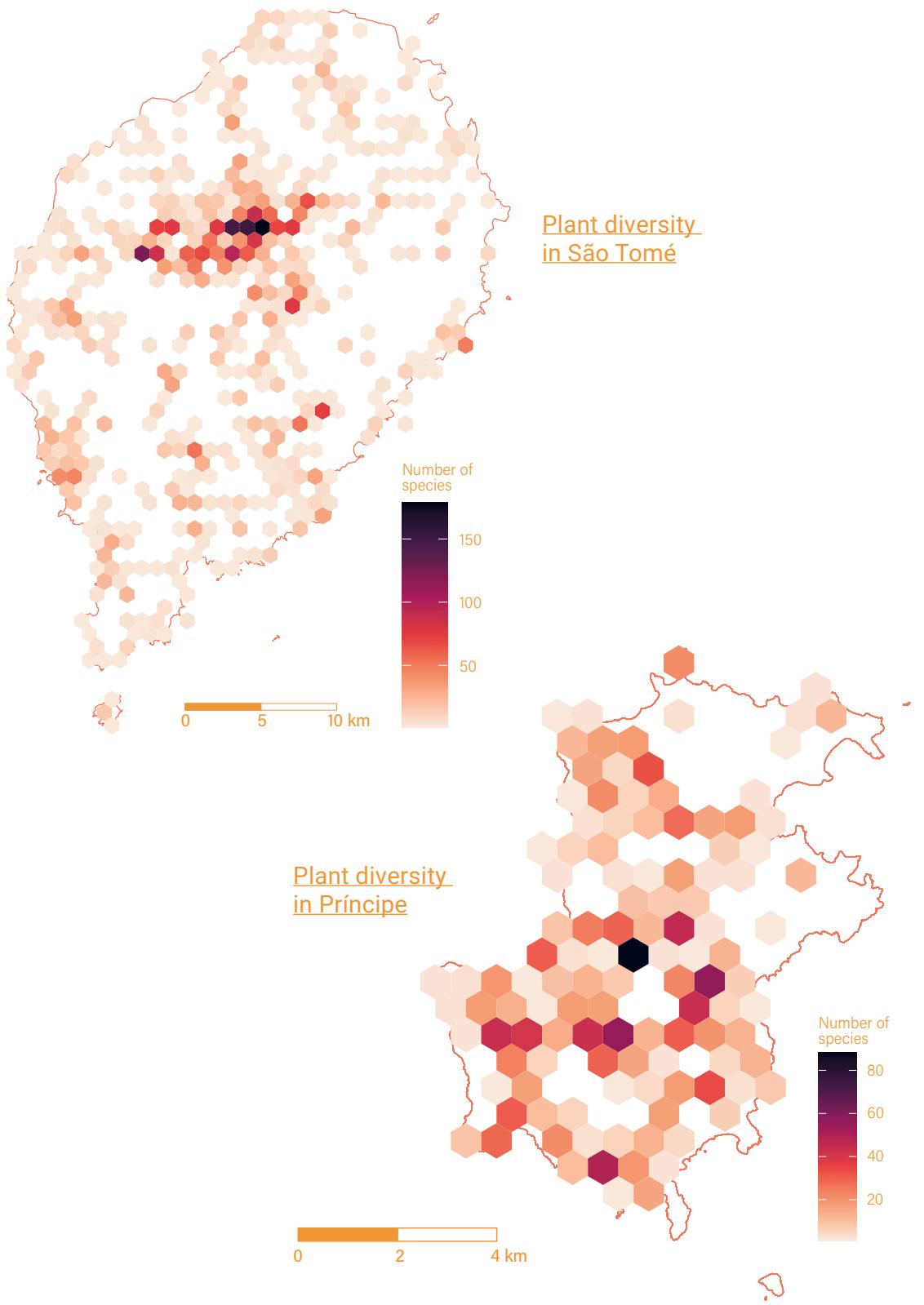
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Collecting effort
in São Tomé



Collecting effort
in Príncipe





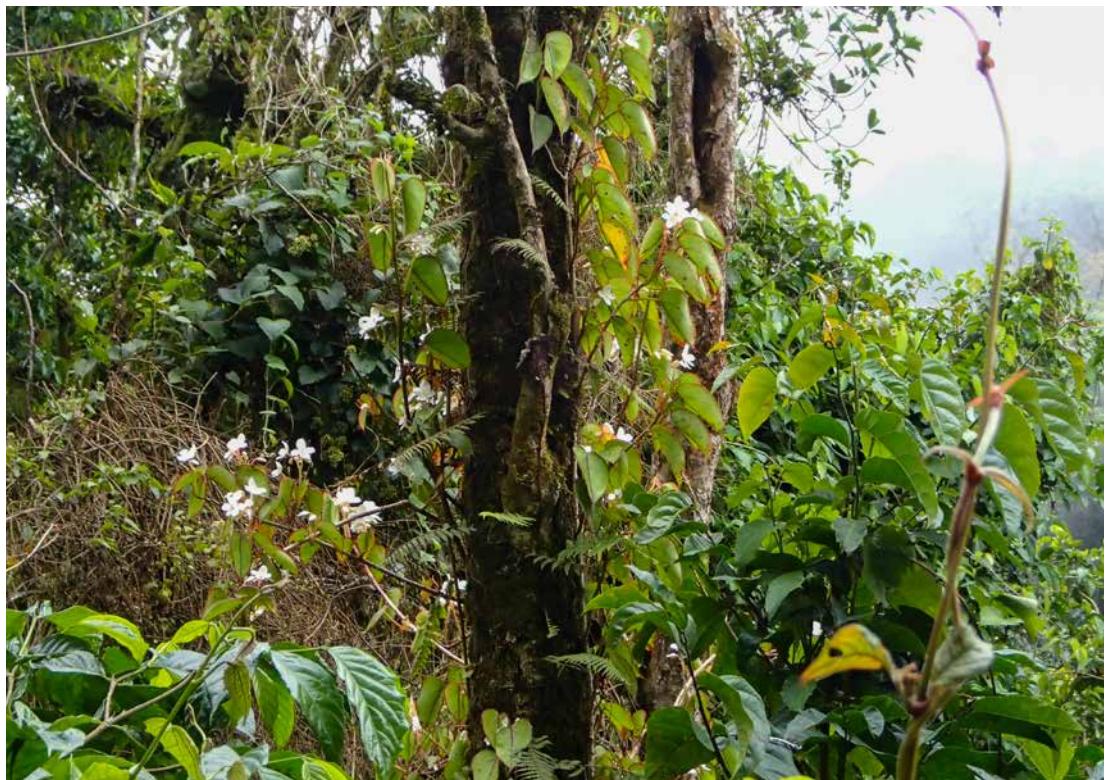
Endemism

The flora of the Gulf of Guinea Islands comprises approximately 1,700 indigenous species of angiosperms (Figueiredo 1994) and is well known for its high level of endemism. Of the 1,028 indigenous species and infraspecific taxa documented from São Tomé, Príncipe, and Annobón, approximately 164 are endemic, yielding a rate of endemism of about 16%. Previous estimates of endemism on Príncipe have varied significantly over the years; the current estimate is 14.7% for vascular plants. Calculations of endemism on São Tomé have decreased over time, from 19.4% (Exell 1944) and 15.4% (Exell 1973) to the current value of 14.5% (Stévert et al 2022).

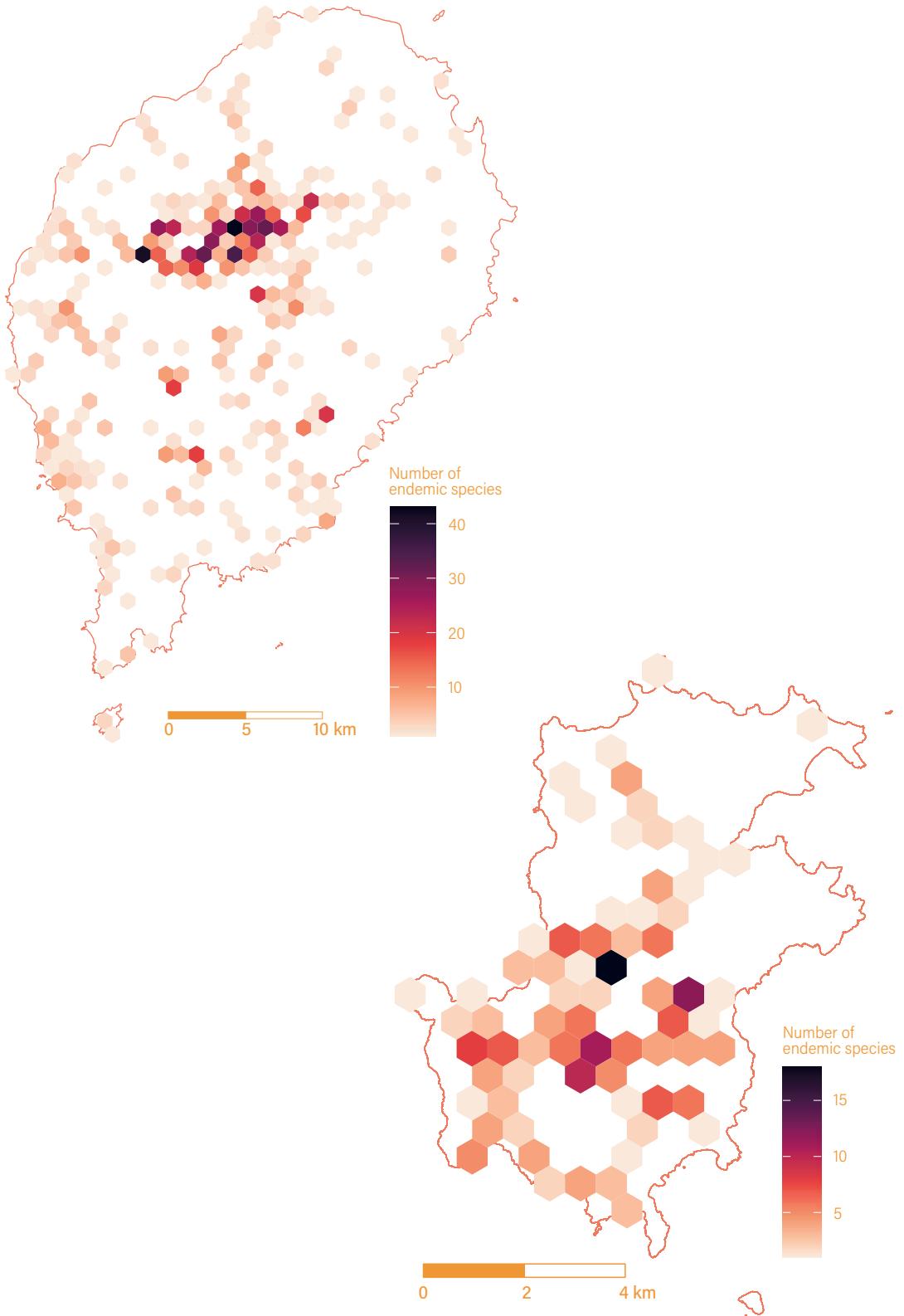
The families with the largest numbers of endemic taxa are Orchidaceae (30), Rubiaceae (29), and Euphorbiaceae (15). The genera *Polystachya* (Orchidaceae), *Begonia* (Begoniaceae), and *Psychotria* (Rubiaceae) have the largest numbers of endemic species. Some emblematic endemics are two gigantic species, *Begonia baccata* Hook.f. and *Begonia crateris* Exell, which can reach a height of 4 m. *Afrocarpus mannii* (Hook.) C.N. Page (Podocarpaceae), the only native gymnosperm, is endemic to São Tomé and is widely grown in many botanic gardens around the world.



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Ecosystems of São Tomé and Príncipe

The main types of ecosystems of São Tomé and Príncipe are presented below.

Coastal Ecosystems

The coasts of São Tomé and Príncipe are approximately 204 and 100 km long, respectively, and are home to mangroves, other humid areas, sandy coasts, and cliffs. Coastal ecosystems cover an area of 10.4 km² (1.2%) on São Tomé and 2.6 km² (1.9%) on Príncipe.

At the interface between the terrestrial, freshwater, and marine realms, mangroves are the most

distinct coastal ecosystems on the islands (Herrero-Barrengua et al. 2017; Alfonso 2019). On São Tomé, at least 14 mangroves areas persist. On Príncipe, mangroves can still be found at Praia Caixão, Praia Grande, and Praia Salgada. Cliffs are frequent on both islands but their distribution and associated biota are poorly characterized. In the south of both São Tomé and Príncipe, dense populations of *Pandanus thomensis* Henríg. (Pandanaceae) frequently colonize these areas. Given its distinct edaphic properties and reduced accessibility, this ecosystem might be less impacted by human activities than others.





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Non-coastal Wetlands

Non-coastal wetlands include all habitats that are seasonally or permanently inundated by freshwater. Riverine forests, waterfalls, lowland swamp and montane swamps can be distinguished.

Riverine forests can be defined as areas that are influenced by rivers and their associated flood planes. Their distribution, extent, and associated biological communities are poorly characterized in São Tomé and Príncipe.

Waterfalls display specific geomorphic and micro-habitat features, with strong but very localized environmental heterogeneity and distinctiveness (Clayton and Pearson 2017).

Lowland swamps are infrequent and small on São Tomé but seem to be somewhat more widespread in the northern plateau of Príncipe.

The only significant example of a montane swamp is the Lagoa Amélia, at c. 1,400 m on São Tomé. There is no evidence that this area has a distinct floristic assemblage, but it represents a unique combination of environmental conditions in the archipelago, being the only super humid, high-altitude swamp.

Inland Uplands

In São Tomé and Príncipe, vegetation can be divided first by elevation, with thresholds at 800 m, 1,400 m and 1,800 m, and then by the 2,000 mm annual rainfall threshold. Using this framework, we are able to distinguish: (1) lowland deciduous forests, (2) lowland moist and wet forests, (3) submontane rainforests, (4) montane forests, and (5) montane shrublands and grasslands. For each of these, we identified abiotic factors that may exacerbate or mitigate the local influence of temperature or water availability relative to the mesic environment.

Lowland Deciduous Forests

Occurring up to 800 m in elevation and with less than 2,000 mm of annual rainfall, these ecosystems are mostly found on flat or gentle slopes of northern São Tomé, where it covers 344.2 km² (40.4%), although it also occurs on Príncipe, with an extent of 43.4 km² (31.1%). Given the limited rainfall, lower cloud frequency, and higher temperatures of these areas, water availability is probably the main limiting factor for plant growth. Almost none of this native forest vegetation type remains today, but we can assume that in areas with mesic conditions it would have been (semi)-deciduous or dry forest.



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Lowland Moist and Wet Rainforests

This regional-scale ecosystem includes all areas up to 800 m elevation and with more than 2,000 mm of annual rainfall, where water availability is less limited due to lower seasonality. On São Tomé this ecosystem covers an area of 459.7 km² (54%) and on Príncipe it occupies an area of 92.2 km² (66.2%). The natural vegetation at sites with mesic conditions was undoubtedly rainforest, which still occupies most of São Tomé and Príncipe, even if most of it is secondary. On São Tomé, industrial palm plantations occupy more than 5% of this ecosystem. Overall, we estimate that native forests persist in less than 40% of their original area.

Submontane Rainforest

Submontane rainforests include areas above 800 m. We distinguished forests (1) on ridges, (2) on steep slopes, and (3) in valleys. On São Tomé, we estimate that 9% of the potential area for submontane rainforest is currently non-forested, most of which is agricultural, while 15% is secondary forest and 2.5% is shade forest. The extent on Príncipe is very limited [0.8 km² (0.6%)] but has been spared from human activities.

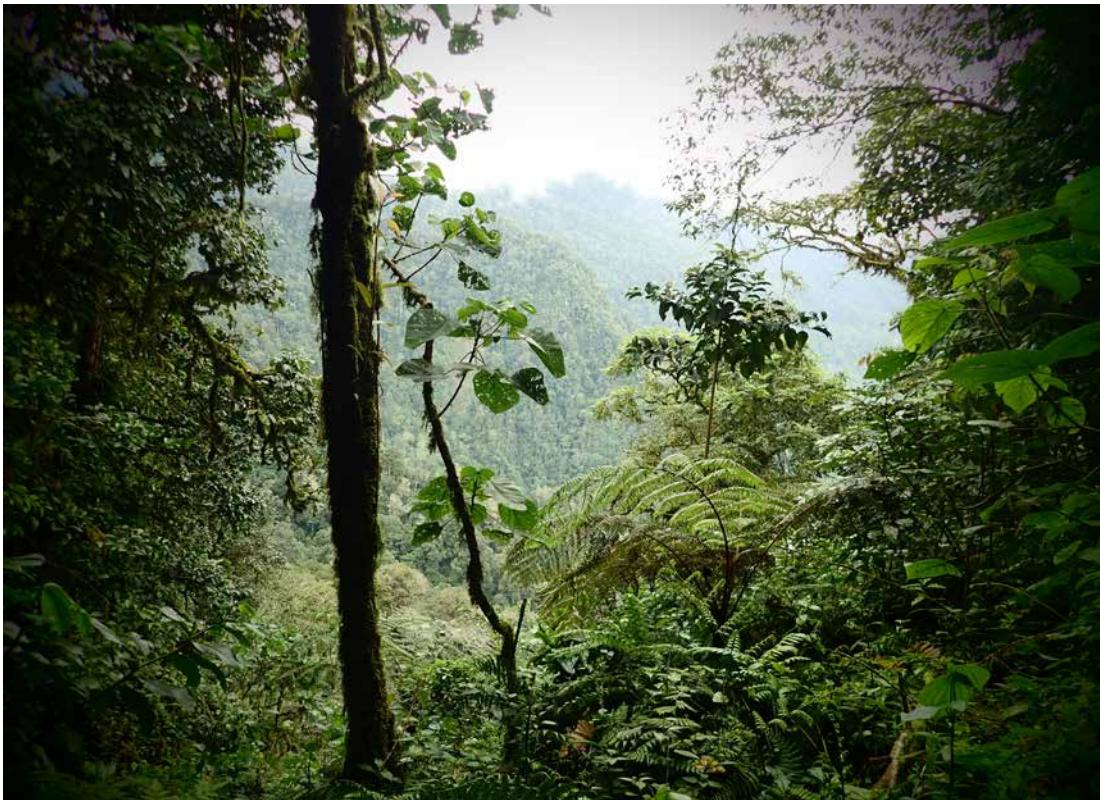
Forests on ridges are often characterized by the endemic gymnosperm species *Afrocarpus mannii*. They represent nearly 10% of submontane forests on São Tomé, while forests on steep slopes represent almost 35%. Both these forest types are likely to be spared from direct human disturbances, even though natural disturbances such as land-slides are probably more frequent there than elsewhere.



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Montane Forests

The area between 1,400 and 1,800 m is restricted to São Tomé and includes mainly montane rainforests. This ecosystem covers an area of 7.9 km² (0.9%) and is almost intact, although introduced plant species can be locally abundant (e.g. the tree *Cinchona* spp.). We distinguish (1) forests on ridges, (2) forests on slopes and plateaus, and (3) montane grasslands.

Montane forests on ridges occupy nearly 20% of this ecosystem and are similar to submontane ridge forests, as indicated by the sun-loving tree

Afrocarpus mannii, but also by herbaceous species such as *Begonia thomeana* C. DC. and *Mapania ferruginea* Ridl. Forests on slopes and plateaus remain poorly documented because of their limited accessibility, even though they represent nearly half of this ecosystem. Both sub-montane and montane forests are characterized by forest species like *Palisota pedicellata* K. Schum., *Homalium henriquesii* Gilg ex Engl. *Tabernaemontana stenosiphon* Stapf, and *Craterispermum cerianthum* Hiern.

Montane Low Forest, Grasslands and Shrublands

Above 1,800 m, we regard this ecosystem as distinct from the Montane Forest because of its specific physiognomy, characterized by the frequency of shrubby vegetation and smaller trees on ridges. Grass mat is also abundant along ridges, but these grassland areas can also be observed at lower altitude along ridges. In São Tomé, this ecosystem covers an area of 0.7 km² (0.1%). The presence of plant taxa such as species of *Erica* and *Lobelia*, as well as tree *Balthasaria mannii*, makes this ecosystem the most distinct in the Oceanic Islands of the Gulf of Guinea, showing affinities to biological assemblages observed in other mountain ranges,

such as on Bioko and in East Africa (Monod 1960). In addition to its unique species assemblage, the upper montane area of São Tomé seem also to display distinct abiotic properties. The “prevalent mist” of the “mist rainforests” is impressive but might be less significant for the development of this specific community than surface soils (Exell 1944). Indeed, as described by Monod (1960), areas above 1,800 m are often above the clouds and therefore tend to be comparatively drier (especially during the dry season), whereas montane and submontane forests at lower altitude remain wetter due to the nearly permanent mist. Monod (1960) even remarked (in August, hence at the end of the dry season) that the vegetation was dry enough to be vulnerable to fires.

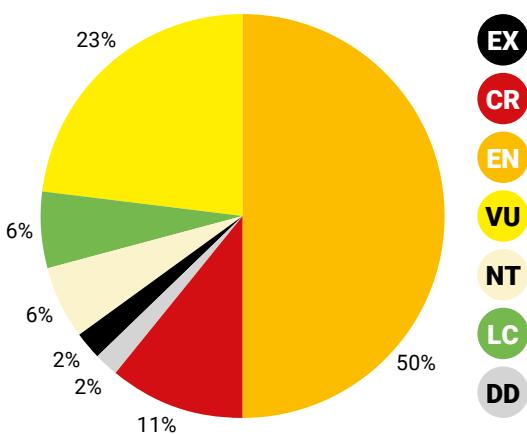


Conservation

Extinction risk assessments were carried out between 1998 and 2020 for 285 native and introduced plant species from the islands of Príncipe, São Tomé and Annobón. These taxa belong to 207 genera and 86 families, and more than 13% are endemic to São Tomé and Príncipe. Thirty-two assessments were carried out in 1998, and 62 more between 2000 and 2017. The number of species assessed has more than doubled between 2018 and 2020.

This project summarises the assessments according to the IUCN Red List categories and criteria for 106 (sub-)endemic species to São Tomé and Príncipe. Of these, two Orchidaceae species (*Angraecopsis dolabriformis* (Rolfe) Schltr., 1918 and *Angraecum astroarche* Ridl., 1887) are classified as Extinct (EX), as they have not been recorded after intensive surveys in the locations where they were previously documented. Twelve are Critically Endangered (CR), 53 Endangered (EN), 25 Vulnerable (VU), six Near Threatened (NT), six Least Concern (LC) and two Data Deficient (DD). This comprehensive assessment highlights the urgent need for conservation efforts to protect the unique flora of São Tomé and Príncipe.

Distribution of the 106 (sub-)endemic taxa assessed according to IUCN Red List categories:



Most historical threats, such as the large-scale plantations that profoundly altered the natural vegetation of both islands have disappeared. Indeed, on Príncipe, current threats are relatively limited and not clearly defined, but certainly include the development of tourism infrastructure, whose impact on the flora has yet to be quantified. The development of human activities is increasing pres-

sure on the remaining forests in the north, which are already threatened by small-scale agriculture, charcoal burning, firewood collection and logging. The collection and use of medicinal plants also puts some species at risk of local extinction. In fact, most of the plants harvested by traditional healers and commercial vendors who collect medicinal plants for alcoholic beverages come from forests, and very few plants are cultivated for medicinal purposes. On São Tomé, threats include local deforestation around the parks and the widespread presence of invasive species. These threats do not affect most species directly, but they do affect the quality of their habitat. However, the most serious current threats on São Tomé are the presence of an oil palm plantation in the southwest of the island, and swidden agriculture near Bom Sucesso and in the dry forests of the north. These activities have expanded in recent years and are directly affecting populations of plant species.

There are many threatened and important ecosystems in the archipelago. In São Tomé, the dry lowland ecosystem appears as the most threatened one. Most of this unique ecosystem was converted into plantations, and only a few patches still exist, covering probably less than 5% of the original coverage.

In Príncipe, the Northwestern dry forest has almost disappeared; the largest remnant forest is nowadays protected (Azeitona forest) but consists of a young secondary forest. The south costal part of the park, near Rio Porco, harbors the last block of natural costal forest of Príncipe. This forest should be considered as primary and is the most important area for conservation in Príncipe.

As a complement to extinction risk assessments, 21 areas of potential importance for plant conservation have been identified across São Tomé and Príncipe, based on field surveys and the distribution of endemic and threatened species. These areas, represented on the adjacent maps, have been assigned a priority level (from 1 to 3) according to their conservation value. In São Tomé, key sites include Parque Natural Ôbo (ID 16), Pico Grande and Pequeno (ID 17), and Bombaim–Formoso–Águas Belas (ID 9), which host high numbers of endemic and threatened species. On Príncipe, the most important sites are the Rio Porco area (ID 3) and Morro Fundão (ID 2). These priority areas provide a spatial framework for future conservation planning across the archipelago (Dauby et al 2022).

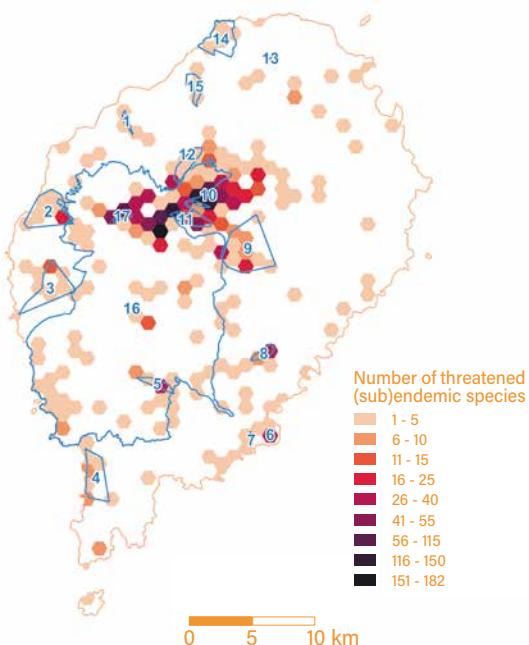
List of areas potentially important for conservation in São Tomé

ID	Name	Priority
1	Ponta Figo	**
2	Santa Catarina	*
3	Western buffer zone	***
4	South western forest	**
5	Monte Carmo	***
6	Pico Macuru	***
7	Rio Ió Grande	*
8	Pico Maria Fernandes	***
9	Bombaim – Formoso – Águas Belas	***
10	Ridge Macambrará	**
11	Trás os Montes – Zampalma	*
12	Chamiço – Morro Santana – Morro Provaz	***
13	Muquinqui	*
14	Northern Savannah in front of Lagoa Azul	**
15	Ribeira Fria	***
16	Parque Natural Obô	***
17	Pico Grande and Pequeno area	***

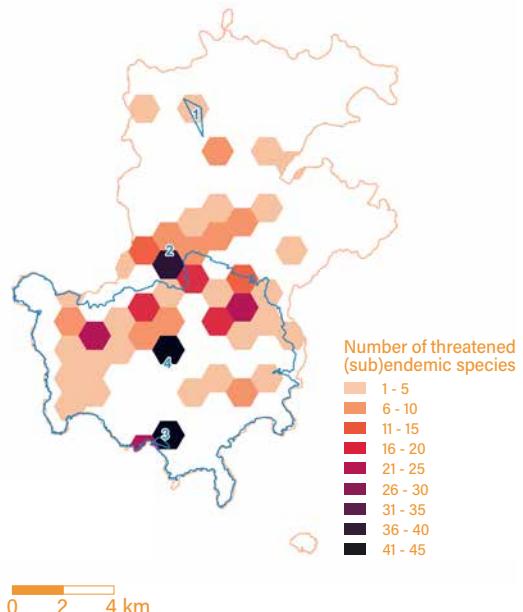
List of areas potentially important for conservation in Príncipe

ID	Name	Priority
1	Azeitona	**
2	Morro Fundão	***
3	Rio Porco area	***
4	Parque Natural Príncipe	***

Areas potentially important for plant conservation in São Tomé



Areas potentially important for plant conservation in Príncipe



How to use this book

This book focuses mainly on species endemic to São Tomé and Príncipe. However, some species that are no longer regarded as endemic to the country because they have recently been found on other Gulf of Guinea islands or on the mainland, are also presented because they are rare and/or threatened. The conservation status of most of these species were assessed during the CEPF project; most of the assessments are already in the Red List database and will be published in the following years, whereas a few of them have already been published. Some assessments still need to be validated and therefore have not been included in this book (they are regarded as not yet evaluated even though a draft assessment is available). We provide a list of these species with their preliminary conservation status, which could, however, change during the validation process. All of the assessments are also available online as part of the book and included on the project website (https://gdauby.github.io/saothreath_book/).

The Database

Recent data on the flora of Príncipe, São Tomé, and Annobón 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 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 in 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 fully georeferenced, constituting the largest and most comprehensive dataset ever compiled for the islands.

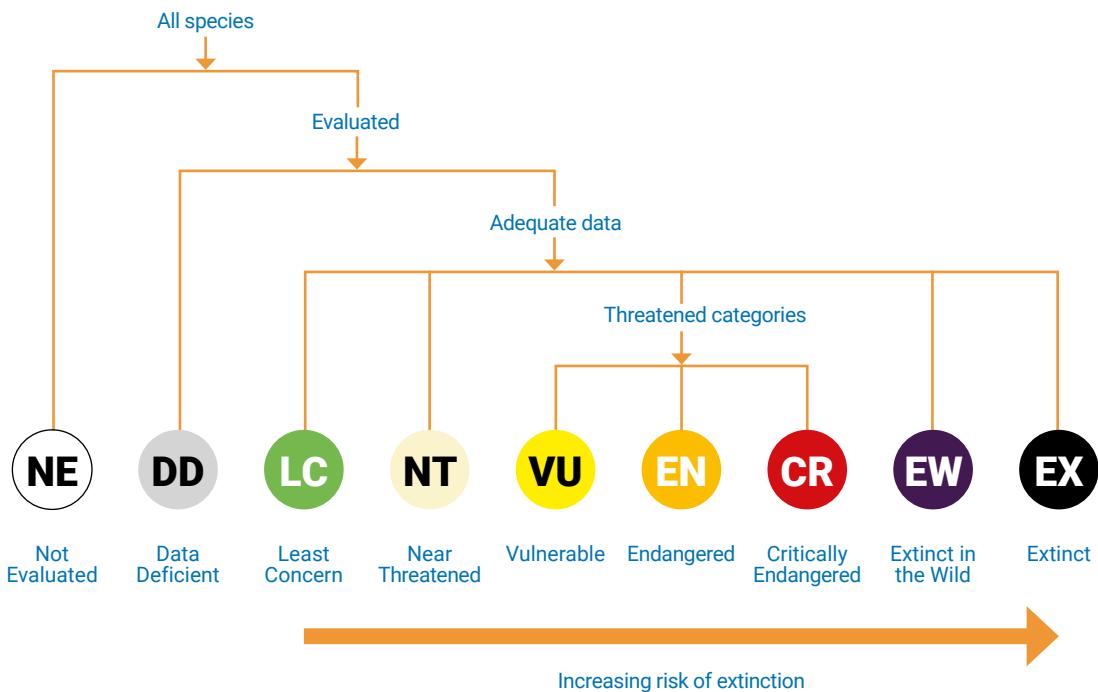
Red List Assessments of species

The IUCN (International Union for Conservation of Nature) 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, assessments carried out by mobilizing the expertise of some 30 specialists. After a preliminary phase of data compilation and verification, all the available information was analyzed and the results were then validated by a group of experts during several workshops and meetings organized at the beginning of 2022 to determine the appropriate category for each species. Each assessment was then 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, based on five complementary and non-exclusive criteria. An assessment can be either Global or Regional. For STP, only Global assessments were done, which means that the entire distribution of the taxon being assessed was considered.



The classification of species into threat 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 five criteria (A to E) is met, the species could be classified as Critically Endangered (CR), Endangered (EN), or Vulnerable (VU).

The 5 Red List criteria

In our case, because of the limited amount of information available for each of the species assessed, in most cases only two of the IUCN Red List Criteria could be applied: Criterion B (based on geographic range) and Criterion D (based on very small or restricted population size). 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 decline in several population factors caused by those threats.

IUCN Criterion B was 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), 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, 2012).

B2: Area of occupancy (AOO), 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, a term that “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
B1. Extent of occurrence (EOO)	<100 km ²	<5,000km ²	<20,000km ²
B2. Area of occupancy (AOO)	< 10 km ²	<500 km ²	<2,000 km ²
and meet at least two of the three proposed sub-conditions a, b and c.			
a. Severely fragmented, OR, Number of locations	= 1	≤ 5	≤ 10
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.			
c. 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 IUCN Criterion D. To be classified under this criterion, a species must either have a number of mature individuals below set thresholds or meet the special conditions for criterion D2 for a Vulnerable (VU) classification. The use of criterion D2, which results in an assessment of VU, is applied to a species that is not currently threatened but for which plausible threats exist that could lead the species to become more threatened or even extinct in the near future (IUCN 2019).

Criterion A was not used for assessing species in STP because it requires being able to document and 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), a condition that is not easily met.

Description of species sheets

A detailed treatment of 106 (sub)endemic STP species is presented in three main sections: 1) Pteridophytes, 2) Gymnosperm, 3) Angiosperm, and then in alphabetical order within each of them, first by family and then species. The information is easily identifiable on each sheet at the bottom of the page. Access to the individual species records is facilitated by an 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 name have only been provided when are commonly used.

2 IUCN Red List Category

In this book, each species has been classified in one of the seven following Red List categories. Extinct (EX), for a taxon presumed to be extinct after exhaustive surveys in known and/or expected habitat, throughout its historic range have failed to record an individual. Three categories, Critically Endangered (CR), Endangered (EN), and Vulnerable (VU), apply to species that are threatened with extinction, in decreasing order of severity. Near Threatened applies to species that are close to meeting the quantitative thresholds for threatened species status and that could become threatened if specific conservation measures are not taken. The Least Concern category applies to species that are at low risk of extinction. And finally, the Data Deficient category is reserved for species for which the best available data are insufficient to directly or indirectly determine their 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 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 Physiology of the species

-  herbaceous plant, annual, biennial, or perennial.
-  1-6 m perennial shrub small (chamaephyte) or large (phanerophyte) up to 6 m tall.
-  +6 m 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

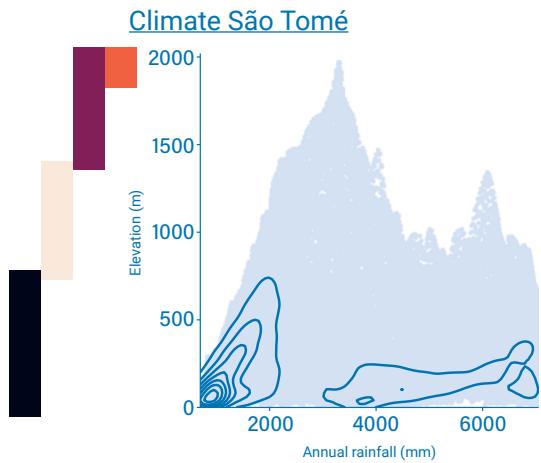
When available, photos are included to illustrate the species sheets. They were chosen both for their aesthetic value and for the morphological and ecological information they provide.

5 Distribution

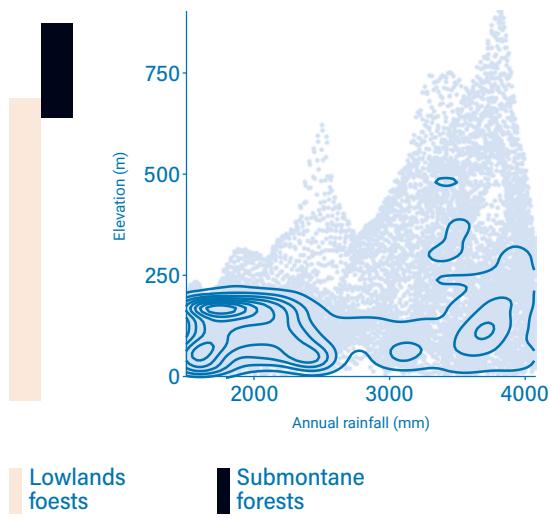
A simplified distribution map is provided on each description sheet. It shows all known occurrence points based on herbarium specimen data. Points used in the risk of extinction assessment are given in orange; those that were excluded because the local population was considered to be extinct are shown as blue triangle.

6 Climate

To illustrate the distribution of species across environmental gradients, we have included a plot that shows the covariation between the two most contrasted environmental factors of STP, namely elevation (in meters) and annual rainfall (in mm). Details on the data used to build these plots can be found in Dauby et al. (2022).



Climate Príncipe





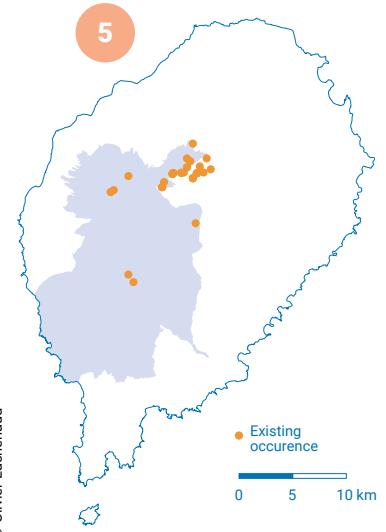
© Rémy Poncelet

Heteradelphia paulowilhelmsia Lindau

1

Distribution

São Tomé

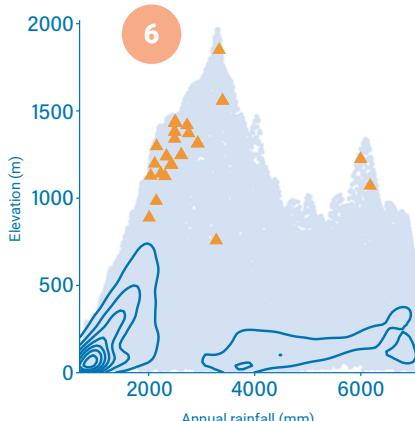


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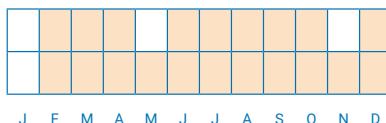
Climate



Phenology

Flowers

Sampling



7

Rationale

8

Heteradelphia paulowilhelmia a shrubby herb up to 2 m high. It is found in submontane and montane forest, often on ridges or along tracks, between 790 and 1,968 m in elevation. The species is endemic to São Tomé and is known from 48 collections made between 1861 (Mann 1094) and 2021 (Ikabanga 1596) in the north-center and south of island. Five collections (Mann 1094, Moller 198, Campos 6, Chevalier 13681, Chevalier 14577) were excluded because they are not precisely located. Although some collections are historical, we consider only one occurrence represents individuals that are extirpated (Moller 162 at Bom Successo). The 42 remaining collections represent 23 occurrences. Based on a 2 x 2 km cell size, the AOO of this species is estimated as 44 km², below the upper threshold for "Endangered" status under subcriterion B2. And the EOO is calculated as 70 km², below the upper threshold for "Critically endangered" status under subcriterion B2. Within the Obô Natural Park de São Tomé (PNOT), two occurrences were documented in the southern part of the park, and one to the east at Formoso Pequeno, all of which are not currently threatened, thus representing a single location. Eleven occurrences situated around Lagoa Amélia and along the path from Bom Sucesso to Pico São Tomé face threats from invasive species, representing another location. Seven occurrences around Bom Sucesso are threatened by horticultural activities, representing one location. The occurrence recorded between S. Luís and Chamiço was threatened by former plantations and is currently threatened by small-scale agriculture, representing one location. Finally, the occurrence at Macambrará is threatened by logging, although the ridge is still forested, and it represents one location. Therefore, the 23 occurrences represent five locations (*sensu* IUCN 2019), with regards to the most important threats (agriculture). Moreover, we infer a past, current, and future continuing decline in the extent

and habitat quality and the number of mature individuals based on the extirpation of one occurrence and because seven occurrences are highly threatened by horticultural activities at Bom Successo. *Heteradelphia paulowilhelmia* is thus assessed as EN B1ab(iii,v)+B2ab(iii,v).

Habitat and ecology

9

Heteradelphia paulowilhelmia is a shrubby herb up to 2 m high. It is found in submontane and montane forest, often on ridges or along tracks, between 790 and 1,968 m in elevation.

Use and trade

10

The species is not used.

Population

11

No population data is known, but the species is locally abundant especially in open forest habitats.

7 Phenology

Where data permit, information on the flowering and fruiting period is given for each species, and in some cases, harvest periods are mentioned.

8 Rationale for Red List assessments

Each species sheet contains text justifying the category of threat according to the IUCN Red List Categories and Criteria.

9 Habitat and ecology

The habitat and ecology of each species is indicated, along with its altitudinal range.

10 Uses and trade

This includes information about how a species is utilized and what level of trade (if any) occurs for the taxon.

11 Population

This section contains population data and the number of known individuals.

Other acronyms

PNOST: Ôbo Natural Park of São Tomé.

PNP: Parque Natural do Príncipe.

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

IUCN: International Union for Conservation of Nature.



Pteridophytes



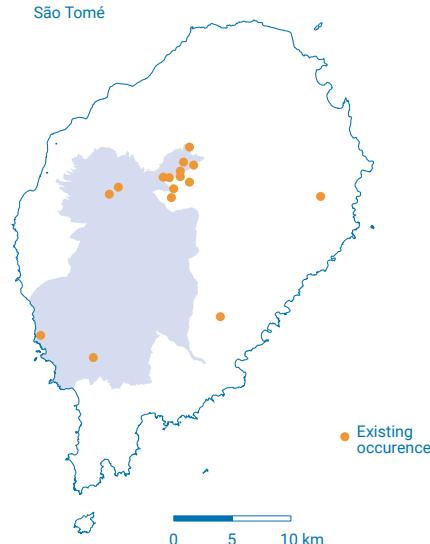
Asplenium eurysorum Hieron

Distribution

Gabon, São Tomé and Príncipe



São Tomé



Príncipe



Rationale

Asplenium euryzorum 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 and on rock faces in 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 new distribution data justify its reassessment.

Asplenium euryzorum 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 PNOST, one outside PNOST to the southeast, and the six others to the northeast outside PNOST. 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 PNP and one outside. The occurrence in Gabon is located within the Ramsar site of Birougou. The 18 remaining occurrences represent 3 subpopulations (the spores of the species are mainly dispersed by wind). Based on a 2 x 2 km cell size, the AOO is estimated as 64 km², below the upper threshold of the EN status under subcriterion B2. The EOO is calculated as 65,392 km², above the upper threshold of the "Vulnerable" status under subcriterion B1. The two occurrences south of PNOST (Oliveira 424, Espírito Santo 5139) are threatened by old cocoa plantations and represent one location. The occurrence in the 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 at Macambrará (Exell 132) is threatened by vegetable agriculture and represents one location. We infer a future disappearance of this occurrence. All occurrences that are along the touristic path in the PNOST (Gascoigne 10, Oliveira 1212, Paiva 883, Sousa 1267, Stévert 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 PNOST (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 PNP is not threatened and represents one location. The occurrences at Pico Pappaia (Watt 24, Welwitsch 14, Paiva 595) are indirectly threatened by ecotourism and represent one

location. The third occurrence of Príncipe at Óquê 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 Macambrará. Therefore, *Asplenium euryzorum* 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 poorly collected. Its current distribution represents 3 subpopulations.



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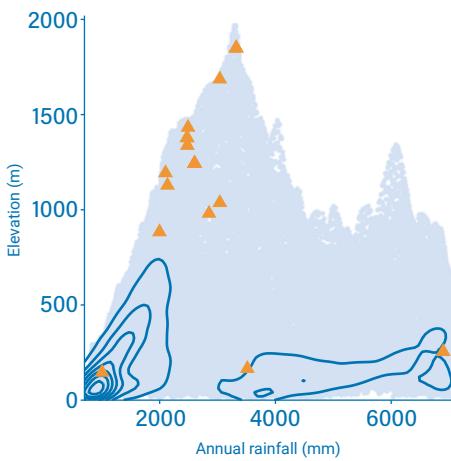


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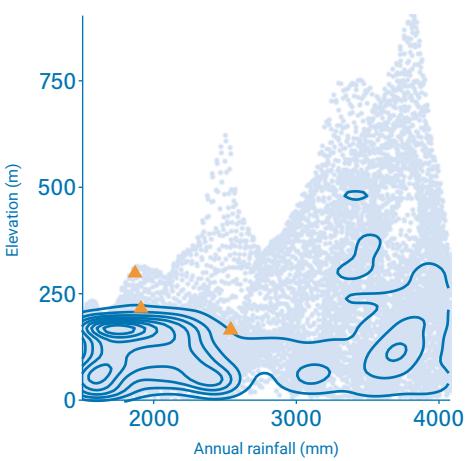


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Climate São Tomé



Climate Príncipe





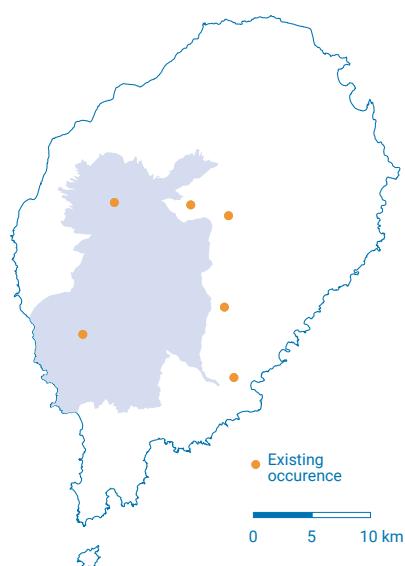
Asplenium **exhaustum** **(H.Christ) Alston**

EN

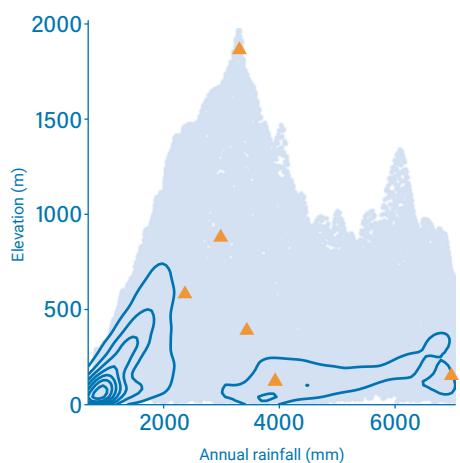


Distribution

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 1,850 m in elevation. It is an endemic species of São Tomé. A preliminary evaluation was already made by Figueiredo and Gascoigne (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 spores of the species are mainly dispersed by wind). Based on a 2 x 2 km cell size, the AOO is estimated as 24 km², below the upper threshold of the EN status under subcriterion B2. The EOO is calculated as 146.357 km², 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 located between Vale Carmo 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 is threatened by small-scale agriculture and illegal logging and represents one location. The area around the Ecofac Center (Oliveira 98) and that between Bom sucesso and Bombaim 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 1,850 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.)

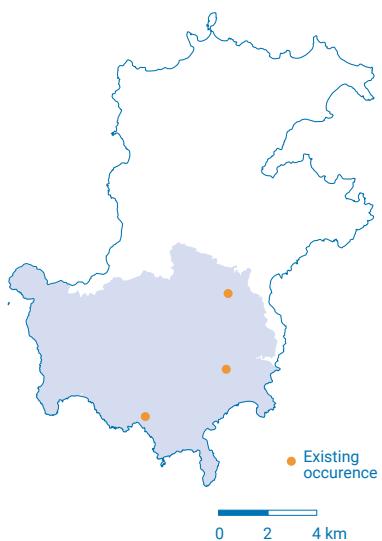
R.M.Tryon var. *currorii* (Holttum)

J.P.Roux

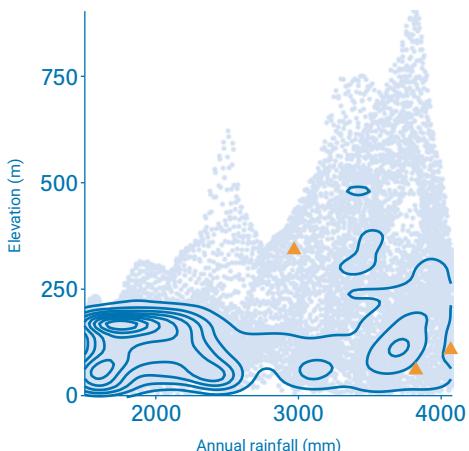


Distribution

Príncipe



Climate



Rationale

Alsophila camerooniana var. *currorii* was preliminary 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. and Curror 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 km², below the upper threshold for EN status under subcriterion B2. The EOO is calculated as 5.1 km², 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 km² (the same value as AOO), which is below the upper threshold of the CR category under subcriterion B1. The three occurrences (Rio Bambu-Porco, Oquê 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.



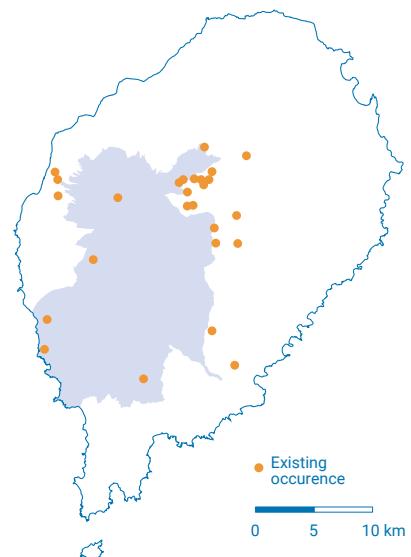
Alsophila welwitschii (Hook.) R.M.Tryon

Distribution

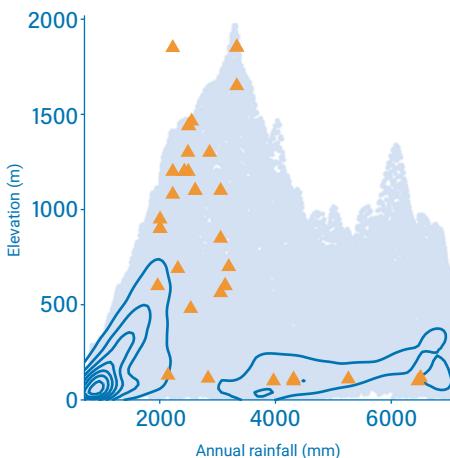
São Tomé



© Olivier Lachenau



Climate



Rationale

Alsophila welwitschii is a tree fern up to 1.5 m tall. The species is endemic to the island of São Tomé. It occurs frequently in open forests on wet slopes, and secondary forests, between 100 and 1,850 m. It was previously assessed as VU (D2) by Figueiredo and Gascoigne (2001) because the population was present in a single location. This assessment was never published on the Red List and its date and the collection of new information justify its reassessment.

Alsophila welwitschii is known from 42 collections made between 1860 (Welwitsch 66) and 2020 (Lachenaud 2986). Two collections (Mann 41/1, 1104) do not have precise coordinates and were not taken into account for estimating the assessment parameters. The 40 remaining collections represent 29 occurrences, including nine within the PNOST and twenty outside the protected area. The occurrences of Monte Café (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 vegetation and 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 spores of the species are mainly dispersed by wind). Based on a 2 x 2 km cell size, the AOO is estimated as 76 km², below the upper threshold of the EN status under subcriterion B2. The EOO is calculated as 288.140 km², below the upper threshold of the EN status under subcriterion B1. Two occurrences located outside the PNOST at Rio lo Grande (Ogonovszky 50) and Caminho de Vale Carmo (Figueiredo 157) are threatened by old plantations (cocoa) and represent one location. Four occurrences inside PNOST 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 (cocoa) and represent one location. The occurrence in the center of PNOST (Ogonovszky 157) is not threatened and represents one location. The two occurrences to the northwest of the PNOST (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 trail inside PNOST (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 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 Macambrará (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 Macambrará. 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 abundant in the center of the island.

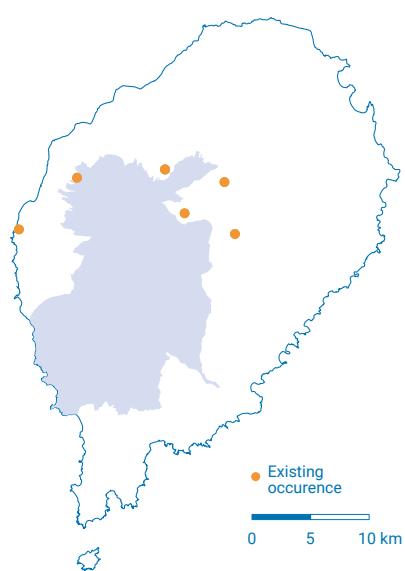
Dryopteris caperata

J.P.Roux

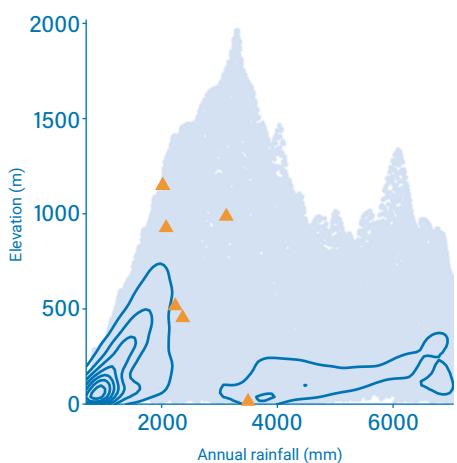


Distribution

São Tomé



Climate



Rationale

Dryopteris caperata is a rhizomatous terrestrial fern and is typically found in both lowland and submontane rainforests. *D. caperata* is known from 17 collections collected between 1885 (Moller 39) and 1998 (Lejoly 244; Oliveira 485, 624, 644). We consider that two occurrences, represented by collections made by Moller (39) and Rozeira (4974), are now extirpated given that the habitat has been deeply changed in Nova Moca and Monte Café. Two other collections (Oliveira 136; Quintas 10) were excluded from this assessment as they lack precise georeferencing. Therefore, the remaining 13 collections represent eleven occurrences, with two of them found within the Parque Natural de Obô de São Tomé (PNOST). Based on a 2 x 2 km cell size, the AOO of this species is estimated as 40 km², and the EOO is calculated as 114 km², both below the upper threshold for "Endangered" status under subcriterion B2 and B1. The two occurrences within 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 near future. Additionally, two occurrences at Macambrará and Trás-os-Montes are threatened by agricultural activities and illegal logging, forming one location. Two occurrences at Bombaim and 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. Similarly, 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. Finally, the occurrence at Cascata de São Nicolau is not threatened and represents one location. Therefore, these eleven occurrences represent eight locations sensu IUCN 2019) 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, the number of locations, and number of mature individuals due to agriculture. *D. caperata* is thus assessed as VU B1ab(ii,iii,iv,v)+2ab(ii,iii,iv,v).

Habitat and ecology

Dryopteris caperata occurs in lowland and submontane rainforests, between 30 and 1,400 m in elevation.

Population

Population data for this species is insufficiently documented, but we suggest the presence of one subpopulation.

Dryopteris cicatricata

J.P.Roux

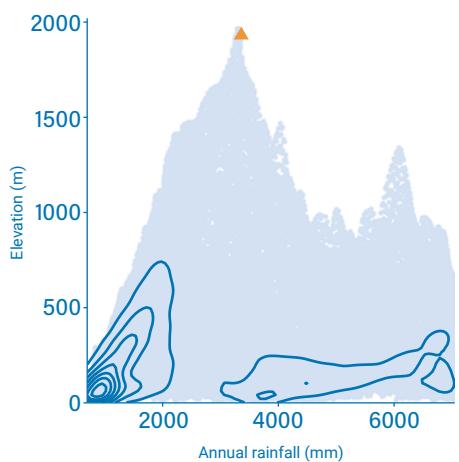


Distribution

São Tomé



Climate



Rationale

Dryopteris cicatricata is a herbaceous plant up to 1 m, known from the montane forest at 1,930 m in elevation. The species is endemic to São Tomé and is only known from one collection (Rozeira 5136) made in 1958. 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 km², below the upper threshold for CR status under criterion B2 (the EOO cannot be calculated). This single occurrence must be threatened by tourism and invasive plants, 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 quality of habitat. *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 once 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 considered 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 on 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 it 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 were identified.

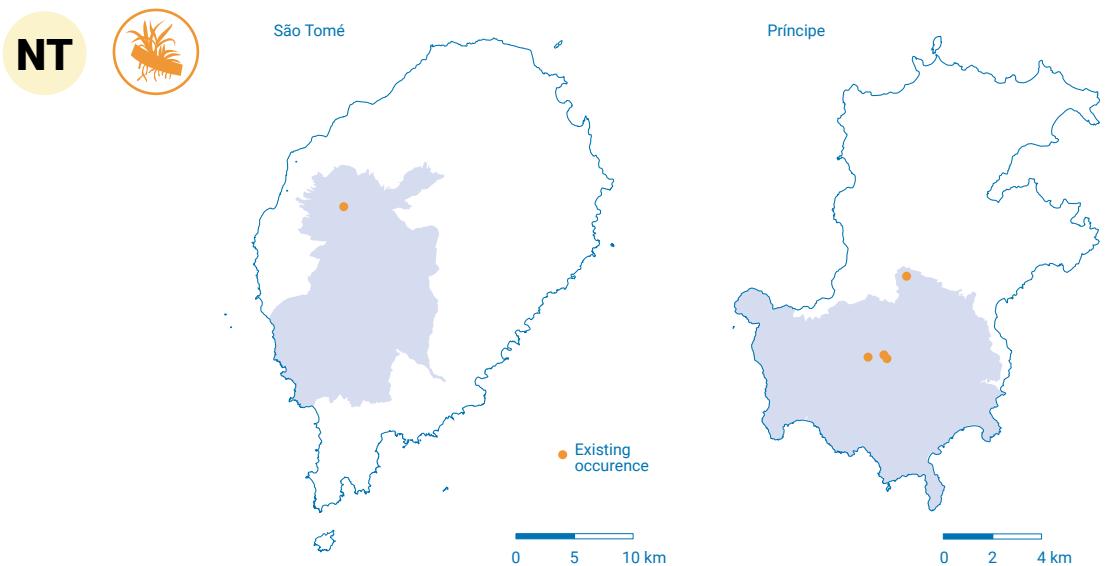
Population

There is no population information.

Grammitis nigrocincta Alston

Distribution

Cameroon, Gabon, Democratic Republic of the Congo, Rio Muni (Equatorial Guinea), and São Tomé and Príncipe



Rationale

Grammitis nigrocincta is an epiphytic 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 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 km², below the upper threshold for EN status under subcriterion B2. The EOO is calculated as 229,315 km², above the upper threshold for VU status under subcriterion B1. In Príncipe three occurrences at 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.

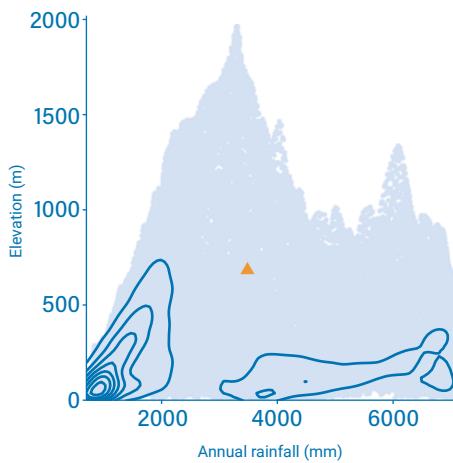
Population

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

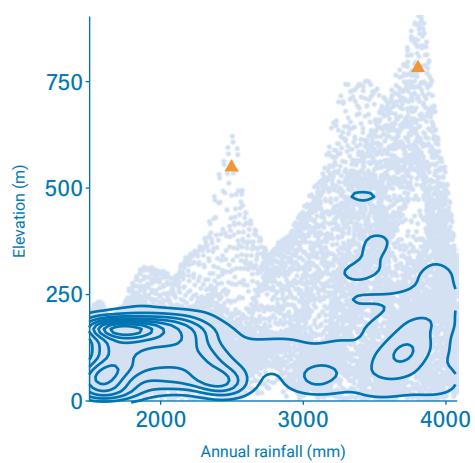


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Climate São Tomé



Climate Príncipe



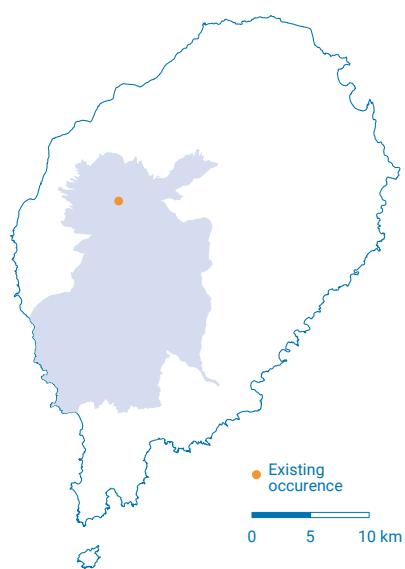


Stenogrammitis tomensis (Schelpe) Labiak

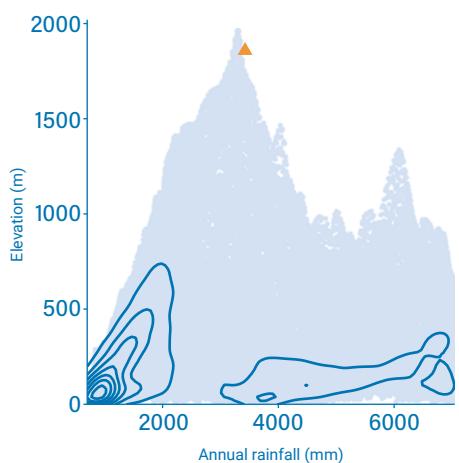


Distribution

São Tomé



Climate



Rationale

Stenogrammitis tomentis 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 km², 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 and invasive plants. 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 tomentis* 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

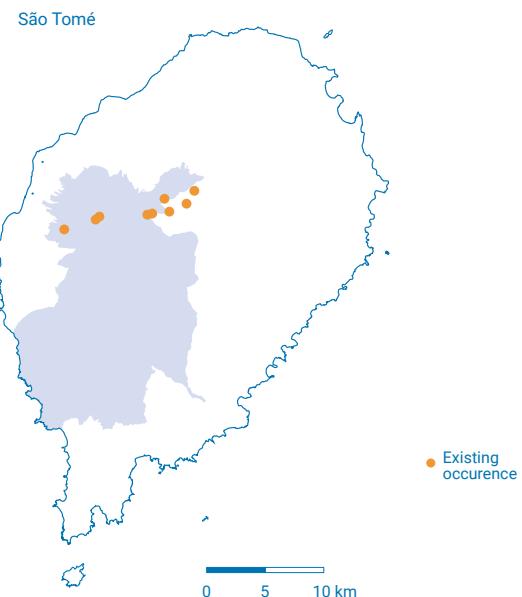
Population information is not precisely known for this species.

Selaginella mannii Baker

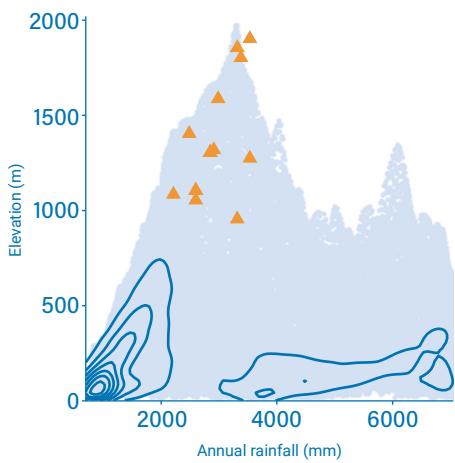


Distribution

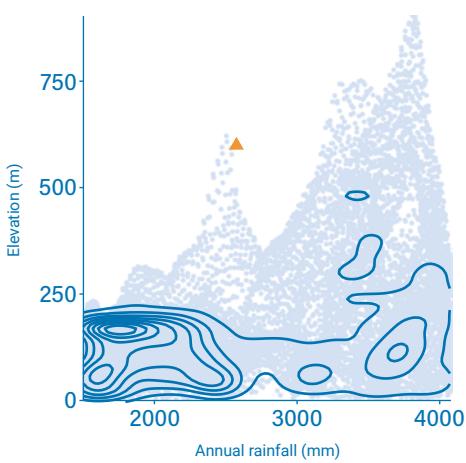
São Tomé and Príncipe



Climate São Tomé



Climate Príncipe



Rationale

Selaginella mannii is known from lowland, submontane and montane 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 km², which falls within the limits of the EN category under Criterion B2. The EOO is calculated as 643 km², below the upper threshold of the EN category under Criterion B1.

Five occurrences of *Selaginella mannii* are located within the PNOST and PNP 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 occurrence represented by collections Moller s.n., Exell 95, 106, 168 is threatened by the encroachment of carrot crops and represent one location. The occurrence Monod 11784 is threatened by invasive plants and represents one location. Two occurrences represent by Paiva 1101 and 1104 (from the same locality) and Rose 151 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. This 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 extent and the quality of the species' habitat, and we infer a continuing decline in mature individuals.

For these reasons, *Selaginella mannii* is assessed as VU B1ab(iii,v)+2ab(iii,v).

Habitat and ecology

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

Use and trade

There are no known uses for this species.

Population

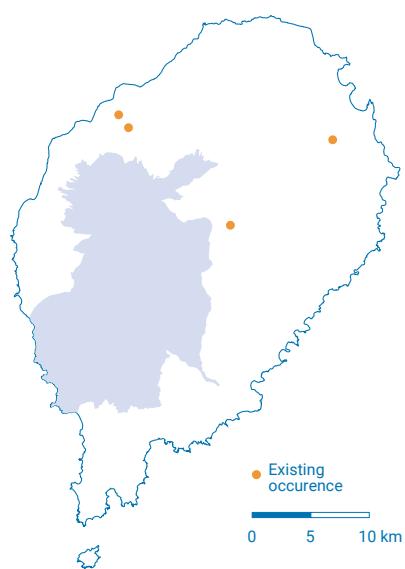
Selaginella mannii is known from two subpopulations. No quantitative population data are available for the species.

Selaginella monodii Alston

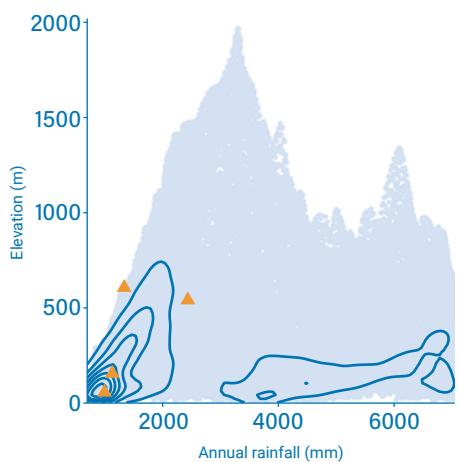


Distribution

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 is very degraded in places of collection, we consider that none of all occurrences has been extirpated. These six collections represent four occurrences (all located outside PNOST), and three subpopulations. Based on a 2 x 2 km cell size, the AOO of this species is estimated as 16 km², below the upper threshold of the EN category under subcriterion B2. The EOO is calculated as 90 km², below the upper threshold of the CR category under subcriterion B1. The occurrence at Bobo Forro (Cascata Blublu) is threatened by urbanization and agricultural 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 cocoa 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

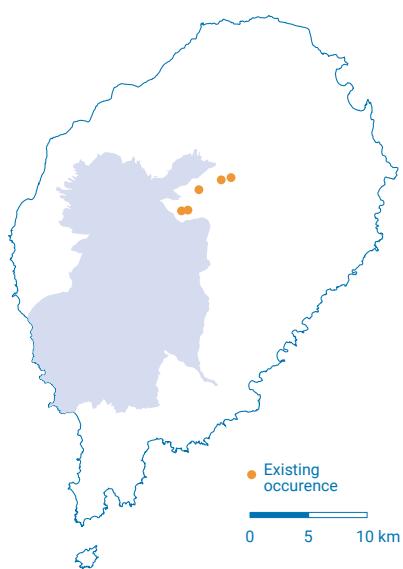
This species appears to be stream-dependent, so the four occurrences (two of which are located on the same stream) represent three subpopulations.

Pseudophlegopteris *henriquesii* **(Baker) Holttum**

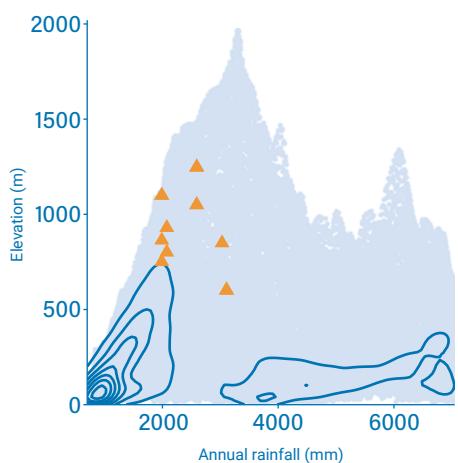


Distribution

São Tomé



Climate



Rationale

Pseudophegopteris henriquesii 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 km², below the upper threshold for EN status under subcriterion B2. The EOO is calculated as 2.5 km², 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 km²), below the upper threshold for CR status. Two occurrences located at Nova Moca and Cascata de São Nicolau are threatened by coffee plantations and represent one location. The occurrence at Zampalma is threatened by agriculture 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 B1ab(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

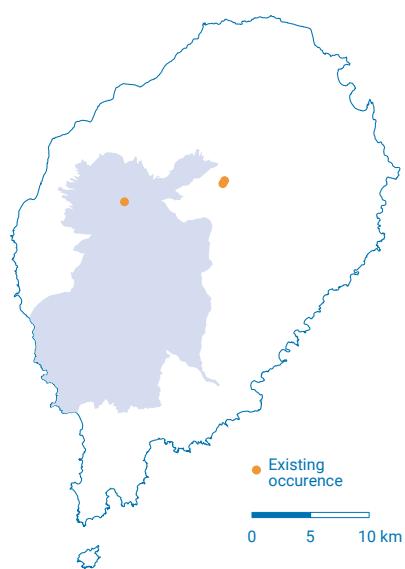
Population information is not known.

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

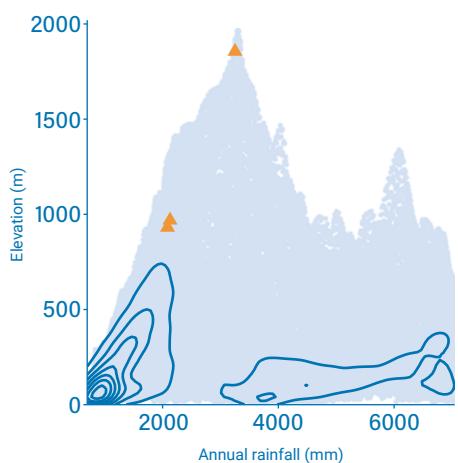


Distribution

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 spores of the species are mainly dispersed by wind). Based on a 2 x 2 km cell size, the AOO is estimated as 8 km², below the upper threshold of the CR status under subcriterion B2. The EOO is calculated as 0.9 km², 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 which induce degradation of its habitat, and represents one location. This can induce 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 subspecies 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.

Population

Population information is not precisely known.

Gymnosophism

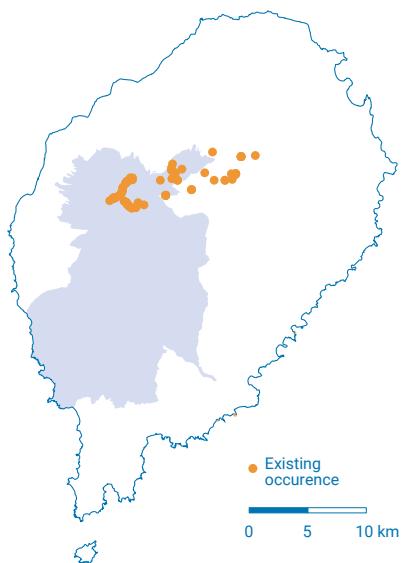


Afrocarpus mannii (Hook.f.) C.N.Page



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 in the center of the 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 agriculture.

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 km², and the EOO is calculated at 14.6 km², 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 km²), 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 quality of habitat. 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 krummholz. 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).

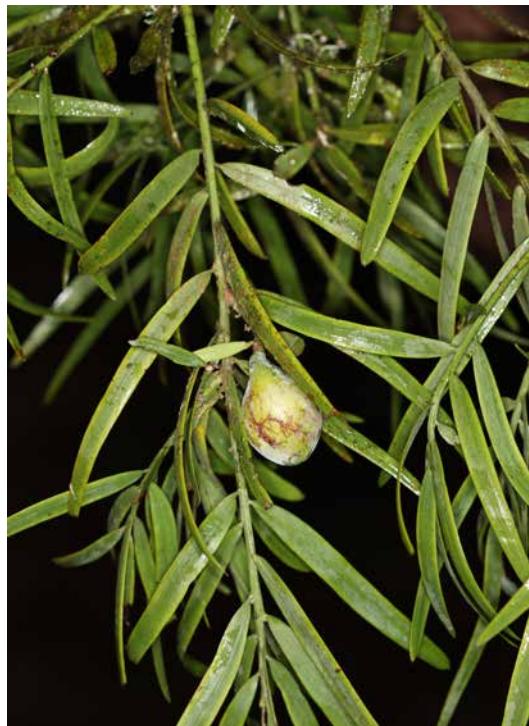
Use and trade

The timber of *Afrocarpus mannii* is valuable in well-shaped large trees, which have become scarce. It is used for light construction. This species has been planted in rural areas in Cameroon and Côte d'Ivoire and probably elsewhere in West Africa as a canopy tree or windbreak for coffee plantations and as an amenity tree in villages (Madureira et al., 2002.)

Some individuals have been planted at CIAT station, around 39 years ago, and they now have about 30 cm in DBH. They were producing fruits after 30 years. Many young seedlings (10 cm tall) have been collected around Lagoa Amélia (Esperança) and planted in the nursery of the Bom Sucesso Botanical Garden (10 individuals were transplanted to the garden). After 4 years, they were about 150 cm tall. Between 300 to 400 seedlings have been delivered to communities as timber trees, but no precise localities are given (Projects CARPE, ECOFAC6, FFEM, Tesouros d'Obô).

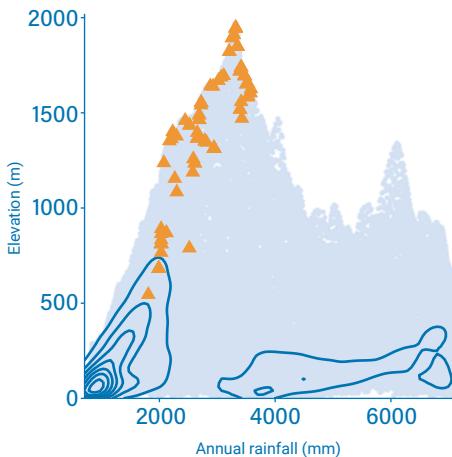
Population

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



© Tariq Stewart

Climate



Phenology

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



Angiosperms

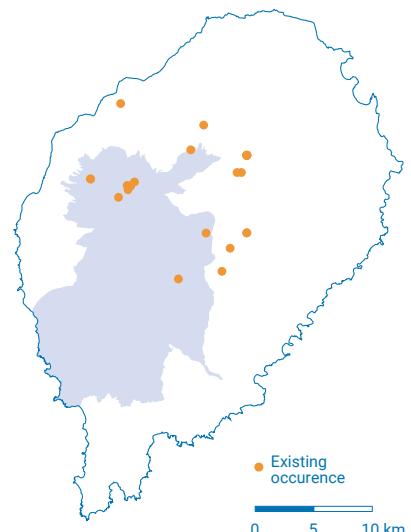


Brachystephanus *occidentalis* Lindau



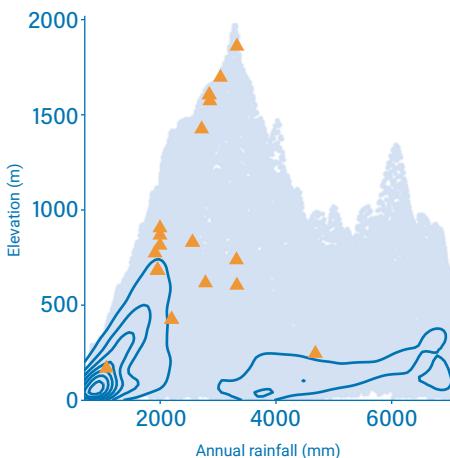
Distribution

São Tomé



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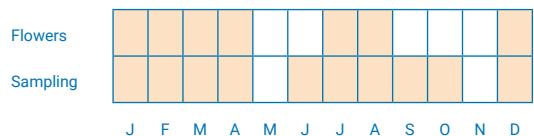
Climate



Rationale

Brachystephanus occidentalis is a perennial herb or shrub that can reach heights of up to 2 meters. Endemic to the island of São Tomé, this species is known from both lowland and montane forests, typically favoring open forest on ridges, and is also observed along riverbanks. Its elevation range spans from 110 to 1,630 meters. While this endemic species has a restricted distribution, it is not considered particularly rare; in fact, it is quite abundant in certain locations, such as the ridge above Morro Vilela. The species is known from 33 collections made between 1860 (Welwitsch 5208) and 2021 (Lachenaud 3442; Ikabanga 1660). No locality information is provided for five collections (Seabra s.n., s.n.; Oliveira 1699; Mann 1096; Welwitsch 5208) and, therefore, they were not considered for this assessment. Moreover, we consider that three occurrences documented by nine historical collections (Moller 128, 281, 327, 505, 832; Quintas 91, 1299, 1300; Paiva 338) are now extirpated given that the habitat has been deeply changed at Nova Moca, Monte Café and Saudade due to small-holder plantations of coffee. The 19 remaining collections represent 16 occurrences, including eleven within the Parque Natural de Obô de São Tomé (PNOST). Based on a 2 x 2 km cell size, the AOO is estimated as 44 km², and the EOO is calculated as 125 km², both below the upper threshold for "Endangered" status under subcriterion B2 and B1. Three occurrences are situated outside the PNOST, at Formoso Grande (Farminhão 108), near Cruzeiro (Farminhão 118) and on the way to Bombaim (Joffroy 53; Oliveira, 489). They are threatened by illegal logging, and represent one location. Two occurrences within the PNOST, to the east (Lachenaud 3003 West of Bombaim; Ogonovszky 328 Rio Ana Chaves) are not threatened, and represent one location. The occurrences within the PNOST, mostly located along the main trail (Monod 11907, 12005 West slope of Pico; Rose 307 Pico; Ogonovszky 271 Pico way down to Manuel Morais; Joffroy 176, Lejoly 12 between Pico of São Tomé and Monte Castro;

Phenology



Matos 7572 between Pico and Morro Vilela; Matos 7390 between Pico and Roça Ponta Figo; Joffroy 184 Rio do Ouro; Ikabanga 1660 trail Mesa-Morro Vilela; Lachenaud 3442 Mesa to Morro Vilela) are considered as one location, indirectly threatened by tourism, which reduce the quality of the habitat. The occurrence within the PNOST, to the north-east (Joffroy 184) is threatened by illegal logging, and represents one location. The occurrence of Chamizo (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 another one location; we infer a future disappearance of this occurrence. Therefore, these 16 occurrences represent 6 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 location, and number of mature individuals based on past disappearance of three occurrences and 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

Brachystephanus occidentalis is known from both lowland and montane forests, typically favoring open forest on ridges, and is also observed along riverbanks. Its elevation range spans from 110 to 1,630 meters.

Use and trade

It is not known if the species is used.

Population

The species is rather local but usually abundant where it occurs. Large populations are found west of Bombaim and on the ridge above Morro Vilela.



Heteradelphia *paulowilhelmia* Lindau



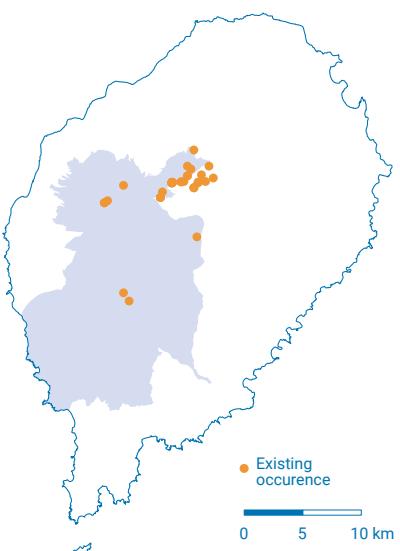
© Rémy Poncet



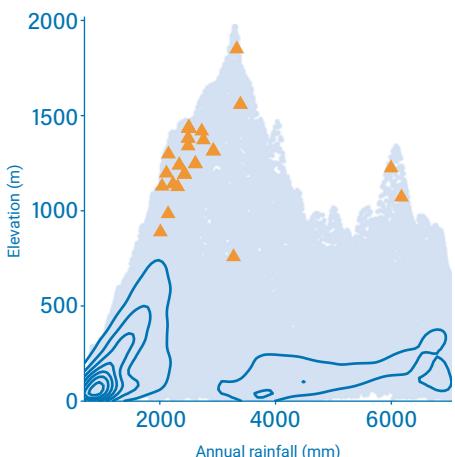
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Distribution

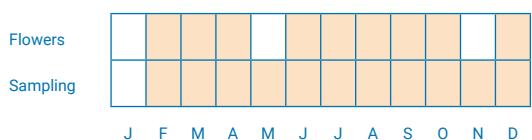
São Tomé



Climate



Phenology



Rationale

Heteradelphia paulowilhelmia a shrubby herb up to 2 m high. It is found in submontane and montane forest, often on ridges or along tracks, between 790 and 1,968 m in elevation. The species is endemic to São Tomé and is known from 48 collections made between 1861 (Mann 1094) and 2021 (Ikabanga 1596) in the north-center and south of island. Five collections (Mann 1094, Moller 198, Campos 6, Chevalier 13681, Chevalier 14577) were excluded because they are not precisely located. Although some collections are historical, we consider only one occurrence represents individuals that are extirpated (Moller 162 at Bom Successo). The 42 remaining collections represent 23 occurrences. Based on a 2 x 2 km cell size, the AOO of this species is estimated as 44 km², below the upper threshold for "Endangered" status under subcriterion B2. And the EOO is calculated as 70 km², below the upper threshold for "Critically endangered" status under subcriterion B2. Within the Obô Natural Park of São Tomé (PNOT), two occurrences were documented in the southern part of the park, and one to the east at Formoso Pequeno, all of which are not currently threatened, thus representing a single location. Eleven occurrences situated around Lagoa Amélia and along the path from Bom Sucesso to Pico São Tomé face threats from invasive species, representing another location. Seven occurrences around Bom Sucesso are threatened by horticultural activities, representing one location. The occurrence recorded between S. Luís and Chamiço was threatened by former plantations and is currently threatened by small-scale agriculture, representing one location. Finally, the occurrence at Macambrá is threatened by logging, although the ridge is still forested, and it represents one location. Therefore, the 23 occurrences represent five locations (*sensu* IUCN 2019), with regards to the most important threats (agriculture). Moreover, we infer a past, current, and future continuing decline in the extent

and habitat quality and the number of mature individuals based on the extirpation of one occurrence and because seven occurrences are highly threatened by horticultural activities at Bom Successo. *Heteradelphia paulowilhelmia* is thus assessed as EN B1ab(iii,v)+B2ab(iii,v).

Habitat and ecology

Heteradelphia paulowilhelmia is a shrubby herb up to 2 m high. It is found in submontane and montane forest, often on ridges or along tracks, between 790 and 1,968 m in elevation.

Use and trade

The species is not used.

Population

No population data is known, but the species is locally abundant especially in open forest habitats.

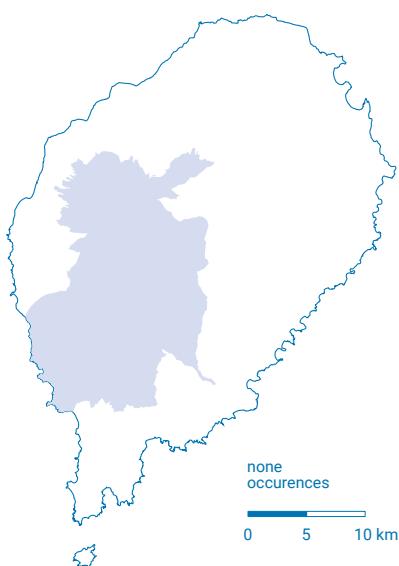
Justicia *thomensis* Lindau

DD



Distribution

São Tomé



Rationale

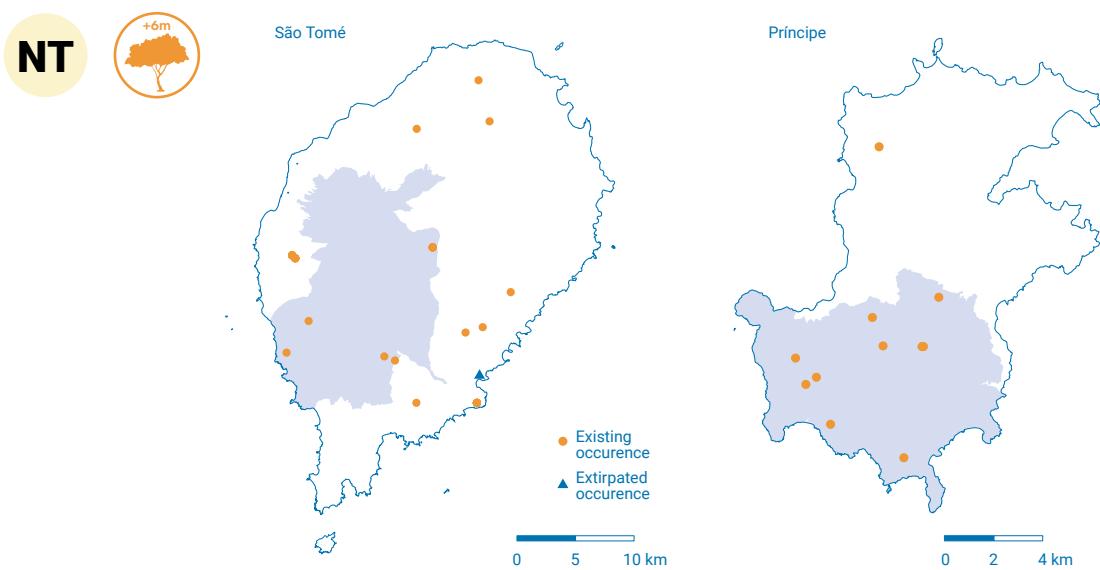
Justicia thomensis is a perennial herb endemic to São Tomé. It is known from a single collection from the 19th century [Sousa s.n. (COI)]. The locality, habitat, and elevation of this specimen are unknown. Numerous expeditions have been conducted over the past 20 years, yet this species has never been collected. Since the specific locality is unknown, the species could potentially exist within the Obô Natural Park de São Tomé and thus be protected, or it could exist outside and face threats, or even be extinct. Therefore, it is not possible to assess this species, and the most appropriate current status for this species is Data Deficient.



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 (Curdado 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 Oquê 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. The 28 occurrences are mostly restricted to the PNP, 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 Roça Potó (A. J. d'Almeida s.n.) is considered extirpated 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 km², above the upper threshold EN status under subcriterion B2. The EOO is calculated to be 2,769 km², 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 . 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 Muquinqui 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 logging and represents one location. The occurrence at São Miguel, although within the PNOST, was threatened by former plan-

tations and illegal logging, 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) from São Paulo and Angra Toldo 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 quality of habitat. 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 lowland forest (77-740 m).

Use and trade

There is no known use for this species.

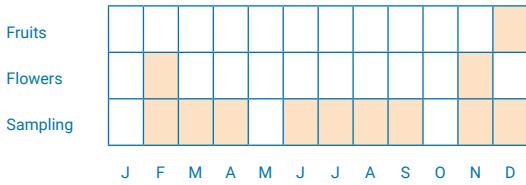
Population

The species is widespread in the lowland forest of São Tomé and Príncipe.

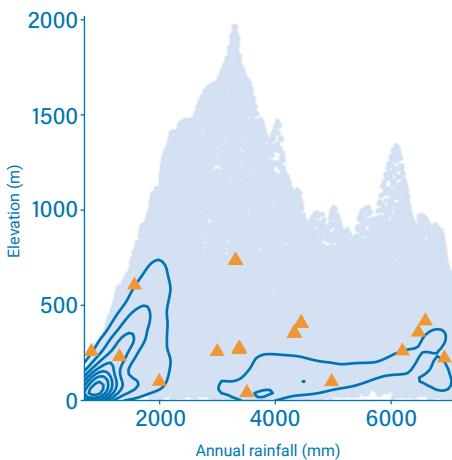


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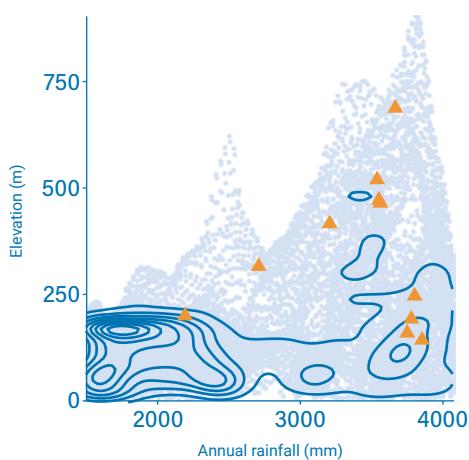
Phenology



Climate São Tomé



Climate Príncipe



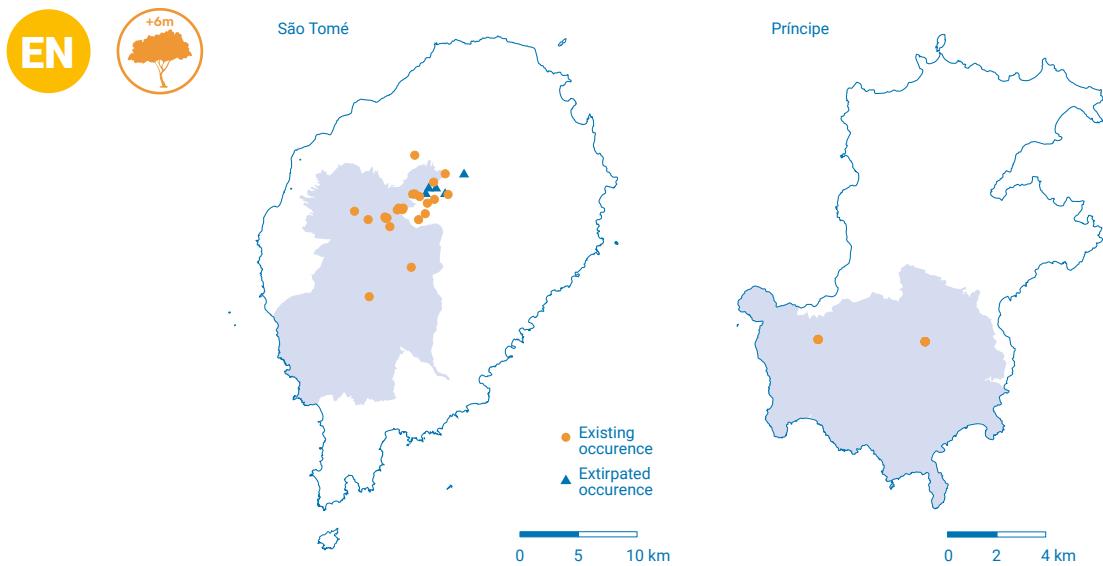




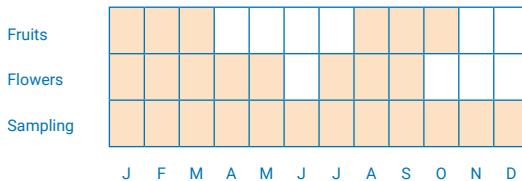
Tabernaemontana *stenosiphon* Stapf

Distribution

São Tomé and Príncipe



Phenology



Rationale

Tabernaemontana stenosiphon is a tree up to 20 m tall, known from submontane and montane forests, between 1,100 and 1,867 m in elevation (with a single record at 725 m). It was previously assessed as NT, but without any information on threats (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 58 collections and 352 individuals from forest transects made between 1885 and 2020. The species can be easily mistaken for other *Tabernaemontana* species. The genus also presents 14 collections and 92 observations in São Tomé, not identified at species level since only sterile material was collected. Moreover, all records from Príncipe refer to a new species, and records from low altitude in São Tomé are another new species. We excluded five collections because no locality information is provided (Welwitsch 5988; Moller s.n.; Campos 3; Henriques 30 and 31) and one made at Bom Sucesso station (Moller 439). We consider that eight occurrences around Bom Sucesso, Macambrará and Monte Café, corresponding to thirteen collections made by Espírito Santo (4493, 4609, 5040), Exell (303; 139), Oliveira (166), de Wilde (119), Matos (7304, 7579, 7313), Lejoly (219), Moller (220), and Randrianaivo (1593), as extirpated due to habitat conversion for small-scale agriculture. Therefore, the 391 remaining collections and individuals represent 24 occurrences and one or two subpopulations. Based on a 2 x 2 km cell size, the AOO of this species is estimated as 40 km², below the upper threshold for "Endangered" status under subcriterion B2. And the EOO is calculated as 60 km², below the upper threshold for "Critically endangered" status under subcriterion B2. Within the Obô Natural Park of São Tomé (PNOST), two occurrences located in the southern part of the park are not currently threatened, thus representing a single location. Twelve occurrences situated around Lagoa Amélia and along the path from Bom Sucesso to Pico São Tomé face threats from invasive species, representing another location. Six occurrences around Bom Sucesso are threatened by horticultural activities, representing one location.

The occurrence recorded near Chamiço was threatened by former plantations and is currently threatened by small-scale agriculture, representing one location. Finally, the three occurrences around Macambrará are threatened by logging, although the ridge is still forested, and it represents one location. Therefore, the 24 occurrences represent five locations (sensu IUCN 2019), with regards to the most important threats (agriculture). We infer a past, current, and future continuing decline in its AOO, its EOO, the number of locations, and the number of mature individuals based on the extirpation of eight occurrence and because six occurrences are highly threatened by horticultural activities at Bom Sucesso. Moreover, we infer a current and a future continuing decline in the extent and the quality of its habitat. *Tabernaemontana stenosiphon* is thus assessed as EN B1ab(i,ii,iii,iv,v)+B2ab(i,ii,iii,iv,v).

Habitat and ecology

The species is known from submontane and montane forests, between 1,100 and 1,867 m in elevation (with a single record at 725 m).

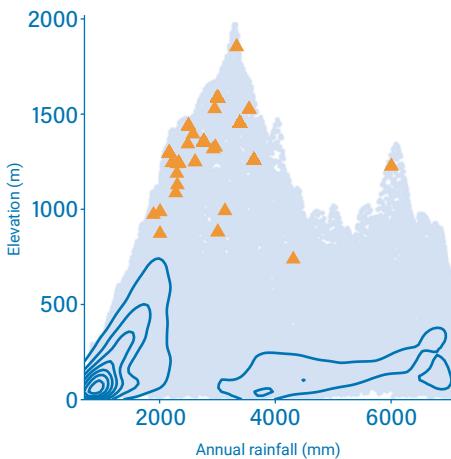
Use and trade

The bark of this species is used in São Tomé as traditional medicine (hypotensor) and for witchcraft protection (Madureira et al., 2002; 2008). *T. stenosiphon* can also be used for the production of lumber and firewood (Carvalho et al. 2004). 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.

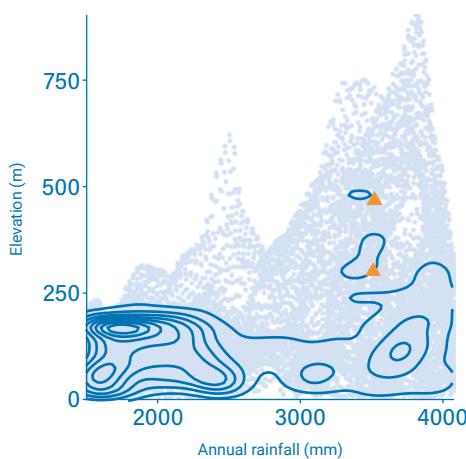
Population

Widespread and abundant in submontane and montane forests, it is mentioned as one of the most frequent tree species near Pico Carvalho (within PNOST) (Decock, 2013). Preliminary data indicate that the population is stable and has good regeneration capacity.

Climate São Tomé



Climate Príncipe





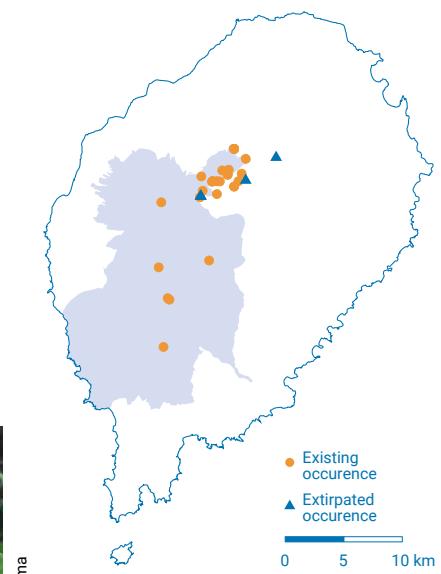


Impatiens buccinalis Hook.f.



Distribution

São Tomé

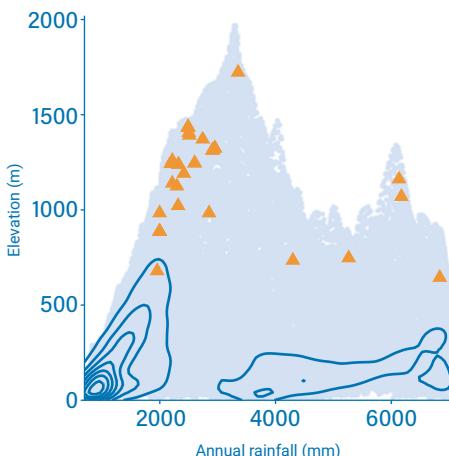


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Climate



Phenology

Flowers	●	●	●	●	●	●	●	●	●	●	●
Sampling	●	●	●	●	●	●	●	●	●	●	●

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

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 km², below the upper threshold for EN status under criterion B2. The EOO is calculated as 74 km², 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-

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.

Impatiens manteroana Exell



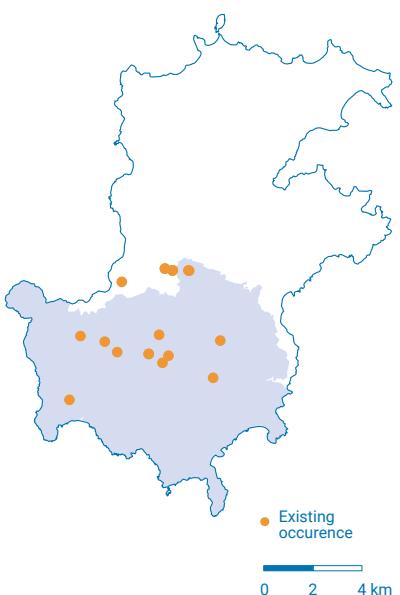
© Tania D'Hajière



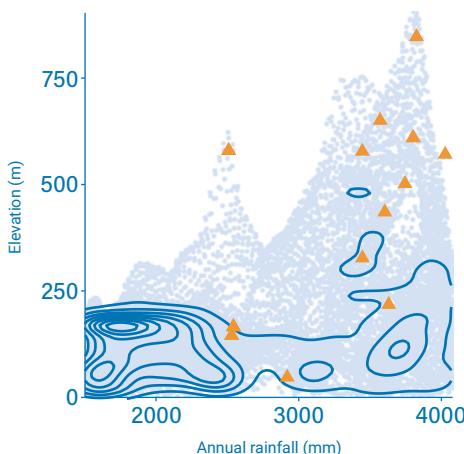
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Distribution

Príncipe



Climate



Phenology

Flowers	●	●	●	●	●	●	●	●	●	●	●
Sampling	●	●	●	●	●	●	●	●	●	●	●

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

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 km², below the upper threshold of the EN category under subcriterion B2. The EOO is calculated as 21.5 km², 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 km²). 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 cocoa plantations (large-scale agriculture) that will induce degradation of the quality of the habitat of this species. This occurrence represents one location. 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 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.

Impatiens thomensis Exell



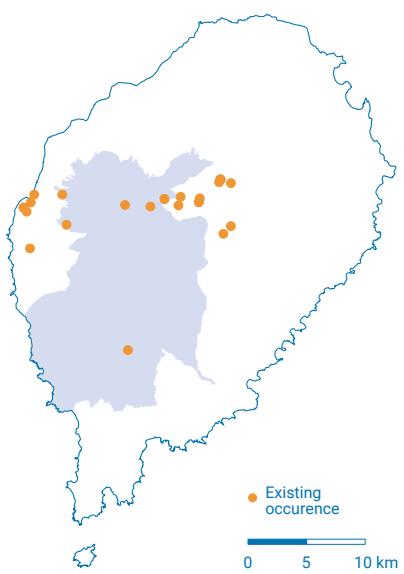
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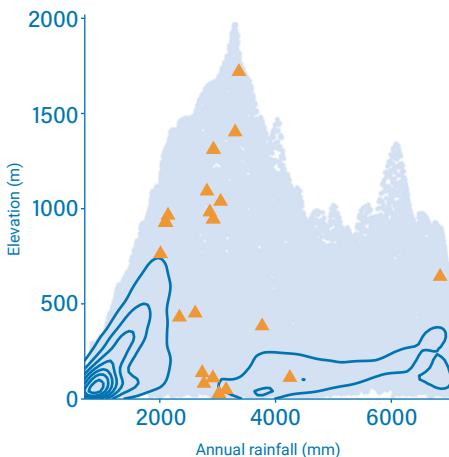
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Distribution

São Tomé



Climate



Phenology

Flowers	
Sampling	

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

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'Hajière 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 Parque 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 km², below the upper threshold of the EN category under subcriterion B2. The EOO is calculated as 236 km², below the upper threshold of the EN category under subcriterion B1. Inside PNOST, two occurrences located along tourism paths are threatened by eco-tourism 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 agriculture 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

small-scale agriculture activities and represent one location. The occurrence at Formiga is threatened by cocoa 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

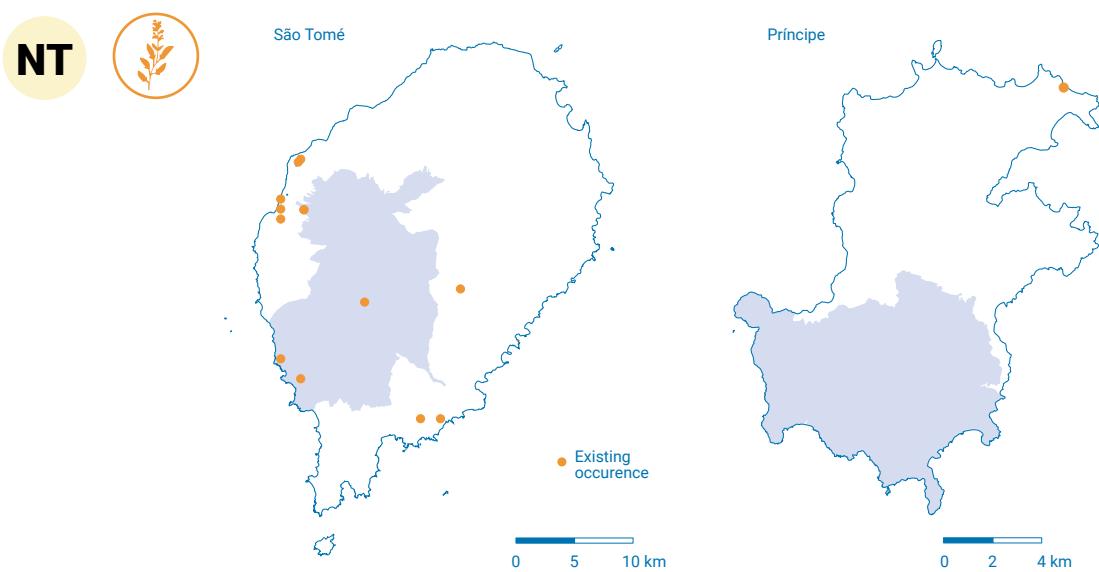
Population information is not precisely known for this species, but we consider the existence of one or two subpopulations.



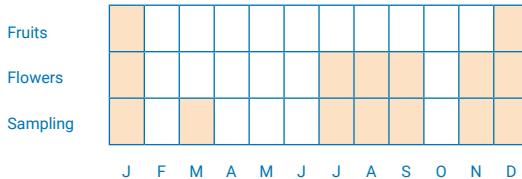
Begonia annobonensis A. DC.

Distribution

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



Phenology



Rationale

Begonia annobonensis is a herb, up to 50 cm high, known from volcanic rocks near the coast, old fallow, cocoa plantations, 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 km², below the upper threshold for EN status under subcriterion B2. The EOO is calculated as 35,214 km², 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 plantations 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 PNOST) 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 Bindá is threatened by large-scale agriculture. The occurrence located at Vila Clotilde is threatened by oil palm plantations. These two occurrences represent two locations. The two occurrences located at Monte Cabumbé and Rio Fugo (within PNOST) are not threatened and represent together one loca-

tion. The two other occurrences located within the PNOST 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 quality of habitat. *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 plantations; below 1,000 m in elevation.

Use and trade

It is not known if the species is used.

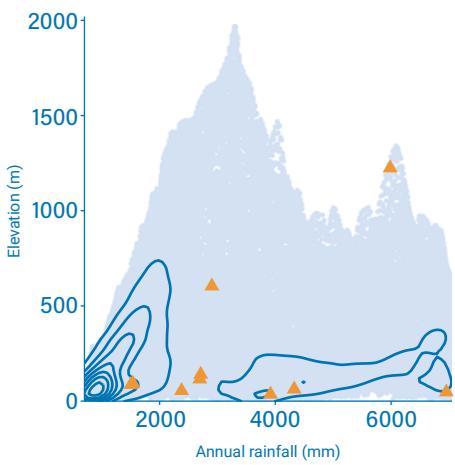
Population

Population information is not known for this species.

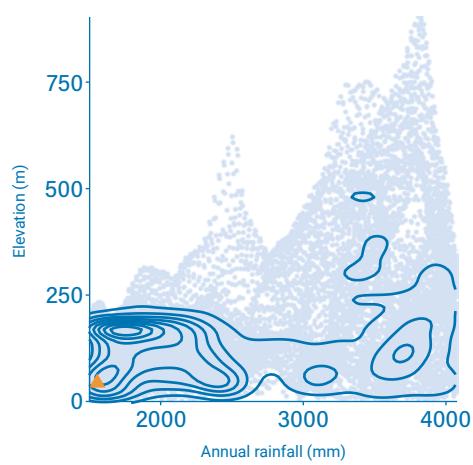


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Climate São Tomé



Climate Príncipe







Begonia baccata Hook.f.

Distribution

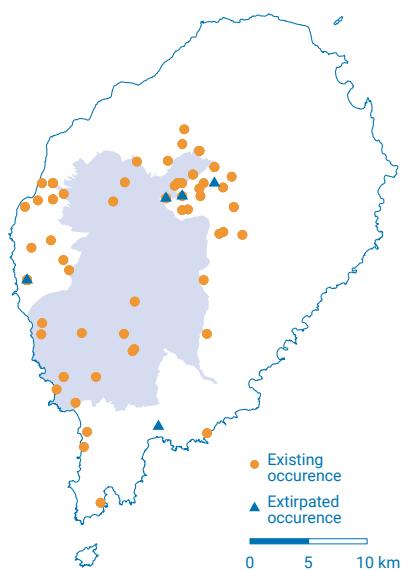
São Tomé



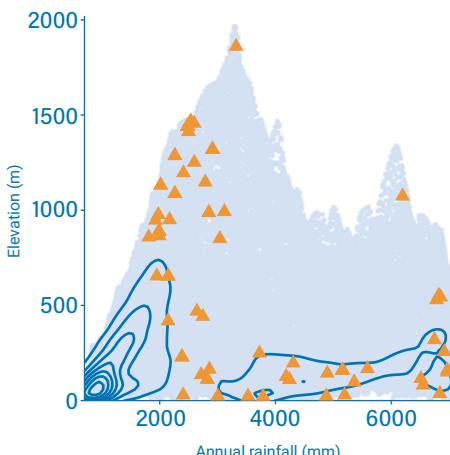
© Diosdado Nguema



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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) 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 are located outside of PNOST. Based on a 2 x 2 km cell size, the AOO of this species is estimated as 152 km², and the EOO is calculated as 399 km², both below the upper threshold for EN status under criterion B. Among the 17 occurrences within PNOST, seven occurrences (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 PNOST) is threatened by traditional medicine and 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 part of PNOST could be threatened by agriculture and represent one location. Therefore these 17 occurrences represent three locations. Among the 32 occurrences outside PNOST, 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 one will probably disappear. The ten occurrences located in the west of the island are threatened by urbanization at Santa Catarina, by small-scale agriculture (near western limit of PNOST)

Phenology

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

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) are 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 it will disappear in near future. The three last occurrences located at the southwest of Macambrarà near PNOST 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 north 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* 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

Fiá-boba-glandji; It is grown as an ornamental plant; it is also used in traditional medicine as a laxative (stem infusion), for menstrual pains (root decoction) or to prevent abortion (leaves) (Madureira et al., 2002; 2008).

Population

Population information is not known for this species, but it is usually common where it occurs.



Begonia crateris Exell

Distribution

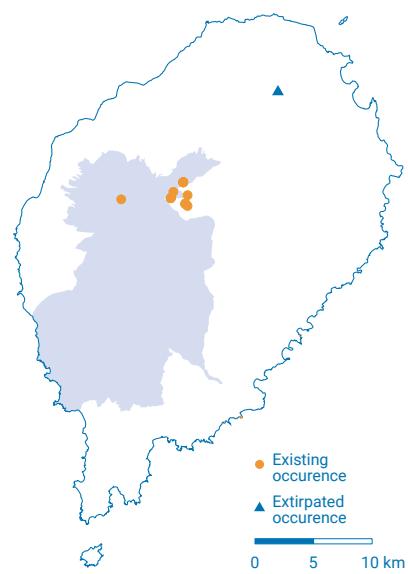
São Tomé



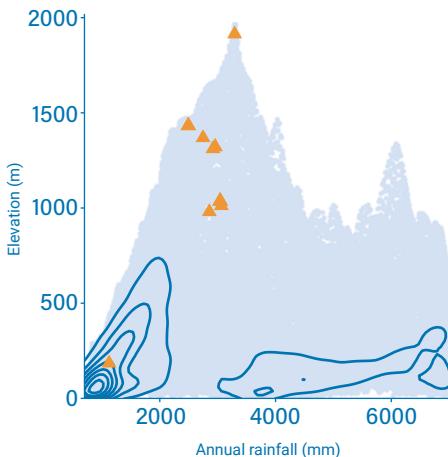
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Climate



Phenology

Fruits											
Flowers											
Sampling											

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

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 considered as extirpated. Three occurrences are located in the area of Roça Calvário, outside of the PNOST. 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 km², below the upper threshold for EN status under subcriterion B2. The EOO is calculated as 34.5 km², below the upper threshold for CR status under subcriterion B1. The five occurrences along path within PNOST are threatened by ecotourism, and invasive plants, represent one location. Two occurrences around Lagoa Amélia (within PNOST), and three others around Macambrará (outside of the protected area), are both threatened for traditional medicinal use, especially at Lagoa Amélia. 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 Macambrará are also threatened by illegal forest logging that affects the species' habitat. Despite occurring within and outside PNOST, the five occurrences (Macambrará and Lagoa Amélia) are affected simultaneously by the same threat and represent one location. Consequently, these 11 occurrences represent two locations (*sensu* IUCN 2019), with regard to the most important threat (traditional medicinal use) which induces a continuing decline in the number of mature individuals by cut-

ting adult individuals. We also infer a past, current and future continuing decline in the extent and quality of habitat. 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

Fiá-boba-d'obô; The fresh leaves are used to prepare a special meal ("Calu-plêtu") to prevent abortion (Madureira et al., 2002; 2008).

Population

Population information is not precisely known for this species, but it is usually common where it occurs.

Begonia fusialata Warb. var. *principensis* J.J.de Wilde

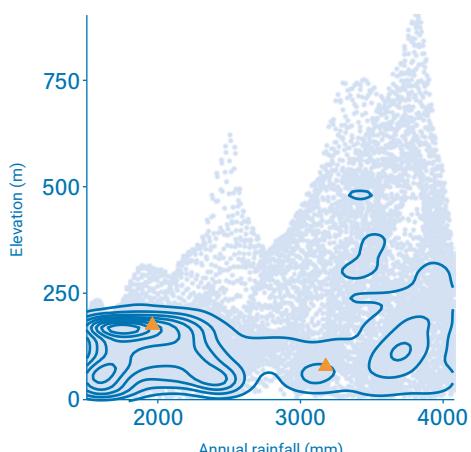


Distribution

Príncipe



Climate



Phenology



Rationale

Begonia fusilatata var. *principensis* 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 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 (Rozera 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 two 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 km² and 5.3 km², 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 km²), 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 cocoa agriculture. This occurrence represents one location. Two occurrences are located within the protected area, the , 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 quality of habitat, and the number of mature individuals. This variety 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

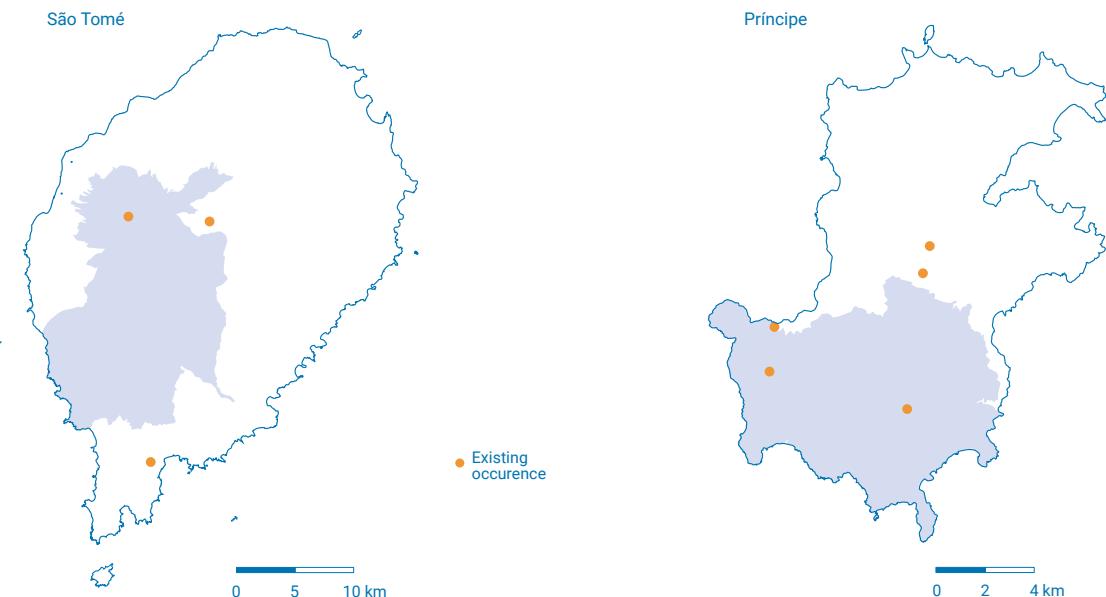
Population information is not known for this species.

Begonia loranthoides Hook.f. subsp. *loranthoides*

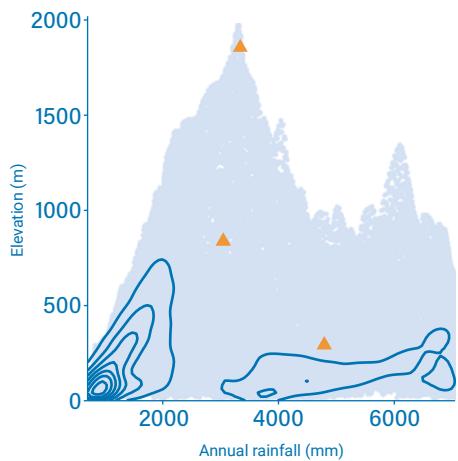


Distribution

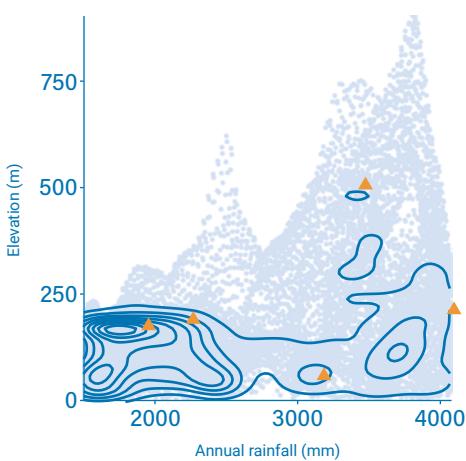
São Tomé and Príncipe



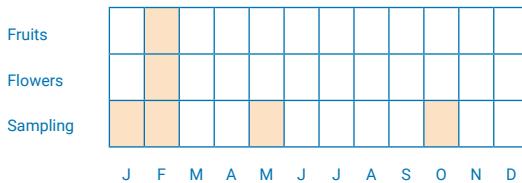
Climate São Tomé



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 km² and 1720 km², both below the upper threshold for EN status under Criterion B. Considering the habitat, which is still important in places of these collections, we consider that none of the occurrences is extirpated. The occurrence in Príncipe island near Porto Real is threatened by stone quarries, house constructions and cocoa 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 (Cachicho) -Maria Fernandes was threatened by old plantation and animal breeding, and thus represents one location. The three occurrences located between Infante D. Henrique - Picos Mencorne - 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 São Tomé 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 by 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 São Tomé) represents one location. The 10 occurrences represent 8-9 locations (*sensu* IUCN 2019) with regards to 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. This subspecies is thus assessed as VU B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v).

Habitat and ecology

The species usually grows as an epiphyte in the crown of tall forest trees, or sometimes on 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).

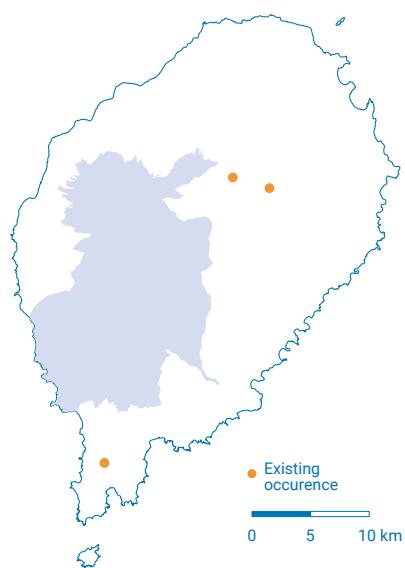
Begonia molleri (C.DC.) Warb.

EN

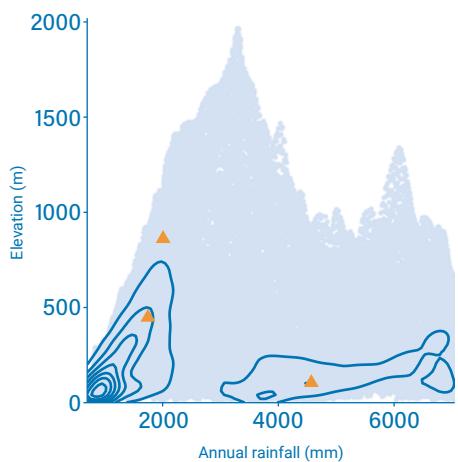


Distribution

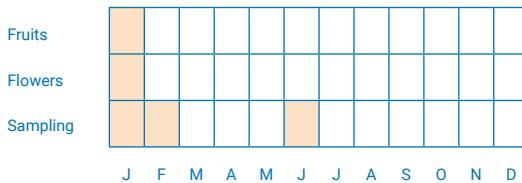
São Tomé



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). A living plant possibly belonging to this species was seen in 2019 in Monte Carmo but could not be collected. 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 is 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 PNOST) represent one or two subpopulations. Based on a 2 x 2 km cell size, the AOO of this species is estimated as 12 km², below the upper threshold of the EN category under subcriterion B2. The EOO is calculated as 40 km², 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 cocoa 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.



Begonia subalpestris A.Chev.

Distribution

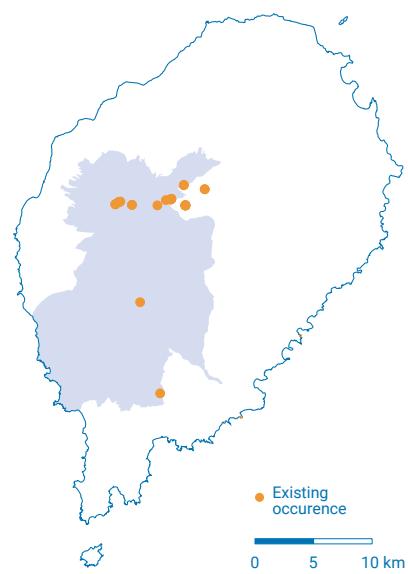
São Tomé



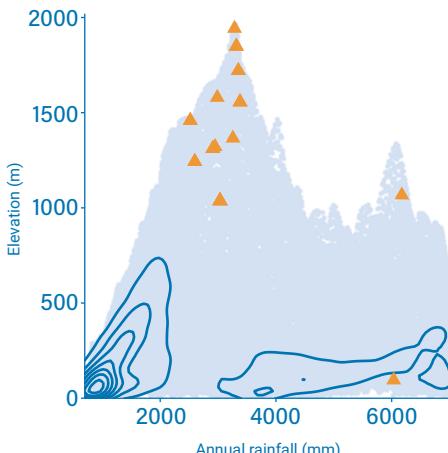
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Climate



Phenology

Fruits	●	●	●	●	●	●	●	●	●	●
Flowers	●	●	●	●	●	●	●	●	●	●
Sampling	●	●	●	●	●	●	●	●	●	●

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

Rationale

Begonia subalpestris is an epiphytic 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 km², below the upper threshold of the EN category under subcriterion B2. The EOO is calculated as 58.8 km², below the upper threshold of the CR status under subcriterion B1. The nine occurrences located along the tourist path within the PNST are threatened by ecotourism activity and invasive plants, and represent one location. The occurrence located at Monte Cabumbé is not threatened and represents one location. The two occurrences located at Macambrarà 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 southwest of Macambrarà near PNST 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 Macambrarà and Campo Grande, we infer a past, and a future decline

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, but mostly above 1500 m.

Use and trade

This species is in cultivation as an ornamental.

Population

Population information is not known for this species, but it is abundant in montane forests.

Begonia thomeana C. DC.



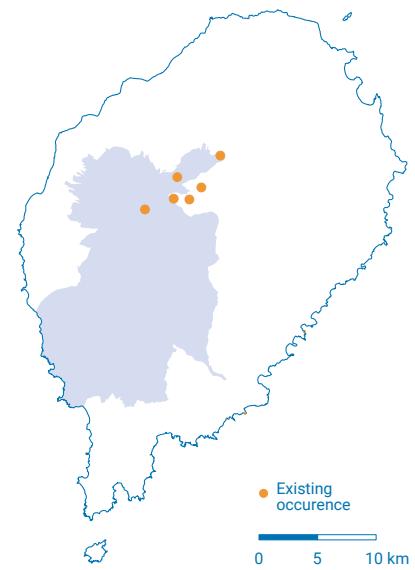
© Miguel Leal



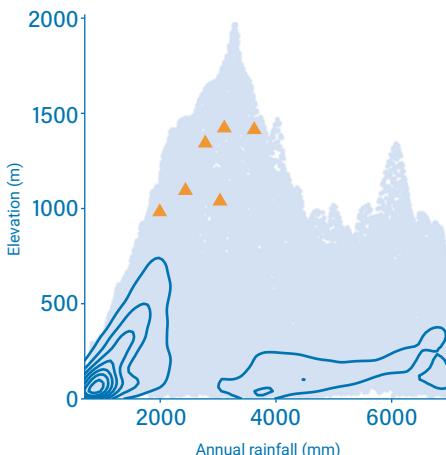
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Distribution

Gabon, and São Tomé



Climate



Phenology

Flowers											
Sampling											

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

Rationale

Begonia thomeana is an epiphytic climbing 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 is very degraded in some places of collection, we consider that none of the occurrences has been extirpated. The dispersal ability is conferred by bird vectors (Plana, 2002), so these 17 occurrences (four of them located within PNOST) represent two subpopulations. Based on a 2 x 2 km cell size, the AOO of this species is estimated as 44 km², below the upper threshold of the EN category under subcriterion B2. The EOO is calculated as 3541 km², below the upper threshold of the EN category under subcriterion B1. In Gabon, the three occurrences located on Mont Songou 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 PNOST are threatened by invasive plants, and represent one location. Two occurrences around Bom Sucesso are threatened by agricultural activities and represent one location. We consider that these two occurrences will disappear in the 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. *Begonia thomeana* is thus assessed as VU B1ab(i, ii,iii,iv,y)+2ab(i,ii,iii,iv,y).

Habitat and ecology

The species occurs in submontane forests, between 690 m (Gabon), and 1,100 m to 1,700 m (São Tomé) in elevation.

Use and trade

There are no known uses of this species.

Population

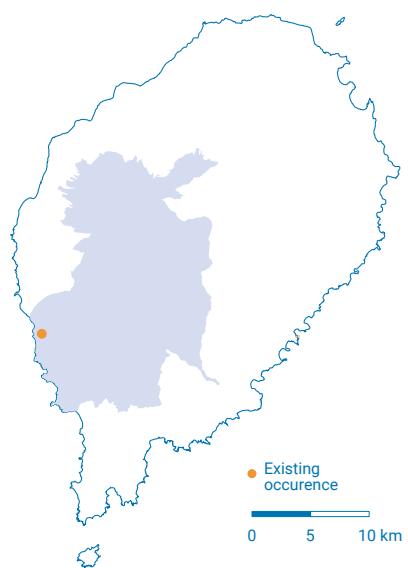
The species appears to be common but very localized, so we considered the existence of two subpopulations.

Ehretia scrobiculata *Hiern*

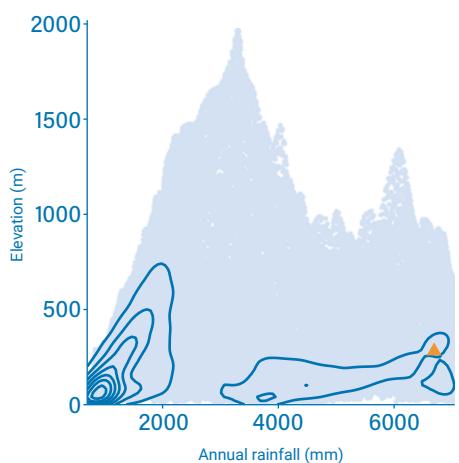


Distribution

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 PNOST 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 km², 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

Distribution

São Tomé



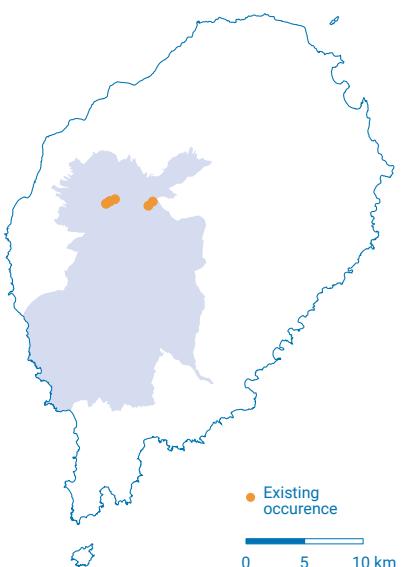
© Davy Kabanga



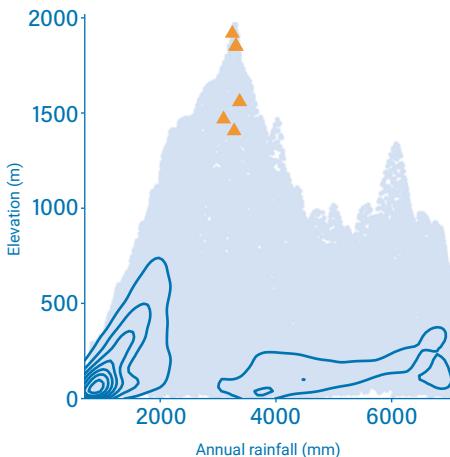
© Davy Kabanga

Existing occurrence

0 5 10 km



Climate



Phenology

Flowers											
Sampling											

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

Rationale

Lobelia barnsii is a monocaulous herb reaching 1 to 2 m in height (Exell, 1944), and forming small stands. It is endemic to São Tomé and found mostly on low shrubby vegetation with *Erica* or *Afrocarpus*; between 1,400 and 2,024 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 Calvário. Considering the natural 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 km², below the upper threshold for EN status under Criterion B2. The EOO is calculated as 1.4 km², below the AOO, so we consider the EOO as 16 km² below the upper threshold for CR status under Criterion B1. The habitat of the species has been partly cut in the past for Cinchona plantations. These have been abandoned but Cinchona are still invading the 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).

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 of 5-20 individuals.



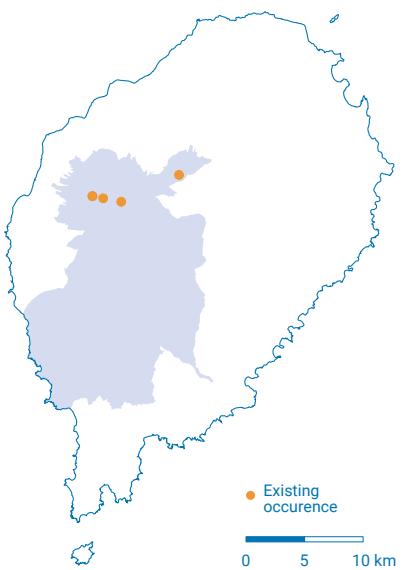
Maytenus monodii Exell



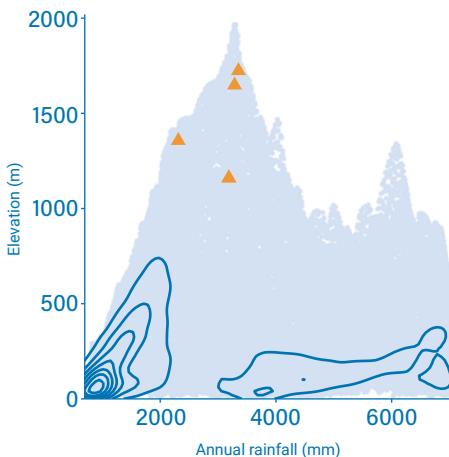
© Olivier Lachenau

Distribution

São Tomé



Climate



Phenology



Rationale

Maytenus monodii is a liana up to 5 m high. 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 PNOST. 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 (Groppi 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 km², below the upper threshold for EN status under Criterion B2. The EOO is calculated as 3.5 km², 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 km²), which corresponds to status CR. Three occurrences around Pico São Tomé (within the PNOST) 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).

Habitat and ecology

The species is known from open submontane and montane rainforest on ridges, between 1,300 and 1,878 m in elevation.

Use and trade

It is not known if the species is used.

Population

Population information is not known for this species, but it occurs locally in dense stands.



Strephonema sp. nov.



© Laura Benitez

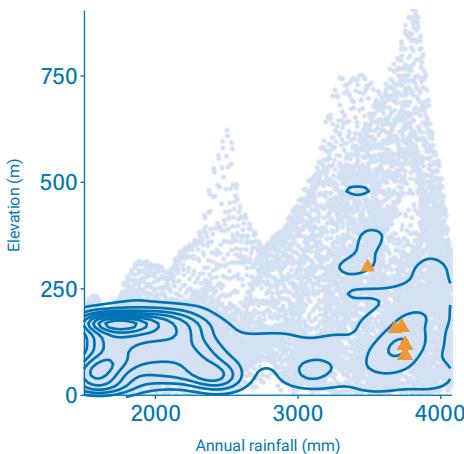
Distribution

Príncipe



© Laura Benitez

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, in mature lowland forest inside . 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 km², within the limit for CR status under subcriterion B1, while its area of occupancy is estimated to be 12 km², 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 km², 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

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

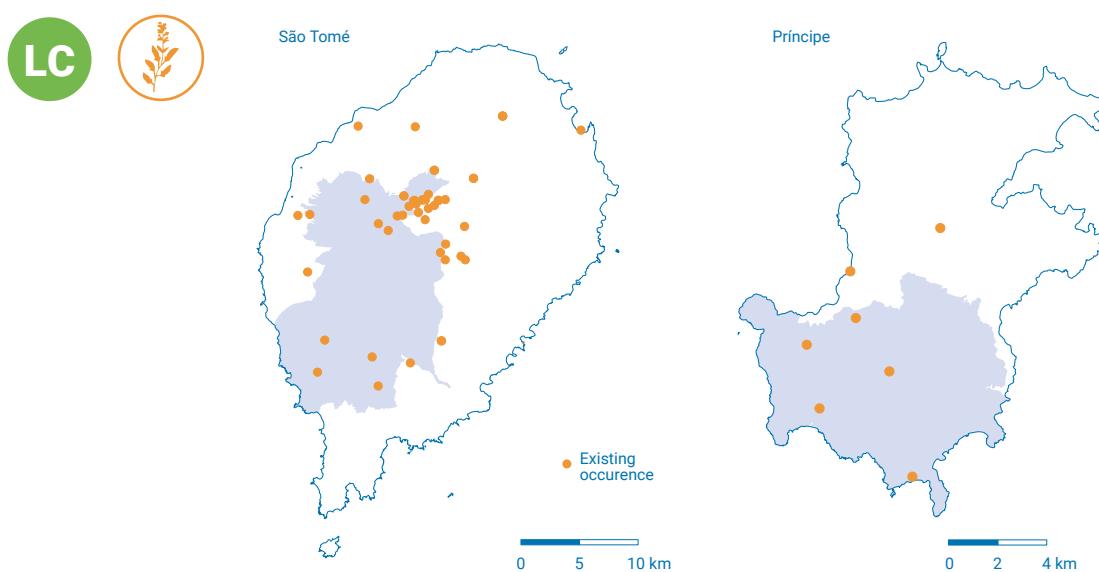
A recent account of the population gives a number of 400 mature individuals. In fact, this species should have had a larger distribution in the lowland forest where it was probably cut for timber during the colonial period from the 15th century. This species appears to be locally abundant but its density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



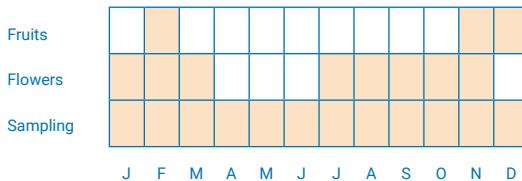
Palisota *pedicellata* K.Schum.

Distribution

Annobón (Equatorial Guinea),
and São Tomé and Príncipe



Phenology



Rationale

Palisota pedicellata is an herb, up to 2 (3) m high. It occurs in open, often degraded areas in lowland and submontane rainforest, and it is found from sea level to 1,600 m in elevation. The species is endemic to São Tomé, Príncipe and Annobón and is known from 76 collections made between 1860 (Welwitsch 6602) and 2020 (Ikabanga 1037, Lewis 187, Lima, 36). Nine collections (Wrigley 271, Campos 61, Chevalier 13723, Moller 111, Moller 11, Henriques 9, Lucas 3, Paiva 1918, Welwitsch 1043, Welwitsch 602) were not taken into account in this assessment since they are not precisely georeferenced (lack localities). The 67 remaining collections represent 42 occurrences in São Tomé, 7 in Príncipe and 1 in Annobón. We, therefore, consider these 50 occurrences as three subpopulations. Twenty-seven occurrences are located outside of PNOST. Based on a 2 x 2 km cell size, the AOO of this species is estimated as 144 km² below the upper threshold for EN status under Criterion B, and the EOO is calculated as 3,958 km², below the upper threshold for VU status under Criterion B. Among the 19 occurrences within PNOST in São Tomé, 14 occurrences (along the tourist path) are threatened by ecotourism activity and invasive plant species, and represent one location, the other being not threatened and representing another location. The three occurrences in the north part of PNOST are threatened by agriculture and logging and represent three locations. The two occurrences west of Monte Café (Maia) are threatened by past plantations and current agriculture and logging and represent one location. The occurrence at Monte Café is threatened by agriculture and logging and represents one location. The occurrence located around Bom Sucesso (Esperança and Macambrára) is threatened by small-scale agriculture (vegetable plantations) and represents two locations. The three occurrences from Santa Maria to Zampalma are threatened by logging and past plantations and represent one location. The occurrences near Bombaim are threatened by plantations and logging and represent one location. Those near Formoso Grande and Pequeno are not threatened and represent one location. The three occurrences at Pico Cabumbé are not threatened and represent one location. The occurrence located near Rio Ió Grande East of the PNOST was threatened by agriculture

and represents one location. The occurrences situated near Santa Clotilde and the one situated near Cascata Apaga-Foguinho are threatened by logging and represent two locations. Therefore these 41 occurrences situated in São Tomé represent 16 locations. Among the 7 occurrences situated in Príncipe 2 are outside PNOST and threatened by small-scale agricultural activities, and represent two locations. Five are located in the south of the island within the PNOST, one was threatened by former plantations, one is threatened by current small-scale agriculture activities and 3 are not threatened; these five occurrences represent three locations. The occurrence situated in Annobón doesn't appear as threatened and represents one location. Therefore, these 44 occurrences represent 22 locations (*sensu* IUCN 2019), with regards to the most serious plausible threats (small-scale agriculture and logging). Despite these threats, this species occurs in many different habitats, is widespread in São Tomé and Príncipe, and is 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 none of the occurrences are expected to disappear or have disappeared. *Palisota pedicellata* species is thus assessed as LC.

Habitat and ecology

The species is an endemic that adapts well to degraded habitats. In São Tomé it can frequently be found in secondary, lowland, submontane and montane forest. In Príncipe it has only been collected at low altitude and it is less frequent.

Use and trade

Ucutê-macaco; Ucutê-d'obô. Used to treat Injuries and bruises. Child baths (stunted child) (Madureira et al., 2002).

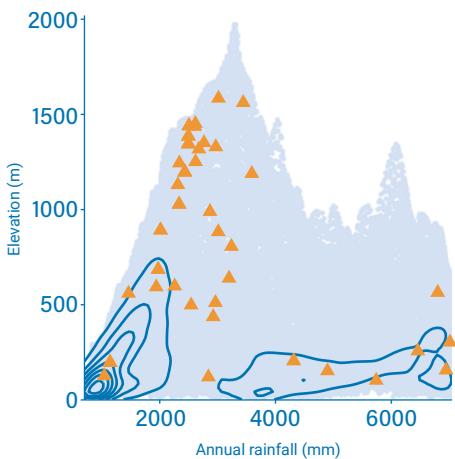
Population

Population information is not known for this species, but the species is widespread and frequent in São Tomé, and in the South part of Príncipe.

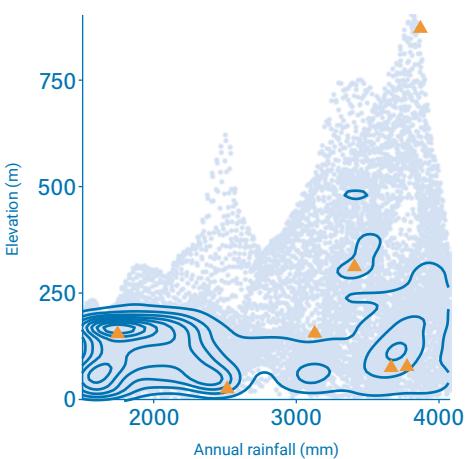


© Davy I kabanga

Climate São Tomé



Climate Príncipe

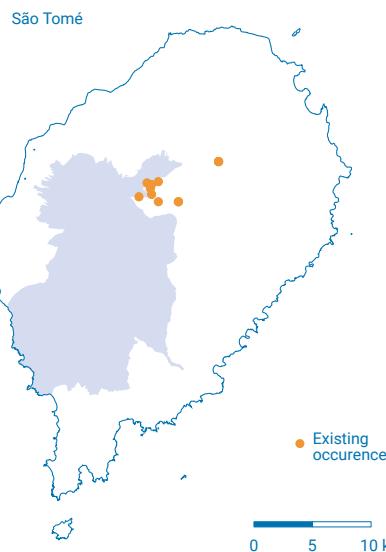






Costus giganteus **Welw. ex Ridl.**

NT



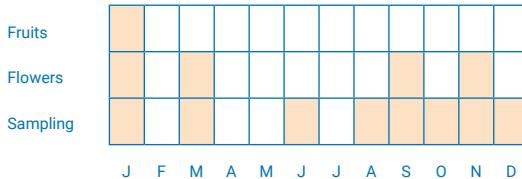
Distribution

Annobón (Equatorial Guinea),
and São Tomé and Príncipe

Príncipe



Phenology



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 herb up to 8 m high, known from open, often degraded areas in rainforest from 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: PNP, PNOST 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 km², below the upper threshold for EN status under subcriterion B2. The EOO is calculated as 4,876 km², 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 quarrying activities 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 at Macambrará are threatened by agricultural 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 PNOST 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 loca-

tions (*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 half-open, wet places, in old-growth or secondary forests, on montane slopes and along streams, between 100 and 1,450 m in elevation.

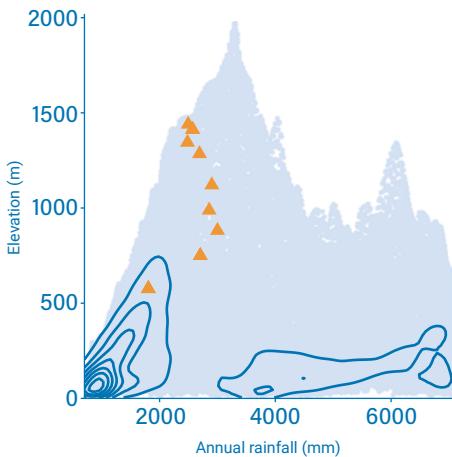
Use and trade

Ucuetê-glandji; Bordão-de-macaco (vernacular names). The juice of the stem is used in massage mixtures to treat rheumatism and also for renal infections (Madureira et al., 2002).

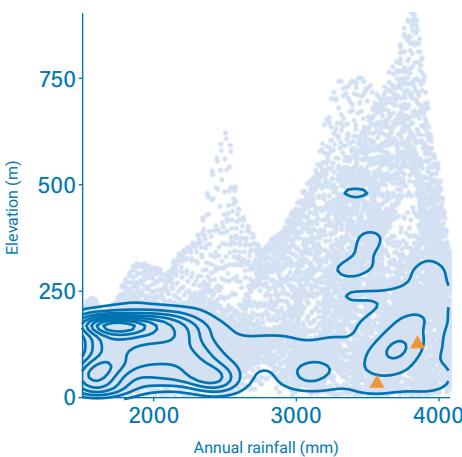
Population

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

Climate São Tomé



Climate Príncipe



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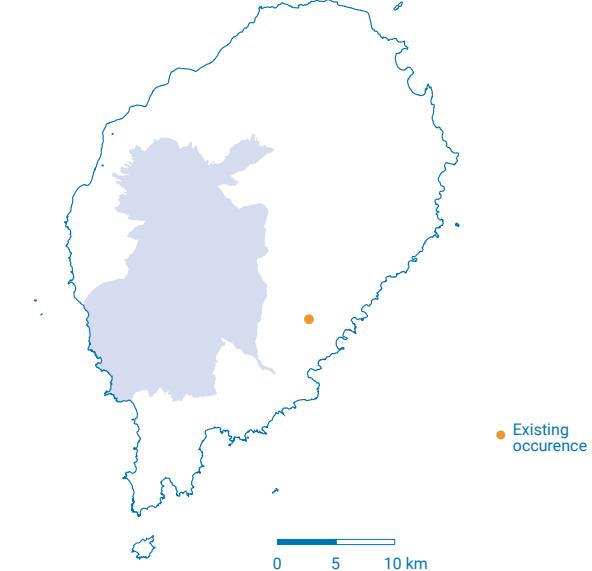
Principina grandis Uitt.



Distribution

Gabon, and São Tomé and Príncipe

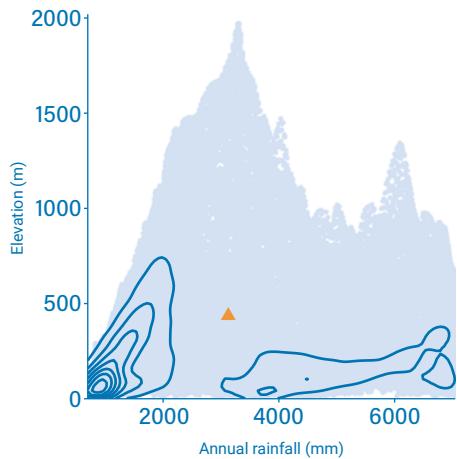
São Tomé



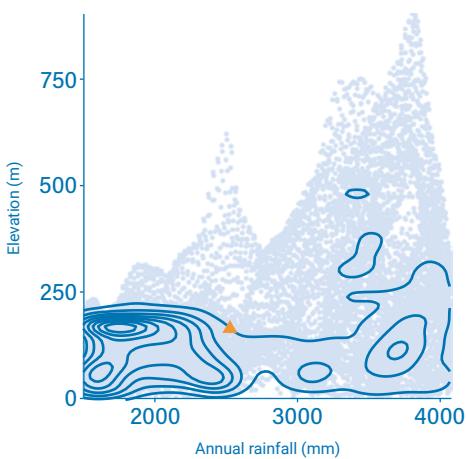
Príncipe



Climate São Tomé



Climate Príncipe





© Attila Mesterházy

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 km², below the upper threshold for EN status under Criterion B2. The EOO is calculated as 31,040 km², above the upper threshold for VU status under Criteria B1. The occurrence at Pico Papagaio in Príncipe is within PNP 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 agriculture, 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.



© Attila Mesterházy



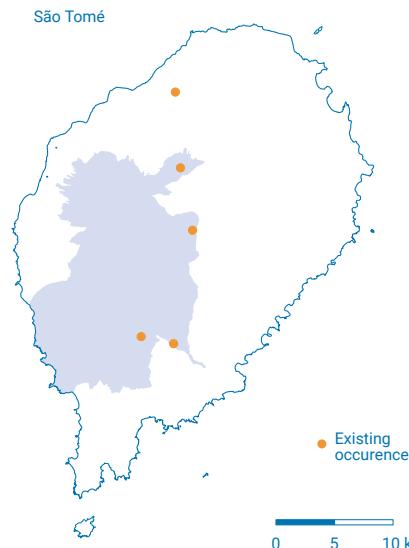
Dichapetalum bocageanum (Henriq.) Engl.

Distribution

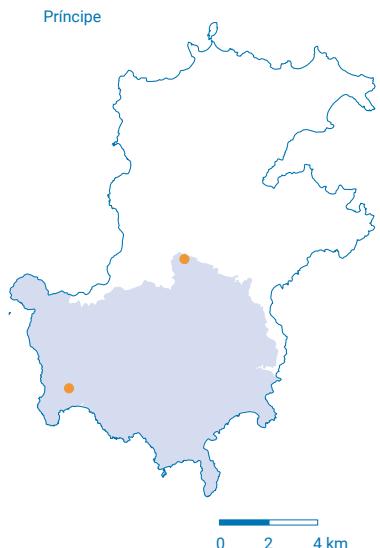
São Tomé and Príncipe



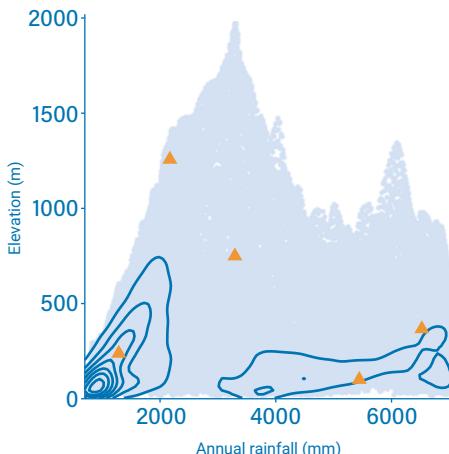
São Tomé



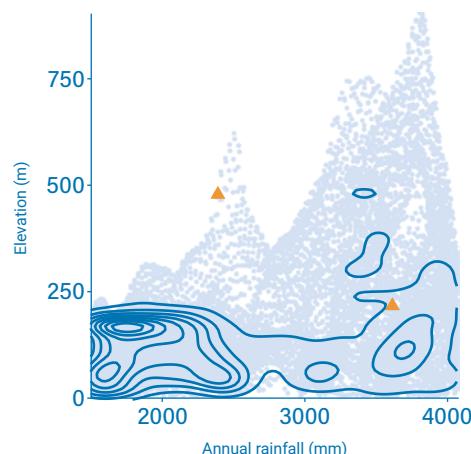
Príncipe



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 led 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 km², below the upper threshold for EN status under subcriterion B2. The EOO is calculated as 1,806 km², below the upper threshold for EN status under subcriterion B1. Five occurrences are located within two protected areas: four in PNOST and one in PNP. In São Tomé, two of the four occurrences within PNOST 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 PNOST are not threatened and represent one location. The two occurrences outside the PNOST

are threatened by agriculture activities (small-scale agriculture) and represent two locations. In Príncipe, the occurrence within PNP is not threatened. However, the occurrence outside the PNP 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, but it usually occurs as isolated individuals.



Erica thomensis (Henriq.) Dorr & E.G.H.Oliv.

Distribution

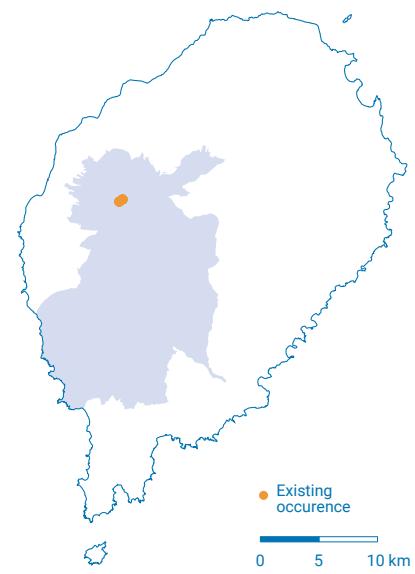
São Tomé



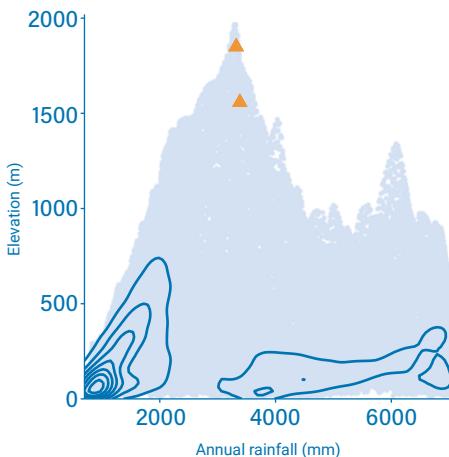
© Davy Ikabanga



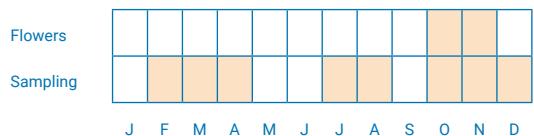
© Davy Ikabanga



Climate



Phenology



Rationale

Erica thomensis is a shrub 3 to 4 m high. It occurs in open montane forest (*Erica* vegetation belt) between 1,900 and 2,020 m in elevation, where it forms locally dense stands. The species is known from 17 collections made between 1885 (Moller 610, 724) and 2019 (Ikabanga 923, Lachenaud 2868) in São Tomé, on the Pico de São Tomé and Pico Pequeno. Two collections (Emilio s.n., Henriques 5) have no precise locality and were not considered for this evaluation. The 15 remaining collections represent four occurrences, all of which are situated within the PNOST and form one subpopulation. Based on field observation where the species has been collected, we consider none of the occurrences as extirpated. One occurrence is located at the top of Pico Pequeno. The three other occurrences are located around the Pico de São Tomé. Based on a 2 x 2 km cell size, the AOO of this species is estimated as 8 km², below the upper threshold for CR status under subcriterion B2. The EOO is calculated as 0.183 km², below the AOO, so we consider the EOO as 8 km², below the upper threshold for CR status under subcriterion B1. All four occurrences are threatened by invasive tree species (*Cinchona* spp.) which has been cultivated in the past and is now regenerating abundantly at the expense of the natural vegetation. The species is dependent on open areas in the forest, which *Cinchona* is invading. We also consider ecotourism as a future and current threat that will induce a decline of the extent and the quality of its habitat at Pico de São Tomé. Therefore, these four occurrences represent one location (*sensu* IUCN 2019) with regard to the most serious plausible threat (invasive species). Based on the impact caused by the invasive species, we infer a past, present and future continuing decline in its EOO, AOO, the extent and the quality of its habitat, the number of locations and the number of mature individuals. *E. thomensis* is thus assessed as CR B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v).

Habitat and ecology

The species is gregarious and dominant in the low *Erica* vegetation belt, which covers only very small areas at the tops of Pico Pequeno and Pico de São Tomé, between 1,900 and 2,020 m in elevation.

Use and trade

This species appears not to be in use or trade.

Population

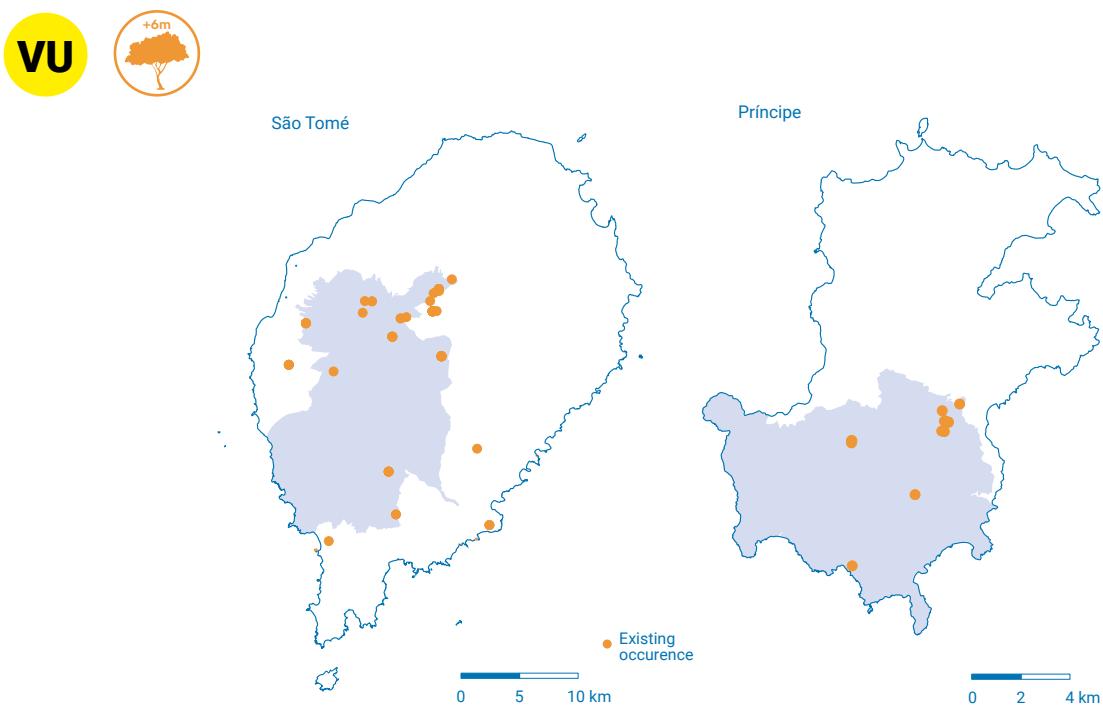
No quantitative population data are available for *Erica thomensis*, but the habitat covered by the species is probably less than few hectares.



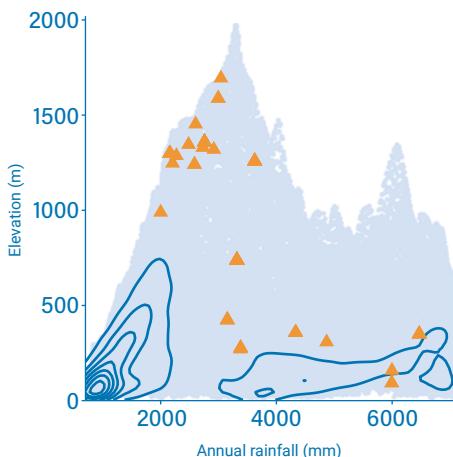
Croton stellulifer Hutch.

Distribution

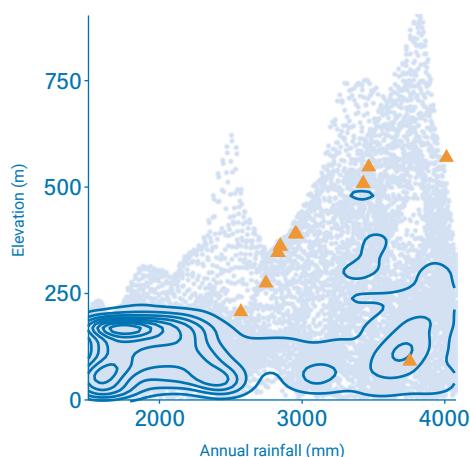
São Tomé and Príncipe



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 . 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 km², below the upper threshold for EN status under subcriterion B2. The EOO is calculated as 2,424 km², below the upper threshold for EN status under subcriterion B1. In Príncipe, the occurrences around Rio Porco, and Pico Mencorne are not threatened and represent one location. Nine occurrences were threatened by past plantations and are currently threatened by the unsustainable bark col-

lection 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 Macambrará are threatened by agricultural activities (vegetable plantations) and represent one location. Five occurrences situated along touristic tracks within the PNOST, 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 PNOST 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 Cão 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 logging plantations and represent two locations. Finally, the occurrences collected near Pico Maria Fernandes 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 situated in the north-center of the island is currently exposed to high human pressure for logging and we can observe 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 occurs 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 1,400 m of elevation and in cloudy-forest above 1,400 m (Christy, 2001). It is currently known from 77 to 1,694 m in elevation. 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 undisturbed forest on the Pico of Príncipe.

Use and trade

The dry and pulverized bark of Cubango (vernacular name) is burned as incense, on charcoal, to flavor and disinfect the house environment and to ward off «evil-eye» (Madureira et al., 2002).

Population

Population information is not known for this species.

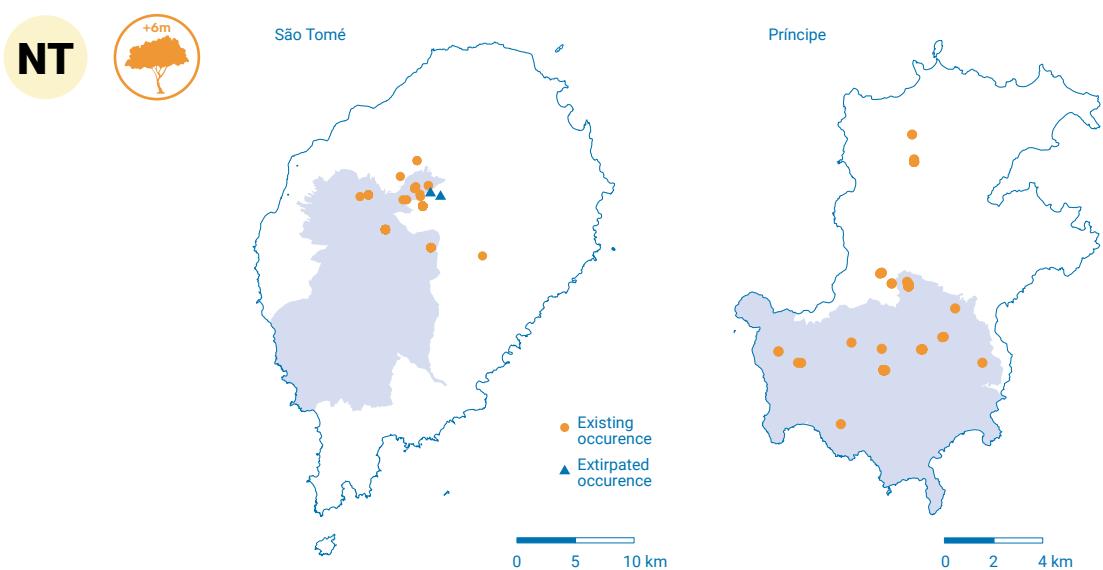


© Davide Dias

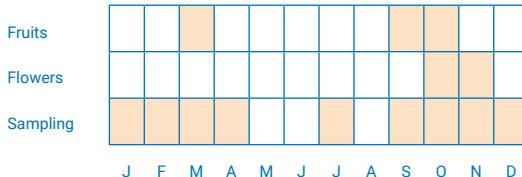
Maesobotrya glabrata (Hutch.) Exell

Distribution

São Tomé and Príncipe



Phenology



© Tariq Stevart

Rationale

Maesobotrya glabrata is shrub or a tree, up to 10 m height; endemic to the islands of São Tomé and Príncipe. The species occurs in humid primary and secondary forest, at elevations from 100 to 1,400 m. It is known from 43 collections and 215 observations made between 1932 (Exell 646, 709, 712) and 2020. We excluded two collections made by Joffroy (100) and Oliveira (1631) because no locality information was provided. We consider that the occurrence corresponding to collections made by Lejoly (229), Oliveira (98/37) and Matos (7706) as extirpated because the habitat of the species around Bom Sucesso has been severely modified. The 38 remaining collections and all the 215 observations represent 39 occurrences and two or three subpopulations. Fifteen occurrences are located in São Tomé and 22 occur in Príncipe. Based on a 2 x 2 km cell size, the AOO is estimated as 84 km², above the upper threshold of EN status under subcriterion B2. The EOO is calculated to be 1,802 km², above the upper threshold for EN status under subcriterion B1. In São Tomé, eight occurrences are inside the PNOST. Five of them located along the tourist road are threatened by ecotourism activities and represent one location. The three other occurrences are not threatened and represent one location. Outside PNOST, two occurrences located around Bombaim are threatened by illegal forest logging and represent one occurrence. Two occurrences located around Chamiço and in Maya are threatened by agriculture activities and represent one location. Two occurrences around Bom sucessos are threatened by vegetable plantations and represent one location. We consider that these two occurrences will disappear in near future. The last occurrence at Caminho de Antena is not threatened and represents one location. Therefore, these 15 occurrences represent six locations in São Tomé. In Príncipe, 19 occurrences are located within the PNP; two in the north part and 17 in the south part. Three of them at Pico Papagaio are threatened by ecotourism activities and represent one location. One occurrence at Oquê Pipi is threatened by small-scale agriculture and represents one location. One occurrence located in Infante D. Henrique is threatened by cattle farming and represents one location. The

twelve other occurrences within PNP are not threatened and represent one location. Two occurrences located in the northern part of PNP are threatened by human disturbance such as logging and wood harvesting and represent one location. Outside PNP, two occurrences at Morro Fundão are threatened by agriculture activities and represent one location. The last occurrence located in Floresta Sundy is threatened by agriculture and represents one location. We also consider that this occurrence will disappear in near future. Therefore, these 22 occurrences represent seven locations in Príncipe. In summary, These 39 occurrences represent 13 locations (*sensu* IUCN 2019), with regards to the most important threats (small-scale agriculture). We infer a future 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 quality of habitat. Although three occurrences of the species are expected to disappear in the near future due to shifting agriculture, the species cannot be considered as threatened according to criterion B. *Maesobotrya glabrata* is therefore assessed as NT as it nearly qualifies for listing as VU B1ab(ii,iii,iv,v)+2a b(ii,iii,iv,v).

Habitat and ecology

The species is known from lowland and mid-alitude evergreen forest, both old growth and degraded. The altitudinal range is 450-1400 m in São Tomé and 150-944 m in Príncipe.

Use and trade

It is not known if the species is used.

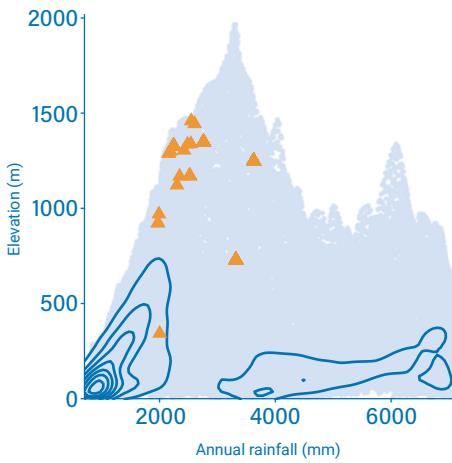
Population

The species is widespread in São Tomé and Príncipe and is often gregarious. The regeneration of the species is normal with many young individuals.

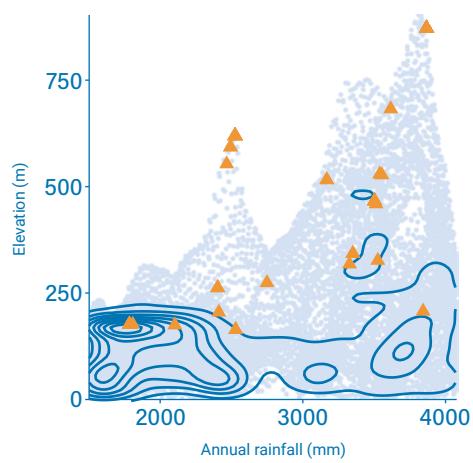


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Climate São Tomé



Climate Príncipe





Tristemma mauritianum

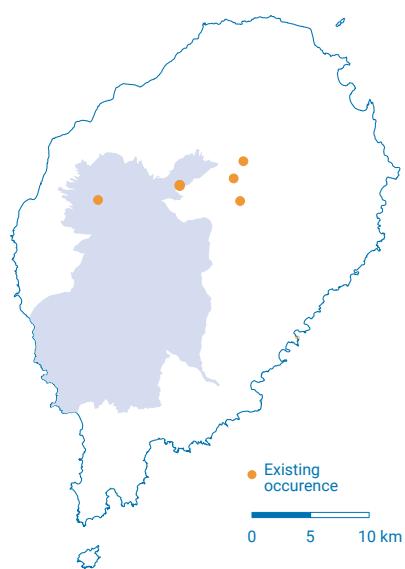
J.F.Gmel.

var. *rozeiranum* Jacq.-Fél.

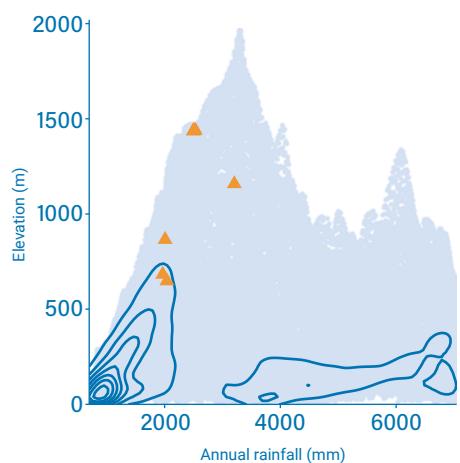


Distribution

São Tomé



Climate



Rationale

Tristemma mauritianum var. *rozeiranum* is an erect perennial herb, found between 600 m and 1,430 m in elevation, mainly in the submontane and montane forests. The variety 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 PNOST. 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 km², and its EOO is calculated to be 21 km², 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 Bombaim- 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 PNOST, 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 quality of habitat 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

The species is known as Fiá-vela and is utilized... (Madureira et al., 2002).

Population

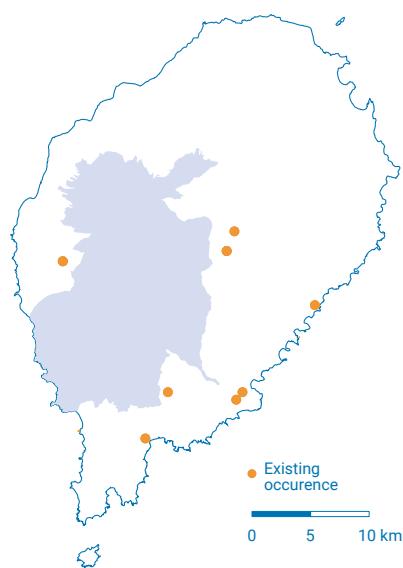
Population information is not known for this species.

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

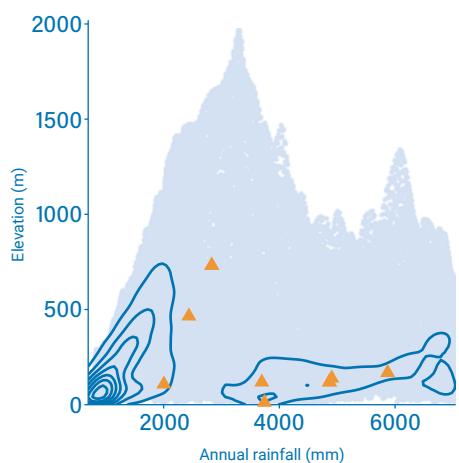


Distribution

São Tomé



Climate



Rationale

Tristemma mauritianum var. *thomense* is a perennial herb, known from lowland forests, concentrated in the coastal southern forests between 16 and 741 m in elevation. The taxon is endemic to São Tomé and is known from nine collections made between 1957 (Rozeira 3413) and 2020 (Ikabanga 1043). The nine collections represent eight occurrences and two or three subpopulations. None of the occurrences are located within the Parque Natural de Obô de São Tomé, and none are considered to be extirpated. Based on a 2 x 2 km cell size, the AOO is estimated as 28 km², and the EOO is calculated as 226 km², both below the upper threshold for "Endangered" status under subcriterion B2 and B1. The occurrence (documented by Rozeira 3413 and 3493) located near the Pico Formoso is threatened by old plantations and current extraction of palm wine and represent one location. The occurrence (Ikabanga 143) between Santa Clotilde and São José is threatened by illegal logging and represents one location. Three occurrences located at Caridade (Maria do Céu Madureira 121), São João (Figueiredo 211) and Fraternidade (Maria do Céu Madureira 274) are threatened by small-scale agriculture and represent three different locations. Finally, the occurrences south of Monte Carmo (Eduardo 41) and Monte Mário (Carvalho 39) 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 litoral. As a consequence, these eight occurrences represent seven 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. *tho-*

mense is therefore assessed as VU B1ab(i,ii,iii,iv,v) +2ab(i,ii,iii,iv,v).

Habitat and ecology

Tristemma mauritianum var. *thomense* is known from lowland forests, concentrated in the coastal southern forests of the island, between 16 and 741 m in elevation.

Use and trade

The species is known as Fiá-vela (Forro) or Anjógó (Angolar) and is utilized... (Madureira et al., 2002).

Population

Population information is not known for this taxon. We assume that the number of subpopulations can be two or three.



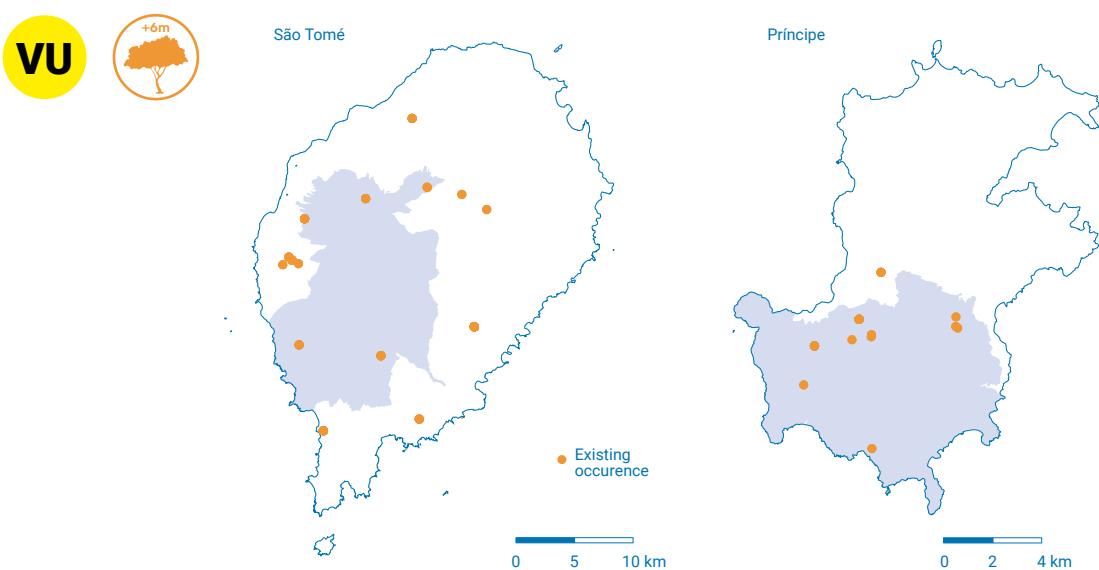
© Eduardo Lewis



Carapa gogo A.Chev. ex Kenfack

Distribution

São Tomé and Príncipe





© Tarik Stévert



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Rationale

Carapa gogo is a tree that grows over 25 m tall and up to 160 cm in DBH, known from lowland forests but also found in montane forests, at elevations between 124 and 1,277 m. The species is endemic to São Tomé and Príncipe and is known from 21 collections and 81 individuals from forest transects made between 1905 (Chevalier 14503) and 2021 (Lachenaud 3464). We excluded one historical collection (Chevalier 14503) because it is not precisely located. Moreover, we consider three historical collections (Groenendijk 24, 31, 35) located at Vila Clotilde as extirpated due to oil palm plantations. Therefore, the remaining 17 collections and 81 individuals represent 25 occurrences and three or four subpopulations. Based on a 2 x 2 km cell size, the AOO of this species is estimated as 72 km², and the EOO is calculated as 2,243 km², both below the upper threshold for "Endangered" status under subcriterion B2 and B1. In Príncipe, the nine occurrences within PNP are not threatened and represent one location. Just outside the PNP, the occurrence located at the top of Morro Fundão is not threatened and represents another location. In São Tomé, five occurrences are located within the PNOST and represent three different locations. Indeed, two of them located in the south are not threatened. The one located near Bom Sucesso is threatened by agriculture, and the last one located at Morro Vilela is indirectly threatened by tourism, which reduces the quality of the habitat. Outside the park, the five occurrences between

Santa Clotilde and São José are threatened by illegal logging and represent one location. The occurrence to the north, located at Ribeira Funda, is threatened by agricultural activities and illegal logging, representing one location. Two occurrences located between Nova Moca and Milagrosa are threatened by coffee plantations and represent one location. The occurrence located in the southeast of São Tomé (Pico Maria Fernandes) was threatened by past cocoa plantations and represents one location. Finally, the occurrence located in the South part of the island is threatened by palm plantations and represent another location. Therefore, the 25 occurrences represent ten locations (*sensu* IUCN 2019), with regards to the most important threats (industrial plantations). We infer a past, current, and future continuing decline in its AOO, its EOO, the number of locations, and the number of mature individuals based on the extirpation of one historical occurrence and because two occurrences near Nova Moca and one in the south of São Tomé are threatened by coffee and oil palm plantations. Moreover, we infer a current and future continuing decline in the extent and quality of its habitat. *Carapa gogo* is thus assessed as VU B1 ab(i,ii,iii,iv,v)+B2ab(i,ii,iii,iv,v).

Habitat and ecology

The species is known from lowland forests but can also be found in montane forests, between 124 and 1,277 m in elevation.

Use and trade

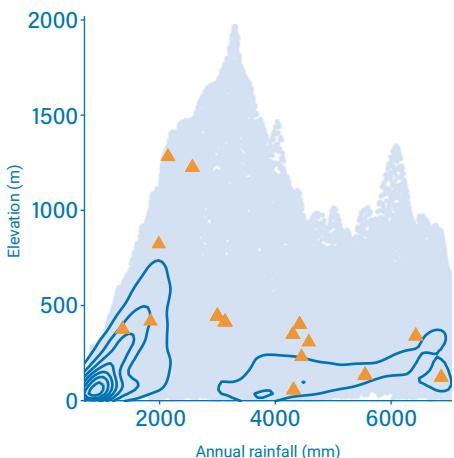
The species is known as Gogô (vernacular name) and is used for massages of displaced or broken bones, for the treatment of venereal diseases (heating), to treat anaemia, and it is used as an aphrodisiac (Madureira et al., 2002).

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.

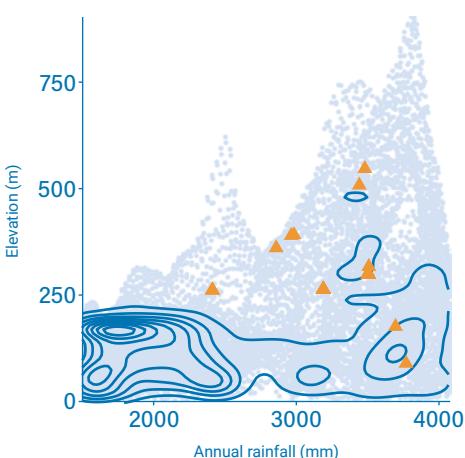
Population

This species probably had a larger distribution on Príncipe, but many individuals were likely cut for timber. This species appears to be locally abundant, but the density is difficult to assess since it is misidentified as *Strephonema* sp. nov. in these areas. Moreover, there is no sign of natural regeneration. Since 2020, a project led by Fauna & Flora International and Fundação Príncipe (Taking action for Príncipe's threatened trees) has been conducting awareness campaigns, surveys, and monitoring of *Carapa gogo*. More information regarding the species is expected in the near future.

Climate São Tomé



Climate Príncipe







Trichilia grandifolia Oliv.

Distribution

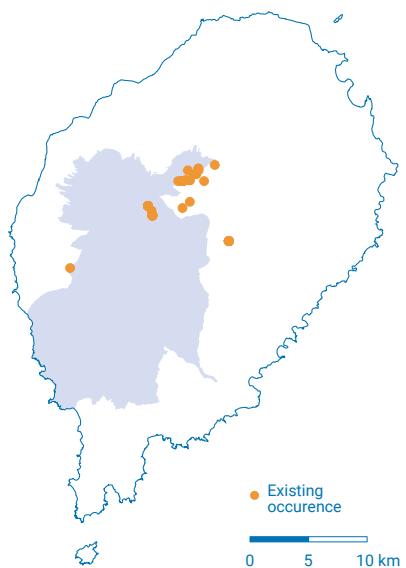
São Tomé



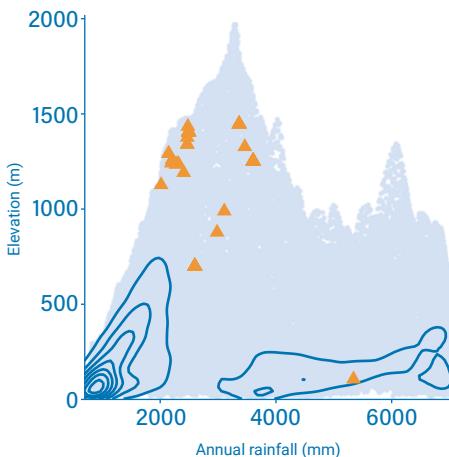
© Olivier Lachenau



© Olivier Lachenau



Climate



Phenology

Fruits	●	●	●	●	●	●	●	●	●	●
Flowers	●	●	●	●	●	●	●	●	●	●
Sampling	●	●	●	●	●	●	●	●	●	●

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

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 submontane forests, and montane forests on slopes, between 713 and 1,500 m in elevation. The species is endemic to São Tomé Island and it is known from 39 collections between 1861 and 2020, representing 23 occurrences. We do not know the dispersal capacity of the species, but it should be limited since seeds are quite large. We consider that none of the occurrences are extirpated. Based on a 2 km x 2 km cell, the AOO for this species is estimated at 40 km², below the upper threshold for EN status under criterion B2. The EOO is calculated as 91 km² 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 agricultural practices and represent, therefore, 1 location. Still, outside the protected area, the occurrences in Trás-os-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 and Pico Ana Chaves, located within the PNOST, 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). 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).

Habitat and ecology

The species is known from submontane and montane forests on slopes, between 713 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

The species is known as Vêludo and is traditionally used as an aphrodisiac (Madureira et al., 2002).

Population

Population information is not known for this species but 36 individuals were collected on transects, most of them belonging to 20-40 cm dbh categories. The dbh curve is normal but with few regeneration and few old trees.



Campylospermum nutans (Hiern) Biss.



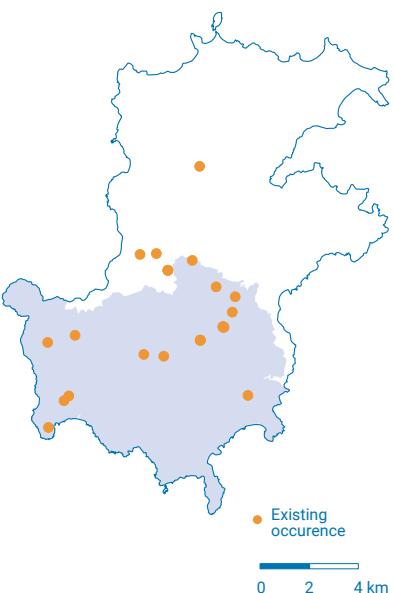
© Olivier Lachenau



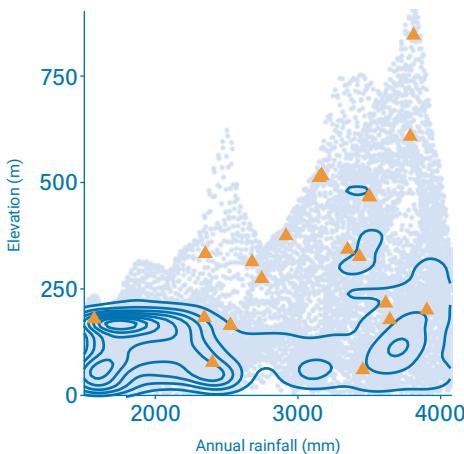
© Olivier Lachenau

Distribution

Príncipe



Climate



Phenology

Fruits											
Flowers											
Sampling											

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

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 km², below the upper threshold for EN status under subcriterion B2. The EOO is calculated as 46 km², 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 in the

number of mature individuals and disappearance of one location due to housing expansion. *Campylospermum nutans* is thus assessed as VU B1ab(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.



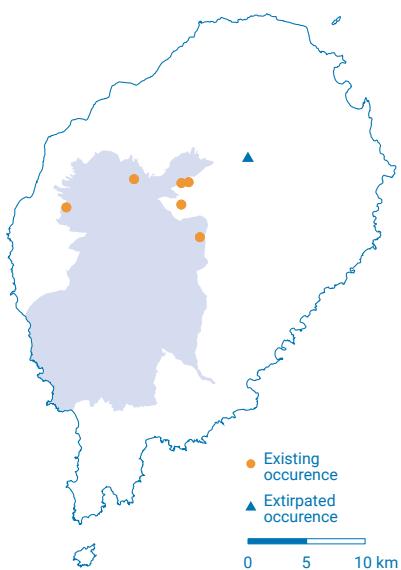
Jasminum thomense Exell



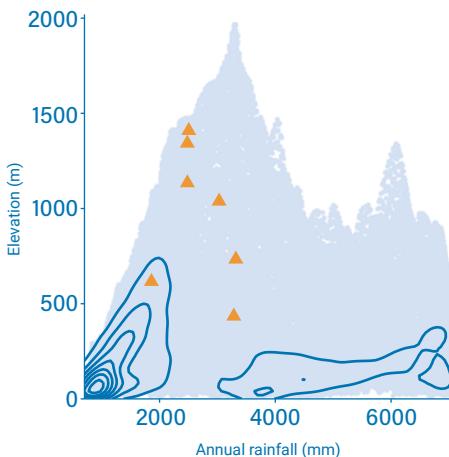
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Distribution

São Tomé



Climate



Phenology

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

Rationale

Jasminum thomense is a liana, known from mid-altitude forest, between 500 and 1,420 m in elevation. The species is endemic to São Tomé and is known from 11 collections made between 1905 (*Chevalier s.n.*) and 2020 (*Lachenaud 3004*). We excluded one historical collection (*Chevalier s.n.*) because no locality information is provided. We also excluded two collections made by *Oliveira* (1508; 169) from Botanical Garden of Bom Sucesso. Moreover, we consider that the occurrence corresponding to the collection made in 1949 by *Espirito Santo* (176) as extirped because the habitat of the species in Monte Café has been severely modified. Therefore, the seven remaining collections represent seven occurrences and one or two subpopulations. Based on a 2 x 2 km cell size, the AOO of this species is estimated as 20 km², below the upper threshold for "Endangered" status under subcriterion B2. And the EOO is calculated as 32 km², below the upper threshold for "Critically endangered" status under subcriterion B2. Five occurrences are located within the Parc Natural Obô de São Tomé (PNOST). Three of them are not threatened and represent one location. Two other occurrences are situated around Lago Amélia and along the path from Bom Sucesso to Lagoa Amélia. One occurrence near the PNOST is again located along the touristic path. We consider that these three occurrences are threatened by tourism and invasive species and represent one location. Finally, one occurrence located around Zampalma is threatened by small-scale agriculture and illegal logging, and represents one location. Therefore, these seven occurrences represent three locations (*sensu IUCN 2019*), with regard to the most serious plausible threat (tourism and invasive species). Based on the disappearance of one occurrence, 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. *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 mid-altitude forest, between 500 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.

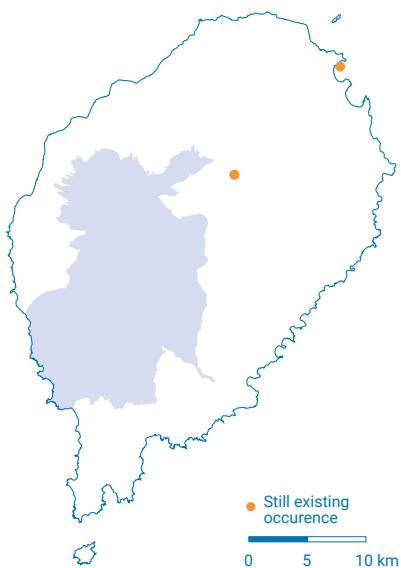


Aerangis flexuosa (Ridl.) Schltr.

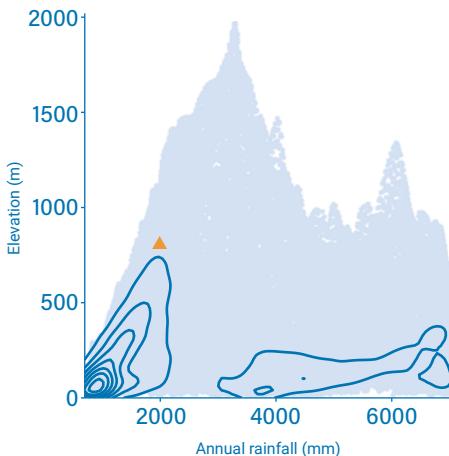


Distribution

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 km², 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 PNOST. 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 PNOST. The number of individuals of the species is not known and cannot be estimated since the species is epiphyte.



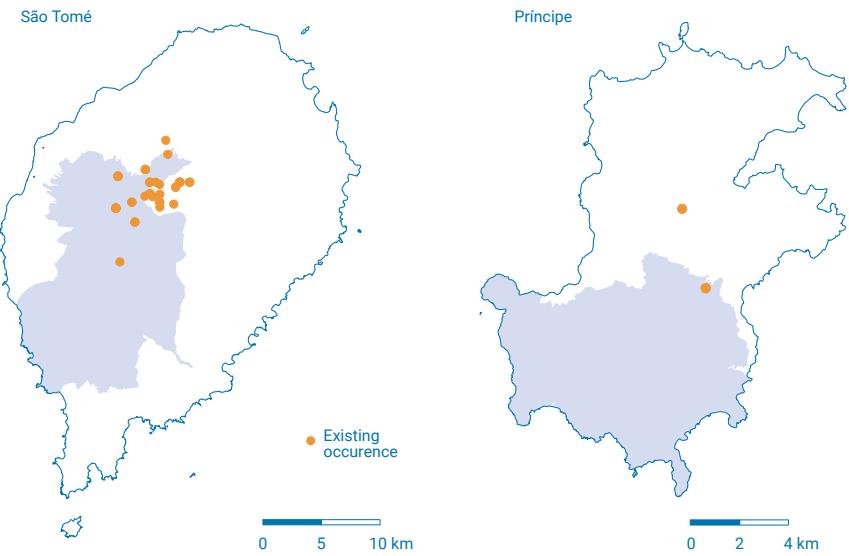
Afropectinariella doratophylla (Summerh.) M.Simo & Stévert

EN

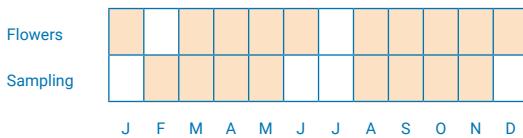


Distribution

São Tomé and Príncipe



Phenology



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 km² and its AOO is about 90 km², 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 PNOST, 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 PNOST 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 (Stévert pers. obs.).

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.

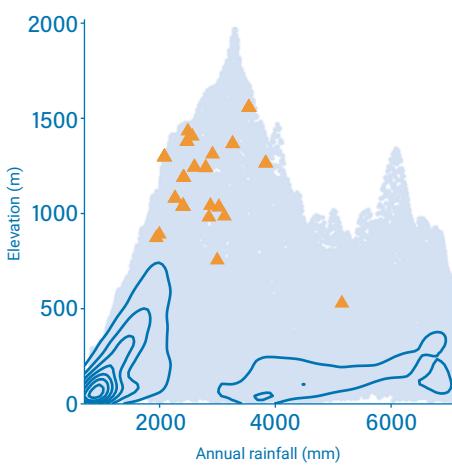
Population

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

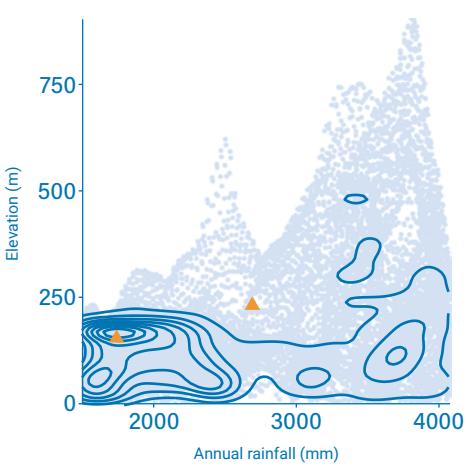


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Climate São Tomé



Climate Príncipe





Angraecopsis dolabriformis (Rolle) 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.





© Tariq Stévert

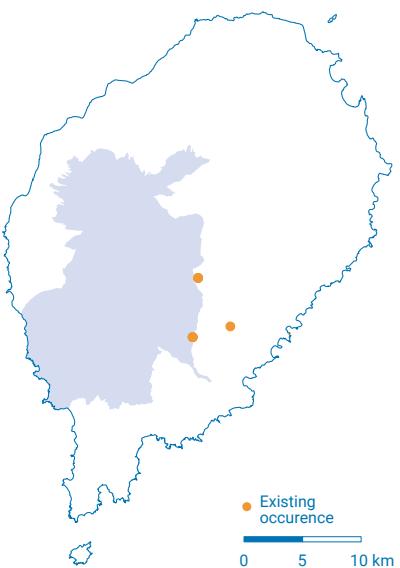
Angraecopsis thomensis Stévert & P.J.Cribb

Distribution

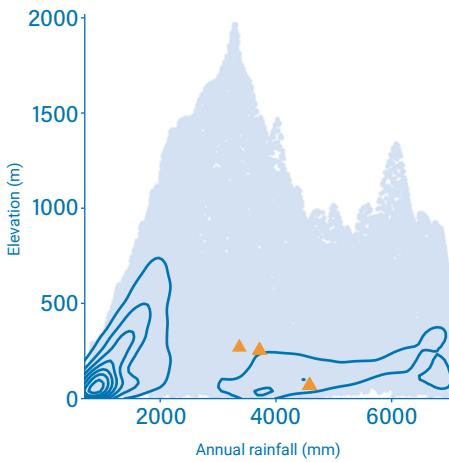
São Tomé



© Tariq Stévert



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 km², 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 PNOST, 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 PNOST, 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.

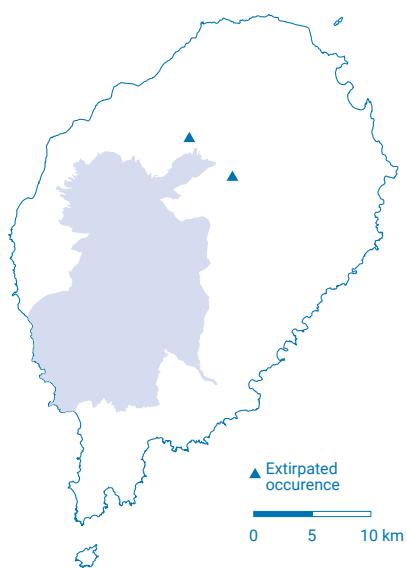
Angraecum astroarche Ridl.

EX

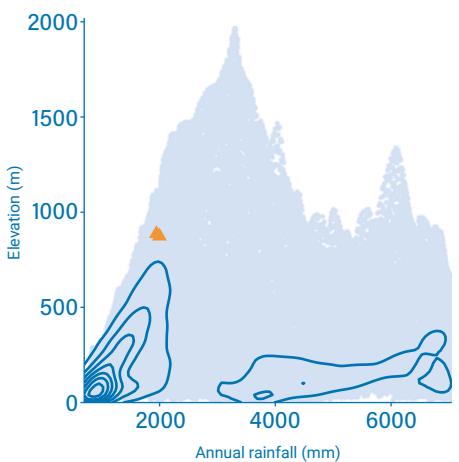


Distribution

São Tomé



Climate



Phenology



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 PNOST. 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

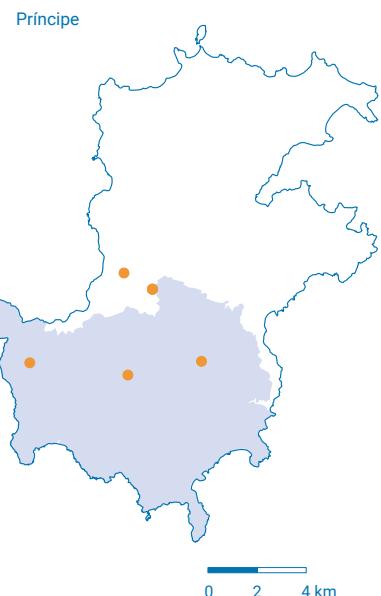
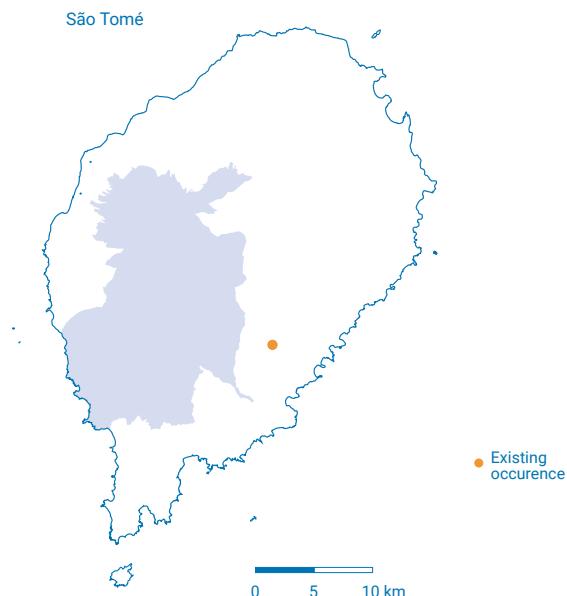
The population of *Angraecum astroarche* is thought to have declined because the species habitat has been degraded by selective logging. *Angraecum astroarche* was known from one subpopulation in the northern part of São Tomé Island. The species is presumed to be extinct.

Brachycorythis basifoliata Summerh.

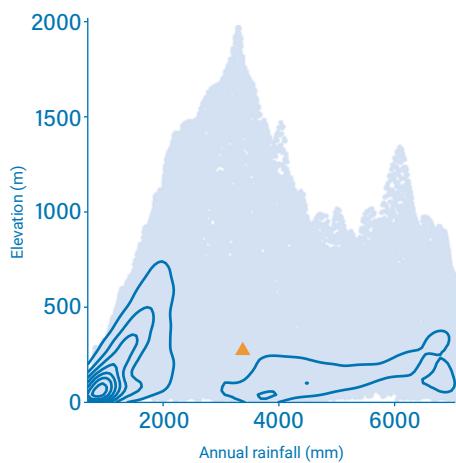


Distribution

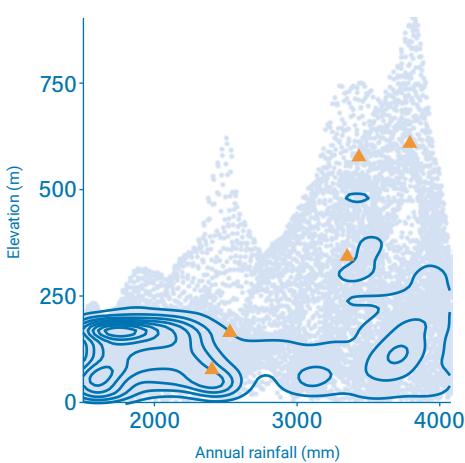
São Tomé and Príncipe



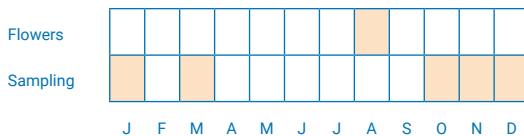
Climate São Tomé



Climate Príncipe



Phenology



Rationale

The species is assessed as EN. The EOO of *Brachycorythis basifoliata* is estimated to be 157 km² and its AOO is about 12 km², both of which fall within the thresholds for EN under criterion B. The species is known from three subpopulations; one on São Tomé Island and the others on Príncipe Island. These three subpopulations represent three different locations, which falls within the thresholds for EN under subcriterion B1a+2a. *Brachycorythis basifoliata* has been collected in an ancient plantation in secondary forests of Pico Maria Fernandes in São Tomé. In Príncipe, the species is recorded in dense old-growth forest, on primary thicket or on a fallen tree trunk in a clearing at the Pico Papagaio, Morro Fundao and near the summit of the Pico de Príncipe. Two of the three recorded locations are unprotected sites which are impacted by human disturbance. The main threats to *B. basifoliata* are deforestation for agriculture and clearance for urbanization. The latter results from a strong demand for timber used in the construction of houses. Also, the future industrial palm oil plantation in the southwest of São Tomé will threaten the species habitat. It is projected that this pressure will continue in the future. The projected ongoing loss of its habitat will result in a continuing decline in the number of locations, mature individuals, its EOO and AOO. For these reasons, *B. basifoliata* is assessed as EN B1a b(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v).

Habitat and ecology

The species is terrestrial in dense old-growth forest in Príncipe Island, on primary thicket on a basalt plate, and in clearance. At São Tomé Island, the species was collected inside an old plantation within secondary forests. It is found between 360 and 660 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 species population is currently thought to decrease because the habitat of *Brachycorythis basifoliata* is currently facing clearance for urbanization and shifting agriculture. The number of individuals of the species is not known and cannot be estimated although the species is terrestrial.



Bulbophyllum lizae J.J. Verm.

EN



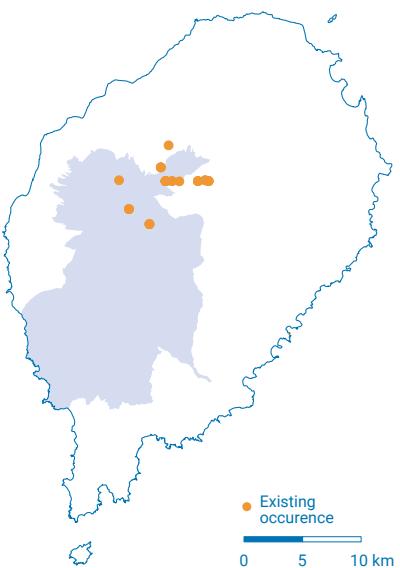
© Tariq Stévart



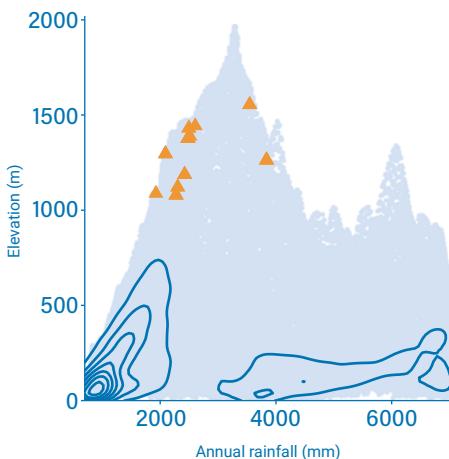
© Tariq Stévart

Distribution

Bioko (Equatorial Guinea) and São Tomé



Climate



Phenology

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 lizae* is estimated to be 1,622 km², whereas its AOO is estimated to be 32 km², 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 PNOST 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.

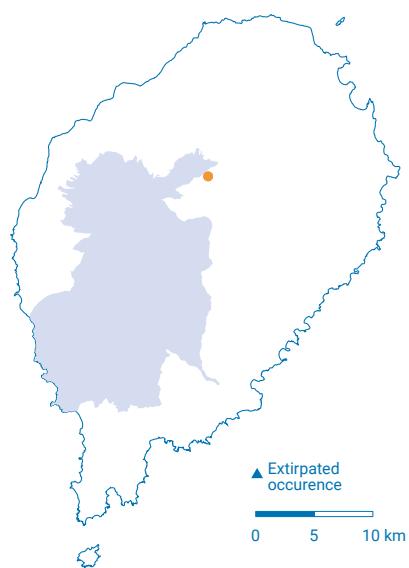
Bulbophyllum luciphilum Stévert

EN

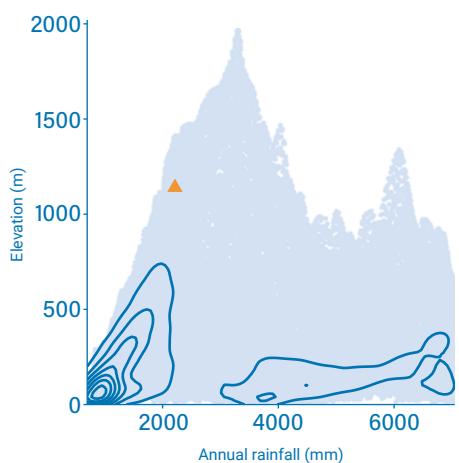


Distribution

Rio Muni (Equatorial Guinea)
and São Tomé



Climate



Phenology



Rationale

The species is assessed as EN. The EOO of *Bulbophyllum lucophilum* cannot be estimated because the species is known only from two collections, whereas its AOO is estimated to be 8 km², 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 lucophilum* 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. lucophilum* 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 lucophilum* is decreasing. The Bom Sucesso subpopulation is under threat by forest clearance. The number of individuals of *B. lucophilum* is not known and cannot be estimated because the species is epiphyte.



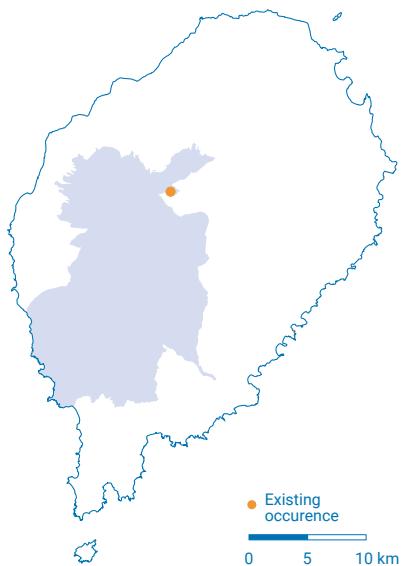
© Tariq Stévert

Calanthe sylvatica (Thouars) Lindl. var. *geerinckiana* Stévert

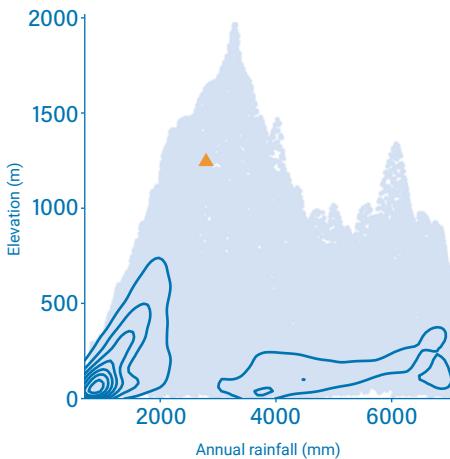


Distribution

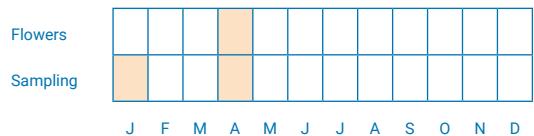
São Tomé



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 km², 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 Ceilão. This situation is leading to a decline in the quality of the habitat. Intensive field-work 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 Ceilão, 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

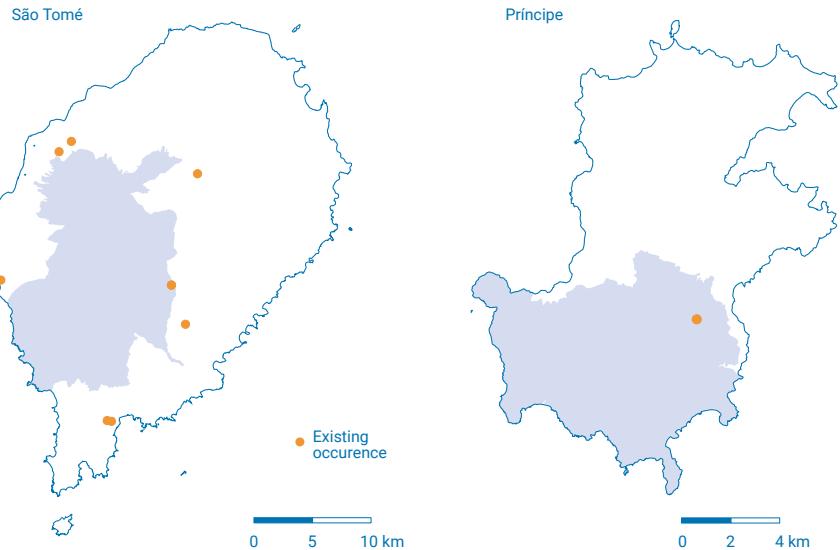
Calanthe sylvatica var. *geerinckiana* is known only from the type collection. Its population is currently thought to decrease because the species habitat is a crop area in secondary vegetation.



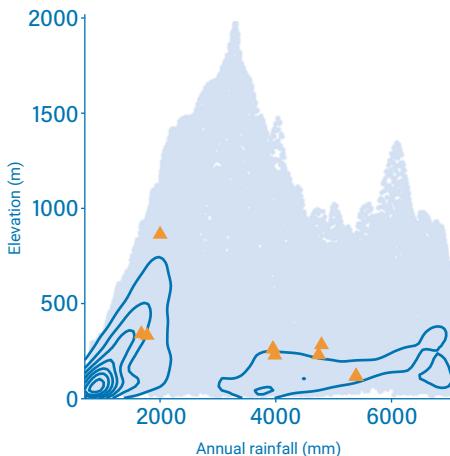
Diaphananthe acuta (Ridl.) Schltr.

Distribution

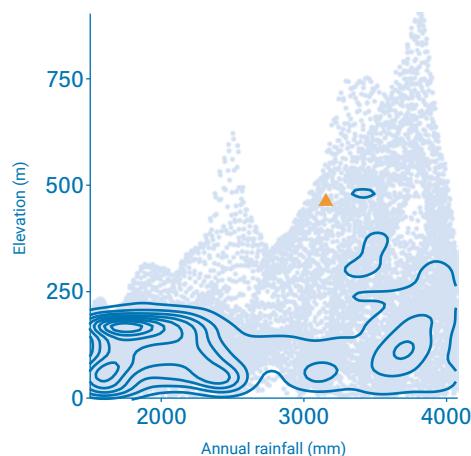
São Tomé and Príncipe



Climate São Tomé



Climate Príncipe



Phenology

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

Rationale

The species is given a Red List status of EN. The EOO of *Diaphananthe acuta* is estimated to be 98.4 km², which falls within the thresholds for CR under subcriterion B1, whereas its AOO is estimated to be 12 km², which falls within the thresholds for EN under subcriterion 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.

Diaphananthe acuta has been collected in low altitude forests surrounding the PNOST, 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 *Diaphananthe 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 subcriterion 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. *Diaphananthe 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 PNOST. 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 *Diaphananthe 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 PNOST, 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 epiphytic.

Diaphananthe papagayi (Rchb.f.) Schltr.

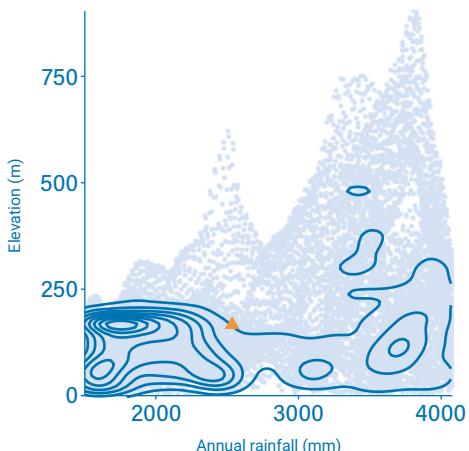


Distribution

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 km², 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

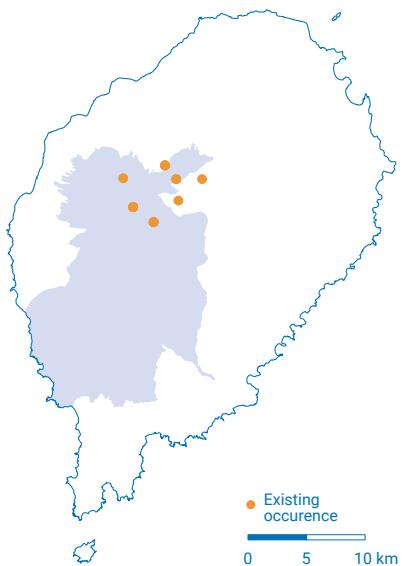
Diaphananthe papagayi is known from the Pico Papagaio which is experiencing increased ecotourism. The population trend of the species is decreasing. The number of mature individuals is not known and cannot be estimated since the species is epiphyte.



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

Distribution

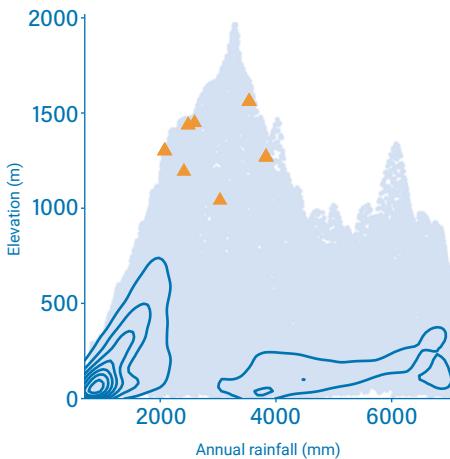
São Tomé



EN



Climate



Phenology

Flowers
Sampling

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

Rationale

The EOO of *Diaphananthe thomensis* is estimated to be 32 km², which falls within the thresholds for CR status under criterion B1, whereas its AOO is estimated to be 32 km², 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 PNOST, 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.

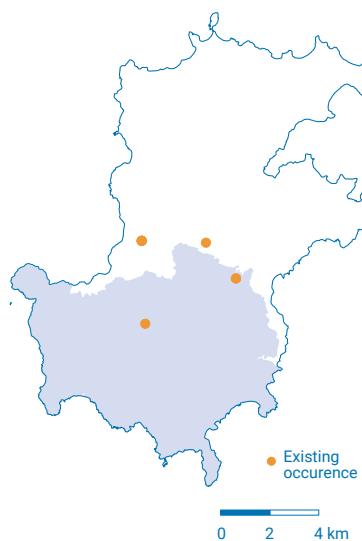
Diaphananthe vagans (Lindl.) P.J.Cribb & Carlsward

EN

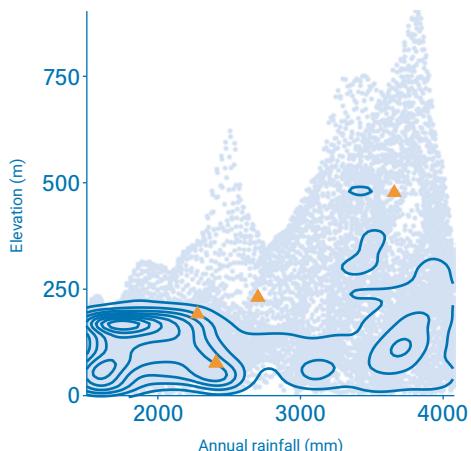


Distribution

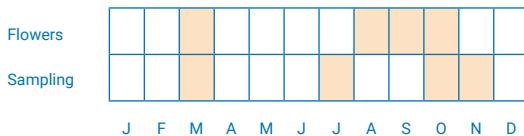
Príncipe



Climate



Phenology



Rationale

The EOO of *Diaphananthe vagans* cannot be estimated because the species is known only from two subpopulations, while the AOO is estimated to be 8 km², 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. *Diaphananthe vagans* occurs 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. The species has been collected in the PNP, 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

Diaphananthe 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.



Dinklageella scandens

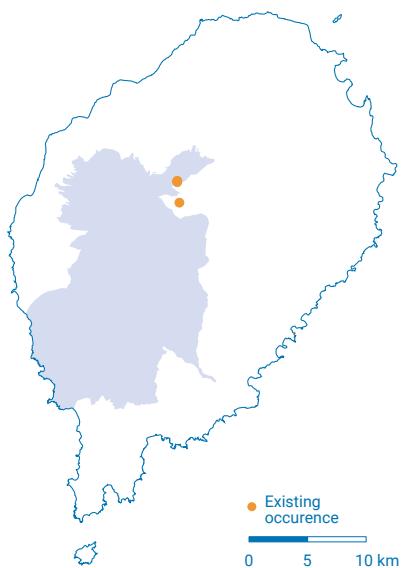
Stévert & P.J.Cribb

EN

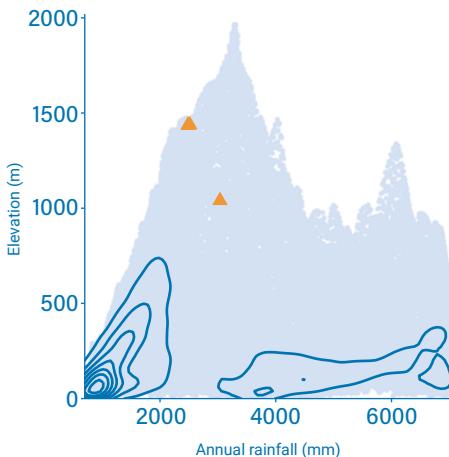


Distribution

São Tomé



Climate



Rationale

The species was placed in the genus *Solenangis* and renamed as a *Solenangis saotomensis* R.Rice in recent studies.

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 km², 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 Amélia (an ancient volcanic crater, now filled in). The species occurs in areas covered by open vegetation characterized by *Heteradelphia paullinifolia* and *Rapanea melanophloeos*. In this habitat, the taxon is terrestrial and forms dense populations, individuals above the herbaceous stratum kept together by long aerial roots (Stévert 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

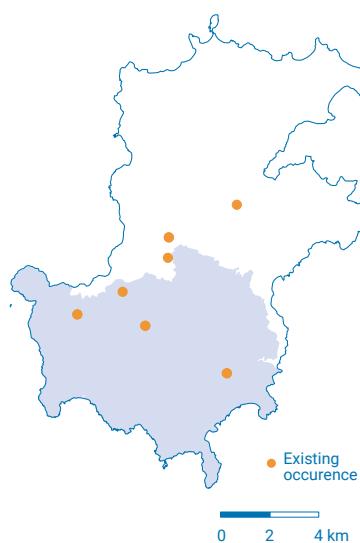
The population of *Dinklageella scandens* is currently thought to be decreasing because the species' habitat is threatened in São Tomé such as shrubs and invasive plants replacing the natural vegetation, and tourists degrading the crater lake. The species is terrestrial. The number of individuals is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

Habenaria letouzeyana (Szlach. & Olsz.) P.J.Cribb & Stévart

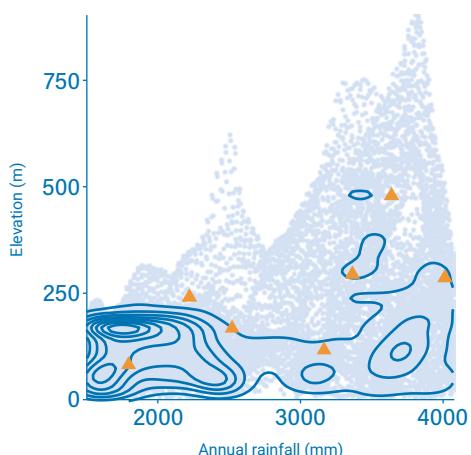


Distribution

Príncipe



Climate



Rationale

The EOO of *Habenaria letouzeyana* is estimated to be 23.8 km², which falls within the thresholds for CR under criterion B1, whereas its AOO is estimated to be 20 km², 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 PNOST, 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(ii)+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.



Polystachya *albescens* Ridl. subsp. *principensis* Stévert



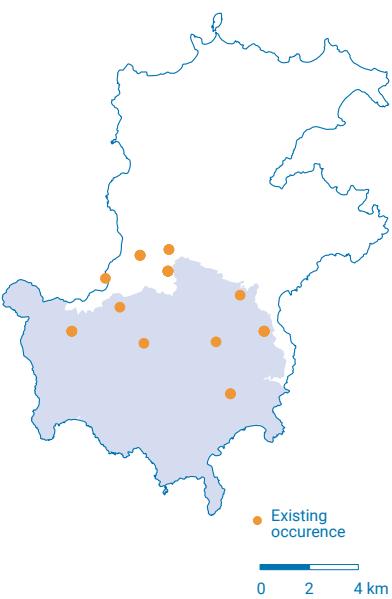
© Tariq Stévert



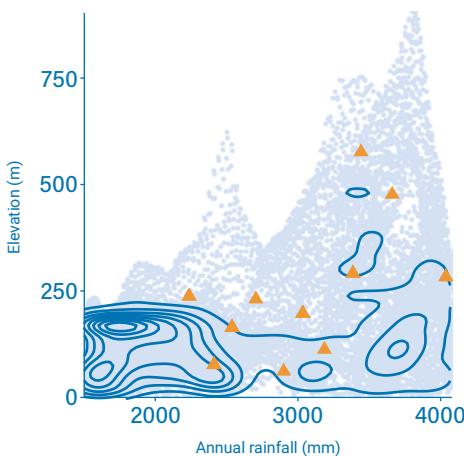
© Tariq Stévert

Distribution

Príncipe



Climate



Rationale

The EOO of *Polystachya albescens* subsp. *principensis* is estimated to be 29.2 km², which falls within the limits for CR category under criterion B1, whereas its AOO is estimated to be 20 km², 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. *principensis* 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 PNOST, 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. *principensis* 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

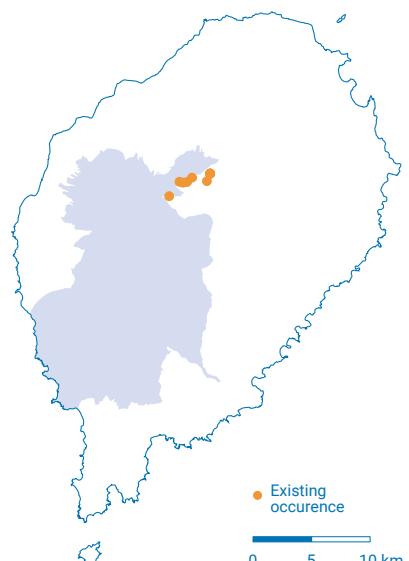
The current population trend of *P. albescens* subsp. *principensis* is thought to decrease. Indeed, some subpopulations occur in unprotected areas that are under human pressure. *Polystachya albescens* subsp. *principensis* is either epiphyte, terrestrial or lithophyte. Its number of individuals is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



Polystachya biteaui P.J.Cribb, la Croix & Stévert

Distribution

São Tomé

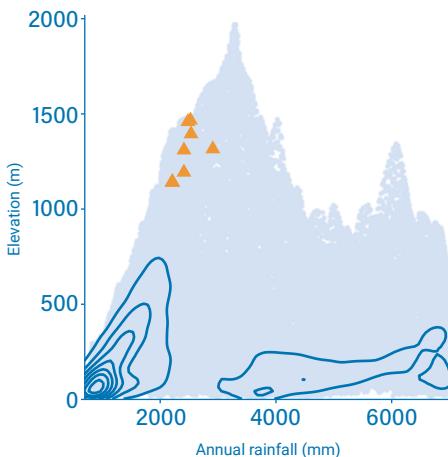


© Tariq Stévert



© Tariq Stévert

Climate



Rationale

The EOO and the AOO of *Polystachya biteau* are estimated to be each 4 km², 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 biteau* 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 biteau* 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 biteau* 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 biteau* is an epiphyte. The number of individuals is not known and cannot be estimated.



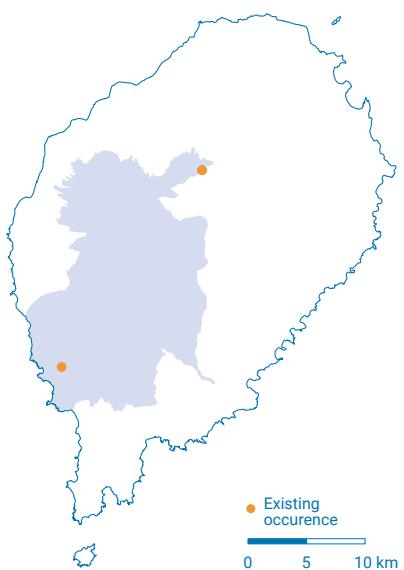
Polystachya expansa Ridl.



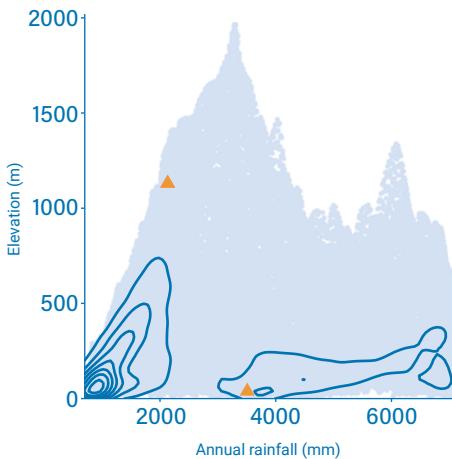
© Tariq Stévart

Distribution

São Tomé



Climate



Phenology

Flowers												
Sampling												

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

Rationale

The EOO and the AOO of *Polystachya expansa* are estimated to be 139 km² and 12 km² 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.

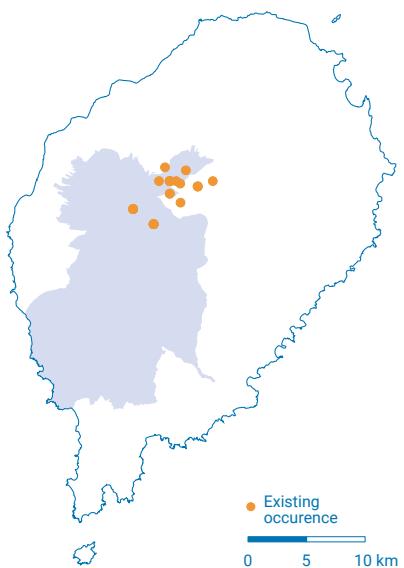
EN



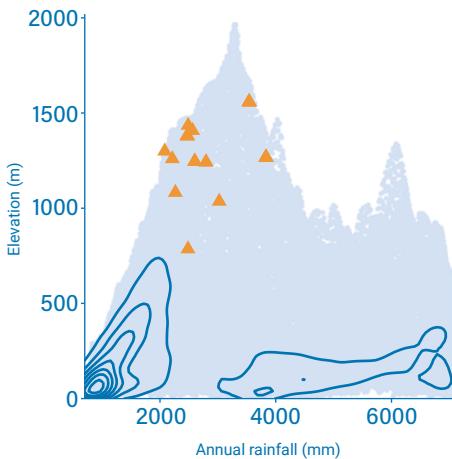
© Tariq Stévart

Distribution

São Tomé



Climate



Phenology

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

Rationale

The EOO of *Polystachya parviflora* is estimated to be 24 km², which falls within the thresholds for CR category under criterion B1, whereas its AOO is estimated to be 24 km², 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.



Polystachya *principia* Stévert & P.J.Cribb



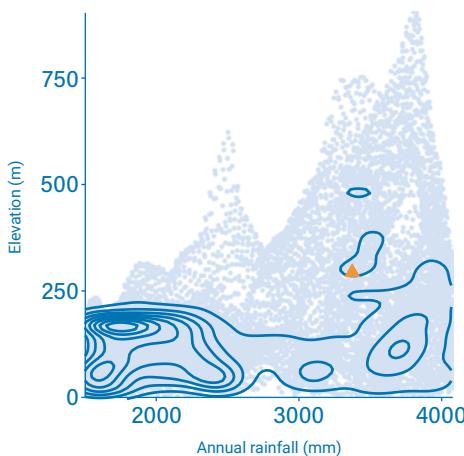
© Tariq Stévert

Distribution

Cameroon, and Príncipe



Climate



Rationale

The EOO and the AOO of *Polystachya principia* are estimated to be 601 and 12 km² 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 Principe 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 , 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

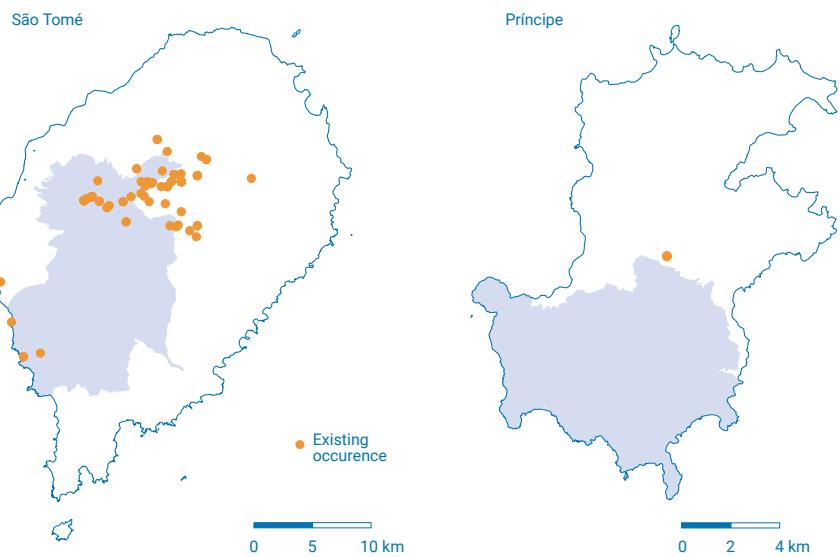
The population trend of *Polystachya principia* is currently thought to be decreasing since the species' habitat in Cameroon is threatened by shifting agriculture. The number of mature individuals of the species is not known and cannot be estimated since the species is epiphyte.



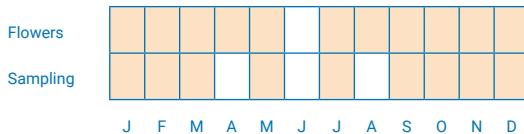
Polystachya ridleyi **Rolfe**

Distribution

Annobón (Equatorial Guinea),
and São Tomé and Príncipe



Phenology



© Tariq Sévart

Rationale

The EOO and the AOO of *Polystachya ridleyi* are estimated to be 1,498 and 48 km² 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 in S. Tomé island. 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.

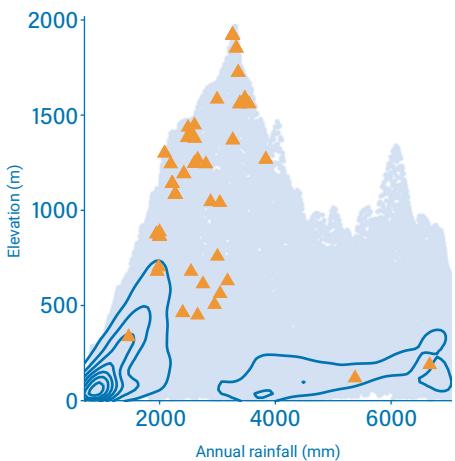
Population

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.

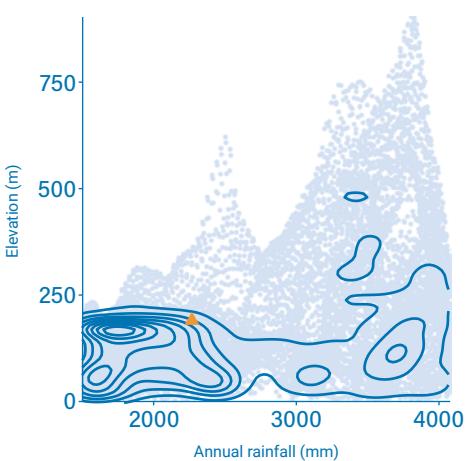
Use and trade

The species is not known to be used.

Climate São Tomé



Climate Príncipe





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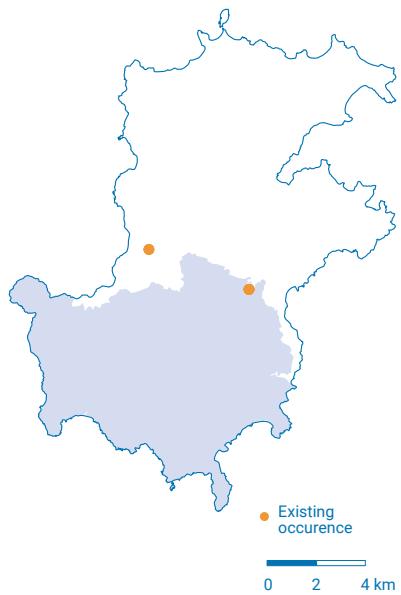
© Tariq Stévart



Polystachya setifera Lindl.

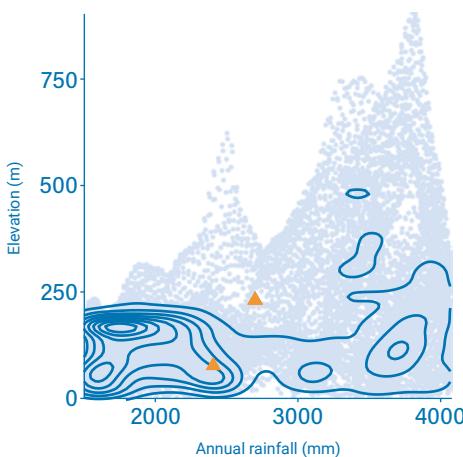
Distribution

Príncipe



© Tariq Stévant

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 km², 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 PNP, 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

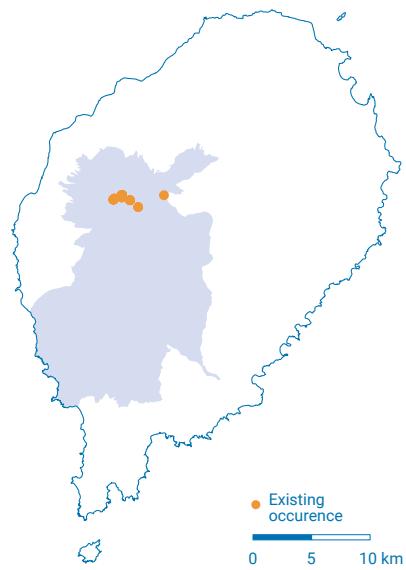
On Príncipe Island, a large proportion of the forest was destroyed two centuries ago. Nowadays, almost all the vegetation located outside protected areas is threatened. The current population trend of *Polystachya setifera* is decreasing since the species' habitat outside the protected area is threatened.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



Polystachya thomensis Summerh.

Distribution

São Tomé

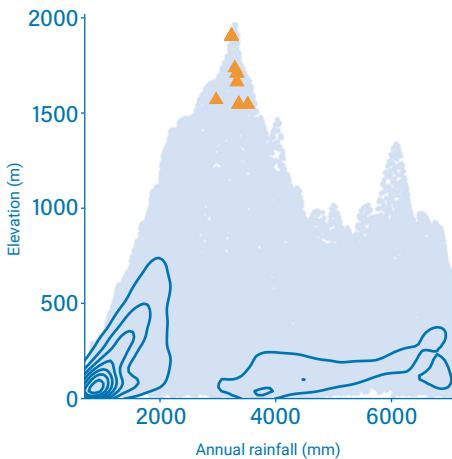


© Tariq Stévart

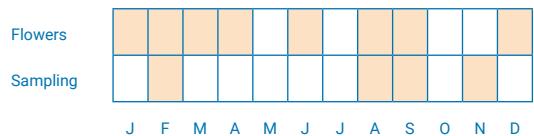


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Climate



Phenology



Rationale

The EOO and the AOO of *Polystachya thomensis* are estimated to be 8 km² 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 PNOST, 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

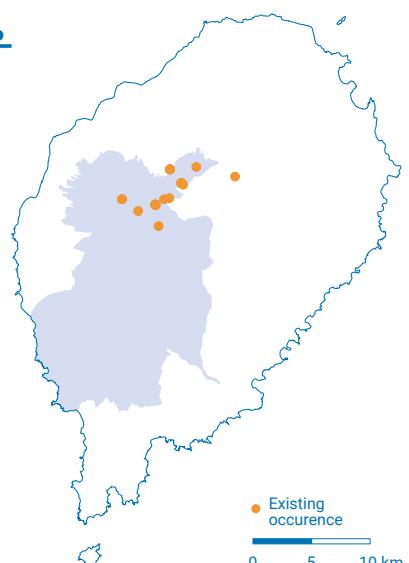
The current population trend of *Polystachya thomensis* is assumed to be stable since all the known collections of the species occur within a protected area which is well managed. Its number of individuals is not known and cannot be estimated since the species is epiphyte.



Rhipidoglossum brevifolium Summerh.

Distribution

São Tomé

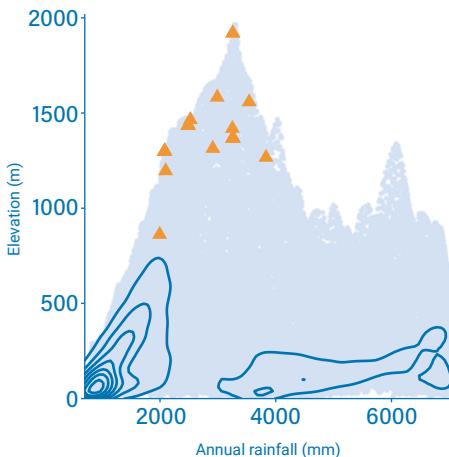


© Tariq Stévart



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Climate



Rationale

We were able to georeference subpopulations in Lagoa Amélia 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 km², which falls within the limits of the CR category under subcriterion B1, whereas the AOO is estimated to be 16 km², 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 Amélia 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 Amélia 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.



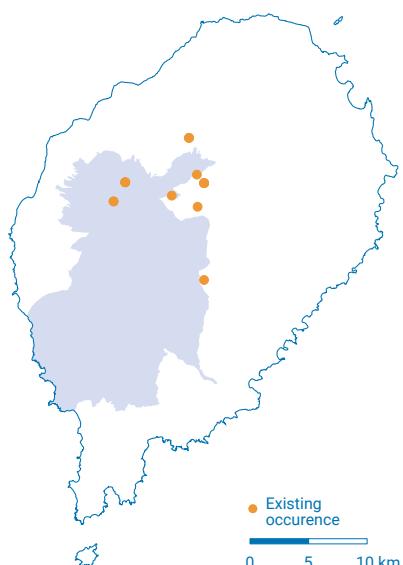
Rhipidoglossum pendulum (la Croix & P.J.Cribb)

Farminhão & Stévert
Syn: Cribbia pendula
la Croix & P.J.Cribb

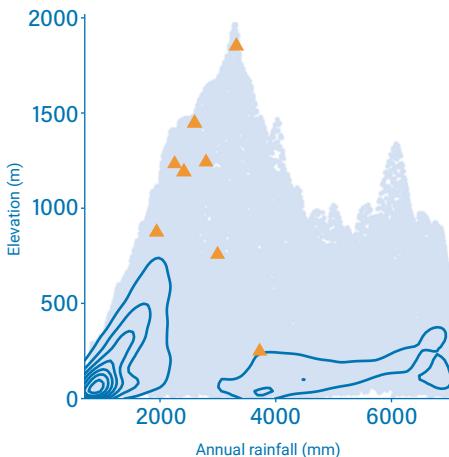


Distribution

São Tomé



Climate



© Tariq Stévert

Rationale

The species is assessed as EN. The EOO of *Rhipidoglossum pendulum* is estimated to be 52.4 km², which falls within the thresholds for CR under criterion B1 whereas its AOO is estimated to be 20 km², 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 PNST. 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, *Rhipidoglossum pendulum* 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.



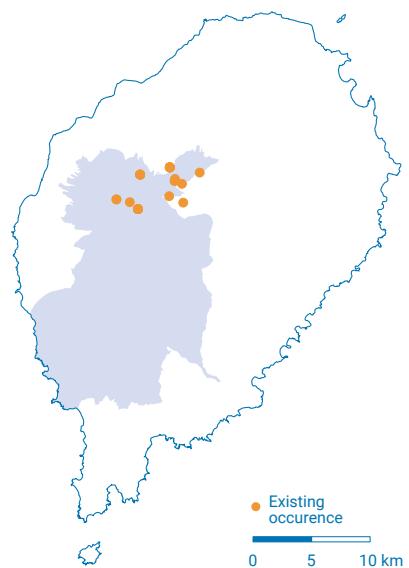
© Tariq Stévert

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

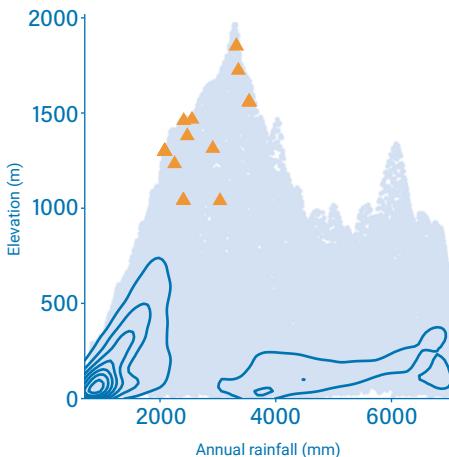


Distribution

São Tomé



Climate



© Tariq Stévart

Rationale

The species is assessed as EN. The EOO of *Rhipidoglossum thomense* is estimated to be 28 km², which falls within the thresholds for CR under criterion B1, whereas its AOO is estimated to be 28 km², 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).

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.



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

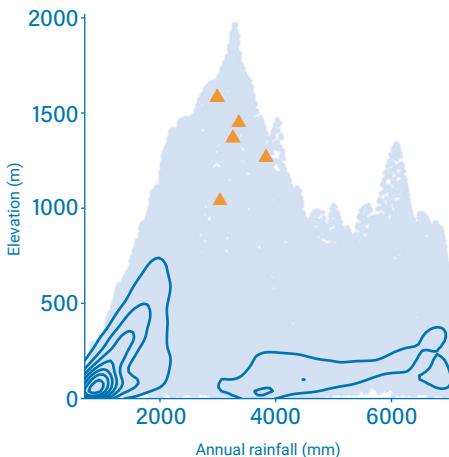


Distribution

São Tomé



Climate



Rationale

The EOO and the AOO of *Stolzia peperomioides* subsp. *thomensis* are estimated to be 8 km² 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 PNOST. 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).

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.

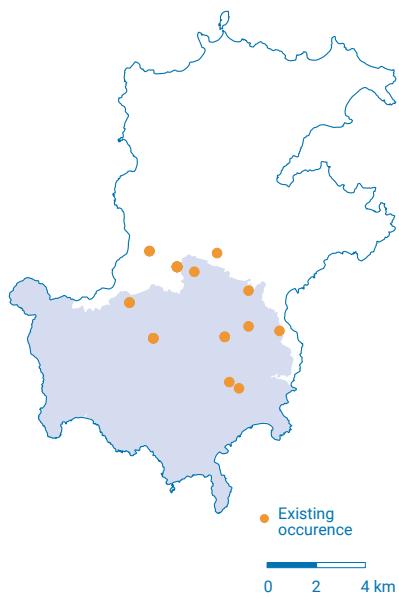


Tridactyle aurantiopunctata P.J.Cribb & Stévert

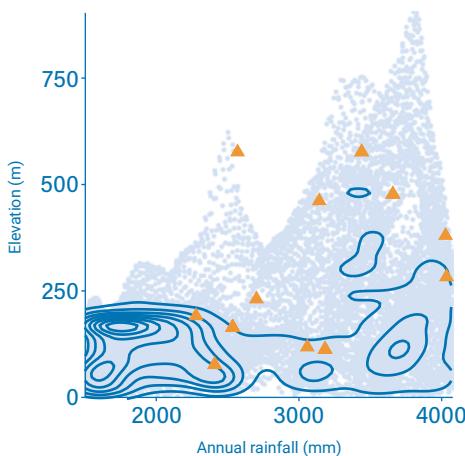


Distribution

Príncipe



Climate



© Tania D'Hondt

Rationale

The 13 occurrences of *Tridactyle aurantiopunctata* represent two subpopulations. Its EOO is estimated to be 754 km² and its AOO is estimated to be 28 km², 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

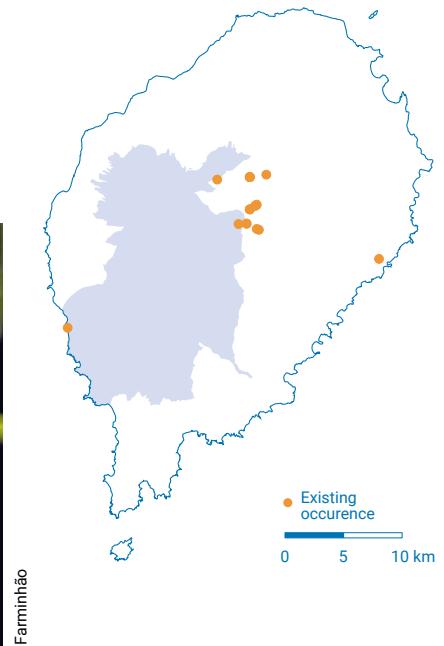
Tridactyle aurantiopunctata is known from two subpopulations. Its population trend is thought to be decreasing because the species habitat in some collecting sites is currently facing human activities.



Tridactyle thomensis P.J.Cribb & Stévert

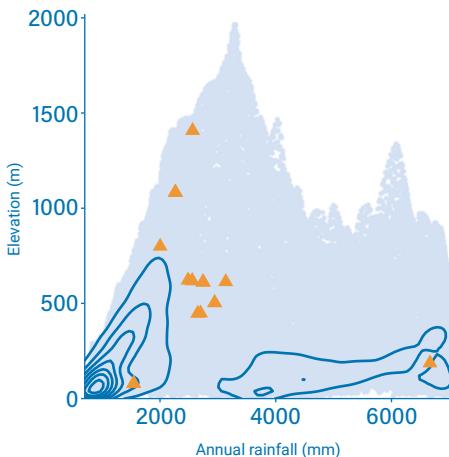
Distribution

São Tomé



© João Farminhão

Climate



© Tania D'Haujère

Rationale

The EOO and the AOO of *Tridactyle thomensis* are estimated to be 284 and 20 km² 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 PNOST, 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.



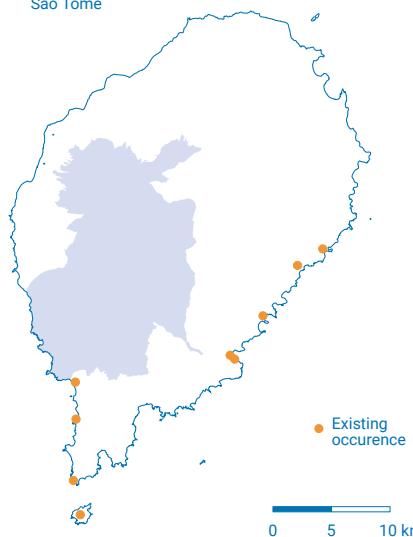
Pandanus thomensis Henriquez.

Distribution

São Tomé and Príncipe



São Tomé



Príncipe



Phenology

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



© Tariq Stevart

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 km², within the limit for EN status under subcriterion B1, while its area of occupancy is estimated to be 48 km², also within the limit for EN status under subcriterion B2. Most of its occurrences occur outside protected areas in São Tomé (except the one at Praia Bindá) and the subpopulations that occur in Príncipe are in the PNP with some observations made 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 (Angra Toldo 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. It occurs in mangroves and other seaside habitats.

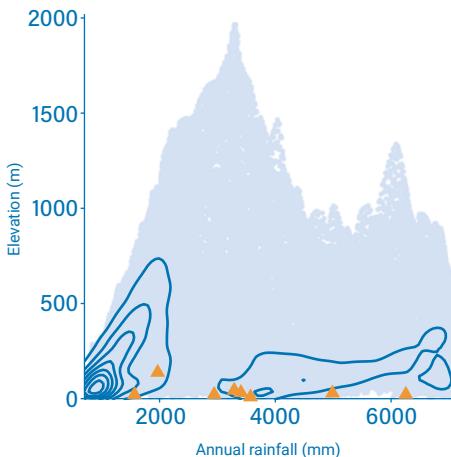
Use and trade

Páia-cela; Pau-esteira is frequently used. In Príncipe, it is used for the manufacture of mats with dry leaves. In São Tomé, it is used in traditional medicine 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 (Madureira et al., 2008).

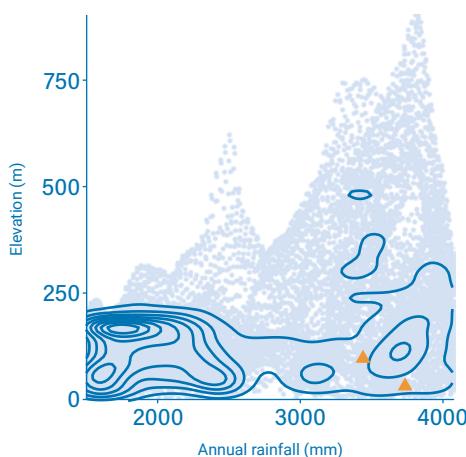
Population

The population of *Pandanus thomensis* was not estimated, but no sign of decline was observed. The species occurs along the coast of both São Tomé and Príncipe in small patches of 1 to 100 individuals.

Climate São Tomé



Climate Príncipe







Balthasaria mannii (Oliv.) Verdc.



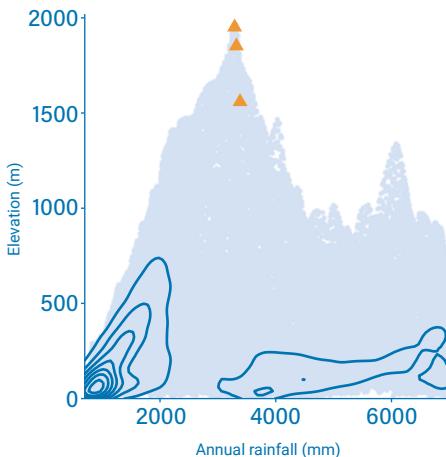
© Gilles Dauby

Distribution

São Tomé



Climate



© Olivier Lachenau

Rationale

Balthasaria mannii is a tree up to 30 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 eight collections made between 1861 (Mann 1066) and 2021 (Lachenau 3427) 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. Recent sampling specifically conducted to search for that species were made in 2021 and allowed to find 15 individuals (including the one previously located in 2019). All but one are very old trees. Flowers were seen to be visited by the endemic Giant Sunbird *Dreptes thomensis* and some developing fruits were seen on the trees with binoculars, but no seedlings were observed, so there is obviously a dispersal/regeneration problem. 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 rege-

neration 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 km², below the upper threshold for CR status under subcriterion B2. The EOO is estimated as 0.12 km², below the AOO, so we consider the EOO as 8 km² below the upper threshold for CR status under subcriterion B1. These three occurrences represent one subpopulation. All are located within the PNOST 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 quality of habitat. In fact, we do not know how many individuals exist since 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 15 adult individuals were found in the field in 2021.



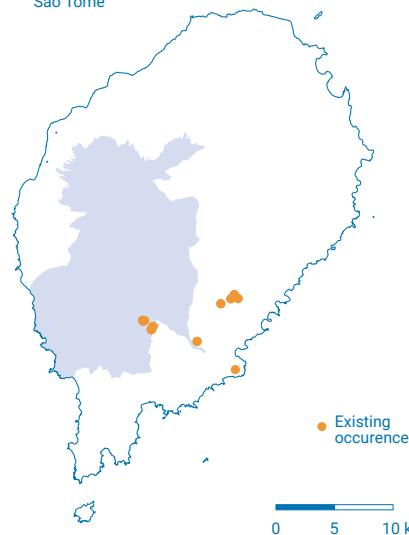
Lasiodiscus rozeirae Exell

Distribution

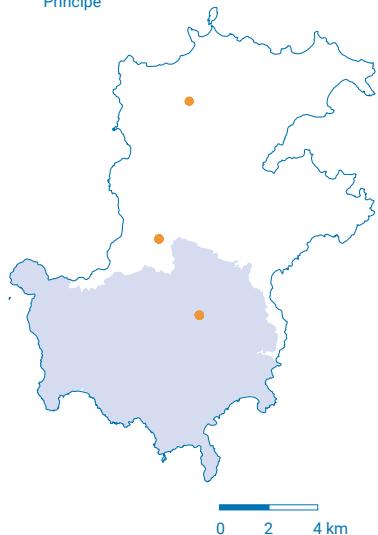
Rio Muni (Equatorial Guinea),
and São Tomé and Príncipe



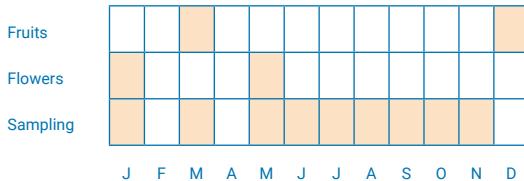
São Tomé



Príncipe



Phenology



© Olivier Lachenau

Rationale

Lasiodiscus rozeirae was assessed by World Conservation Monitoring Centre (1998) as VU, and this assessment has been published by the Red List Unit in 1998. Since then, 16 collections have been made, allowing a reassessment. The species is a small tree up to 9 m tall, occurring in wet evergreen lowland forest, often on ridges or rocky soils, sometimes also in forest regrowth on abandoned plantations, between 100 and 587 m in elevation. The species is endemic to São Tomé and Príncipe and is known from 19 collections and 45 individuals (MBG transects) made between 1954 (Rozeira 253) and 2021 (Lachenaud 3474). We excluded one collection (Oliveira s.n.) because no locality information is provided. Moreover we consider one historical collection (Rozeira 253) as extirpated due to oil palm plantation. *Lasiodiscus rozeirae* occurs within two protected areas: Parque Natural de Príncipe (PNP) and Parque Natural de Obô de São Tomé (PNOST). The 62 remaining records represent 16 occurrences and three subpopulations. Based on a 2 x 2 km cell size, the AOO of this species is estimated as 36 km², and the EOO is calculated as 1,356 km², both below the upper threshold for "Endangered" status under subcriteria B2 and B1. In São Tomé, the five occurrences located within the PNOST are not threatened and represent one location. Outside the park, the occurrence located at Ribeira Peixe is threatened by palm oil plantations, and represents one location. We

consider that this occurrence will disappear in the near future. The two occurrences located at the top of Pico Macuru are not threatened and represent one location. Four occurrences are located at Pico Maria Fernandes, one of them at the top is not threatened but the three other occurrences are threatened by cocoa plantations. These four occurrences represent two locations. In Príncipe, the two occurrences within PNP are not threatened and represent one location. Just outside the PNP, the occurrence located at the top of Morro Fundão is not threatened and represents another location. Finally, the occurrence located in the north of the island is threatened by cocoa plantations and represents one location. Therefore, these 16 collections represent eight locations (*sensu* IUCN 2019), with regards to the most serious plausible threat (palm oil plantation). Based on the disappearance one historical occurrence, and the future disappearance of the occurrence located at Ribeira Peixe we infer a continuing decline in its AOO, its EOO, the extent and the quality of its habitat, the number of locations, and the number of mature individuals. *Lasiodiscus rozeirae* is thus assessed as VU B1ab(i,ii,iii,iv,v)+B2ab(i,ii,iii,iv,v).

Habitat and ecology

The species is known from wet evergreen lowland forest, often on ridges or rocky soils, sometimes also in forest regrowth on abandoned plantations, between 100 and 587 m in elevation.

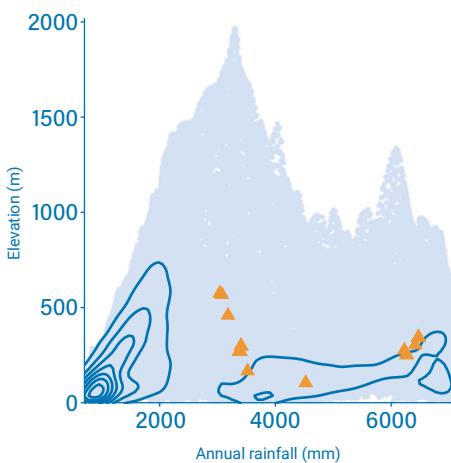
Population

The species is locally very abundant in Monte Carmo (being a dominant species of the undergrowth there).

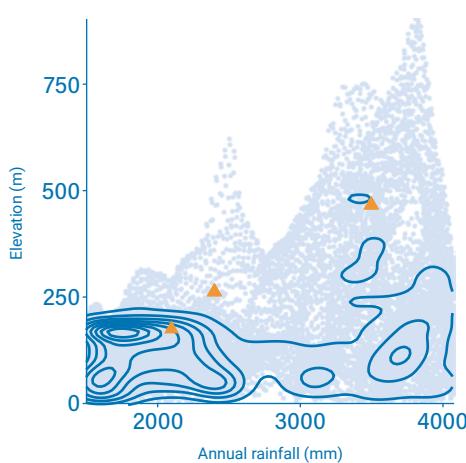
Use and trade

There is no known use for the species.

Climate São Tomé

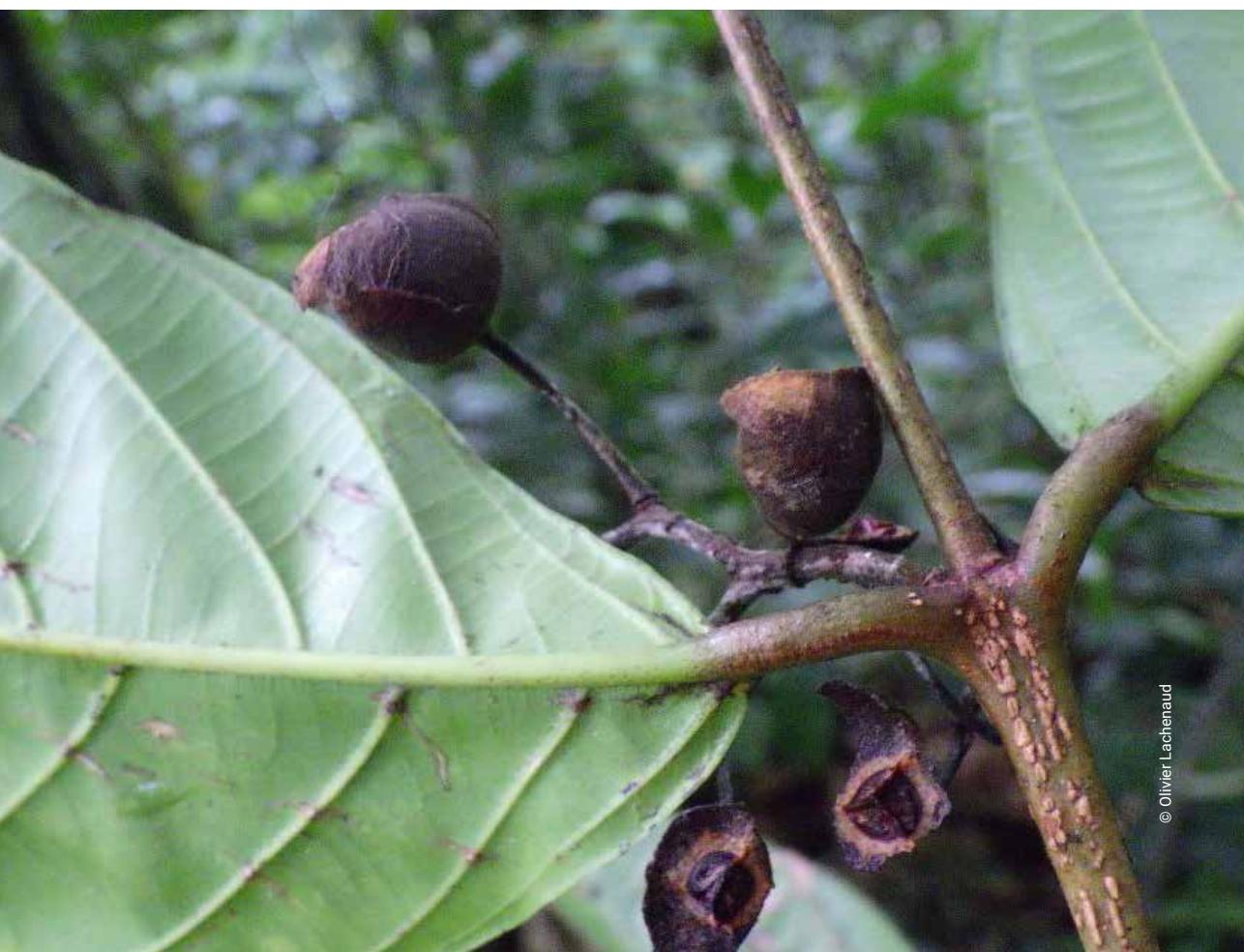


Climate Príncipe





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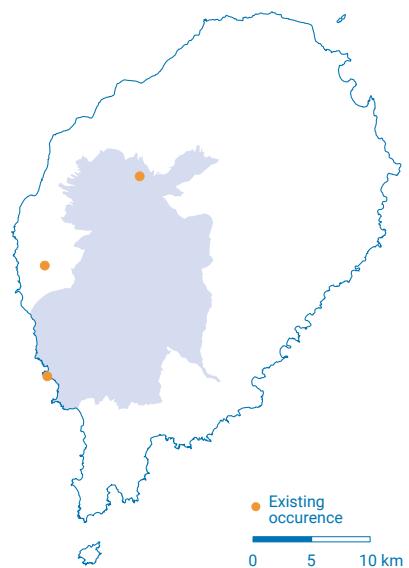


Cassipourea glomerata Alston

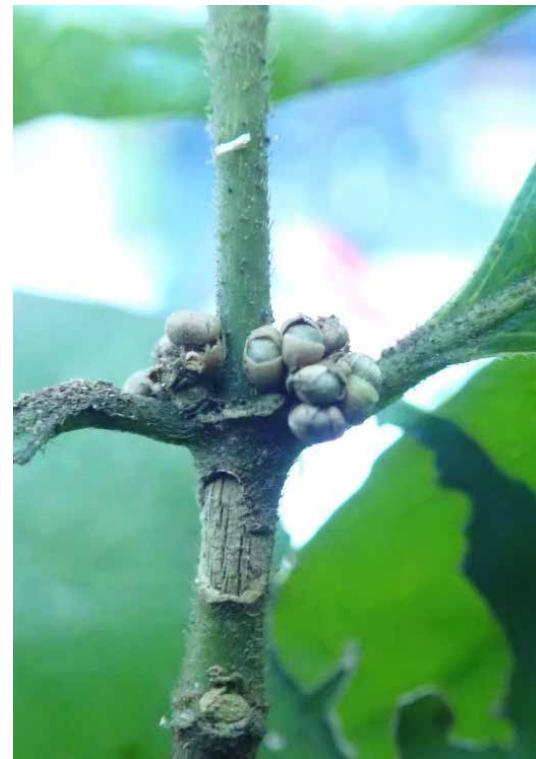
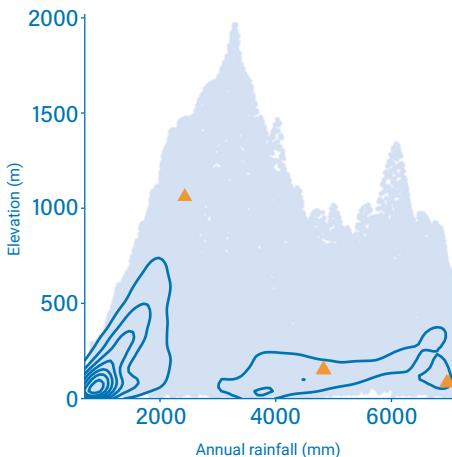


Distribution

São Tomé



Climate



© Davy Ikabanga

Rationale

Cassipourea glomerata is a shrub up to 6 m tall. The species is endemic to São Tomé, known from wet lowland evergreen rainforest, both old growth and secondary, from sea level to 1,042 m in elevation. It is known from seven collections made between 1905 (*Chevalier 14271, 14512*) and 2021 (*Lachenaud 3451*). The two historical collections made by Chevalier in 1905 were excluded because they are not precisely located. Moreover, we consider that the occurrence documented by the collection made by Quintas (1086) located at Angolares is extirpated because of the intensive oil palm plantations in this region that has induced the disappearance of the natural habitats. These occurrences are not taken into account in the AOO and EOO calculations. Therefore, the four remaining collections represent four occurrences, and one-three subpopulations (the dissemination type is not known). Two of them occur within the Parque Natural de Obô de São Tomé (PNOST). Based on a 2 x 2 km cell size, the AOO is estimated as 16 km², below the upper threshold for Endangered status under subcriterion B2. The EOO is calculated as 45 km², below the upper threshold for Critically Endangered status under subcriterion B1. The occurrences (documented by Lachenaud 2958) east of Praia São Miguel (within PNOST) was threatened by old cocoa plantations and currently threatened by illegal logging, and represents one location. The two occurrences (*Ikabanga 1058, Lima 84*) located in the area of Lembá are threatened by small-scale

agriculture, and represent the same location. Finally, one occurrence (*Lachenaud 3451*) located at Morro Vilela within the park is indirectly threatened by tourism, which reduce the quality of the habitat, and represents one location. Therefore, these four occurrences represent three locations (*sensu* IUCN 2019), with regards to the most important threat (small-scale agriculture). Based on these threats and the disappearance of one occurrence, we infer past, current and future continuing decline in its AOO, the extent and the quality of its habitat, the number of locations, and number of mature individuals. Therefore, the species is assessed as EN B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v).

Habitat and ecology

The species is known from wet lowland evergreen rainforest, both old growth and secondary, from sea level to 1,042 m in elevation.

Use and trade

It is not known if the species is used.

Population

No quantitative population data is available. The species is generally uncommon, and does not form large stands.

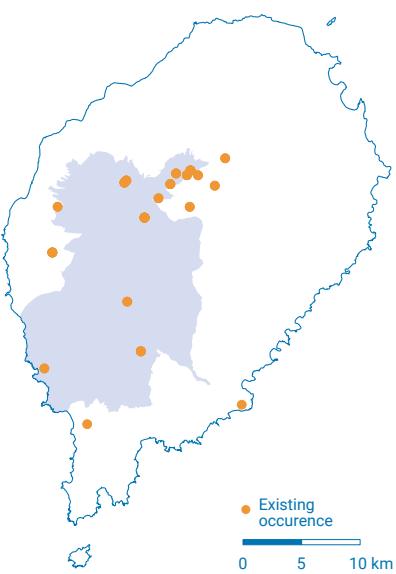


Aulacocalyx pallens (Hiern) Bridson & Figueiredo subsp. pallens

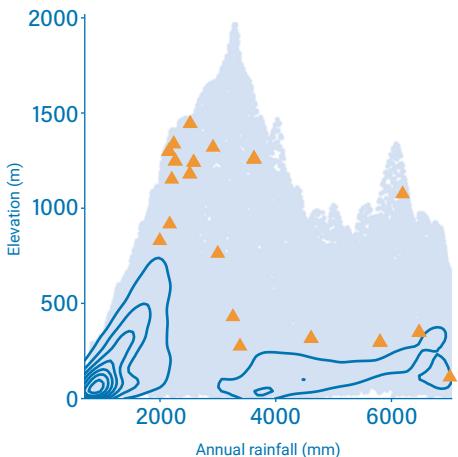


Distribution

São Tomé



Climate



© Olivier Lachenaud

Rationale

Aulacocalyx pallens subsp. *pallens* is a tree up to 18 m tall and 30 cm in diameter, known from mature and secondary forest, between 140 and 1,460 m in elevation. The subspecies is endemic to São Tomé and known from 28 collections and 22 individuals from forest transects made between the 1860s and 2021. However, we excluded two collections (Mann 1066 and Seabra s.n) because no locality information is 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 23 remaining collections and 22 individuals from forest transects represent 16 occurrences and one to four subpopulations. Based on a 2 x 2 km cell size, the AOO of this species is estimated as 48 km², below the upper threshold for "Endangered" status under subcriterion B2. The EOO is calculated as 282 km², below the upper threshold for "Endangered" status under subcriterion B1. Seven occurrences, located within the Obô National Park, to date seems to not be under threat, and represent the same location. However, four other occurrences (Lejoly 97/355; Lachenaud 2849; MBG Transect 6, 14, and 191; Lima 49; Oliveira 18, 99; Toelen 42) located within the Obô National Park around Lagoa Amélia and along the path from Bom Sucesso to Pico São Tomé face threats from invasive species and tourism, representing another location. One occurrence (Ogonovszky 31) located near Zampalma is threatened by small-scale agriculture and illegal logging and represents one location. One occurrence (documented by Lima 9) located in

São Miguel southeast of the Park was threatened by old cocoa plantations and currently threatened by illegal logging, and represents one location. The occurrence located in the west part of the island (MBG Transect 672) located between Santa Clotilde and São José is threatened by illegal logging and represents one location. The occurrence (MBG Transect 739) located in the South part of the island is threatened by palm plantations and represent another location. Finally, the occurrence (Lewis 124) located at the summit of Pico Macuru is threatened by small et large scale agriculture (oil palm plantation) and represents one location. All activities induce a decline in the quality and the extent of the habitat of the species. As a consequence, these 16 occurrences represent seven locations (*sensu* IUCN 2019) with regard to the most serious plausible threats (illegal logging). 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 VU 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

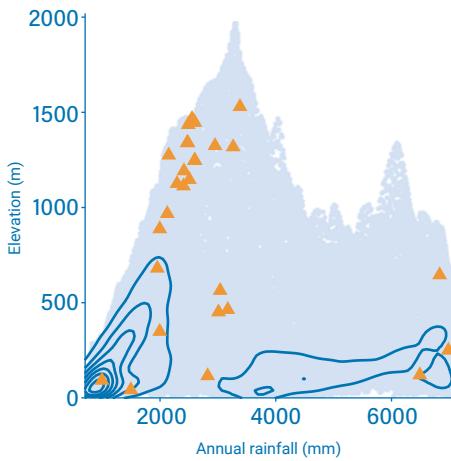
The species is usually common where it occurs. The regeneration of the species is normal with many young individuals.



Chassalia doniana **(Benth.) G.Taylor**

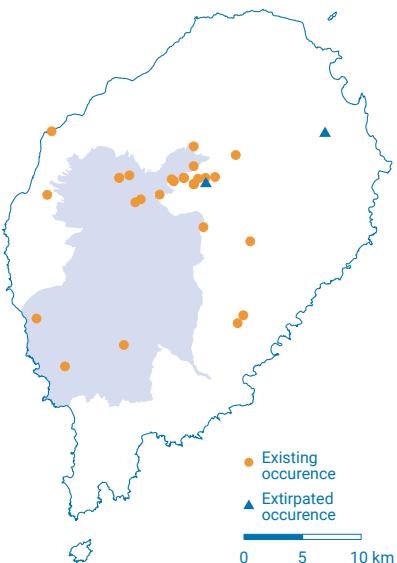


Climate



Distribution

São Tomé



Phenology

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



© Tania D'Hajere

Rationale

Chassalia doniana is a shrub endemic to São Tomé, occurring in submontane and lowland evergreen forest, from 120 to 1536 m in elevation but mostly above 700 m. It was previously assessed as NT by Figueiredo (2005), since it does not appear to be under immediate threat and no data were indicating a decline in the size of populations or distribution area (Figueiredo, 2005). This assessment was not published on the Red List. Its date and the collection of new information justify its reassessment. Its distribution can be considered as widespread in São Tomé. The species is known from 39 collections made between 1885 (Moller 809; sn; Quintas 874) and 2020 (Eduardo 209). Five collections (Campos 56; Don s.n.; Paiva 881; 912; s.c.) do not have precise coordinates. The thirty-four remaining collections represent 25 occurrences, including 10 within PNOST, six in the PNOST's buffer zone, and nine outside the protected area. Two occurrences (Moller s.n.; Lejoly 327), made respectively in 1885 and 1997 at Blublu and between Macambrará and Zampalma, are considered as probably extirpated given the intensity of agricultural activity in this locality. Indeed, the occurrence located between Macambrará and Zampalma (Lejoly 327) has been extirpated by the plantations of vegetables; the occurrence located at Blublu has been extirpated by the oil palm plantations. These two collections were not taken into account to estimate the Red List parameters. Therefore, *C. doniana* is known from 23 occurrences that represent 5-6 subpopulations. Based on a 2 x 2 km cell size, *C. doniana*'s extent of occurrence is calculated to be 295,341 km², within the limit for EN status under subcriterion B1, while its area of occupancy is estimated to be 72 km², also within the limit for EN status under subcriterion B2. Old occurrences were threatened by habitat destruction for large cocoa plantations in São Tomé. We thus inferred that the distribution of the species has declined in the past times due to the intensive clearing for coffee and cocoa plantations, confining the majority of the remaining occurrences to high altitude, explaining the current distribution. Three occurrences in the South of PNOST are not threatened (Monte Carmo, São Miguel-Rio Quija, Juliana de Sousa-São Miguel), and represent one location. Seven occurrences in the North of PNOST (around Lagoa Amélia, between Bom Sucesso and Lagoa Amélia, Caminho Fugido ridge, Lagoa Amélia-Calvario, Descent of Calvario and near Estação Sousa, Estação Sousa, Morro Vilela) and occurrence at the edge PNOST (between Bom Sucesso and Lagoa Amélia) represent one location, indirectly threatened by tourism and invasive plants reducing the quality of its habitat. Two occurrences between Bom Sucesso and Macambrará, outside PNOST are threatened by current agricultural activities (vegetable plantations) representing one location. One occurrence at Bom Sucesso to Lagoa Amélia (Sentier S1) is not threatened, representing one location. Two occurrences in Monte Café and São Nicolau are threatened by current agricultural activities (vegetable plantations), representing one location. One occurrence at Monte Café-Chamiço is threatened by small-scale agriculture, representing one location. Two occurrences at Bombaim-Monte Formoso and Morro Michelangelo (Ecologica zone) are threatened by illegal logging and represent one location. The occurrence at Santa Catarina is threatened by illegal logging, and represents one location. The occurrence at Diogo Vaz is threatened by cocoa plantations and represents one location. Therefore, these 25 occurrences represent nine locations (*sensu* IUCN 2019), with regards to the most important threat (small-scale agriculture). Thus, 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 recent disappearance of two occurrences threatened by palm oil plantations and agriculture. Therefore, *C. doniana* is assessed as VU B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v).

so and Lagoa Amélia, Caminho Fugido ridge, Lagoa Amélia-Calvario, Descent of Calvario and near Estação Sousa, Estação Sousa, Morro Vilela) and occurrence at the edge PNOST (between Bom Sucesso and Lagoa Amélia) represent one location, indirectly threatened by tourism and invasive plants reducing the quality of its habitat. Two occurrences between Bom Sucesso and Macambrará, outside PNOST are threatened by current agricultural activities (vegetable plantations) representing one location. One occurrence at Bom Sucesso to Lagoa Amélia (Sentier S1) is not threatened, representing one location. Two occurrences in Monte Café and São Nicolau are threatened by current agricultural activities (vegetable plantations), representing one location. One occurrence at Monte Café-Chamiço is threatened by small-scale agriculture, representing one location. Two occurrences at Bombaim-Monte Formoso and Morro Michelangelo (Ecologica zone) are threatened by illegal logging and represent one location. The occurrence at Santa Catarina is threatened by illegal logging, and represents one location. The occurrence at Diogo Vaz is threatened by cocoa plantations and represents one location. Therefore, these 25 occurrences represent nine locations (*sensu* IUCN 2019), with regards to the most important threat (small-scale agriculture). Thus, 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 recent disappearance of two occurrences threatened by palm oil plantations and agriculture. Therefore, *C. doniana* is assessed as VU B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v).

Habitat and ecology

The species occurs in submontane and more rarely in lowland evergreen forests, from 120 to 1,536 m in elevation.

Use and trade

It is not known if the species is used.

Population

No precise population data is available, but the species is locally common.



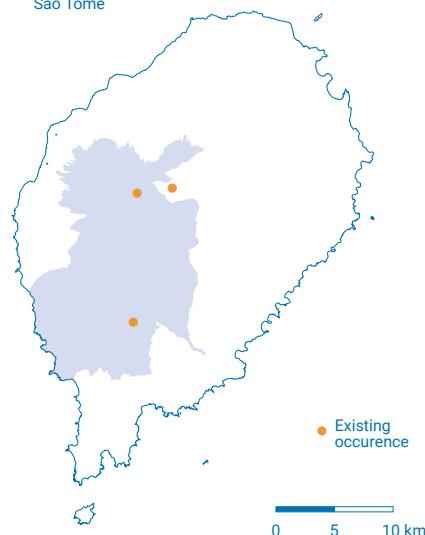
Chassalia euchlora (K.Schum.) Figueiredo

Distribution

São Tomé and Príncipe



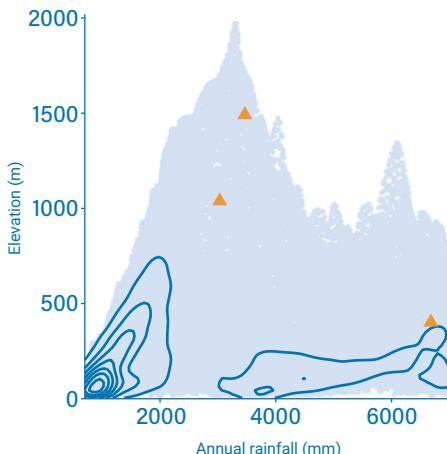
São Tomé



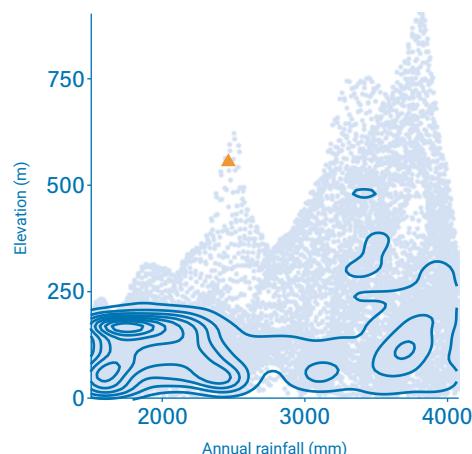
Príncipe



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 PNOST (Quintas 33 at Caminho do Pico; Lachenaud 2918 at Monte Carmo) in São Tomé. Two other collections were made within PNP, 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 presumably 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 km², below the upper threshold for EN status under subcriterion B2. The EOO is calculated as 783 km², below the upper threshold for EN status under subcriterion B1. The occurrence located near Bom Sucesso is threatened by small-scale agriculture and firewood collection, which induces a decline in the quality of the habitat of the species. This occurrence represents one location. Among the three occurrences within PNOST, 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 be-

cause we consider that the level of 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 quality of habitat. *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* but it is clearly a rare species

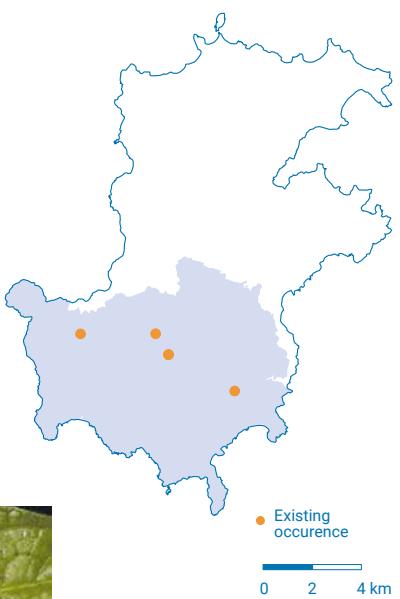


Chassalia hiernii var. *glandulosa* G. Taylor



Distribution

Príncipe

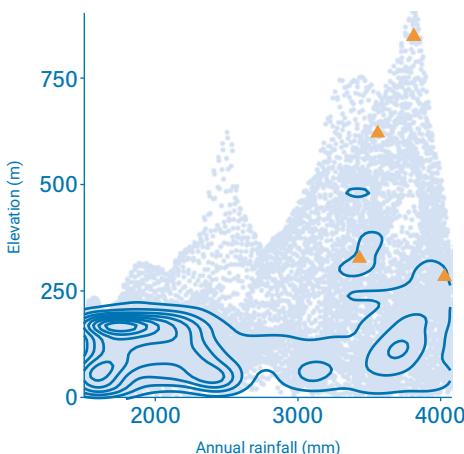


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Climate



Phenology

Fruits											
Flowers											
Sampling											

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

Rationale

Chassalia hiernii var. *glandulosa* G. Taylor is a shrub known from fairly light undergrowth from 230 to 615 m in altitude. The species and the variety are endemic to Príncipe. This species was assessed as VU D2 by Figueiredo (2005) but not published on the IUCN Red List, based on three collections: Exell 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 km² and 7.1 km²; the EOO estimated is less than AOO, so we consider EOO as same as AOO (16 km²), 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

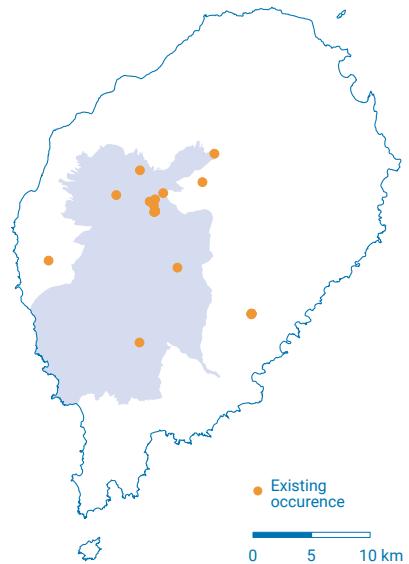
No quantitative population data are available for this subspecies.



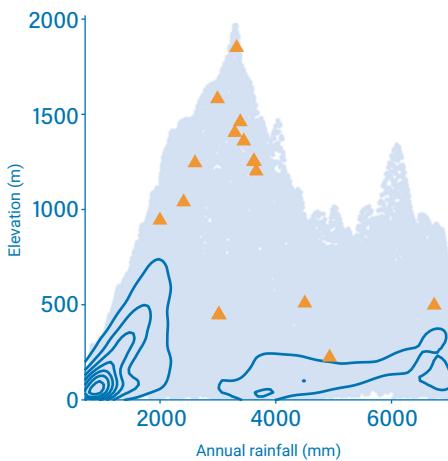
Pauridiantha insularis (Hiern) Bremek

Distribution

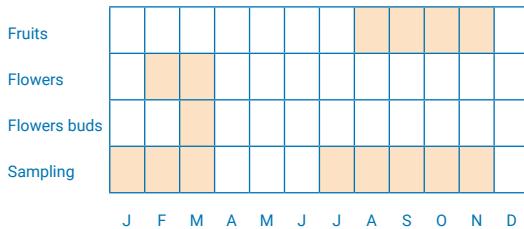
São Tomé



Climate



Phenology



© Davy Ikabanga

Rationale

Pauridiantha insularis is a shrub up to 5 m tall, sometimes forming aggregated populations, occurring in open evergreen forest on ridges; between 200 and 1,400 m in elevation. The species is endemic to São Tomé Island and is known from 16 collections and 8 field observations. Collections were made between 1861 (Mann 1061) and 2020 (Ikabanga 1110; 1137; Nguema 3331; Transects São Tomé 758) in the center of the island. Nine collections and five observations were made in the PNOST, especially in the northeastern region where seven collections were made. One herbarium specimen (Ogonovszky 337) was collected from east of Pico Ana Chaves in center-east of PNOST. The last collection (Lachenaud 2927) is located in PNOST around Monte Carmo. The seven other collections and three observations were made outside the protected area. Three of them were made in the center-east of the island, specifically at Morro Claudina (de Oliveira 15), Macambrarà (Exell 415), and at the summit of Mongo in Monte Café area (Espírito Santo 4075). Three collections and three observations were made in southeastern part, two collections (Lachenaud 2730; Transect São Tomé 444) and three observations at Pico Maria Fernandes and another collection (Espírito Santo 3935) at Ribeira Peixe-Cabumbé. The last collection (de Lima 86) was from Santa Clotilde in western part of the island. We consider the occurrence corresponding to a collection made in 1932 by Espírito Santo at the summit of Mongo as extirpated because the habitat in this place has been severely modified. Therefore, these 15 collections and 8 observations represent 15 occurrences and at least one subpopulation. Based on a 2 x 2 km cell size, the AOO of this species is estimated as 44 km^2 , below the upper threshold for EN status under Criterion B2. The EOO is calculated as 179 km^2 , below the upper threshold for EN status under Criteria B1. The two occurrences located at Morro Claudina and Macambrarà are threatened by small-scale agricultural activities. We consider that both occurrences will disappear in a near future, and they represent one location. The occurrence located at Pico Maria Fernandes was threatened by past cocoa plantations and represents one location. The occurrence at Ribeira Peixe-Cabumbé is threatened by oil palm plantation and represents one location. The occurrence at Santa Clotilde is

threatened by agriculture and represents one location. Seven of the nine occurrences in the PNOST are located along the touristic road, and are potentially at risk from touristic activities and invasive plants (*Cinchona*); these seven occurrences represent one location. The two other occurrences are not threatened and represent one location. Consequently, these 15 occurrences represent six locations (*sensu* IUCN 2019), with regard to the past and current most important threat (small scale agriculture) which induces a 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 PNOST, we infer past, current, and future continuing decline in its AOO, its 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 VU B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v).

Habitat and ecology

The species occurs in open evergreen forest on ridges; between 200 and 1,400 m.

Use and trade

It is not known if the species is used.

Population

No quantitative population data are available for *Pauridiantha insularis*. However, based on the 8 observations with associated DBH data (aggregated into diameter classes), the species presents a decrease of the DBH of the population which indicates no problem of regeneration in the field.

Pauridiantha principensis

Ntore & O.Lachenaud

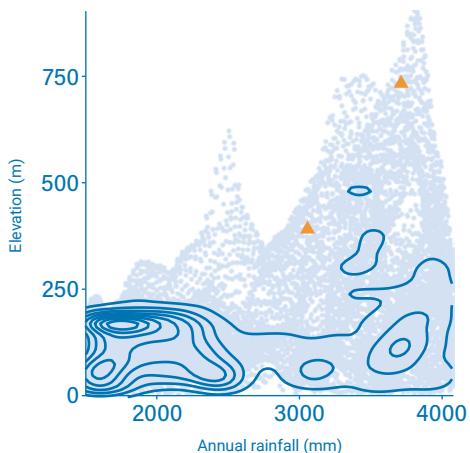


Distribution

Príncipe



Climate



Rationale

Pauridiantha principensis 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 PNP, 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 km², 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. principensis* 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, but it is presumably very rare, having not been found during recent inventories.



Pavetta monticola Hiern

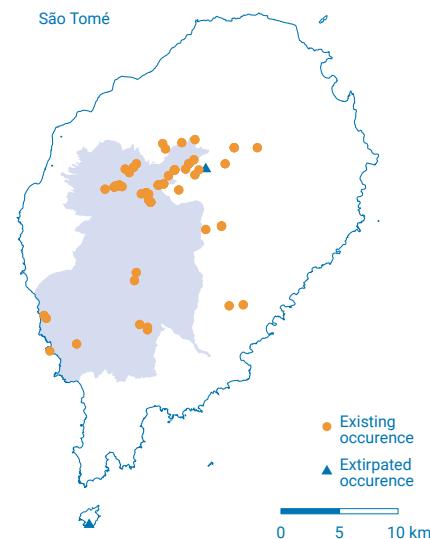
Distribution

Annobón (Equatorial Guinea),
and São Tomé and Príncipe

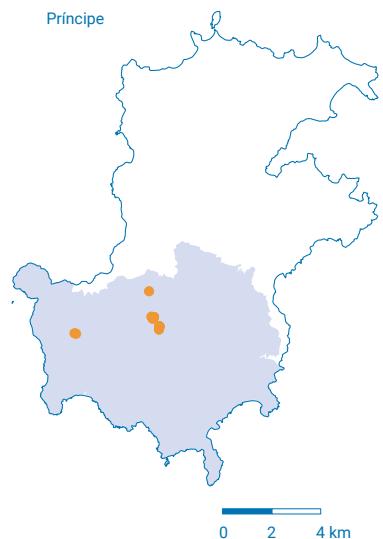
NT



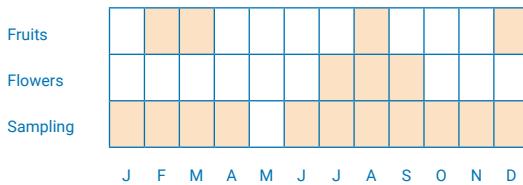
São Tomé



Príncipe



Phenology



© Olivier Lachenau

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). It occurs in lowland, submontane and montane evergreen forest, 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 (Lachenau 2982, Ikabanga 1097). Five collections (Oliveira 205, 1037, 1050, 1685; Stévert 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 PNP. 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 might be 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 in São Tomé and one subpopulation in Príncipe and another in Annobón. Based on a 2 x 2 km cell size, the AOO is estimated as 132 km², above the upper threshold EN status under subcriterion B2. The EOO is cal-

culated to be 3,858.818 km², above the upper threshold for EN status under subcriterion B1. Eight occurrences inside the PNP 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 southeast of São Tomé is threatened by small-scale agriculture and represents a location. The two occurrences at the base and flank of Pico Maria Fernandes are threatened by small-scale agriculture and represent a location. The three occurrences at Bombaim Roça and next to Formoso Grande are threatened by illegal logging and represent a location. The four occurrences in the southwest 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 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 Macambrará is threatened by vegetable plantation, and might disappear in the future, and represents a location. The two occurrences near Santana and in Maia are threatened by small-scale agriculture and represent a location. The occurrence in Monte Café-S. Luís 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 quality of habitat. *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 occurs in lowland, submontane and montane evergreen forest, including degraded areas, at elevations from 100 to 2,000 m.

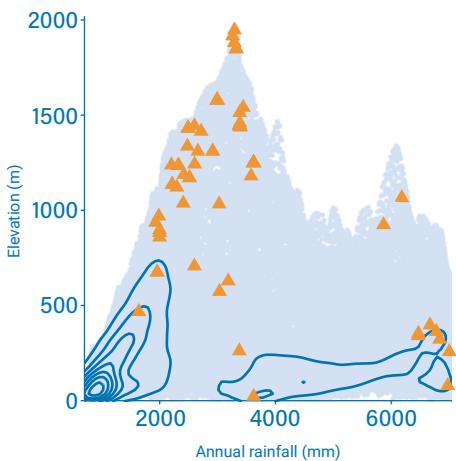
Use and trade

It is not known if the species is used.

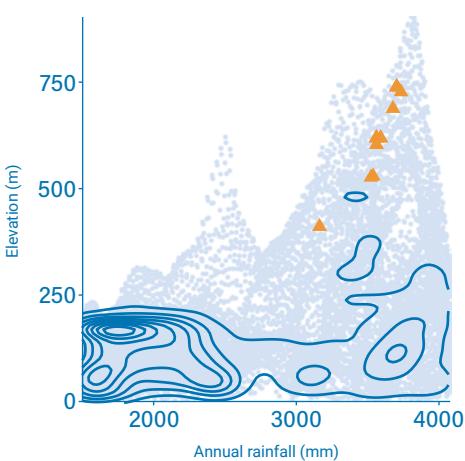
Population

Although widespread in São Tomé, the species appears rare in Príncipe and Equatorial Guinea (Annobón). The species mostly occurs as isolated individuals, it does not form large populations.

Climate São Tomé



Climate Príncipe





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Psychotria exelli R. Alves, Figueiredo & A.P.Davis



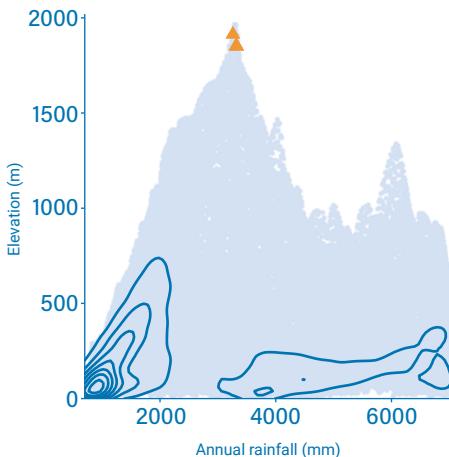
© Olivier Lachenau

Distribution

São Tomé



Climate



Phenology

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

Rationale

Psychotria exellii was preliminary assessed VU D2 by Alves et al (2005) but not published on the IUCN Red List. This assessment was based on four examined collections from a single location and a very restricted area of occupancy (less than 20 km²). *P. exellii* is currently known from nine collections made between the 19th century (Alves et al 2005) and 2021 (Lachenaud 3392, 3415), all of them made in PNOST. It occurs around Pico de São Tomé, in low and open montane forest, between 1,800 and 2,000 m in elevation. Two collections (s.c. s.n., s.c. reg. 14971) were not taken into account in this assessment since they are not precisely georeferenced. The seven remaining collections represent five occurrences and one subpopulation. Based on a 2 x 2 km cell size, the AOO of this species is estimated as 8 km², below the upper threshold for CR status under subcriterion B2. The EOO is calculated as 0,1 km², below the upper threshold for CR status under subcriterion B1. Since the EOO is less than the AOO, we consider the EOO equal to the AOO (8 km²), below the upper threshold for CR status. The habitat of the species is threatened by *Cinchona pubescens* invasion and represents one location (*sensu* IUCN 2019) with regard to the most serious plausible threat (invasive species). Based on this threat, we infer past, current and future continuing decline in its EOO, AOO, the extent and the quality of its habitat, and a decline in the number of individuals. *P. exellii* is thus assessed as CR B1ab(i,ii,iii,v)+2ab(i,ii,iii,v).

Habitat and ecology

The species occurs in low and open montane forest, between 1,800 and 2,000 m 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.



Psychotria *guerkeana* K.Schum



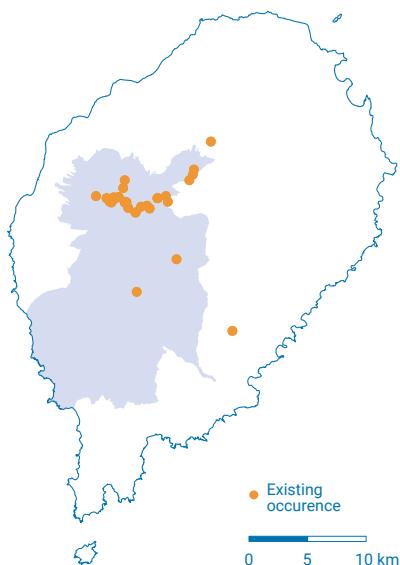
© Tariq Stévan



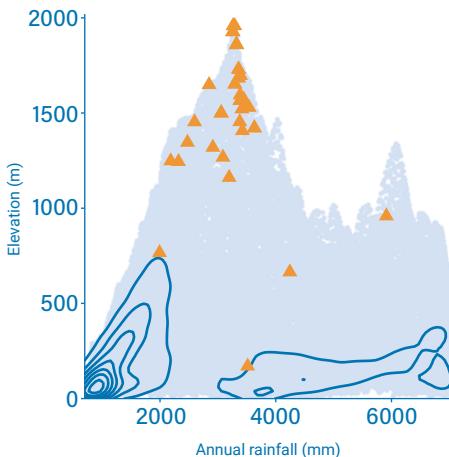
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Distribution

São Tomé



Climate



Phenology

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

Rationale

Psychotria guerkeana is a shrub or a small tree up to 4 m tall, known from montane rainforest, between 700 and 2,024 m in elevation. It was previously assessed as VU D2, but without any information on threats (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 52 collections made between 1885 (Moller 728; 734) and 2021 (Ikabanga 1630; Lachenaud 3414; 3424). However, we excluded seven collections because no locality information is provided for three of them (Campos 4; 8; 66). Two collections (Chevalier 14325; Espírito Santo 4059) are not precisely located, and two collections (Oliveira 991; 1122) were made at the Botanical Garden of Bom Sucesso. The 45 remaining collections represent 29 occurrences, and one or two subpopulations. Based on a 2 x 2 km cell size, the AOO of this species is estimated as 48 km², and the EOO is calculated as 114 km², both below the upper threshold for "Endangered" status under subcriteria B2 and B1. The occurrences located within the Obô Natural Park of São Tomé (PNOST) along the tourist paths are threatened by invasive plants (*Cinchona*) and ecotourism activity and represent one location, while the two occurrences located south of PNOST are not currently threatened and represent one location. The two occurrences (Stévert 2928; Lejoly 504) located around Bom Sucesso are threatened by agricultural activities (vegetable plantations) and represent one location. We expect that these two occurrences will disappear in the near future. The occurrence (Joffroy 158) located at Escadas (outside the PNOST) is threatened by illegal logging and represents one location. The occurrence of Chamiço (Oliveira 69) is threatened by small-scale agriculture and represents one location. The occurrence (Joffroy 127) located in the southeast of São Tomé (Pico Maria Fernandes) was threatened by past cocoa plantations and repre-

sents one location. As a consequence, these 29 occurrences represent six locations (*sensu* IUCN 2019), with regard to the most important threat (agriculture). Based on the future disappearance of the occurrences located around Bom Sucesso and all threats mentioned above, we infer past, current, and future continuing decline in its AOO, the number of locations, the extent and the quality of its habitat, and the number of mature individuals. *Psychotria guerkeana* is thus assessed as VU B1ab(ii,iii,iv,v)+2ab(ii,iii,iv,v).

Habitat and ecology

The species is known from montane rainforest, between 700 and 2,024 m in elevation.

Use and trade

It is not known if the species is used.

Population

No quantitative population data are available for the species, but it is locally very abundant at higher altitudes, where it sometimes forms almost pure stands in the undergrowth.



Psychotria molleri **K.Schum.**



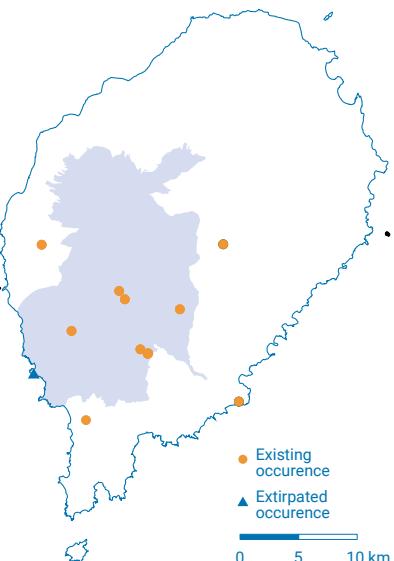
© Olivier Lachenau



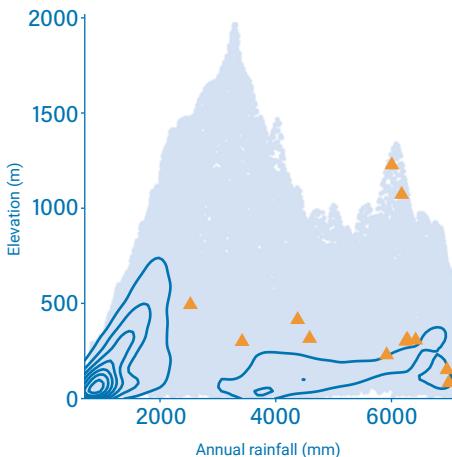
© Olivier Lachenau

Distribution

São Tomé



Climate



Phenology

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

Rationale

Psychotria molleri was assessed by Alves et al. (2005) as CR, but this assessment has not been published by the Red List Unit. Since 2005, eight collections have been made, allowing a reassessment. The species is a shrub or a small tree up to 6 m tall, known from wet evergreen lowland forest or rarely in submontane forest, up to 1,100 m in elevation. It is endemic to São Tomé and known from 16 collections made between 1886 (*Quintas 1024*) and 2020 (*Ikabanga 1008; Lachenaud 2948*). Three collections (*Quintas 1024; Chevalier 14182; 14623bis*) located at Angolares (Ponta Baleia) and Porto Alegrê are considered as presumably extirpated given the intensity of agricultural activities (palm oil and vegetable plantations) and human constructions. These occurrences are not taken into account in the AOO and EOO calculations. The 13 remaining collections represent 13 occurrences and two or three subpopulations. Based on a 2 x 2 km cell size, the AOO of this species is estimated as 36 km², and the EOO is calculated as 206 km², both below the upper threshold for "Endangered" status under subcriteria B2 and B1. The nine occurrences located within the Parque Natural Obô de São Tomé (PNOST) are not threatened and represent the same location. Outside PNOST, the occurrence (*Oliveira 413*) around Bom-baim was threatened by past coffee plantations and currently threatened by illegal logging and thus represents one location. The occurrence (*Lachenaud 2948*) located in Pico Macuru is threatened by small and large-scale agriculture (oil palm plantation) and represents one location. The occurrence (*Ikabanga 1008*) between Santa Clotilde and São José is threatened by illegal logging and cocoa plantations and represents one location. Finally, the occurrence (*Ikabanga 1084*) located near Alexandra is threatened by small-scale agriculture and represents one location. Therefore, these 13 occurrences represent five locations (*sensu* IUCN 2019), with regards to the

most important threat (agriculture). Based on these threats and the disappearance of three occurrences, we infer a past, current, and future continuing decline in its EOO, AOO, the extent and the quality of its habitat, the number of locations, and the number of mature individuals. 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 wet evergreen lowland forest or rarely in submontane forest, up to 1,100 m in elevation.

Use and trade

It is not known if the species is used.

Population

Population information is not known for this species.



Psychotria nubicola **G.Taylor**



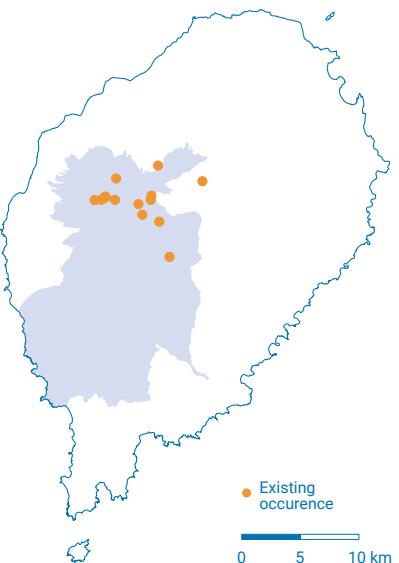
© Olivier Lachenau



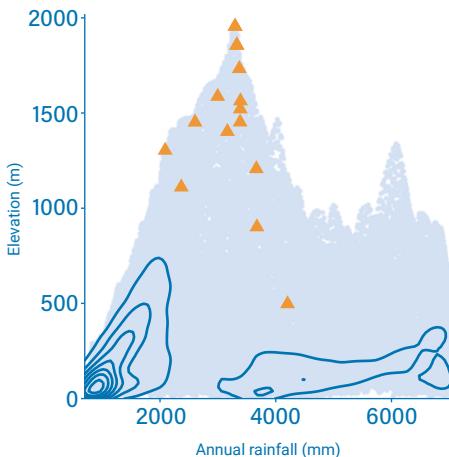
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Distribution

São Tomé



Climate



Phenology

Fruits											
Flowers											
Flowers buds											
Sampling											

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

Rationale

Psychotria nubicola is a shrub or a small tree up to 4 m tall, known from montane rainforest, between 1,200 and 2,014 m in elevation. It was assessed by Alves et al. (2005) as VU D2, but this assessment has not been published by the Red List Unit. Since 2005, eight collections have been made, allowing a reassessment. The species is endemic to São Tomé island and is known from 21 collections made between 1861 (Mann 1062) and 2021 (Ikabanga 1634; Lachenaud 3405). We excluded one collection made by Campos (2) because no locality information is provided. The 20 remaining collections represent 18 occurrences, and at least one or two subpopulations. All collections, except one (de Wilde 159), are located within the Obô Natural Park of São Tomé (PNOT). Based on a 2 x 2 km cell size, the AOO of this species is estimated as 40 km², below the upper threshold for "Endangered" status under subcriterion B2. The EOO is calculated as 40 km², below the upper threshold for "Critically endangered" status under subcriterion B1. The occurrence located outside PNOT on the track between Nova Moca and Calvario is threatened by small-scale agricultural activities (vegetable plantations). We consider that this occurrence will disappear in the near future and represent one location. Within PNOT, 14 occurrences are located along the tourist path and could be threatened by tourism, representing the same location. The three other occurrences are not threatened and represent another location. Consequently, these 18 occurrences represent three locations (*sensu* IUCN 2019), with regard to the past most important threat (small-scale agriculture). Based on the future disappearance of the occurrence located outside the park and the threat of the other occurrences located along the tourist path, we infer past, current, and future continuing decline in its EOO, AOO, the number of locations, the extent and the quality of its habitat, and the number of mature individuals.

Psychotria nubicola 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 montane rainforest, between 1,200 and 2,014 m in elevation.

Use and trade

It is not known if the species is used.

Population

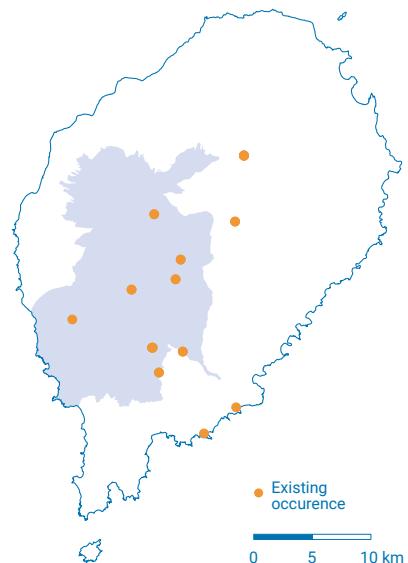
No quantitative population data are available for the species, but it is locally abundant at higher altitudes.



Psychotria thomensis **G.Taylor**

Distribution

São Tomé

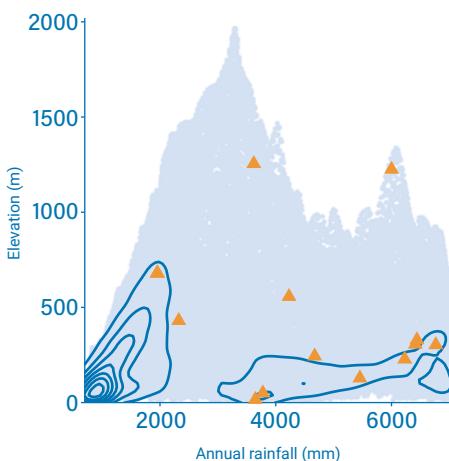


© Davy Ikabanga

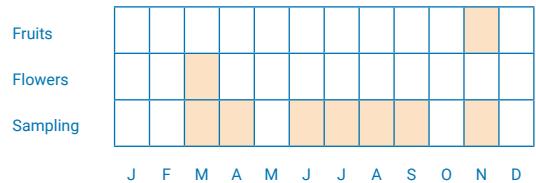


© Davy Ikabanga

Climate



Phenology



Rationale

Psychotria thomensis was assessed by Alves et al (2005) as CR, but this assessment has not been published by the Red List Unit. Since 2005, five collections have been made, allowing a reassessment. The species is a shrub up to 2 m tall, known from lowland and submontane terra firme forests, between 200 and 1,450 m in elevation. It is endemic to São Tomé and known from 19 collections made between 1885 (Moller 343) and 2021 (Lachenaud 3472). We excluded one collection made by Seabra (s.n.) because no locality information is provided. Moreover, we consider five historical collections representing two occurrences made in Monte Café (Moller 343, 368; Quintas 1303, Espírito Santo 4019) and São Nicolau (Moller s.n.) as extirpated because the habitat of the species in this place has been severely modified. These occurrences are not taken into account in the AOO and EOO calculations. Therefore, the 13 remaining collections represent 13 occurrences and two or three subpopulations. Based on a 2 x 2 km cell size, the AOO of this species is estimated as 48 km², and the EOO is calculated as 197 km², both below the upper threshold for "Endangered" status under subcriteria B2 and B1. Ten occurrences are located within the Parque Natural de Obô de São Tomé (PNOST), eight of which are not threatened and represent a single location. However, one occurrence (Oliveira 399) located along the path from Bom Sucesso to Pico São Tomé faces threats from invasive species and tourism, representing another location, and the one located at the Park's SE boundary (Ikabanga 1003) is threatened by activities linked to industrial oil palm plantations and represents another location. Outside the park, the species is known from three occurrences. The occurrence (Joffroy 47) located at Bombaim was threatened by past coffee plantations and currently threatened by illegal logging and thus represents one location. Finally, the

two occurrences (*Espirito Santo* 3914; *Joffroy* 148) located on the coast are threatened by small-scale agriculture and represent two different locations. Therefore, these 13 occurrences represent six locations (*sensu* IUCN 2019), with regards to the most important threat (small-scale agriculture). Based on these threats and the disappearance of two occurrences, we infer a past, current, and future continuing decline in its EOO, AOO, the extent and the quality of its habitat, the number of locations, and the number of mature individuals. Therefore, the species is assessed as VU B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v).

Habitat and ecology

The species is known from lowland and submontane terra firme forests, between 20 and 1,450 m in elevation.

Use and trade

There are no known uses for this species.

Population

No quantitative population data are available for the species, but it always occurs as isolated individuals or small groups (no large populations).



Sabicea cauliflora Hiern



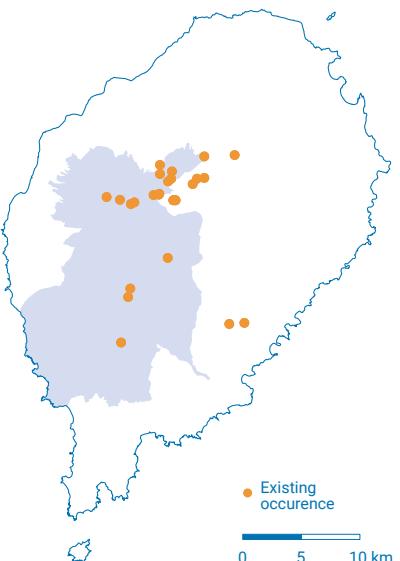
© Davy Ikabanga



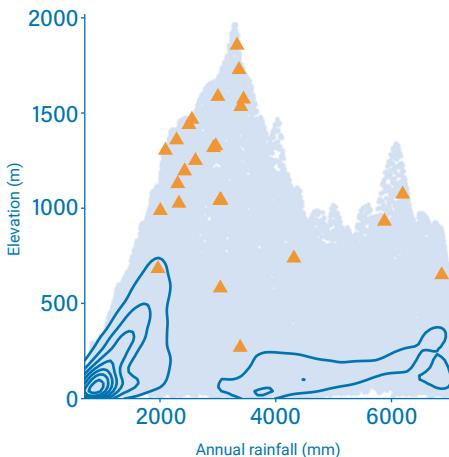
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Distribution

São Tomé and Príncipe



Climate



Phenology

Fruits												
Flowers												
Sampling												

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

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 hiberniana*. 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 km², below the upper threshold for EN status under subcriterion B2. The EOO is calculated as 1420 km², above the upper threshold for EN status under subcriteria B1. In São Tomé, the 17 occurrences located within the PNST are not threatened and represent one location. Nine occurrences are located outside the PNST. Three of them, located around Bom Sucesso, are threatened by vegetable plantations and represent one location. One occurrence located at Monte 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 Macambrarà 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 and current cocoa 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 Monte 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 quality of 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 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.



Sabicea exellii G.Taylor



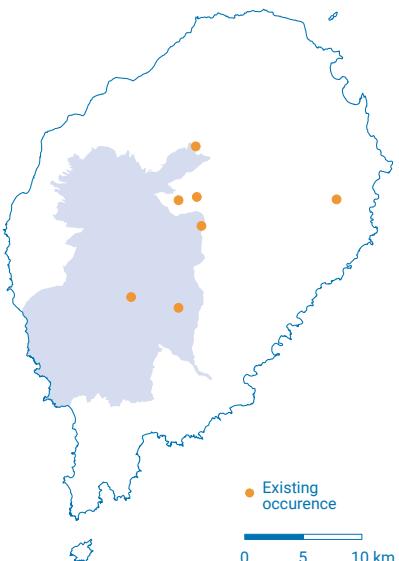
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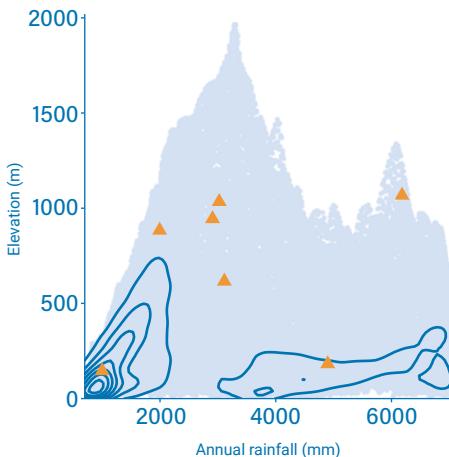
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Distribution

São Tomé



Climate



Phenology

Fruits										
Flowers										
Sampling										

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

Rationale

Sabicea exellii was preliminary assessed as CR B2ab (i,ii,iii,iv) based on two collections examined (Figueiredo 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 km², below the upper threshold for EN status under subcriterion B2. The EOO is calculated as 84 km², 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 near Bombaim (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 in forest edges, and sometimes in open montane forest on ridges, 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.



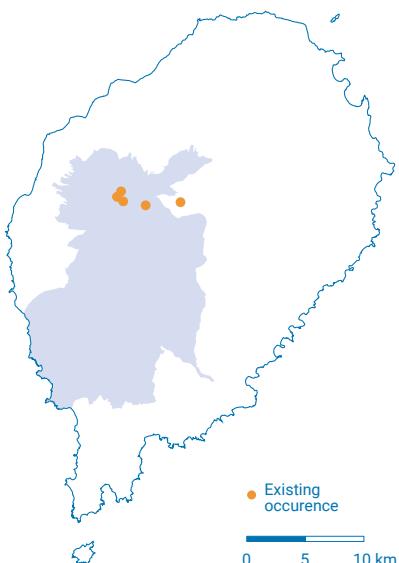
Sabicea thomensis Joffroy



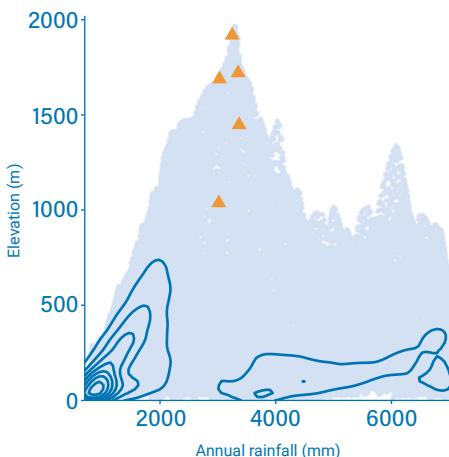
© Davy Icabanga

Distribution

São Tomé



Climate



Phenology

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

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 km² 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 km², below the upper threshold for EN status under criterion B2. The EOO is calculated as 4.1 km², 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 km²), both below the upper threshold for EN status. The four occurrences inside the PNST, are not directly 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

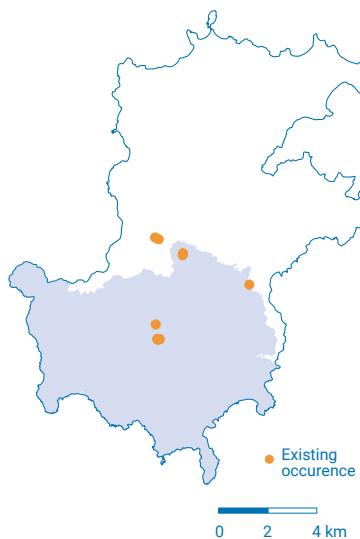
No quantitative population data are available for this species.

Tarenna principensis Degreef

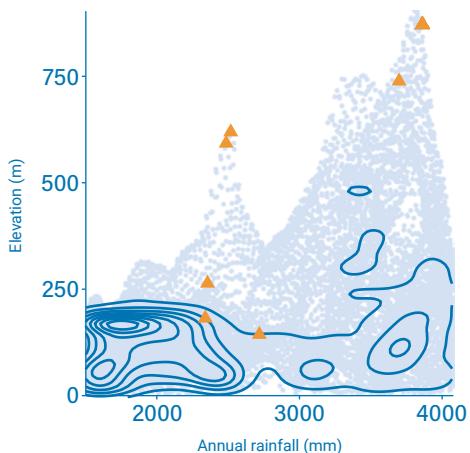


Distribution

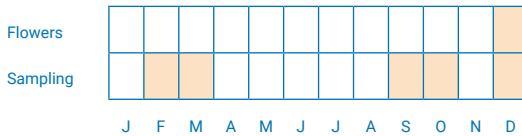
Príncipe



Climate



Phenology



Rationale

Tarennia 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 PNP, of which three are located at Pico de Príncipe, one at Oquê 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 PNP. 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 km², below the upper threshold of the EN status under criterion B2. The EOO is estimated as 8.1 km², 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 Oquê 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. *Tarennia principensis* 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.



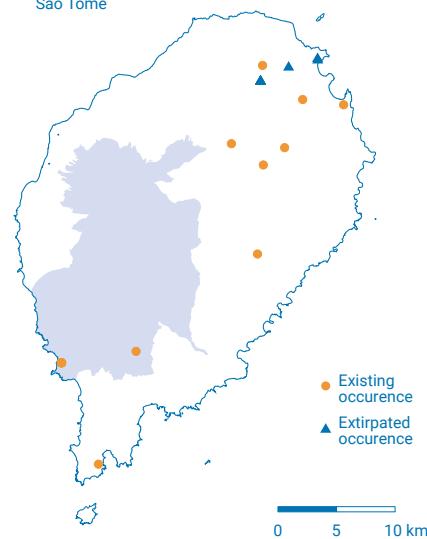
Chytranthus mannii Hook.f.

Distribution

São Tomé and Príncipe



São Tomé



Príncipe





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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 km², and its area of occupancy is estimated to be 60 km², both within the threshold for EN status under subcriteria B1 and B2. Two occurrences were recorded within the PNST 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.

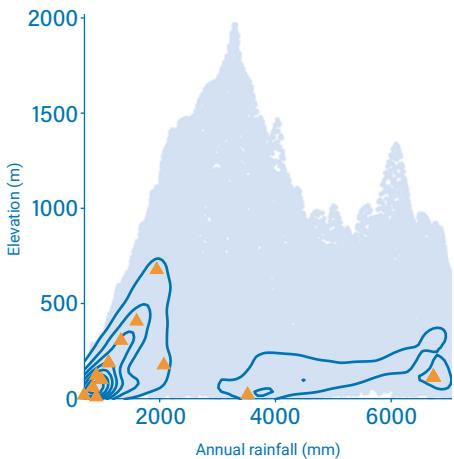
Use and trade

Pessegueiro-de-S. Tomé; is used in traditional medicine, fruits are edible, and toothbrushes are made with seedlings.

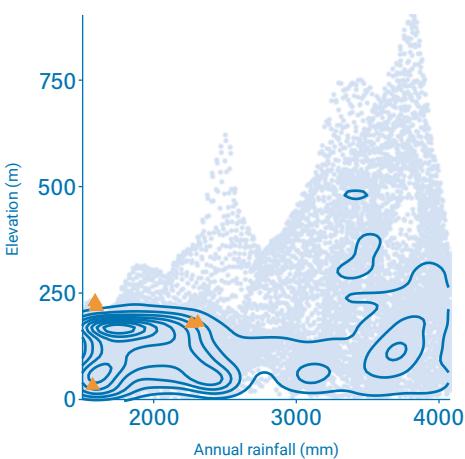
Population

No population information is known for this species.

Climate São Tomé



Climate Príncipe



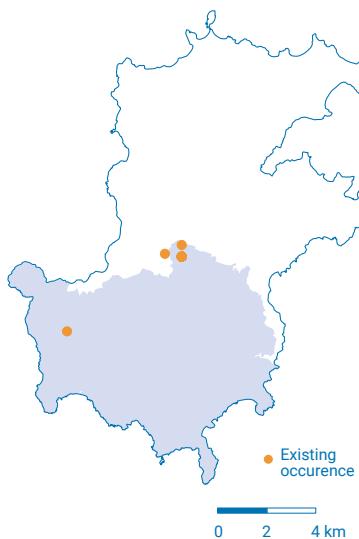


Chrysophyllum calophyllum Exell

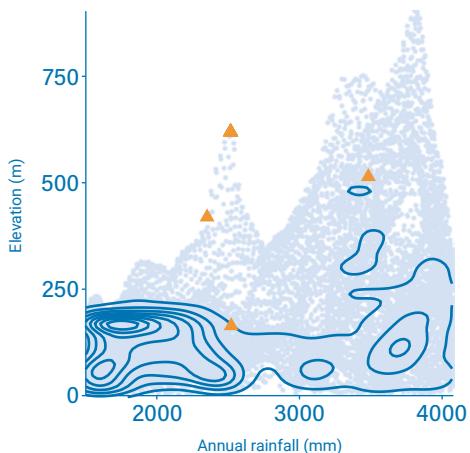


Distribution

Príncipe



Climate



Phenology

Fruits												
Flowers												
Sampling												

J F M A M J A S O N D

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 PNP and none is considered as extirpated. Based on a 2 x 2 km cell size, its EOO is calculated to be 1,116 km², and its AOO is estimated to be 8 km², 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 km², 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 quality of habitat. *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.



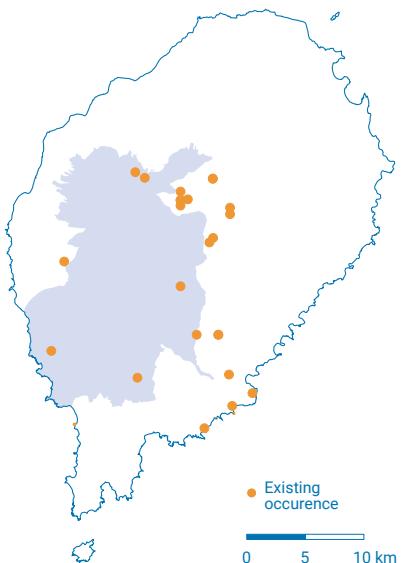
© Tariq Stévert



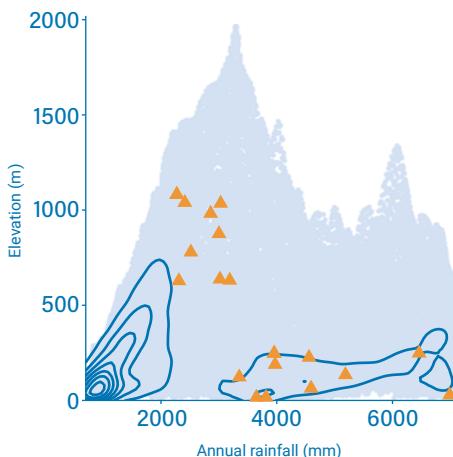
© João Farminhão

Distribution

São Tomé



Climate



© João Farminhão

Rationale

Thunbergianthus quintasii is a liana species endemic to São Tomé Island. It occurs mostly in 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 Esperança (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 all elevations. 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 km², and the EOO is calculated as 274 km², both below the upper threshold for EN status under Criterion B.

One occurrence located near São 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 Ió Grande are not threatened but represent two locations. Finally, the occurrences collected along the coast, near Ango-

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 island, has a broad altitudinal range and occurs mostly in secondary habitats. 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 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

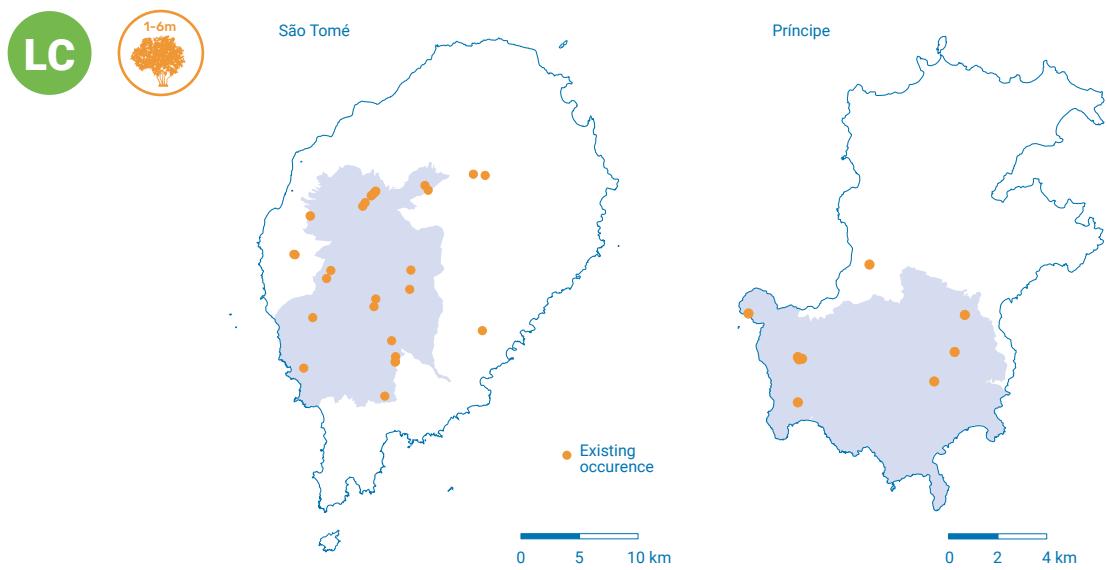
No information is available, but the species is quite widespread in São Tomé, and we consider only one subpopulation.



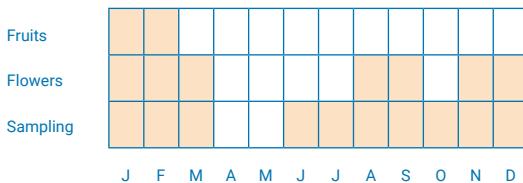
Dicranolepis thomensis Engl. & Gilg

Distribution

São Tomé and Príncipe



Phenology



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 km², and the EOO is calculated as 2,625 km², 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 PNOST, near Morro Vilela, are threatened by tourism activities, and invasive species, they represent one location. Twelve occurrences located inside PNOST are not threatened and represent

one location, while the occurrence near São Miguel was previously threatened by plantations and currently by illegal logging. Finally, the occurrences collected near Pico Maria Fernandes 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 park, 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. So even if it is close to VU status, the species should be assessed as LC.

Habitat and ecology

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

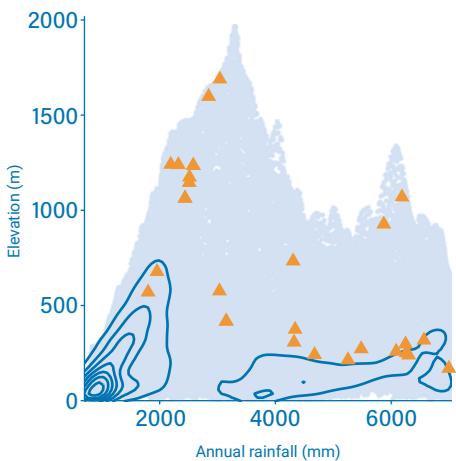
Use and trade

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

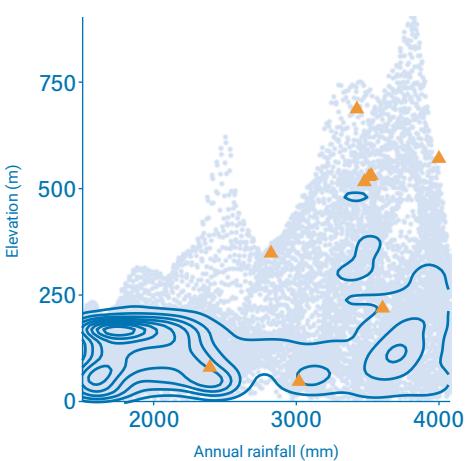
Population

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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© Diosdado Nguema



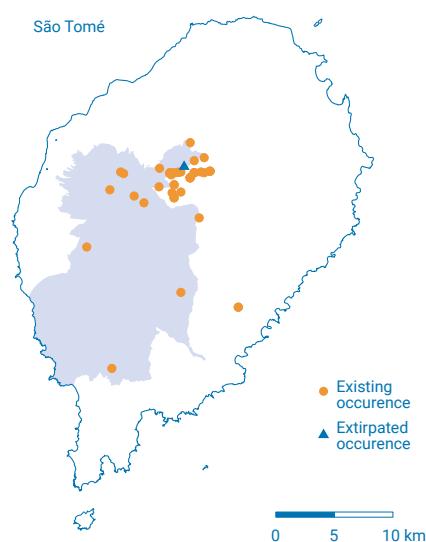
Elatostema thomense Henrique

Distribution

São Tomé and Príncipe



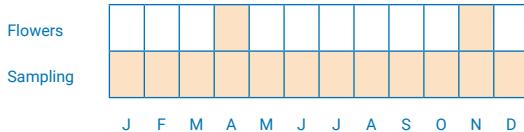
São Tomé



Príncipe



Phenology



© Olivier Lachenau



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Rationale

Elatostema thomense is undergrowth herbaceous up to 0.66 m high, sometimes 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; Lachenau 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 1968 by Espírito Santo (4617) as extirpated because the habitat of the species in Monte 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 km², below the upper threshold for EN status under subcriterion B2. The EOO is calculated as 1,771 km², above the upper threshold for EN status under subcriterion B1. Twenty-six collections representing eighteen occurrences located between Bom Sucesso in the North and the center of PNOST are threatened by tourism and invasive plant species. 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 Bombaim, Monte Formoso and Morro Miguel Angelo are threatened by old cocoa 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 cocoa 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 PNOST are not threatened and represent the sixth location. Two collections (Joffroy 224; Oliveira 585) located within Parque 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 Monte Café, and the threat of the other occurrences located outside PNOST 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. *Elatostema thomense* 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.

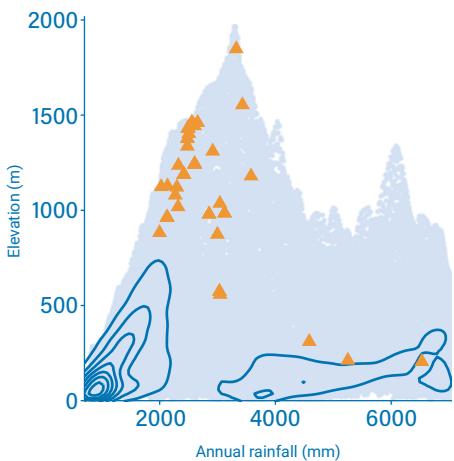
Use and trade

It is not known if the species is used.

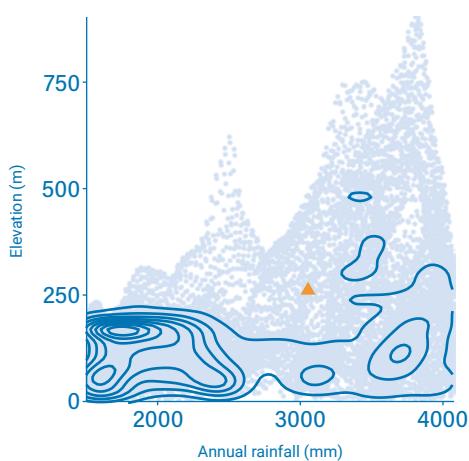
Population

No quantitative population data are available for this species, but the species often occurs in large populations.

Climate São Tomé



Climate Príncipe



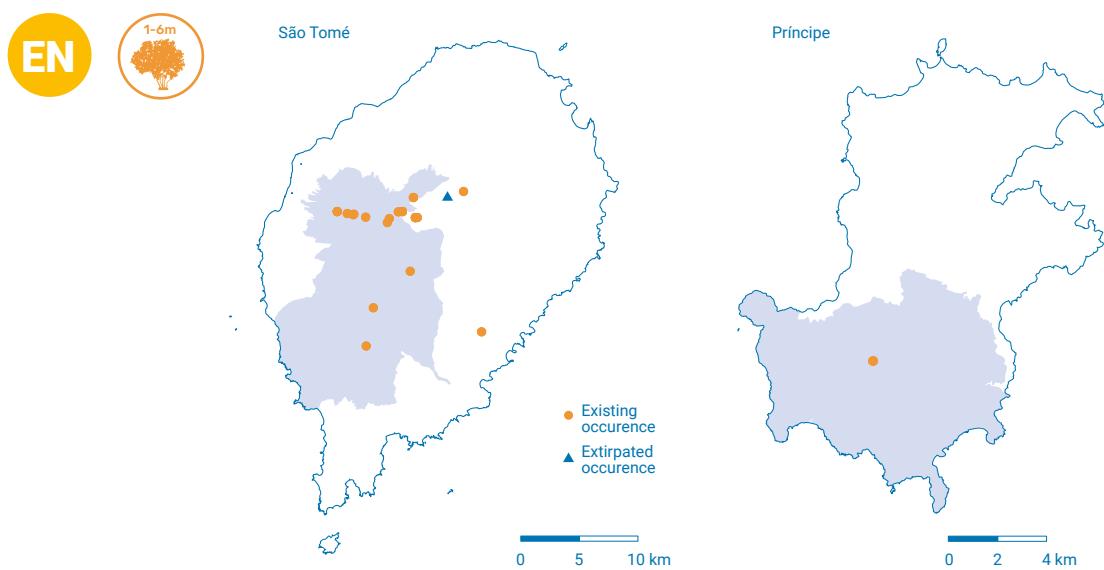




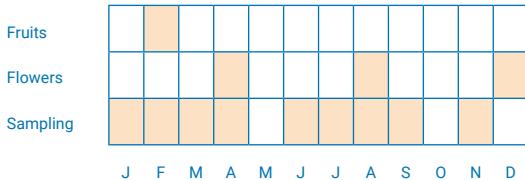
Pilea manniana Wedd

Distribution

São Tomé and Príncipe



Phenology



© Olivier Lachenau



© Olivier Lachenau

Rationale

Pilea manniana is a shrub up to 2 m in height, 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 36 collections made between 1861 (Mann 1063) and 2021 (Lachenau 3483). Four collections (Mann 1063; two collections of Seabra s.n.; Campos 39) were excluded because no locality information is provided. We also excluded one collection made by Oliveira (872) from Botanical Garden of Bom Sucesso, and both collections made by Chevalier (14559, 14524) because they are not precisely located. Moreover, we consider that the occurrences corresponding to collections made in 1885 and 1956 respectively by Moller (36) and 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 19 occurrences, and at least two or three subpopulations. Based on a 2 x 2 km cell size, the AOO of this species is estimated as 52 km², and the EOO is calculated as 1,570 km², both below the upper threshold for "Endangered" status under subcriterion B2 and B1. Three occurrences located in the area of Macambrará are threatened by small-scale agriculture and illegal forest logging, and represent one location. The occurrence (Ogonovszky 87) located in the southeast of São Tomé (Pico Maria Fernandes) was threatened by past cocoa plantations and represents one location. Eleven occurrences located along the touris-

tic road mostly between Bom Sucesso and Pico São Tomé are threatened by invasive species and tourism and represent one location. Three other occurrences located within the Parque Natural de Obô de São Tomé are not threatened and represent one occurrence. The occurrence (Joffroy 208 made in 1999) located within the Parque Natural de Príncipe is not threatened and represents one location. Therefore, these 19 occurrences represent five locations (*sensu* IUCN 2019), with regard to the most serious plausible threat (small-scale agriculture). Based on all the threats mentioned above and the fact that two occurrences are extirpated, we infer a past, current and a future continuing decline in the AOO, the extent and the quality of its habitat, number of locations, and number of mature individuals. *Pilea manniana* is thus assessed as EN B1ab(ii,iii,iv,v)+2ab(ii,iii,iv,v).

Habitat and ecology

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

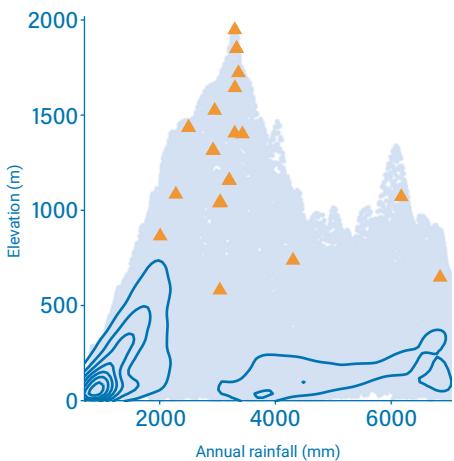
Use and trade

It is not known if the species is used.

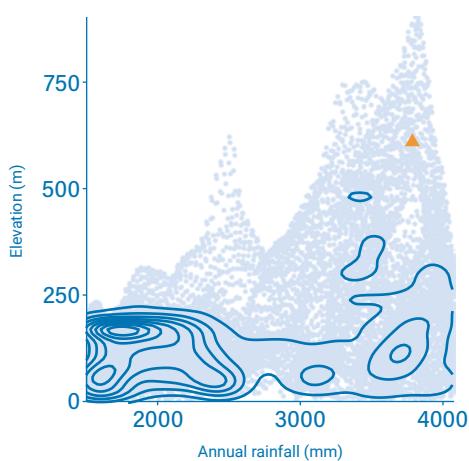
Population

No quantitative population data are available for *Pilea manniana*, but it usually occurs in large populations.

Climate São Tomé



Climate Príncipe







Rinorea chevalieri Exell



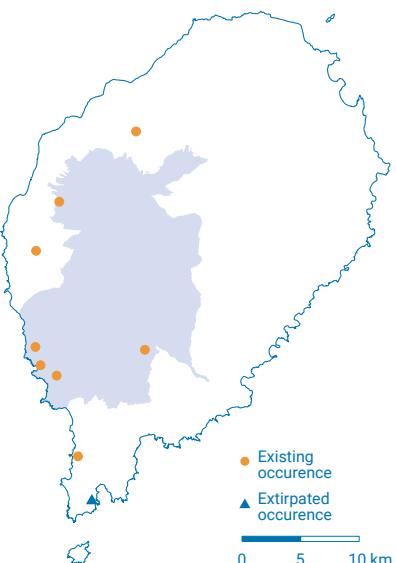
© Gilles Dauby



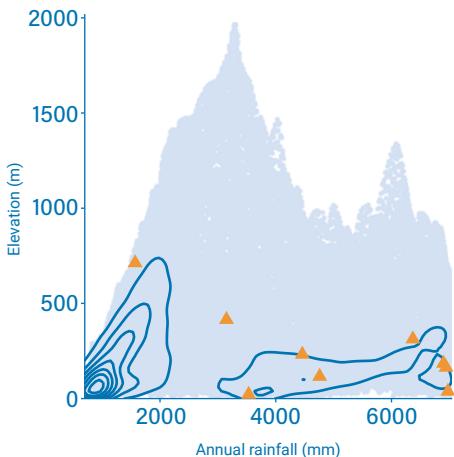
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Distribution

São Tomé



Climate



Phenology

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

Rationale

Rinorea chevalieri is a shrub or a small tree, known from rainforests, between the coast and 1,235 m in elevation. The species is endemic to São Tomé and is known from 13 collections and 15 individuals (MBG transects) made between 1905 and 2020. We consider that one occurrence, represented by three historical collections made by Chevalier (14202; 14216; 15864) in 1905, is now extirpated given that the habitat has been changed in Porto Alegre. The 25 remaining records represent ten occurrences, and one or two subpopulations. Based on a 2 x 2 km cell size, the AOO of this species is estimated as 32 km², and the EOO is calculated as 203 km², both below the upper threshold for "Endangered" status under subcriteria B2 and B1. Six occurrences of *Rinorea chevalieri* are located within the Parque Natural Obô de São Tomé (PNOST). Four of them, east of Praia São Miguel, were threatened by old cocoa plantations and currently threatened by illegal logging and represents one location. One occurrence situated around Lagoa Amélia face threats from invasive species, representing another location. The two other occurrences located within the park are not threatened and represent another location. Outside the park, the occurrence at Roça Fortunato (Oliveira 343) is threatened by illegal logging and represents one location. The occurrence (Ikabanga 1057) between Santa Clotilde and São José is threatened by illegal logging and represents one location. Finally, the occurrence in the south located at Praia Xixi (MBG transect 852) is threatened by large-scale agriculture (palm oil plantation) and represents one location. We infer the future disappearance of this occurrence. As a consequence, these ten occurrences represent six locations (*sensu* IUCN 2019), with regard to the most important threat (agriculture). Based on the disappearance of the occurrence at Porto Alegre, and the future disappearance of the occurrence located at Praia Xixi we infer a continuing

decline in its AOO, its EOO, the extent and the quality of its habitat, the number of locations, and the number of mature individuals. *Rinorea chevalieri* is thus assessed as VU B1ab(i,ii,iii,iv,v)+B2ab(i,ii,iii,iv,v).

Habitat and ecology

The species is known from rainforests, between the coast and 1,235 m in 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

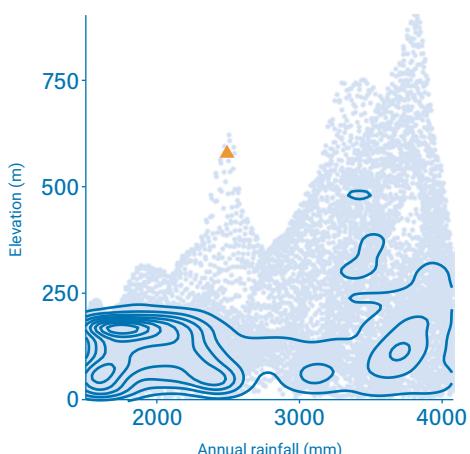


Distribution

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 PNP. 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 km², 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.

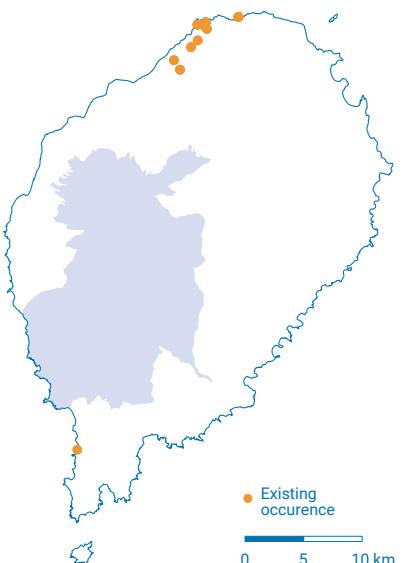


Rinorea molleri M. Brandt

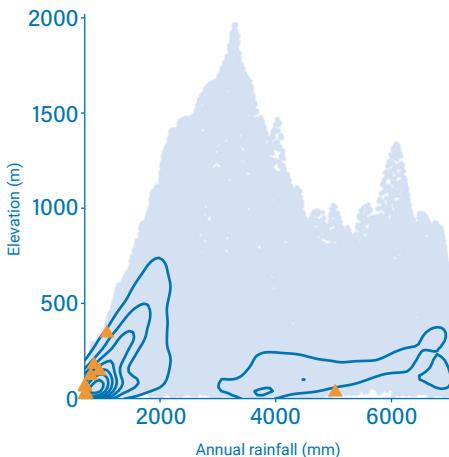


Distribution

São Tomé



Climate



Phenology

Fruits												
Flowers												
Sampling												

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

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 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 km², below the upper threshold of the EN status under subcriterion B2. The EOO is calculated as 64 km², 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 I village is threatened by cocoa plantations and represents one location. Two occurrences around Lagoa Azul are threatened by shifting agriculture and 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 agricultural activities and represents one location. Therefore, these five occurrences represent four 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 quality of habitat. *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. The species is usually abundant and numerous where it occurs, although most of its habitat is highly degraded.



Rinorea thomensis Exell



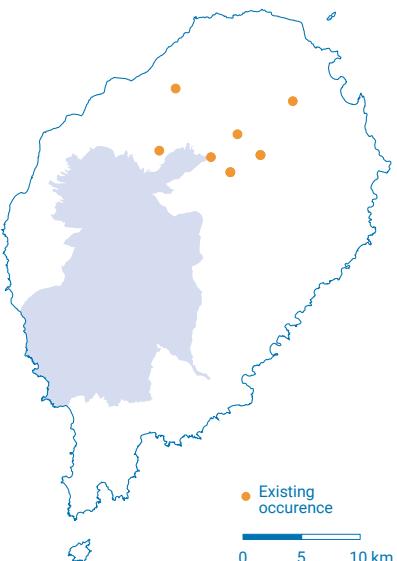
© Olivier Lachenau



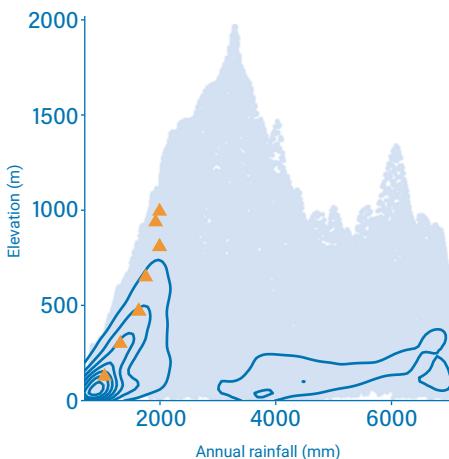
© Olivier Lachenau

Distribution

São Tomé



Climate



Phenology

Flowers											
Sampling											

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

Rationale

Rinorea thomensis is a small shrub found in rainforest, between 400 and 1,000 m in elevation. The species is endemic to the northern part of São Tomé Island and is known from nine collections made between 1885 and 2019. These collections represent seven occurrences (one or two subpopulations) of which we considered none of them as extirpated given the still presence of forest cover in areas of collections. Based on a 2 x 2 km cell size, the AOO of this species is estimated to be 28 km², which falls within the limits of the EN category under Criterion B2. The EOO is calculated as 55.5 km², below the upper threshold of the CR category under Criterion B1.

All the occurrences of *R. thomensis* are located outside the PNOST, where their habitat does appear under threat due to human activities. Indeed, the collections Moller 18 and 406 are threatened by coffee plantations and represent one location. One occurrence (Espírito Santo 4360) is threatened by shifting agriculture and represents one location. One occurrence (Lachenaud 2811) has been threatened by an ancient coffee plantation. This occurrence is presently threatened by agriculture and wood collecting and is expected to disappear very soon, and represents one location. One occurrence (Lachenaud 2837) has been threatened by a plantation and represents one location. One occurrence (Moller s. n.) is threatened by shifting agriculture and represents one location. One occurrence (Espírito Santo 4490) is threatened by the encroachment of carrot crops and represents one location. One occurrence (Moller

849) is threatened by illegal logging and represents one location.

Based on the main threat which is small-holder farming, the seven occurrences represent seven 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 future disappearance of the occurrence Espírito Santo 4490 and Lachenaud 2811 is leading us to infer a decline in AOO, number of locations, and mature individuals of the species. For these reasons, *Rinorea thomensis* is assessed as VU B1ab(ii,iii,iv,v)+2ab(ii,iii,iv,v).

Habitat and ecology

The species is found in lowland and submontane rainforest, between 400 and 1,000 m in elevation.

Use and trade

There are no known uses for this species.

Population

Rinorea thomensis is known from one or two subpopulations. No quantitative population data are available for the species, but the species usually occurs in small populations.

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Most references used in this work are listed here. Additional sources will be available in the published species assessments on the IUCN Red List website.



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RED DATA BOOK

This Red Data Book on the endemic species of São Tomé and Príncipe is the result of a multi-partner project funded by the Critical Ecosystem Partnership Fund (CEPF).

The book provides the first overview of the endemic species whose conservation status was assessed during this project. The book summarizes the assessments according to the IUCN Red List categories and criteria for 106 (sub-)endemic species of São Tomé and Príncipe. Among these, two species of Orchidaceae (*Angraecopsis dolabriformis* (Rolfe) Schltr., 1918 and *Angraecum astroarche* Ridl., 1887) are classified as extinct, having not been recorded after intensive surveys. Twelve species are Critically Endangered, 53 Endangered, 25 Vulnerable, six Near Threatened, six Least Concern and two Data Deficient. This thorough assessment underlines the urgent need for conservation efforts to protect the unique flora of São Tomé and Príncipe.

Richly illustrated with numerous original graphs and species distribution maps, the book also introduces the ecosystems of São Tomé and Príncipe, the methodologies used, and a section on conservation. This work will serve as an essential scientific reference on the endemic flora of São Tomé and Príncipe, providing a vital tool for land managers, government officials, local communities, the private sector and conservation practitioners.

