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Inventory

Tree species composition in Ilha Grande, Rio de Janeiro, Brazil

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Abstract: In the present study a specific and comprehensive analysis of the arboreal flora of Ilha Grande, located in the municipality of Angra dos Reis, on the southern coast of the state of Rio de Janeiro, Brazil, is presented. Unpublished data and contributions from studies already carried out at the site that investigated issues related to the composition and richness of tree species, the degree of threat, endemism and the history of occupation and/or changes in land use were gathered and analyzed. This study is part of the PPBio Mata Atlântica – Programa de Pesquisa em Biodiversidade (Biodiversity Research Program) which, through phytosociological inventories of the tree component, has been contributing, since 2010, to the increase in the floristic knowledge of Ilha Grande. The inventory identified 509 tree species, belonging to 220 genera and 74 families. Of these, 34 species were categorized as threatened, two of which are critically endangered, 18 are endangered and 14 are vulnerable. 53 exotic tree species were indicated. The results presented here reinforce the importance of these inventories as indispensable tools for the construction of strategies and actions for conservation, restoration and management of diversity in the context of the Atlantic Forest.
Keywords: *Atlantic Forest; conservation of biological diversity; endemism; insular environments; protected areas.*

Composição de espécies arbóreas na Ilha Grande, Rio de Janeiro, Brasil

Resumo: No presente estudo é apresentada uma análise específica e abrangente da flora arbórea da Ilha Grande, localizada no município de Angra dos Reis, litoral Sul do estado do Rio de Janeiro, Brasil. Informações inéditas e contribuições dos estudos já conduzidos no local que investigaram questões relacionadas à composição e riqueza de espécies arbóreas, grau de ameaça, endemismos e histórico de ocupação e/ou alterações de uso da terra foram reunidas e analisadas. Este estudo é parte do Programa de Pesquisa em Biodiversidade (PPBio) Mata Atlântica que, através de inventários fitossociológicos do componente arbóreo, vêm contribuindo, desde 2010, para o incremento do conhecimento florístico da Ilha Grande. O inventário identificou 509 espécies arbóreas, pertencentes a 220 gêneros e 74 famílias. Dessas, 34 espécies foram categorizadas como ameaçadas de extinção, sendo duas criticamente em perigo, 18 em perigo e 14 vulneráveis. Foram indicadas 53 espécies arbóreas exóticas. Os resultados aqui apresentados reforçam a importância desses inventários como ferramentas indispensáveis para a construção de estratégias e ações de conservação, restauração e manejo da diversidade no contexto da Mata Atlântica.
Palavras-chave: *Mata Atlântica; conservação da diversidade biológica; endemismo; ambientes insulares; áreas protegidas.*

Introduction

Knowing and evaluating the biological diversity present in different ecosystems is an important tool for the conservation of natural environments (Ashton 1992). In this sense, the study of natural areas impacted by human activities is of crucial importance for understanding the damage caused (Coelho et al. 2020), as well as for taking adequate measures for their conservation, restoration, management and impact mitigation (Juffe-Bignoli et al. 2021).

Among the factors responsible for the degradation of biodiversity, the loss and fragmentation of natural environments represent one of the main sources of threat (Laurance & Cochrane 2001, Metzger 2006). In tropical forest regions, changes and increases in the intensity of land use have led to changes in biodiversity patterns, with influences on the abundance and distribution of species (Pereira et al. 2007), determining the loss of potentially significant features and functions (Cardinale et al. 2012). A recent study shows that land use change would account for the highest values of total loss of habitat for plants in the Atlantic Forest, with a deleterious impact on species with a more restricted distribution (Leão et al. 2021).

Island environments have long instigated biogeographic investigations (e.g., MacArthur & Wilson 1967, Whittaker 1998). As islands vary in shape, size, spatial arrangement, geology, environments and biotic characteristics, investigations conducted on islands contribute to the understanding of fragmented continental landscapes (Tavares et al. 2019; Pessoa & Araujo 2020), interpreted as habitat islands (Whittaker 1998). On the southern coast of Rio de Janeiro, especially between the municipalities of Mangaratiba and Paraty, studies carried out both in continental areas (Marques et al. 1997, Maurenza et al. 2018) and in islanders (e.g., Callado et al. 2009) have shown relevance as sources of biological information, especially in relation to biodiversity conservation in fragmented areas (Carvalho et al. 2007).

In this region, the proximity of the Serra do Mar mountain range to the Atlantic Ocean accounts for the presence of abrupt and continuous walls with a crystalline basement (Barros 2008). The extension of the relief of this coast also generated a large number of coastal islands, originated in the last marine transgression, when the sea level rose between 17,000 and 5,100 years BP (Tessler & Goya 2005). Among these, there is Ilha Grande, considered a coastal island due to its location on the continental shield and a past connection to the mainland. Its geological formation belongs to the same events that gave rise to the Serra do Mar and Mantiqueira mountain ranges, the coastal massifs and the Baía de Guanabara graben (Ramos et al. 2015). Thus, Ilha Grande represents the top of a submerged mountain and has basically two types of relief: mountains and narrow coastal plains (Gralato 2016).

The largest island in the state of Rio de Janeiro and the third largest in the country (Ramuz 1998), Ilha Grande is part of the Serra do Mar biological corridor. Considered an ecological sanctuary, not only for its natural beauty, but mainly for its rich biological diversity and endemism (Callado et al. 2009, Nunes-Freitas et al. 2009). It represents one of the most important remnants of Atlantic Forest in Southeast Brazil (Alho et al. 2002). Botanical and plant population ecology studies carried out on this island concentrated efforts in the region of Reserva Biológica Estadual da Praia do Sul (Araujo & Oliveira 1988, Oliveira 2002, Nunes-Freitas et al. 2006, Cruz & Nunes-Freitas 2019) or focused on specific botanical families (Pederneiras et al. 2012, Nunes-Freitas et al. 2009, Santo 2016, Rosa 2017). As important as the works mentioned, there are those related to biological invasion (e.g., Ribas et al. 2010, Caires 2015, Zucaratto et al. 2020), endangered species (Vianna Filho et al. 2020) and scientific dissemination (Caires 2021).

However, there is still no specific and comprehensive analysis of the arboreal flora of Ilha Grande in the literature. In this inventory, contributions from studies already carried out at the site that investigated issues related to the composition and richness of tree species, the degree of threat, endemism and the history of occupation and/or changes in land use were gathered and analyzed. This study is part of the PPBio Mata Atlântica – Programa de Pesquisa em Biodiversidade (Biodiversity Research Program) which, through phytosociological inventories of the tree component, has been contributing, since 2010, to the increase in the floristic knowledge of Ilha Grande.

In this sense, the present study aims to answer the following questions: a) What is the current composition of tree species on Ilha Grande? b) Which species are new occurrences? c) Which ones are categorized as endangered? and d) How can the current composition of native and exotic species reflect the history of occupation and alteration of the vegetation mosaic of Ilha Grande?

Material and Methods

1. Study site

Ilha Grande (23 k 7445626.33S – 591101.45 E and 7429707.18 S – 564711.27 E, UTM, SIRGAS 2000) is located in the municipality of Angra dos Reis, in Baía da Ilha Grande, south coast of the state of Rio de Janeiro, Brazil (Figure 1). It is located in the coastal portion of Serra do Mar, which reaches the Atlantic Ocean through steep slopes. In this region, part of the coastal massif was isolated from the mainland, forming a set of islands and islets, especially Ilha Grande, with an area of 193 km^2 and approximately 30 km long and 12 km wide (Araujo & Oliveira 1988, Santiago et al. 2009). Ilha Grande has three conservation units (UC), which together protect about 80% of its territory: PEIG – Parque Estadual da Ilha Grande (Ilha Grande State Park), RBEPS – Reserva Biológica Estadual da Praia do Sul (Praia do Sul State Biological Reserve) and RDSA – Reserva de Desenvolvimento Sustentável do Aventureiro (Adventurer's Reserve for Sustainable Development) (INEA 2021). In addition to being part of the Área de Proteção Ambiental de Tamoios (Tamoios Environmental Protection Area). In 2019, Ilha Grande was considered a UNESCO World Cultural and Natural Heritage Site.

Two geomorphological domains make up the relief, the first consisting of igneous rocks (granites and charnockites) that form the steep slopes in most of the island. The second is formed with the deposition of sediments from climatic actions, marine deposition and erosion of rocks that make up the lowlands and coastal plains of the restingas in the coves close to the sea. The region comprises a mountainous relief with two drainage dividers that are arranged in the North-South and East-West directions, being interconnected through their topographic highs (Gama et al. 2009). For its largest part, it is below 500 m altitude, with the highest points being Serra do Retiro (1.031 m), Pico da Pedra d'Água (1.011 m) and Pico do Papagaio (959 m), positioned in the Central-Eastern portion of the island (Oliveira 2002). The predominant soil types are Cambisol and Spodosol (Gama et al. 2009). The climate is hot and humid (*Af*, *sensu* Köppen-Geiger), with no well-defined dry season. The rainfall is high and unevenly distributed across the island, e.g., varying between 1,245 and 4,531 mm

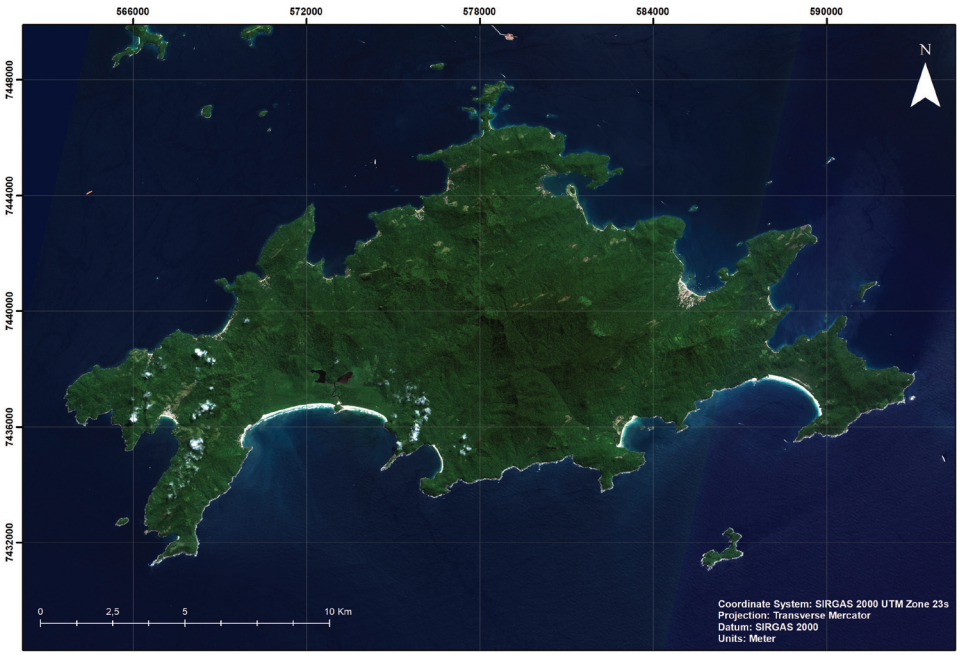

Figure 1. Map of Ilha Grande, Angra dos Reis, RJ, Brazil, showing its vegetation cover.

in different areas in a period of one year. Extreme values observed in the period of 1997–1998 (Oliveira & Coelho Netto 2001), with higher rainfall in summer and relative air humidity of 80% throughout the year. In January, average temperatures vary between 23 and 25°C and, in July, between 19 and 20°C (Salgado & Vasquez 2009).

The vegetation is inserted in the Dense Rainforest (*sensu* IBGE 2012), with predominance of Submontane and Montana formations, in addition to pioneers with marine influence (restingas and rocky shores), fluviomarine (mangrove) and fluvial (alluvial formations) (Callado et al. 2009) (Figure 2). The vegetation cover is characterized today by large extensions of secondary formations, in different stages of regeneration, with small patches of most conserved forests restricted to the higher altitudes.

Economic activities promoted major environmental changes on Ilha Grande and began with Portuguese colonization. The first period runs from the 16th century to the end of the 19th century. The second lasted during the development of prison activities (1903–1994) and the third, with the implementation of tourism in Ilha Grande, started in 1970, but intensified after the implosion of the maximum security prison Instituto Penal Cândido Mendes in 1994. During colonization, there was a predominance of agricultural exploitation and, in its heyday, this process was greatly increased. From the 17th century onwards, the coffee (*Coffea arabica* L.) season began on the farms of Abraão, Dois Rios, Palmas, Sant'Anna and Sítio Forte. This activity thrived until the 19th century (Ramuz 1998; Ribas et al. 2010). In the 19th century, with the expansion of coffee farming to the Vale do Paraíba region and also with the end of the slave trade, Ilha Grande went into great decline, with the coffee plantations and the entire structure of the farms abandoned (Santiago et al. 2009). With the implementation of conservation units in Ilha Grande, environmental protection led to a new phase, which encouraged tourism associated with nature and allowed the vegetation to regenerate.

2. *Data collection and analyzes*

In this work, a tree was considered to be any woody plant over 3.0 m tall, with a well-defined trunk, branches above the base and a root system fixed to the soil throughout its life cycle (Lima & Guedes-Bruni, 1997). Woody species that begin their life cycle as epiphytes were also accepted, of which the best known are popularly called "figueiras mata-pau". These plants go through three phases during their development: epiphytic, hemiepiphytic and arboreal or free-living (Coelho 2005). Arborescent ferns were not included.

Samples were obtained using the walking method (Filgueiras et al. 1994) and the phytosociological inventory in permanent plots of the PPBio Mata Atlântica, using the RAPELD methodology (Magnusson et al. 2005, Ribeiro et al. 2012). The core material is registered in the RFFP herbarium. The floristic inventory was complemented through consultations with the JABOT (2021) and INCT (2021) platforms, using the term "Ilha Grande" as a search filter. This material is found mainly in the RFFP, HRJ, HB, GUA and RB herbaria (acronyms according to Thiers 2021). Tree species considered exotic (Zenni & Ziller, 2011) were not included in the main list, but aggregated in a separate list. Species indicated as native in Flora e Funga do Brasil (2022), but not naturally occurring on Ilha Grande, are here considered exotic. They were addressed in the current conservation context (Dechoum et al. 2018, Sharrock et al. 2018) and associated with the history of occupation of Ilha Grande (Barros et al. 2022). Geographic origin data were consulted in Lorenzi et al. (2003).

The identification of the material was carried out through specialized bibliography, herbarium collections and, when necessary, consultation with specialists. The floristic list was organized according to the APG IV (2016), with the exception of Leguminosae, which followed the proposal of the LPWG (2017). The nomenclature of native species was conferred by Flora e Funga do Brasil (2022) and that of exotic species by The World

Figure 2. Types of vegetation that occur in Ilha Grande, Angra dos Reis, RJ, Brazil: a) Dense Rainforest; b) Restinga in Praia do Sul; c) Forest of Restinga in Lopes Mendes; d) Rocky Outcrop Vegetation on the East Coast; e) Rocky Outcrop Vegetation at Morro do Cavalinho; f) Mangrove in Saco do Céu; g) Flooded Forest in Lopes Mendes. Images: a, c, d, g) A.A.M. de Barros; b, f) Ilha Grande Portal; e) D.N.S. Machado.

Flora Online (2021). The classification of species according to their conservation status at the national level was based on MMA (2022) and CNCFlora (pers. comm., for non-threatened species) and, for the state of Rio de Janeiro, on Martinelli et al. (2018). Species not mentioned in published works (Araujo & Oliveira 1988, Oliveira 2002, Lobão et al. 2005, Callado et al. 2009, Pederneiras et al. 2011a, 2011b, 2012, Rosa 2013, 2017, Santo 2016, Ferreira et al. 2018, Lopes et al. 2019, Vianna Filho et al. 2020) were considered new occurrences for the vegetation of Ilha Grande.

Species sampled were classified according to their ecological group, into early-stage species (pioneers and early secondary) and late-stage species (late secondary). Information on the successional characterization of the species was obtained from the literature and the determination of the categories followed the proposal by Gandolfi et al. (1995).

The Venn diagram (Gotelli & Ellison 2016) was built to assess species sharing between the Rainforest areas and pioneer formations of Restinga. The Jaccard index (Magurran 2013) was used to assess the similarity between the arboreal flora of Ilha Grande and that of the Área de Proteção Ambiental (APA) de Cairuçu (Marques et al. 1997) and of the APA de Mangaratiba/Parque Estadual Cunhambebe (Maurenza et al. 2018). These conservation units are located on the mainland and are approximately 20 km and 7 km away, respectively, from Ilha Grande.

Results

1. Floristic analysis

The inventory identified 509 tree species, belonging to 220 genera and 74 families (Table 1). The families with the highest species richness were: Myrtaceae (87 species), Leguminosae (57), Rubiaceae (38), Melastomataceae (26), Lauraceae (25), Euphorbiaceae (19), Annonaceae

Table 1. Floristic list of tree species inventoried in Ilha Grande, Angra dos Reis, state of Rio de Janeiro, Brazil, with indications of new occurrences (NO), distinguishing those from general collections (G) and from the sampling of RAPELD Plots (R) and the respective categories of threat of extinction (IUCN) at the national (BR) and state (RJ) levels and the numbers of falls in the herbaria.

Family (nº genera/species)/Scientific Name	NO		IUCN		Voucher
	G	R	BR	RJ	
Acanthaceae (1/1)					
Avicennia schaueriana Stapf & Leechm. ex Moldenke	X		NE		RFFP12931
Achariaceae (1/1)					
Carpotroche brasiliensis (Raddi) A.Gray	X		NE		RFFP18233
Anacardiaceae (3/3)					
Anacardium occidentale L.			NE		HB85315
Schinus terebinthifolia Raddi			NE		RFFP13344
Tapirira guianensis Aubl.			NE		RFFP13310
Annonaceae (6/14)					
Anaxagorea dolichocarpa Sprague & Sandwith			LC		RBR38283
Annona cacans Warm.			LC		RFFP20321
Annona dolabripetala Raddi			LC		RFFP12869
Annona glabra L.			LC		RFFP12495
Annona mucosa Jacq.	X		NE		GUA39997
Duguetia pohliana Mart.			NE	EN	RBR32929
Guatteria australis A.St.-Hil.			LC		RFFP12752
Guatteria candolleana Schltdl.		X	LC		RFFP20322
Guatteria ferruginea A.St.-Hil.	X		LC		HRJ12455
Guatteria latifolia R.E.Fr.			NE		FCAB5441
Oxandra espintana (Spruce ex Benth.) Baill.		X	NE		RFFP18683
Oxandra martiana (Schltdl.) R.E.Fr.			LC		HRJ12212
Xylopia brasiliensis Spreng.			VU		RFFP16702
Xylopia langsdorffiana A.St.-Hil. & Tul.			NT		HRJ11631
Apocynaceae (4/4)					
Aspidosperma pyricollum Müll.Arg.			NE		RB259048
Geissospermum laeve (Vell.) Miers			NE		RBR38330
Malouetia cestroides (Nees ex Mart.) Müll.Arg.		X	LC		HRJ12214
Tabernaemontana laeta Mart.			NE		RFFP3746
Aquifoliaceae (1/5)					
Ilex cerasifolia Reissek			LC		RFFP20559
Ilex dumosa Reissek			NE		RB390925
Ilex integerrima (Vell.) Reissek			NE		HRJ12215
Ilex paraguariensis A.St.-Hil.			LC		GUA27861
Ilex theezans Mart. ex Reissek		X	NE		RB385112
Araliaceae (2/2)					
Didymopanax angustissimus Marchal			NE		HRJ11352
Oreopanax capitatus (Jacq.) Decne. & Planch.			LC		HB85431
Arecaceae (5/5)					
Astrocaryum aculeatissimum (Schott) Burret			LC		HB88051
Attalea dubia (Mart.) Burret			NE		RB710214

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Family (nº genera/species)/Scientific Name	NO		IUCN		Voucher
	G	R	BR	RJ	
Bactris setosa Mart.			NE		RB710226
Euterpe edulis Mart.			VU		RB710284
Syagrus romanzoffiana (Cham.) Glassman			LC		RB725399
Asteraceae (1/1)					
Vernonanthura discolor (Spreng.) H.Rob.		X	NE		RBR32933
Bignoniaceae (5/6)					
Cybistax antisyphilitica (Mart.) Mart.			NE		RFFP17549
Jacaranda obovata Cham.			LC		RB699062
Jacaranda puberula Cham.		X	LC		RFFP19404
Handroanthus heptaphyllus (Vell.) Mattos			LC		HRJ12218
Sparattosperma leucanthum (Vell.) K.Schum.			NE		RFFP17915
Tabebuia stenocalyx Sprague & Stapf			NE		HRJ12219
Burseraceae (1/3)					
Protium brasiliense (Spreng.) Engl.			NE		NY608751
Protium glaziovii Swart		X	EN		RFFP20323
Protium widgrenii Engl.			LC		HRJ11671
Calophyllaceae (1/1)					
Kielmeyera membranacea Casar.			LC		RFFP18658
Cannabaceae (2/2)					
Celtis iguanaea (Jacq.) Sarg.			NE		not collected
Trema micrantha (L.) Blume			NE		RFFP12766
Capparaceae (1/1)					
Crateva tapia L.	X		NE		GUA35930
Cardiopteridaceae (1/1)					
Citronella paniculata (Mart.) R.A.Howard	X		NE		HRJ12294
Caricaceae (1/2)					
Jacaratia heptaphylla (Vell.) A.DC.			NE		HRJ11621
Jacaratia spinosa (Aubl.) A.DC.		X	LC		RFFP20324
Celastraceae (3/9)					
Cheiloclinium cognatum (Miers) A.C.Sm.		X	NE		RFFP18504
Monteverdia aquifolia (Mart.) Biral			LC		RFFP20325
Monteverdia ardisiifolia (Reissek) Biral			LC		RFFP14986
Monteverdia brasiliensis (Mart.) Biral		X	LC		RFFP12797
Monteverdia communis (Reissek) Biral	X		NE		HRJ12296
Monteverdia gonoclada (Mart.) Biral	X		NE		GUA36156
Monteverdia littoralis (R.M.Carvalho-Okano) Biral	X		LC		GUA16995
Monteverdia obtusifolia (Mart.) Biral			LC		HB85336
Peritassa laevigata (Hoffmanns. ex Link.) A.C.Sm.	X		NE		HRJ11624
Chloranthaceae (1/1)					
Hedyosmum brasiliense Mart. ex Miq.	X		NE		RFFP12753

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Chrysobalanaceae (5/6)				
Chrysobalanus icaco L.			NE	RB568633
Couepia monteclarensis Prance	X		LC	RB712178
Hirtella hebeclada Moric. ex DC.		X	LC	HRJ12199
Licania octandra (Hoffmanns. ex Roem. & Schult.) Kuntze			NE	HRJ12226
Licania riedelii Prance	X		LC	HRJ11503
*Parinari brasiliensi*s (Schott) Hook.f.			LC	RBR32941
Clethraceae (1/1)				
Clethra scabra Pers.			LC	HB85200
Clusiaceae (4/8)				
Clusia criuva Cambess. subsp. *criuva*			LC	HB85488
Clusia criuva subsp. *parviflora* Vesque			LC	RB716884
Clusia fluminensis Planch. & Triana	X		NE	RFFP12732
Clusia lanceolata Cambess.			NE	RFFP14455
Garcinia brasiliensis Mart.			NE	RB489232
Garcinia gardneriana (Planch. & Triana) Zappi		X	NE	RFFP18218
Tovomita leucantha (Schltdl.) Planch. & Triana			NE	RFFP20560
Tovomitopsis paniculata (Spreng.) Planch. & Triana	X		NE	not collected
Combretaceae (2/2)				
Combretum laxum Jacq.		X	NE	RFFP20326
Laguncularia racemosa (L.) C.F.Gaertn.			NE	RFFP13374
Cordiaceae (1/6)				
Cordia aberrans I.M.Johnst.		X	LC	RFFP17998
Cordia magnoliifolia Cham.			LC	RFFP13367
Cordia sellowiana Cham.		X	NE	RFFP20327
Cordia taguahyensis Vell.			NE	RFFP18678
Cordia trichoclada DC.	X		LC	RBR32937
Cordia trichotoma (Vell.) Arráb. ex Steud.	X		NE	RFFP17168
Cunoniaceae (1/1)				
Lamanonia ternata Vell.			NE	RFFP3819
Dichapetalaceae (1/1)				
Stephanopodium estrellense Baill.		X	NE	HRJ11869
Elaeocarpaceae (1/3)				
Sloanea garckeana K.Schum.			LC	RB715139
Sloanea guianensis (Aubl.) Benth.		X	NE	RB532588
Sloanea hirsuta (Schott) Planch. ex Benth.		X	LC	RFFP17164
Erythropalaceae (1/2)				
Heisteria perianthomega (Vell.) Sleumer		X	NE	RFFP20339
Heisteria silvianii Schwacke			NE	HRJ12170
Erythroxylaceae (1/4)				
Erythroxylum ambiguum Peyr.			LC	HB85506
Erythroxylum cuspidifolium Mart.			NE	RFFP12992
Erythroxylum passerinum Mart.	X		LC	HB88343
Erythroxylum pulchrum A.St.-Hil.			LC	RFFP12870

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Family (nº genera/species)/Scientific Name	NO		IUCN		Voucher
	G	R	BR	RJ	
Euphorbiaceae (13/19)					
Actinostemon concolor (Spreng.) Müll.Arg.	X		NE		HRJ12303
Actinostemon klotzschii (Didr.) Pax		X	NE		RFFP16699
Actinostemon verticillatus (Klotzsch) Baill.	X		NE		RFFP13332
Alchornea glandulosa subsp. *iricurana* (Casar.) Secco			NE		RB412990
Alchornea triplinervia (Spreng.) Müll.Arg.			NE		RFFP13312
Algernonia brasiliensis Baill.	X		VU		RFFP19623
Algernonia leandrii (Baill.) G.L.Webster			LC		RFFP12899
Aparisthmium cordatum (A.Juss.) Baill.			NE		HRJ12209
Caryodendron grandifolium (Müll.Arg.) Pax		X	LC		RFFP14490
Croton floribundus Spreng.			LC		RFFP19393
Croton organensis Baill.	X		LC		RB385014
Gymnanthes multiramea (Klotzsch) Müll.Arg.			NE		RFFP16584
Mabea fistulifera Mart.	X		NE		RFFP16692
Mabea piriri Aubl.			NE		GUA27547
Pachystroma longifolium (Nees) I.M.Johnst.	X		NE		HRJ11540
Pausandra morisiana (Casar.) Radlk.			LC		RFFP16722
Sapium glandulosum (L.) Morong			NE		GUA38848
Senefeldera verticillata (Vell.) Croizat			LC		HRJ11302
Tetrorchidium rubrivenium Poepp.			LC		RFFP17260
Humiriaceae (2/2)					
Humiria balsamifera (Aubl.) A.St.-Hil.			NE		RB717541
Humiriastrum dentatum (Casar.) Cuatrec.	X		NE		GUA40466
Lacistemaceae (1/2)					
Lacistema pubescens Mart.			NE		HRJ11718
Lacistema serrulatum Mart.			LC		RB198184
Lamiaceae (2/2)					
Aegiphila integrifolia (Jacq.) Moldenke			NE		HB86574
Vitex polygama Cham.		X	NE		RBR33021
Lauraceae (10/25)					
Aiouea saligna Meisn	X		NE		RB718010
Aniba firmula (Nees & Mart.) Mez			LC		RFFP16246
Beilschmiedia angustifolia Kosterm.			NE	EN	HRJ11886
Beilschmiedia emarginata (Meisn.) Kosterm.	X		LC		HRJ12328
Cryptocarya moschata Nees & Mart.			NE		HRJ11597
Cryptocarya saligna Mez	X		NE		RFFP16694
Endlicheria glomerata Mez		X	LC		HRJ11599
Endlicheria paniculata (Spreng.) J.F.Macbr.			NE		GUA26991
Licaria armeniaca (Nees) Kosterm.	X		NE		GUA29936
Nectandra membranacea (Sw.) Griseb.			NE		RFFP18741
Nectandra puberula (Schott) Nees			NE		RFFP16231

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Ocotea corymbosa (Meisn.) Mez	X		NE		HRJ12330
Ocotea daphnifolia (Meisn.) Mez	X		LC		HRJ12221
Ocotea diospyrifolia (Meisn.) Mez			NE		FCAB5486
Ocotea dispersa (Nees & Mart.) Mez	X		NE		HRJ12331
Ocotea divaricata (Nees) Mez			NE		RFFP15030
Ocotea glaziovii Mez		X	NE		RFFP13451
Ocotea indecora (Schott) Mez	X		NE		HRJ12332
Ocotea odorifera (Vell.) Rohwer	X		EN		HRJ12334
Ocotea puberula (Rich.) Nees	X		NT		GUA40408
Ocotea pulchella (Nees & Mart.) Mez	X		LC		RB718523
Ocotea silvestris Vattimo-Gil	X		LC		HRJ12335
Ocotea teleiandra (Meisn.) Mez			LC		FCAB5453
Rhodostemonodaphne macrocalyx (Meisn.) Rohwer ex Madriñán	X		NE		HRJ11609
Urbanodendron bahiense (Meisn.) Rohwer			EN		HRJ12336
Lecythidaceae (3/3)					
Cariniana estrellensis (Raddi) Kuntze			NE		HRJ12337
Couratari pyramidata (Vell.) Kunth			EN	EN	HB85300
Lecythis pisonis Cambess.			NE		HRJ1233
Leguminosae (29/57)					
Abarema brachystachya (DC.) Barneby & J.W.Grimes			NE		RFFP16121
Abarema cochliacarpos (Gomes) Barneby & J.W.Grimes	X		LC		RFFP13621
Albizia pedicellaris (DC.) L.Rico	X		NE		HRJ13002
Anadenanthera colubrina (Vell.) Brenan			NE		RFFP14974
Anadenanthera peregrina (L.) Speg.	X		NE		HB96163
Andira fraxinifolia Benth.			NE		RB748871
Andira ormosioides Benth.			NE		RFFP13591
Bauhinia forficata Link	X		NE		HB96148
Bauhinia longifolia (Bong.) Steud.	X		LC		RFFP18255
Cassia ferruginea (Schrad.) Schrad. ex DC.			NE		RFFP14969
Chamaecrista ensiformis (Vell.) H.S.Irwin & Barneby		X	NE		RFFP13400
Copaifera langsdorffii Desf.	X		NE		HRJ12316
Copaifera lucens Dwyer			LC		HRJ12315
Copaifera trapezifolia Hayne			NE		RFFP18536
Dahlstedtia pinnata (Benth.) Malme			LC		RFFP12799
Erythrina speciosa Andrews			LC		RFFP11901
Hymenaea courbaril L.	X		LC		HRJ12319
Inga bullata Benth.	X		NT		RFFP12803
Inga capitata Desv.		X	NE		RFFP15011
Inga cordistipula Mart.	X		VU		HRJ11179
Inga edulis Mart.			NE		RFFP12868
Inga flagelliformis (Vell.) Mart.		X	NE		RFFP18577
Inga lanceifolia Benth.			LC		FCAB5445
Inga laurina (Sw.) Willd.	X		LC		RFFP12744

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Family (nº genera/species)/Scientific Name	NO		IUCN		Voucher
	G	R	BR	RJ	
Inga marginata Willd.			NE		RB491062
Inga maritima Benth.	X		EN		HRJ13177
Inga sellowiana Benth.			LC		RB371309
Inga sessilis (Vell.) Mart.	X		LC		HB96158
Inga striata Benth.			NE		NY413947
Inga subnuda subsp. *luschnathiana* (Benth.) T.D.Penn.			NE		RFFP16906
Inga tenuis (Vell.) Mart.			NE		FCAB5443
Inga vera subsp. *affinis* (DC.) T.D.Penn.	X		NE		RB351749
Lonchocarpus cultratus (Vell.) A.M.G.Azevedo & H.C.Lima			NE		RB418225
Mimosa bimucronata (DC.) Kuntze			NE		RFFP13480
Myrocarpus frondosus Allemão		X	LC		RFFP20328
Ormosia arborea (Vell.) Harms			LC		RB489077
Ormosia fastigiata Tul.	X		LC		HRJ12322
Piptadenia gonoacantha (Mart.) J.F.Macbr.			LC		HB96257
Platymiscium floribundum Vogel	X		NE		RB505773
Pseudopiptadenia contorta (DC.) G.P.Lewis & M.P.Lima			LC		FCAB5444
Pseudopiptadenia schumanniana (Taub.) G.P.Lewis & M.P.Lima		X	LC		RFFP19622
Pterocarpus violaceus Vogel	X		NE		RFFP12922
Schizolobium parahyba (Vell.) Blake			NE		HRJ13205
Senegalia polyphylla (DC.) Britton & Rose			NE		not collected
Senna macranthera (DC. ex Collad.) H.S.Irwin & Barneby	X		NE		RFFP19976
Senna multijuga (Rich.) H.S.Irwin & Barneby			NE		RFFP14968
Senna pendula (Humb. & Bonpl. ex Willd.) H.S.Irwin & Barneby			NE		RFFP17545
Stryphnodendron polyphyllum Mart.	X		NE		RFFP16130
Swartzia acutifolia Vogel	X		LC		FCAB7124
Swartzia flaemingii Raddi var. *flaemingii*	X		LC		RB553376
Swartzia myrtifolia Sm.			NE		HRJ12324
Swartzia oblata R.S.Cowan			LC		HRJ11716
Tachigali denudata (Vogel) Oliveira-Filho			NT		HRJ12325
Tachigali paratyensis (Vell.) H.C.Lima	X		LC		RFFP16685
Vatairea heteroptera (Allemão) Ducke			LC		HRJ12326
Zollernia glabra (Spreng.) Yakovlev			LC		HRJ13207
Zygia latifolia (L.) Fawc. & Rendle	X		NE		RFFP15388
Malpighiaceae (2/3)					
Bunchosia maritima (Vell.) J.F.Macbr.			LC		RFFP17273
Byrsonima chrysophylla Kunth	X		NE		GUA48565
Byrsonima sericea DC.			NE		RFFP3699
Malvaceae (6/9)					
Ceiba crispiflora (Kunth) Ravenna	X		EN		GUA30140
Ceiba speciosa (A.St.-Hil.) Ravenna			NE		HB85261
Eriotheca gracilipes (K.Schum.) A.Robyns	X		NE		RB491172

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Eriotheca pentaphylla (Vell.) A.Robyns		LC		HB86443
Guazuma ulmifolia Lam.	X	NE		BHCB76003
Luehea conwentzii K.Schum.	X	LC		HB85464
Luehea divaricata Mart.		NE		RFFP20330
Quararibea similis C.D.M.Ferreira & Bovini		NE		RFFP18237
Taliparitipernambucense (Arruda) Bovini		NE		RFFP3811
Melastomataceae (6/26)				
Huberia ovalifolia DC.		NE		RFFP3818
Leandra acutiflora (Naudin) Cogn.		NE		RB482272
Leandra variabilis Raddi		NE		RFFP13334
Meriania claussenii (Naudin) Triana	X	LC		RFFP14.982
Meriania glazioviana Cogn.		NE	EN	RFFP3824
Meriania longipes Triana		NE	EN	RFFP16243
Miconia albicans (Sw.) Triana		NE		RFFP13608
Miconia brasiliensis (Spreng.) Triana		LC		HRJ13125
Miconia calvescens DC.		NE		RFFP11877
Miconia cinerascens Miq.		NE		RB482222
Miconia cinnamomifolia (DC.) Naudin		NE		RB433995
Miconia cubatanensis Hoehne		LC		HRJ12345
Miconia dodecandra Cogn.		NE		RFFP13257
Miconia flammea Casar.		NE		RB482230
Miconia formosa Cogn.		LC		HRJ12627
Miconia holosericea (L.) DC.		NE		HRJ13141
Miconia ibaguensis (Bonpl.) Triana		LC		RFFP13392
Miconia latecrenata (DC.) Naudin		NE		HRJ13145
Miconia mirabilis (Aubl.) L.O.Williams		NE		HRJ11344
Miconia prasina (Sw.) DC.		NE		RFFP12755
Miconia pusilliflora (DC.) Naudin		NE		RFFP16348
Mouriri arborea Gardner		LC		HRJ12347
Mouriri doriana Saldanha ex Cogn.		EN		HRJ12348
Pleroma estrellense (Raddi) P.J.F.Guim. & Michelang.		NE		RFFP17923
Pleroma granulosum (Desr.) D.Don		NE		HRJ13169
Pleroma thereminianum (DC.) Triana		NE	EN	RFFP3770
Meliaceae (4/12)				
Cabralea canjerana (Vell.) Mart.		NE		RFFP16708
Cedrela odorata L.		VU		RFFP16703
Guarea guidonia (L.) Sleumer		NE		RFFP3720
Guarea macrophylla subsp. *tuberculata* (Vell.) T.D.Penn.		NE		RFFP14859
Trichilia casaretti C.DC.		LC		RFFP12953
Trichilia catigua A.Juss.	X	LC		not collected
Trichilia elegans A.Juss.		NE		HB87106
Trichilia hirta L.		LC		FCAB5429
Trichilia lepidota subsp. *schumanniana* (Harms) T.D.Penn.		LC		HRJ12612

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Family (nº genera/species)/Scientific Name	NO		IUCN		Voucher
	G	R	BR	RJ	
Trichilia martiana C.DC.			NE		RFFP18042
Trichilia pallida Sw.	X		NE		RB385110
Trichilia silvatica C.DC.			LC		RB701357
Monimiaceae (2/11)					
Macrotorus utriculatus (Mart.) Perkins	X		LC		RFFP12967
Mollinedia acutissima Perkins			VU	EN	RFFP16442
Mollinedia glabra (Spreng.) Perkins			LC		HRJ12352
Mollinedia heteranthera Perkins		X	NE		RFFP20331
Mollinedia lamprophylla Perkins		X	NT		RFFP20344
Mollinedia longifolia Perkins			LC		RFFP12979
Mollinedia oligantha Perkins	X		NE		RFFP11331
Mollinedia ovata Ruiz & Pav.	X		LC		RFFP17206
Mollinedia schottiana (Spreng.) Perkins			NE		RFFP18508
Mollinedia triflora (Spreng.) Tul.	X		NE		RFFP11330
Mollinedia uleana Perkins	X		NE		RB645857
Moraceae (3/12)					
Brosimum guianense (Aubl.) Huber			NE		GUA39782
Ficus adhatodifolia Schott in Spreng.			LC		RFFP11892
Ficus arpazusa Casar.			NE		RFFP13541
Ficus cyclophylla (Miq.) Miq.			NT		RB691862
Ficus eximia Schott	X		LC		HRJ11539
Ficus gomelleira Kunth			NE		RB693040
Ficus organensis (Miq.) Miq.			NE		RFFP13248
Ficus pulchella Schott			LC		HRJ 12982
Ficus trigona L.f.			NE		GUA28423
Ficus vermifuga (Miq.) Miq.			LC		RB692352
Sorocea guilleminiana Gaudich.			LC		RB693382
Sorocea hilarii Gaudich.			NE		RFFP13445
Myristicaceae (1/2)					
Virola bicuhyba (Schott ex Spreng.) Warb.			EN		HRJ12357
Virola gardneri (A.DC.) Warb.			NE		RFA31267
Myrtaceae (9/87)					
Campomanesia guaviroba (DC.) Kiaersk.			NE		HRJ11742
Campomanesia guazumifolia (Cambess.) O.Berg.	X		NE		HRJ11714
Campomanesia schlechtendaliana (O.Berg) Nied.			LC		RFFP20332
Eugenia astringens Cambess.			LC		RFFP16716
Eugenia bahiensis DC.			LC		RFFP18247
Eugenia batingabranca Sobral	X		LC		HRJ12392
Eugenia bimarginata DC.	X		LC		GUA16998
Eugenia brasiliensis Lam.			LC		RFFP12930
Eugenia bunchosiifolia Nied.			VU		HB85574

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Eugenia cerasiflora Miq.		X	LC		RFFP20333
Eugenia copacabanensis Kiaersk.	X		LC		GUA41452
Eugenia disperma Vell.			EN		RB385023
Eugenia dodonaeifolia Cambess.	X		NE		RBR32988
Eugenia expansa Spring ex Mart.	X		LC		HRJ12618
Eugenia excelsa O.Berg			LC		GUA40417
Eugenia fusca O.Berg			NE		RFFP15001
Eugenia involucrata DC.			NE		RBR32989
Eugenia longohypanthiata Giaretta			EN		RB701829
Eugenia macahensis O.Berg	X		EN		RFFP20334
Eugenia macrobracteolata Mattos	X		EN		RFFP17265
Eugenia magnibracteolata Mattos & D.Legrand	X		LC		RBR38303
Eugenia magnifica Spring ex Mart.	X		LC		GUA43917
Eugenia malacantha D.Legrand	X		VU		SPF223476
Eugenia marambaiensis M.C.Souza & M.P.Lima	X		CR	EN	RFFP18235
Eugenia monosperma Vell.			LC		FCAB5470
Eugenia mosenii (Kausel) Sobral	X		NE		RB413044
Eugenia multicostata D.Legrand	X		NE		RFFP20347
Eugenia neoglomerata Sobral			NE		HRJ12398
Eugenia neosilvestris Sobral		X	LC		RFFP20335
Eugenia pisiformis Cambess.			LC		RFFP16602
Eugenia plicata Nied.	X		NE		GUA35902
Eugenia pluriflora DC.			LC		RB368853
Eugenia prasina O.Berg			LC		RFFP19568
Eugenia pruinosa D.Legrand		X	EN		RFFP20336
Eugenia pruniformis Cambess.	X		NE		HRJ12402
Eugenia puberula Nied.	X		LC		RFFP18008
Eugenia speciosa Cambess.			NE		RFFP13308
Eugenia stigmatosa DC.			NE		RB391566
Eugenia sulcata Spring ex Mart.	X		NE		GUA40474
Eugenia tenuipedunculata Kiaersk.	X		VU		GUA45028
Eugenia zuccarinii O.Berg			LC		RFFP18057
Myrceugenia miersiana (Gardner) D.Legrand & Kausel	X		LC		RFFP16689
Myrceugenia myrcioides (Cambess.) O.Berg			LC		RFFP19395
Myrcia aethusa (O.Berg) N.Silveira	X		NE		RFFP17251
Myrcia anacardiifolia Gardner	X		LC		HRJ12409
Myrcia brasiliensis Kiaersk.			NE		RBR38302
Myrcia crocea Kiaersk.			NE		RB388777
Myrcia eugenioides Cambess.			NE		HRJ11745
Myrcia excoriata (Mart.) E.Lucas & C.E.Wilson			NE		HRJ12236
Myrcia flagellaris (D.Legrand) Sobral	X		NT		GUA38481
Myrcia fusiformis (M.L.Kawas.) A.R.Lourenço & E.Lucas			NE		RFFP3723
Myrcia glomerata (Cambess.) G.Burton & E.Lucas		X	NE		HRJ12377

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Family (nº genera/species)/Scientific Name	NO		IUCN		Voucher
	G	R	BR	RJ	
Myrcia guianensis (Aubl.) DC.		X	LC		RFFP20337
Myrcia ilheosensis Kiaersk.			NE		RFFP8338
Myrcia insigniflora M.F.Santos	X		NE		RFFP15026
Myrcia laxiflora Cambess.	X		NE		HRJ12619
Myrcia legrandii A.R.Lourenço & E.Lucas	X		LC		HRJ12381
Myrcia lonchophylla A.R.Lourenço & E.Lucas	X		NE		HRJ12379
Myrcia loranthifolia (DC.) G.P.Burton & E.Lucas			NE		HRJ12237
Myrcia martiusiana (DC.) A.R.Lourenço & E.Lucas			NE		RB298713
Myrcia multiflora (Lam.) DC.			NE		RFFP13309
Myrcia neoblanchetiana E.Lucas & Sobral			NE		RFFP13447
Myrcia neocaudata A.R.Lourenço & E.Lucas	X		DD		HRJ12376
Myrcia neolucida A.R.Lourenço & E.Lucas			NE		HB85267
Myrcia neosuaveolens E.Lucas & C.E.Wilson	X		LC		RFFP18056
Myrcia ovata Cambess.			LC		RFFP14448
Myrcia pubipetala Miq.	X		LC		RFFP19399
Myrcia racemosa (O.Berg) Kiaersk.			NE		RFFP13314
Myrcia spectabilis DC.			NE		HRJ12602
Myrcia splendens (Sw.) DC.			NE		RFFP13564
Myrcia strigipes Mart.			NE		RFFP16437
Myrcia strigosa A.R.Lourenço & E.Lucas		X	NE		RFFP18532
Myrcia subsericea A.Gray	X		LC		RFFP3855
Myrcia vellozoi Mazine		X	LC		GUA28478
Myrciaria floribunda (H.West ex Willd.) O.Berg			LC		RFFP13557
Myrciaria glomerata O.Berg			LC		HB84982
Myrciaria pumila (Gardner) O.Berg	X		NE		HRJ12417
Myrciaria tenella (DC.) O.Berg	X		DD		HRJ12418
Neomitranthes amblymitra (Burret) Mattos	X		EN		HRJ12419
Neomitranthes glomerata (D.Legrand) D.Legrand			LC		HRJ12420
Neomitranthes warmingiana (Kiaersk.) Mattos		X	LC		HRJ12421
Pimenta pseudocaryophyllus (Gomes) Landrum	X		NT		HRJ12422
Plinia edulis (Vell.) Sobral			VU		HRJ12423
Plinia peruviana (Poir.) Govaerts	X		LC		RFFP11928
Plinia rivularis (Cambess.) Rotman			NE		HRJ12424
Psidium cattleyanum Sabine			LC		RFFP13313
Psidium guineense Sw.			NE		RFFP13589
Nyctaginaceae (2/3)					
Guapira opposita (Vell.) Reitz			NE		RFFP 3800
Guapira hirsuta (Choisy) Lundell	X		LC		RB284426
Neea floribunda Poepp. & Endl.	X		NE		GUA26542
Ochnaceae (1/5)					
Ouratea cuspidata (A.St.-Hil.) Engl.			LC		RFFP13317

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Ouratea multiflora (Pohl) Engl.	X		LC	RFFP16128
Ouratea oliviformis (A.St.-Hil.) Engl.	X		LC	HB94006
Ouratea parviflora (A.DC.) Baill.	X		NE	RB198181
Ouratea vaccinioides (A.St.-Hil. & Tul.) Engl.	X		LC	HB93082
Pentaphyllacaceae (1/1)				
Ternstroemia brasiliensis Cambess.			LC	RFFP8348
Peraceae (2/2)				
Chaetocarpus myrsinites Baill.	X		NE	GUA38579
Pera glabrata (Schott) Baill.			NE	RFFP13281
Phyllanthaceae (1/1)				
Hyeronima alchorneoides Allemão			NE	HRJ11299
Petiveriaceae (1/1)				
Gallesia integrifolia (Spreng.) Harms	X		NE	HRJ11637
Picramniaceae (1/3)				
Picramnia ciliata Mart.	X		NE	HRJ12452
Picramnia gardneri Planch.			NE	RB413139
Picramnia ramiflora Planch.	X		NE	RFFP17267
Polygonaceae (1/3)				
Coccoloba alnifolia Casar.			NE	HB88250
Coccoloba glaziovii Lindau			NE	RFFP3709
Coccoloba declinata (Vell.) Mart.			NE	GUA26158
Primulaceae (1/5)				
Myrsine coriacea (Sw.) R.Br. ex Roem. & Schult.			NE	RFFP11894
Myrsine guianensis (Aubl.) Kuntze			NE	RFFP12734
Myrsine lineata (Mez) Imkhan.	X		NE	not collected
Myrsine umbellata Mart.			NE	RB354244
Myrsine venosa A.DC.	X		NE	GUA25718
Proteaceae (1/2)				
Roupala montana Aubl.		X	NE	HRJ12367
Roupala sculpta Sleumer			EN	RBR32998
Putranjivaceae (1/1)				
Drypetes sessiliflora Allemão	X		LC	HRJ12368
Quinaceae (1/1)				
Quiina glaziovii Engl.			LC	RFFP17210
Rhizophoraceae (1/1)				
Rhizophora mangle L.			NE	HRJ226
Rubiaceae (17/38)				
Alseis floribunda Schott			NE	RBR33000
Amaioua intermedia Mart. ex Schult. & Schult.f.			NE	RFFP16859
Amaioua pilosa K.Schum.	X		LC	HB96215
Bathysa gymnocarpa K.Schum.	X		LC	RBR33003
Bathysa mendoncaei K.Schum.			LC	RFFP16620
Bathysa stipulata (Vell.) C.Presl			NE	RFFP18282

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Family (nº genera/species)/Scientific Name	NO		IUCN		Voucher
	G	R	BR	RJ	
Cordiera myrciifolia (K.Schum.) C.H.Perss. & Delprete		X	NE		RFFP14868
Coussarea accedens Müll.Arg.			VU		RB390917
Coussarea meridionalis var. *porophylla* (Vell.) M.Gomes			NE		RFFP17169
Coutarea hexandra (Jacq.) K.Schum.			NE		RFA37418
Faramea hyacinthina Mart.			LC		HRJ11731
Faramea pachyantha Müll.Arg.			LC		RFFP19561
Faramea stipulacea (Cham. & Schltdl.) DC.	X		NE		RFFP12746
Faramea truncata (Vell.) Müll.Arg.	X		LC		RBR 33006
Guettarda viburnoides Cham. & Schltdl.		X	LC		RB491703
Melanopsidium nigrum Colla			VU		RFFP16600
Palicourea racemosa (Aubl.) G.Nicholson			NE		RB490069
Palicourea sessilis (Vell.) C.M.Taylor			NE		RFFP18685
Posoqueria latifolia (Rudge) Schult.			LC		RB490121
Posoqueria longiflora Aubl.			NE		RFFP18573
Psychotria carthagenensis Jacq.			LC		RB385029
Psychotria cupularis (Müll.Arg.) Standl.	X		LC		RB491706
Psychotria glaziovii Müll.Arg.	X		VU		HRJ12229
Psychotria nuda (Cham. & Schltdl.) Wawra			NE		RFFP18034
Psychotria pedunculosa Rich.		X	NE		RB491628
Psychotria pubigera Schltdl.		X	NE		RFFP16210
Randia armata (Sw.) DC.			NE		RFFP16144
Rudgea coronata (Vell.) Müll.Arg.	X		LC		RFFP13389
Rudgea interrupta Benth.			LC		HRJ11337
Rudgea jasminoides subsp. *corniculata* (Benth.) Zappi			NE		HRJ12231
Rudgea macrophylla Benth.			NT		RB490068
Rudgea minor (Cham.) Standl.	X		LC		RFFP17256
Rudgea recurva Müll.Arg.	X		LC		HRJ11605
Rudgea reticulata Benth.			LC		RFFP17255
Rustia formosa (Cham. & Schltdl.) Klotzsch			LC		RFFP18249
Rustia gracilis K.Schum.	X		EN		RFFP16464
Simira alba (Mart.) Delprete, Margalho & Groppo	X		LC		HRJ11546
Tocoyena sellowiana (Cham. & Schltdl.) K.Schum.	X		LC		HRJ12200
Rutaceae (7/11)					
Conchocarpus macrocarpus (Engl.) Kallunki & Pirani	X		NE		HRJ12373
Conchocarpus ruber (A.St.-Hil.) Bruniera & Groppo	X		NE		RFFP15017
Dictyoloma vandellianum A.Juss.			NE		RFFP17754
Esenbeckia grandiflora Mart.	X		NE		HRJ13187
Galipea jasminiflora (A.St.-Hil.) Engl.	X		NE		RFFP18571
Galipea laxiflora Engl.	X		LC		RFFP19390
Neoraputia alba (Nees & Mart.) Emmerich ex Kallunki		X	NE		RFFP20340
Neoraputia magnifica (Engl.) Emmerich ex Kallunki	X		NE		RFFP 16337

Continue...

...Continuation

Pilocarpus giganteus Engl.	X		NT	RFFP16467
Pilocarpus spicatus A.St.-Hil.			NE	RB347076
Zanthoxylum rhoifolium Lam.			NE	RBR33013
Sabiaceae (1/1)				
Meliosma sellowii Urb.	X		NE	HRJ12369
Salicaceae (2/6)				
Casearia commersoniana Cambess.			NE	RFFP13352
Casearia decandra Jacq.			NE	FCAB7698
Casearia obliqua Spreng.		X	LC	RFFP20341
Casearia pauciflora Cambess.			LC	RFFP14981
Casearia sylvestris Sw.			NE	RFFP17733
Xylosma glaberrima Sleumer			NT	P4734754
Sapindaceae (5/13)				
Allophylus leucoclados Radlk.			LC	RFFP14429
Allophylus petiolulatus Radlk.			NE	RFFP3805
Allophylus racemosus Sw.			NE	RB723997
Cupania concolor Radlk.			NT	HB93807
Cupania emarginata Cambess.			NE	RFFP13370
Cupania furfuracea Radlk.			NT	HB96177
Cupania oblongifolia Mart.			NE	RFFP16683
Cupania racemosa (Vell.) Radlk.			LC	HRJ11309
Matayba grandis Radlk.			LC	GUA29342
Matayba intermedia Radlk.			NE	RB413958
Matayba talisioides Radlk			DD	R229705
Sapindus saponaria L.			NE	HB93999
Tripterodendron filicifolium Radlk.			LC	RFFP18052
Sapotaceae (6/13)				
Chrysophyllum flexuosum Mart.			LC	RFFP18511
Chrysophyllum splendens Spreng.			NT	HB85195
Ecclinusa ramiflora Mart.			NE	RFA 31279
Manilkara subsericea (Mart.) Dubard			LC	RFA37290
Micropholis crassipedicellata (Mart. & Eichler) Pierre			LC	RFA 31265
Micropholis gardneriana (A.DC.) Pierre		X	NE	HRJ11717
Pouteria bangii (Rusby) T.D.Penn.	X		NE	RFFP20346
Pouteria beaurepairei (Glaz. & Raunk.) Baehni	X		LC	RB489237
Pouteria caimito (Ruiz & Pav.) Radlk.		X	NE	HRJ12468
Pouteria coriacea (Pierre) Pierre	X		NE	RFFP12820
Pouteria durlandii (Standl.) Baehni		X	NE	HRJ12469
Pouteria gardneri (Mart. & Miq.) Baehni	X		NE	RB413968
Pradosia kuhlmannii Toledo			EN	HRJ11413
Schoepfiaceae (1/1)				
Schoepfia brasiliensis A.DC.			NE	GUA30106
Simaroubaceae (1/1)				
Homalolepis floribunda (A.St.-Hil.) Devecchi & Pirani		X	CR	RFFP20342

Continue...

...Continuation

Family (nº genera/species)/Scientific Name	NO		IUCN		Voucher
	G	R	BR	RJ	
Symplocaceae (1/1)					
Symplocos laxiflora Benth.		X	NE		RFFP20343
Siparunaceae (1/2)					
Siparuna brasiliensis (Spreng.) A.DC.			LC		RFFP11912
Siparuna guianensis Aubl.			NE		RFFP12887
Solanaceae (2/8)					
Cestrum axillare Vell.			NE		HB87444
Cestrum schlechtendalii G.Don		X	NE		RFFP17165
Solanum carautae Carvalho			NT		RB671567
Solanum castaneum Carvalho			LC		RFFP3798
Solanum mauritianum Scop.	X		NE		RB186794
Solanum melissarum Bohs	X		LC		RB346712
Solanum pseudoquina A.St.-Hil.			LC		RFFP13403
Solanum swartzianum Roem. & Schult.			NE		RFFP3796
Strombosiaceae (1/1)					
Tetrastylidium grandifolium (Baill.) Sleumer		X	LC		HRJ12363
Thymelaeaceae (2/3)					
Daphnopsis martii Meisn.			LC		RFFP14432
Daphnopsis racemosa Griseb.	X		NE		MO100318668
Funifera brasiliensis (Raddi) Mansf.	X		VU		RFFP12981
Urticaceae (2/4)					
Cecropia glaziovii Snethl.			LC		RFFP14492
Cecropia pachystachya Trécul			NE		HB88898
Coussapoa curranii S.F.Blake			EN		HRJ13007
Coussapoa microcarpa (Schott) Rizzini			NE		HB85311
Verbenaceae (1/1)					
Citharexylum myrianthum Cham.			NE		RBR33020
Violaceae (1/1)					
Amphirrhox longifolia (A.St.-Hil.) Spreng.			NE		RFFP12995
Vochysiaceae (2/6)					
Qualea cryptantha (Spreng.) Warm.			LC		GUA46649
Qualea glaziovii Warm.			LC		HRJ12477
Vochysia bifalcata Warm.			LC		RFFP20254
Vochysia laurifolia Warm.		X	LC		RB685396
Vochysia oppugnata (Vell.) Warm.	X		LC		HRJ12479
Vochysia saldanhana Warm.			NT		RBR33022
Ximeniaceae (1/1)					
Ximenia americana L.	X		NE		RFFP12818

Categories – VU: Vulnerable; EN: Endangered; CR: Critically Endangered; NE: Not Evaluated; LC: Least Concern; NT: Near Threatened; DD: Data Deficient.

(14), Sapindaceae and Sapotaceae (13 species each), Meliaceae and Moraceae (12 species each), Monimiaceae and Rutaceae (11 species each), totaling 67% of the inventoried species (Figure 3). The other 61 families had less than 10 species, with 25 families represented by a single species. Due to their richness, the genera *Eugenia* (38 species), *Myrcia* (31), *Inga* and *Miconia* (15 species each), *Ocotea* (12), *Mollinedia* (10), *Ficus* (9), *Trichilia* (8), *Monteverdia* and *Rudgea* (7 species each) stood out, making up 30% of the total species (Figure 4). Of the total inventoried, 207 species (41%) are new occurrences for Ilha Grande, with 54 (11%) sampled in the permanent plots of the PPBio (Table 1).

Of the 509 inventoried species, 471 (93%) occur in the Rainforest, 87 (17%) in Restinga environments and only 49 (10%) are present in both (Figure 5). Regarding ecological groups, 188 (37%) are late secondary, 143 (28%) from early stages (20 pioneers [4%] and 123 early secondary [24%]) and 178 (35%) remain unclassified. The Jaccard similarity index between the arboreal flora of Ilha Grande and the APA de Cairuçu was 0.39 and between the former and the APA de Mangaratiba/Parque Estadual Cunhambebe, 0.38. More than half of the tree species on Ilha Grande are shared with the APA de Cairuçu (53%) and the APA de Mangaratiba/Parque Estadual Cunhambebe (53%).

2. *Species of conservation interest*

Regarding to conservation status at the national level, 34 species were categorized as threatened, with two critically endangered, 18 endangered and 14 vulnerable. The others are distributed in the categories data deficient (3 species), near threatened (16 species), of least concern (184 species) and not evaluated (272 species) (Table 1). *Eugenia marambaiensis* and *Homalolepis floribunda* were categorized as critically endangered. Among those categorized as endangered, *Ocotea odorifera*, *Inga maritima*, *Couratari pyramidata*, *Ceiba crispiflora*, *Virola bicuhyba* and *Pradosia kuhlmannii* can be cited. In the vulnerable category, *Euterpe edulis*, *Algernonia brasiliensis*, *Cedrela*

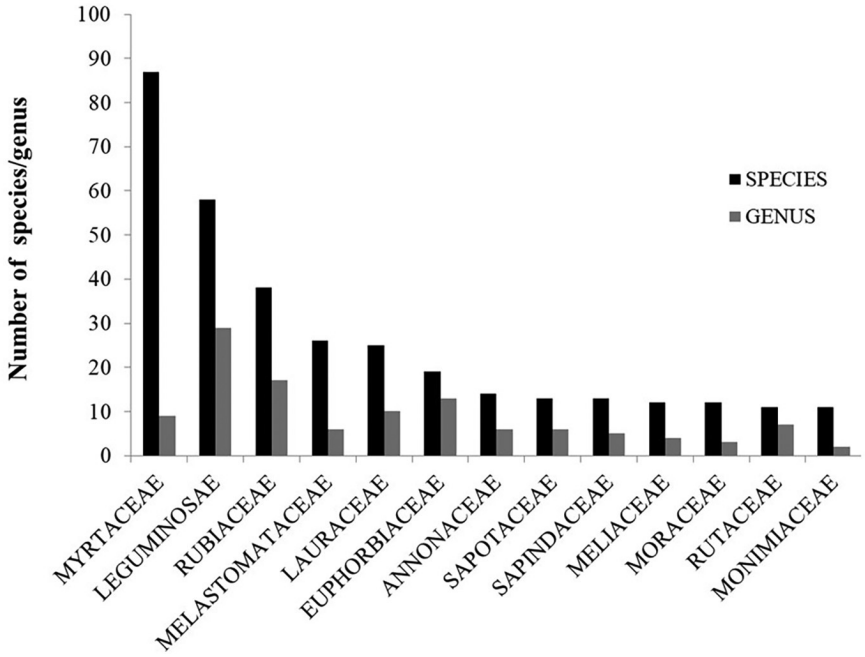

Figure 3. Angiosperm families with the highest tree species richness in Ilha Grande, Angra dos Reis, RJ, Brazil.

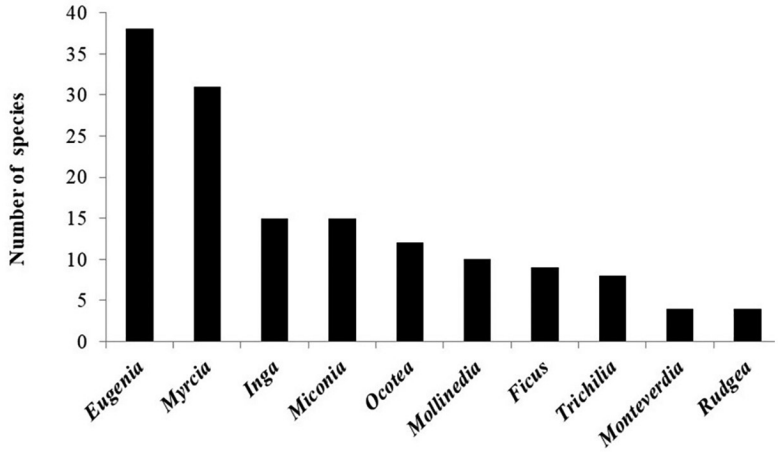

Figure 4. Angiosperm genera with the highest tree species richness in Ilha Grande, Angra dos Reis, RJ, Brazil.

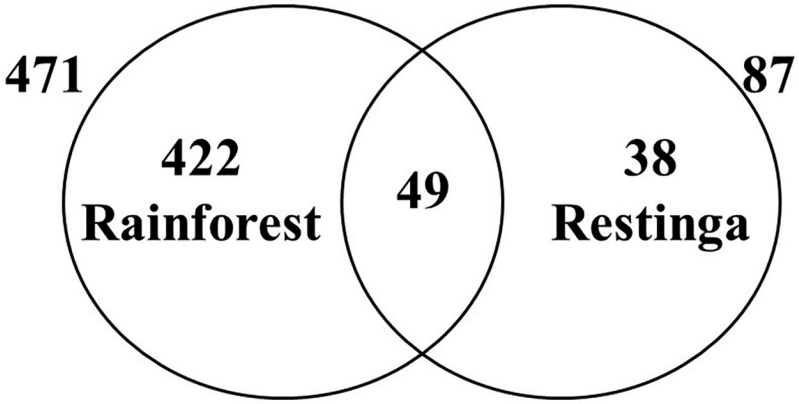

Figure 5. Sharing of tree Angiosperm species between the Rainforest and the pioneer formations of Restinga da Ilha Grande, Angra dos Reis, RJ, Brazil.

odorata, *Eugenia bunchosiifolia*, *Plinia edulis* and *Melanopsidium nigrum*, among others, were classified.

Among the endemic species of the state of Rio de Janeiro, eight were categorized with some degree of threat: *Eugenia marambaiensis*, critically endangered; *Mollinedia acutissima*, vulnerable; and in the endangered category, *Beilschmiedia angustifolia*, *Couratari pyramidata*, *Duguetia pohliana*, *Meriania glazioviana*, *Meriania longipes* and *Pleroma thereminianum* (Table 1). For the species *Eugenia marambaiensis, Mollinedia acutissima*, *Beilschmiedia angustifolia*, *Couratari pyramidata* and *Duguetia pohliana*, Ilha Grande represents a new place of occurrence.

3. *Exotic and invasive tree species*

Fifty-three exotic tree species were inventoried on Ilha Grande, two of which were Gymnosperms (*Araucaria angustifolia* and *Araucaria columnaris*). The others are Angiosperms belonging to 26 families and 41 genera (Table 2). Most of them originate in Asia and are basically fruit trees, such as *Artocarpus altilis*, *Carica papaya*, *Citrus limon*, *Cocos nucifera*, *Eriobotrya japonica*, *Mangifera indica* and *Persea americana*, among others. Some were or are being cultivated for ornamental purposes, windbreaks, shading or even constitute species commonly used in urban afforestation and include *Couroupita guianensis*, *Ficus elastica*, *Melia azedarach*, *Moquilea tomentosa* and *Pachira aquatica*.

Carapa guianensis, *Clitoria fairchildiana*, *Couroupita guianensis*, *Libidibia ferrea*, *Mimosa caesalpiniifolia*, *Moquilea tomentosa*, *Pachira aquatica*, *Peltophorum dubium*, *Spondias mombin* and *Sterculia apetala*, although native to Brazil, were brought from other parts of the state of Rio de Janeiro or the country and cultivated with different purposes. Others, such as eucalyptus (*Eucalyptus grandis* and *Eucalyptus tereticornis*), may have been used in constructions from the prison period on Ilha Grande. *Albizia lebbeck*, *Clitoria fairchildiana* and *Mimosa caesalpiniifolia* date back to ancient reforestation practices using non-native species. Common on the edge of streets and roads, they do not depend on management for their reproduction.

The greatest occurrence of exotic species is at the ends of the trails, close to the villages, in the stretches where there were old dwellings, in the forks and parts of the trails that cross the villages. The settlements on Ilha Grande are located by the sea, on coastal plains, largely due to the rugged relief, with only a few lowland areas.

DISCUSSION

1. *Floristic analysis*

The observed results corroborate the species richness of Euphorbiaceae, Lauraceae, Leguminosae, Melastomataceae, Myrtaceae and Rubiaceae, families indicated among the most diverse in the Atlantic Forest and among the ten with the greatest richness among Angiosperms in Brazil (BFG 2015). The prominence presented by these families was also observed in studies of the structure and composition of different stretches of Atlantic Forest in the state of Rio de Janeiro (e.g., Kurtz & Araujo 2000, Barros 2008, Machado 2018, Pessoa & Araujo 2020) and in investigations of the flora of Área de Proteção Ambiental de Mangaratiba/Parque Estadual Cunhambebe (Maurenza et al. 2018) and Área de Proteção Ambiental de Cairuçu (Marques et al. 1997). The genera *Eugenia* and *Myrcia*, highlighted in this study, are also identified as the most diverse in the country (BFG 2015). The results obtained here for other families and genera and found in the aforementioned studies suggest the presence of similar floristic patterns.

The presence of widely distributed species in different formations of the Southeast Atlantic Forest (Oliveira-Filho & Fontes 2000), such as: *Alchornea glandulosa*, *Alchornea triplinervia*, *Andira fraxinifolia*, *Cabralea canjerana*, *Cariniana estrellensis*, *Casearea sylvestris*, *Cordia sellowiana*, *Endlicheria paniculata*, *Guapira opposita*, *Guarea guidonia*, *Hymenaea courbaril*, *Nectandra oppositifolia*, *Pera glabrata*, *Piptadenia gonoacantha* and *Tapirira guianensis*, reinforces the existence of similarity in floristic patterns of the tree component. The floristic similarity (Jaccard > 0.25, or 25%, *sensu* Mueller-Dombois & Ellenberg 1974) of Ilha Grande with the APA de Cairuçu and APA de Mangaratiba/Parque Estadual Cunhambebe is, most likely, related to geographic proximity and similar physiographic conditions and occupation history.

In natural environments, species richness is closely related to the variety of environments and the size of the area of occurrence. This variety provides different environmental characteristics and its size provides the necessary home range for each species. In this sense, the richness of tree species observed in this study and of flora in general (Callado et al. 2009, Vianna Filho et al. 2020) is most likely due to the fact that Ilha Grande presents distinct altitudinal bands and, in these, different formations, sometimes in different successional stages of regeneration. The addition of another 207 species to the previously

Table 2. Floristic list of exotic tree species inventoried in Ilha Grande, Angra dos Reis, state of Rio de Janeiro, Brazil, with indications of vernacular name, use and continent of origin.

Family (nº genera/species)/Scientific Name	Vernacular Name	Use	Origin
ANGIOSPERMS			
Adoxaceae (1/1)			
Sambucus nigra L.	sabugueiro	Me	Europe
Anacardiaceae (2/2)			
Mangifera indica L.	mangueira	A	Asia
Spondias mombin L.	cajazeiro	A	Brazil
Annonaceae (1/1)			
Annona muricata L.	gravioleira	A,Me	America
Arecaceae (4/6)			
Cocos nucifera L.	coqueiro	A,O	Asia
Dypsis lutescens (H.Wendl.) Beentje & J.Dransf.	palmeira-areca	O	Africa
Livistona chinensis (Jacq.) R.Br. ex Mart.	palmeira-leque	O	Asia
Roystonea borinquena O.F.Cook.	palmeira-imperial-de-porto-rico	O	America
Roystonea oleracea (Jacq.) O.F.Cook	palmeira-imperial	O	America
Roystonea regia (Kunth) O.F.Cook.	palmeira-imperial-de-cuba	O	America
Bignoniaceae (1/1)			
Spathodea campanulata P.Beauv.	espatódea, tulipeira	O	Africa
Caricaceae (1/1)			
Carica papaya L.	mamoeiro	A	America
Casuarinaceae (1/1)			
Casuarina equisetifolia L.	casuarina	O,Q	Asia
Chrysobalaceae (1/1)			
Moquilea tomentosa Benth.	oitizeiro	O	Brazil
Combretaceae (1/1)			
Terminalia catappa L.	amendoeira	S	Africa, Asia
Ebenaceae (1/1)			
Diospyros kaki L.f.	caquizeiro	A	Asia
Lamiaceae (1/1)			
Clerodendrum quadriloculare (Blanco) Merr.	flor-cotonete	O	Asia/Oceania
Lauraceae (2/2)			
Laurus nobilis L.	louro	A,Me	Asia/Europe
Persea americana Mill.	abacateiro	A	America
Lecythidaceae (1/1)			
Couroupita guianensis Aubl.	abricó-de-macaco	O	Brazil
Leguminosae (6/6)			
Albizia lebbeck (L.) Benth.	língua-de-sogra	R,S	Asia
Clitoria fairchildiana R.A.Howard	sombreiro	O,S	Brazil
Delonix regia (Bojer ex Hook.) Raf.	flamboyant	O,S	Africa
Mimosa caesalpiniifolia Benth.	sabiá	O,Cv,R	Brazil
Libidibia ferrea (Mart. ex Tul.) L.P.Queiroz	pau-ferro	O	Brazil
Peltophorum dubium (Spreng.) Taub.	canafístula	O	Brazil

Continue...

...Continuation

Family (nº genera/species)/Scientific Name	Vernacular Name	Use	Origin
Lythraceae (1/1)			
Punica granatum L.	romãzeira	Me	Asia
Malvaceae (2/2)			
Pachira aquatica Aubl.	munguba	O	Brazil
Sterculia apetala (Jacq.) H.Karst.	chichá	O	Brazil
Meliaceae (2/2)			
Carapa guianensis Aubl.	andiroba	Me	Brazil
Melia azedarach L.	melia	O	Asia
Moraceae (2/5)			
Artocarpus altilis (Parkinson) Fosberg	fruta-pão	A	Asia
Artocarpus integer (Thunb.) Merr.	champedaque	A	Asia
Artocarpus heterophyllus Lam.	jaqueira	A	Asia
Ficus elastica Roxb.	figueira-da-borracha	O	Asia
Ficus microcarpa L.f.	figueira-asiática	O	Asia
Myristicaceae (1/1)			
Myristica fragrans Houtt.	noz-moscada	A,Me	Asia
Myrtaceae (3/6)			
Eucalyptus grandis W.Hill ex Maiden	eucalipto	Ma	Oceania
Eucalyptus tereticornis Sm.	eucalipto	Ma	Oceania
Psidium guajava L.	goiabeira	A	America
Syzygium aromaticum (L.) Merr. & L.M.Perry	cravo-da-Índia	A,Me	Asia, Oceania
Syzygium cumini (L.) Skeels	jamelão	A	Asia
Syzygium malaccense (L.) Merr. & L.M.Perry	jambeiro-vermelho	A	Asia
Oxalidaceae (1/1)			
Averrhoa carambola L.	caramboleira	A,Me	Asia
Peraceae (1/1)			
Chaetocarpus echinocarpus (Baill.) Ducke	pitoma-de-espinho	O	Brazil
Rosaceae (1/1)			
Eriobotrya japonica (Thunb.) Lindl.	nespereira, ameixa-amarela	A	Asia
Rubiaceae (1/1)			
Coffea arabica L.	cafeeiro	A	Africa
Rutaceae (1/3)			
Citrus limon (L.) Osbeck	limoeiro	A,Me	Asia
Citrus reticulata Blanco	tangerineira	A,Me	Asia
Citrus sinensis (L.) Osbeck	laranjeira	A,Me	Asia
Sapotaceae (1/1)			
Mimusops coriacea (A.DC.) Miq.	abricó-da-praia	A,O	Africa
GIMNOSPERMS			
Araucariaceae (1/2)			
Araucaria angustifolia (Bertol.) Kuntze	pinheiro-do-Paraná	A,O	Brazil
Araucaria columnaris (J.R.Forst.) Hook.	pinheiro-de-Natal	O	Oceania

Use: A = food, Cv = hedge, O = ornamentation, Ma = timber, Me = medicinal, Q = windbreak, R = reforestation and S = shading.

known list demonstrates the existence of collection gaps, even in an area with a history of botanical investigations (Araujo & Oliveira 1988, Araujo 2000, Oliveira 2002, Lobão et al. 2005, Callado et al. 2009, Pederneiras et al. 2011a, 2011b, 2012, Rosa 2013, 2017, Santo 2016, Ferreira et al. 2018, Lopes et al. 2019, Vianna Filho et al. 2020), while reinforcing the importance of the PPBio Mata Atlântica in increasing the floristic knowledge of Ilha Grande.

The result for the distribution of species in the different plant formations reflects the spatial predominance of the Rainforest formation in the island's landscape, despite the structural and floristic transformations that occurred as a result of the occupation history (Prado 2003, Ribeiro et al. 2009). It is not uncommon to find remnants of old farms and houses, traces of caiçara plantations (i.e., subsistence plantations developed by indigenous populations that inhabit the coastline of Southeastern Brazil) and activities associated with the prison period, as evidence of past occupations (Oliveira & Coelho Netto 1996, Santiago et al. 2009). In the Restinga environment, considered a marginal or peripheral habitat by Scarano (2002), environmental filters such as high atmospheric temperature, salinity effect, water and nutritional deficiency in the soil are limiting factors for plant development, especially for tree species. This vegetation formation is restricted to small areas in the coves of Ilha Grande, except for Reserva Biológica da Praia do Sul and Praia de Lopes Mendes; the latter the vegetation is significantly altered due to anthropic actions.

The long history of use by human populations has significantly influenced the current floristic composition of Ilha Grande. Among the historical uses, two stand out, from the 18th century onwards: the farms for the production of coffee and brandy and the caiçara plantations. The latter, made in the slash-and-burn model, achieved a virtual omnipresence on Ilha Grande, as evidenced by ruins of old dwellings in various parts of the territory of Ilha Grande (Oliveira & Fernandez, 2016). In addition to these vestiges of material culture, long-lived pioneer species (e.g., *Guarea guidonia*, *Miconia cinnamomifolia* and *Schizolobium parahyba*) also contribute to the spatialization of old plantations (Delamonica et al. 2002, Callado & Guimarães 2010, Oliveira et al. 2013) and can be identified as indicators of the history of human intervention on the forested environment of Ilha Grande. These long-cycle pioneer species also play an important ecological role in the remaining secondary forests, as they allow forest regeneration under their canopies, favoring typical associations of early and late secondary species (Oliveira 2002).

The results found for the distribution of species by ecological group, suggest a balance between early and late-stage species, reinforcing the affirmation of the vegetation cover of Ilha Grande as a vegetation mosaic resulting from natural disturbances and/or caused by anthropic action. Although part of the species has not been classified into ecological groups, the results suggest that forest vegetation is in an average to advanced stage of regeneration. The regeneration of a forest generally moves towards a greater complexity of forms, directly influenced by the type of disturbance and time arising from the disturbance. The existence of shaded environments expands the possibility of establishing late-stage species, which are more common in forests in advanced stage. Temporal changes typical of the dynamic process of the community, such as the gap, construction and mature phases (Swaine & Whitmore 1988) intervene in the success of species recruitment, and small glades may have more late secondary species than early secondary and pioneer species (Tabarelli & Mantovani 1997). Although the classification of species into ecological groups may be questionable, as several species can survive and grow under relatively wide gradients of light intensity, this classification has proved to be a useful tool in the evaluation of the regeneration process and the maintenance of species diversity in tropical forests (Tabarelli & Mantovani 1999).

2. Species of conservation interest

In the state of Rio de Janeiro, as in other coastal states, large extensions of the original natural territory were suppressed by human occupation (Fundação SOS Mata Atlântica & INPE 2021). Among the main risk factors for species, habitat loss and degradation, as well as competition with exotic species and over-exploitation by humans, are identified as preponderant in the assessment of the conservation status of species (Martinelli & Moraes 2013, Martinelli et al. 2018). Among the endangered, *Inga maritima*, endemic to the restingas of the state of Rio de Janeiro, is threatened precisely due to the fragmentation of these areas (e.g., Rocha et al. 2007). *Euterpe edulis*, classified as vulnerable, has been subject to intense extractivism for use in food (Leitman et al. 2013). *Ocotea odorifera*, *Pradosia kuhlmannii* and *Virola bicuhyba*, categorized as endangered, are recorded in different state protected areas, but with greatly reduced populations due to logging over time. In Ilha Grande, there are examples of species with wide local use, exploited for use as firewood, boards, beams, rafters and slats (Santiago et al. 2009, Santos 2009, Ribas 2015, Mendes 2017).

For endemic and threatened species in the state of Rio de Janeiro, the increase in field expeditions and the identification of samples deposited in herbariums have expanded the distribution of some, such as *Couratari pyramidata*, known for the municipalities of Cachoeiras de Macacu, Guapimirim, Maricá, Niterói, Paraty and Rio de Janeiro (Ribeiro et al. 2018), and now registered in Ilha Grande. *Eugenia marambaiensis*, also collected on Ilha Grande, was considered endemic to Restinga de Marambaia (Souza & Morim 2008) and later collections identified it in Morro do Telégrafo, municipality of Niterói (Barros 2008). *Pleroma thereminianum,* known only from collections from Angra dos Reis, Mangaratiba, Paraty and Rio Claro, occurs on Ilha Grande, but with few populations (Rosa 2017, Baumgratz et al. 2018). These results reinforce the importance of intensifying collections, even in places with a long history of field research.

3. Exotic and invasive tree species

Different historical moments of occupation and use of natural resources contributed, directly or indirectly, to the movement of translocation of exotic species to Ilha Grande (Barros et al. 2022). Phytosociological studies (Caires 2015, Mendes 2017) inventoried forest remnants in this locality, suggesting that there are no "untouched" forests and that the regenerating forest retains the marks of this historical presence in its structure and composition (Oliveira 2015). However, some species are dispersing beyond the original point where they were initially cultivated, as is the case of the imperial palm (*Roystonea oleracea*) (Zucaratto et al. 2020) and jackfruit tree (*Artocarpus heterophyllus*) (Caires 2015, Bergallo et al. 2016).

Roystonea oleracea is an imposing palm that has been cultivated as an ornamental in many parts of the world (Lorenzi et al. 2004). Its dissemination in Brazil is associated with historical issues involving the Portuguese imperial family and its introduction as an ornamental tree, especially in old coffee farms. Once the species has reached the final stage

of invasion on Ilha Grande, eradication or control measures are urgently required (Zucaratto et al. 2020). Rodrigues (2021) showed, however, based on anatomical characteristics, that part of the individuals on Ilha Grande does not correspond only to *Roystonea oleracea*, but to two other very similar species, *Roystonea brinquena* and *Roystonea regia*.

The jackfruit tree is the exotic tree with the highest number of studies on Ilha Grande (Raíces et al. 2008, 2017, Mello et al. 2015, Bergallo et al. 2016). The evaluation of the presence of exotic plants in certain trails (Ribas et al. 2010, Caires 2015, Bergallo et al. 2016) points to jackfruit tree in more than half of them. However, two trails, Freguesia de Santana – Bananal and Vila Dois Rios – Caxadaço, stand out for their density much higher than all the others, possibly because they are paths that gave access to old farms (Bergallo et al. 2016), in which jackfruit served as food for enslaved Africans (Ribas et al. 2010).

The invasive character of jackfruit tree constitutes a serious environmental problem, as its expansion is facilitated by the lack of predators and by the allelopathic effects on the germination of native species (Pereira & Kaplan 2013). Research carried out on Ilha Grande shows that such behavior has negatively influenced the process of natural restoration of the forest, since some species of small mammals are helping to expand the distribution area of this species to the detriment of native plants that could also compose its diet. In addition, it leads to a decrease in populations of animals that do not consume its fruits, favoring those that use this resource (Raíces et al. 2017). However, jackfruit can be understood as a biocultural species (Sousa, 2014), since its use on Ilha Grande, in the ethnobotanical context, goes beyond food. Wood was used in the construction of houses and canoes and is also considered ritualistic for some African peoples who practice the phytolatry of worshiping deities in the tree itself, which dates back to the period of slavery (Caires 2015).

The effects of introducing invasive exotic species are disproportionately greater in island environments. Species native to islands generally have small populations and limited distribution, making them more vulnerable to invasive exotic species than those from mainland areas (Vitousek 1997). Thus, the concern with the presence of exotic species is greater, as the islands harbor a peculiar biological diversity, due to their geographic isolation and the richness of occurring endemic species (Dechoum et al. 2018, Rocha 2018). In the case of Ilha Grande, the proximity to the mainland does not actually represent significant geographic isolation, but biological invasion is an environmental threat factor that cannot be neglected. The use of such species for the most diverse purposes devalues the local biological diversity, mischaracterizing the native floristic composition and favoring the development of a culture increasingly distant from the surrounding natural environment (Leão et al. 2011).

The results presented here reinforce the importance of these inventories as indispensable tools for the construction of strategies and actions for conservation, restoration and management of diversity in the context of the Atlantic Forest. At the same time, they also demonstrate that, despite adverse factors caused by changes aroused by human, the creation of conservation units on Ilha Grande was decisive in mitigating the loss of natural vegetation. By inhibiting threats, such as selective logging or the introduction of invasive species, conservation units help to reduce the loss and/or extinction of species. In addition, the flora studied can also be considered as a repository of stories of the man/nature relationship on Ilha Grande. Other coastal islands in Southeast Brazil, such as Ilha Anchieta (Guillaumon et al. 1989), Ilha de São Sebastião (Leonel 2015) and Ilha do Cardoso (Barros et al. 1991), currently with their territories partially or fully protected by conservation units, experienced occupation histories very similar to Ilha Grande and also keep this man/nature relationship.

Associated with flora inventory surveys, the creation of PaB – Parque Botânico do Ecomuseu Ilha Grande (Botanical Park of the Ilha Grande Ecomuseu), in 2015, constitutes an effective action for the conservation of local biodiversity, in view of its contribution to *ex situ* and *in situ* conservation, mainly of rare, endangered or even locally extinct species (Callado et al. 2020). At PaB, the "Vila Dois Rios Exotic Plants Circuit" was created. Based on interviews with visitors, it was observed that, even not knowing the term "exotic plants" and the environmental impacts, after the interviewers explained the topic, most visitors responded that they considered this knowledge and its unfolding important for the conservation of native insular flora (Moreira et al. 2021).

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Conflicts of Interest

The authors declare they have no conflicts of interest related to the publication of this manuscript.

Ethics

The manuscript is an original and unpublished contribution and is not being evaluated for publication by any other journal and follows the appropriate guidelines established by the ethics committees.

Data Availability

Supporting data are available at <https://ipt.sibbr.gov.br/sibbr/manage/resource?r=uerj_ilhagrande_01>.

References

ALHO, C.J.R., SCHNEIDER, M. & VASCONCELLOS, L.A. 2002. Degree of threat to the biological diversity in the Ilha Grande State Park (RJ) and guidelines for conservation. Brazilian Journal of Biology 62(3):375-385.

APG IV. 2016. An update of the Angiosperm Phylogeny Group classification for the orders and families of flowering plants: APG IV. Botanical Journal of the Linnean Society 181:1-20.

ARAUJO, D.S.D. 2000. Análise florística e fitogeográfica das restingas do estado do Rio de Janeiro. Tese de doutorado, Universidade Federal do Rio de Janeiro, Rio de Janeiro.

ARAUJO, D.S.D. & OLIVEIRA, R.R. 1988. Reserva Biológica Estadual da Praia do Sul (Ilha Grande, Estado do Rio de Janeiro): lista preliminar da flora. Acta Botanica Brasilica (1(2, suppl.1):83-94.

ASHTON, P.S. 1992. Species richness in plant communities. In Conservation biology: the theory and practice of nature conservation, preservation, and management (P.L. Fiedler & S.K Jain, ed.). Chapman and Hall, New York, p.3-22.

BARROS, A.A.M. 2008. Análise florística e estrutural do Parque Estadual da Serra da Tiririca, Niterói e Maricá, RJ, Brasil. Tese de doutorado, Instituto de Pesquisas Jardim Botânico do Rio de Janeiro, Rio de Janeiro.

BARROS, A.A.M., RIBAS, L.A. & MACHADO, D.N.S. 2022. Exóticas no paraíso: translocações de plantas e conservação da biodiversidade na Ilha Grande, RJ. Revista Ineana (Edição Especial Ilha Grande – biodiversidade e conservação):38-57.

BARROS, F., MELO, M.M.R.F., CHIEA, S.A.C., KIRIZAWA, M., WANDERLEY, M.G.L. & JUNG-MENDAÇOLLI, S.L. 1991. Caracterização geral da vegetação e listagem das espécies ocorrentes. In Flora fanerogâmica da Ilha do Cardoso (M.M.R.F. Melo, F. Barros, M.G.L. Wanderley, M. Kirizawa, S.L. Jung-Mendaçolli & S.A.C. Chiea, ed.). Instituto de Botânica, São Paulo, v.1, p.1-184.

BAUMGRATZ, J.F., GONÇALVES, K.C.S., ROSA, P., SANTOS FILHO, L., NEGRÃO, R., AMARO, R., MESSINA, T., MORAES, M., WIMMER, F., MARGON, H., AVANCINI, R., NOVAES, L., AMORIM, T., BRAGA, R. & MENEZES, V. 2018. Melastomataceae. In Livro vermelho da flora endêmica do Estado do Rio de Janeiro (G. Martinelli, E. Martins, M. Moraes, R. Loyola & R. Amaro, org.). Jardim Botânico do Rio de Janeiro, Secretaria de Estado do Ambiente, Andrea Jakobsson Estúdio, Rio de Janeiro, p.317-340.

BERGALLO, H.G., BERGALLO, A.C., ROCHA, H.B. & ROCHA, C.F.D. 2016. Invasion by *Artocarpus heterophyllus* (Moraceae) in an island in the Atlantic Forest Biome, Brazil: distribution at the landscape level, density and need for control. Journal of Coastal Conservation 20(3):191-198.

BFG. 2015. Growing knowledge: an overview of seed plant diversity in Brazil. Rodriguésia 66(4): 1085-1113.

CAIRES, L.R. 2015. Resultantes ecológicas na composição estrutural e florística como consequência dos processos interativos homem-floresta na mata do Caxadaço, Ilha Grande, Angra dos Reis, RJ, Brasil. Monografia de graduação, Universidade do Estado do Rio de Janeiro, São Gonçalo.

CAIRES, L.R. 2021. Guia ilustrado de árvores em parcelas permanentes, Ilha Grande, RJ, Brasil: Parcela Estrada. Dissertação de mestrado, Instituto de Pesquisas Jardim Botânico do Rio de Janeiro, Rio de Janeiro.

CALLADO, C.H., BARROS, A.A.M., RIBAS, L.A., ALBARELLO, N., GAGLIARDI, R. & JASCONE, C.E.S. 2009. Flora e cobertura vegetal. In O ambiente da Ilha Grande (M. Bastos & C.H. Callado, org.). UERJ, CEADS, Rio de Janeiro, p.91-162.

CALLADO, C.H. & GUIMARÃES, R.C. 2010. Estudo dos anéis de crescimento de *Schizolobium parahyba* (Leguminosae: Caesalpinioideae) após episódio de mortalidade em Ilha Grande, Rio de Janeiro. Brazilian Journal of Botany 33(1):85-91.

CALLADO, C.H., MOREIRA, N.S., CASTILHORI, M.F., REIS, R.C.C. & MANÃO, C.Y.G. 2020. Parque Botânico do Ecomuseu Ilha Grande no patrimônio cultural e de biodiversidade da Unesco. Revista Paubrasilia 3(1): 46-55.

CARDINALE, B.J. et al. 2012. Biodiversity loss and its impact on humanity. Nature 486:59-67.

CARVALHO, A.L.; ARAÚJO, A.F.B. & SILVA, H.R. 2007. Lagartos da Marambaia, um remanescente insular de Restinga e Floresta Atlântica no estado do Rio de Janeiro, Brasil. Biota Neotropica 7(2): 221-226.

COELHO, A.J.P., MAGNAGO, L.F.S., MATOS, F.A.R., MOTA, N.M., DINIZ, E.S. & MEIRA-NETO, J.A.A. 2020. Effects of anthropogenic disturbances on biodiversity and biomass stock of Cerrado, the Brazilian savanna. Biodiversity and Conservation 29(11-12):3151-3168.

COELHO, L.F.M. 2005. Ecologia de hemiepífitas estranguladoras no Parque Estadual da Ilha do Cardoso. Dissertação de mestrado, Universidade Estadual Paulista, Rio Claro.

CRUZ, A.C.R. & NUNES-FREITAS, A.F. 2019. Epífitas vasculares da mata de restinga da Praia do Sul, Ilha Grande, RJ, Brasil. Rodriguésia 70: e03192017.

DECHOUM, M.S., SAMPAIO, A.B., ZILLER, S.R. & ZENNI, R.D. 2018. Invasive species and the Global Strategy for Plant Conservation: how close has Brazil come to achieving Target 10? Rodriguésia 69(4): 1567-1576.

DELAMONICA, P., LIMA, D.F., OLIVEIRA, R.R. & MANTOVANI, W. 2002. Estrutura e funcionalidade de populações de *Miconia cinnamomifolia* (DC.) Naud. em florestas secundárias estabelecidas sobre antigas roças caiçaras. Pesquisas, Botânica 52:125-142.

FERREIRA, C.D.M., DE TONI, K.L.G. & BOVINI, M.G. 2018. Miscellaneous additions to *Quararibea* (Malvaceae) from the Atlantic Forest of Southeastern Brazil. Systematic Botany 43(4):1011-1019.

FILGUEIRAS, T.S., NOGUEIRA, P.E., BROCHADO, A.L. & GUALA II, G.F. 1994. Caminhamento: um método expedito para levantamentos florísticos qualitativos. Cadernos de Geociências 12:39-43.

FLORA E FUNGA DO BRASIL 2022. Jardim Botânico do Rio de Janeiro. http://floradobrasil.jbrj.gov.br/ (last access on 29/03/2022)

FUNDAÇÃO SOS MATA ATLÂNTICA & INPE. 2021. Atlas dos remanescentes florestais da Mata Atlântica: período 2019/2020, relatório técnico. Fundação SOS Mata Atlântica, São Paulo.

GAMA, S.V.G., SILVA, L.G.A.E. & SALGADO, C.M. 2009. Geologia, relevo e solos. In O ambiente da Ilha Grande (M. Bastos & C.H. Callado, org.). UERJ, CEADS, Rio de Janeiro, p.21-64.

GANDOLFI, S., LEITÃO FILHO, H.F. & BEZERRA, C.L.F. 1995. Levantamento florístico e caráter sucessional das espécies arbustivo-arbóreas de uma floresta mesófila semidecídua no município de Guarulhos, SP. Revista Brasileira de Biologia 55(4):753-767.

GOTELLI, N.J. & ELLISON, A.M. 2016. Princípios de estatística em ecologia. Artmed Editora, Porto Alegre.

GRALATO, J.C.A. 2016. Dinâmica costeira e vulnerabilidade do litoral oriental da Ilha Grande (Angra dos Reis - RJ) às ondas de tempestades. Dissertação de mestrado, Universidade do Estado do Rio de Janeiro, Rio de Janeiro.

GUILLAUMON, J.R., MARCONDES, M.A.P., NEGREIROS, O.C., MOTA, I.S., EMMERICH, W., BARBOSA, A.F., BRANCO, I.H.D.C., CAMARA, J.J.C., OSTINI, S., PEREIRA, R.T.L., SCORVO FILHO, J.D., SHIMOMICHI, P.Y., SILVA, D.A. & MELO NETO, J.E. 1989. Plano de Manejo do Parque Estadual da Ilha Anchieta. Instituto Florestal, São Paulo.

IBGE. 2012. Manual técnico da vegetação brasileira. 2 ed. IBGE, Rio de Janeiro.

INCT. 2021. Herbário virtual da flora e dos fungos. Instituto Nacional de Ciência e Tecnologia. http://inct.splink.org.br (last access on 05/06/2021)

INEA 2021. Biodiversidade e território. http://www.inea.rj.gov.br/biodiversidade-territorio/conheca-as-unidades-de-conservacao/ (last access on 27/10/2021)

JABOT. 2021. http://jabot.jbrj.gov.br/v3/consulta.php (last access on 27/06/2021)

JUFFE-BIGNOLI, D., BURGESS, N.D., HOBBS, J., SMITH, R.J., TAM, C., THORN, J.P.R. & BULL, J.W. 2021. Mitigating the impacts of development corridors on biodiversity: a global review. Frontiers in Ecology and Evolution 9: 683949.

KURTZ, B.C. & ARAÚJO, D.S.D. 2000. Composição florística e estrutura do componente arbóreo de um trecho de Mata Atlântica na Estação Ecológica Estadual do Paraíso, Cachoeiras de Macacu, Rio de Janeiro, Brasil. Rodriguésia 51(78/115):69-112.

LAURANCE, W.F & COCHRANE, M.A. 2001. Synergistic effects in fragmented landscapes. Conservation Biology 15(6):1488-1489.

LEÃO, T.C.C., ALMEIDA, W.R., DECHOUM, M.S. & ZILLER, S.R. 2011. Espécies exóticas invasoras no Nordeste do Brasil: contextualização, manejo e políticas públicas. CEPAN, Instituto Hórus, Recife.

LEÃO, T.C.C., REINHARDT, J.R., LUGHADHA, E.N. & REICH, P.B. 2021. Projected impacts of climate and land use changes on the habitat of Atlantic Forest plants in Brazil. Global Ecology and Biogeography 30(10):2016-2028.

LEITMAN, P., JUDICE, D.M., BARROS, F.S.M. & PRIETO, P.V. 2013. Arecaceae. In Livro vermelho da flora do Brasil (G. Martinelli & M.D. Moraes, org.). Andrea Jakobsson, Instituto de Pesquisas Jardim Botânico do Rio de Janeiro, Rio de Janeiro, p.187-195.

LEONEL, C. (coord.). 2015. Parque Estadual de Ilhabela: Plano de Manejo. Fundação Florestal do Estado de São Paulo, São Paulo.

LIMA, H.C. & GUEDES-BRUNI, R.R. 1997. Plantas vasculares da Reserva Ecológica de Macaé de Cima. In Serra de Macaé de Cima: diversidade florística e conservação em Mata Atlântica (H.C. Lima & R.R. Guedes-Bruni, ed.). Instituto de Pesquisas Jardim Botânico do Rio de Janeiro, Rio de Janeiro, p.315-345.

LOBÃO, A.Q., ARAUJO, D.S.D. & KURTZ, B.C. 2005. Annonaceae das restingas do estado do Rio de Janeiro, Brasil. Rodriguésia 56(87):85-96.

LOPES, L.C.M., AMORIM, T.A., MACEDO, L.B. & ROSADO, B.H.P. 2019. The importance of sampling anthropized areas of Atlantic Forest for new records of woody species. Revista do Instituto Florestal 31(1):75-80.

LORENZI, H., SOUZA, H.M., COSTA, J.T.M., CERQUEIRA, L.S.C. & FERREIRA, E. 2004. Palmeiras Brasileiras e exóticas cultivadas. Instituto Plantarum, Nova Odessa.

LORENZI, H.; SOUZA, H.M.; TORRES, M.A.V.; BACHER, L.B. 2003. Árvores exóticas no Brasil: madeireiras, ornamentais e aromáticas. Instituto Plantarum, Nova Odessa.

LPWG. 2017. A new subfamily classification of the Leguminosae based on a taxonomically comprehensive phylogeny. Taxon 66(1): 44-77.

MACARTHUR, R.H. & WILSON, E.O. 1967. The theory of island biogeography. Princeton University Press, Princeton.

MACHADO, D.N.S. 2018. Diversidade florística de Leguminosae nas florestas litorâneas dos municípios de Niterói e Maricá, RJ. Dissertação de mestrado, Instituto de Pesquisas Jardim Botânico do Rio de Janeiro, Rio de Janeiro.

MAGNUSSON, W.E., LIMA, A.P., LUIZÃO, R., LUIZÃO, F., COSTA, F.R.C., CASTILHO, C.V. & KINUPP, V.F. 2005. RAPELD: a modification of the Gentry method for biodiversity surveys in long-term ecological research sites. Biota Neotropica 5(2): bn01005022005. https://doi.org/10.1590/S1676-06032005000300002 (last access on 16/08/2021)

MAGURRAN, A.E. 2013. Medindo a diversidade biológica. Ed. da UFPR, Curitiba.

MARQUES, M.C.M., VAZ, A.S.F. & MARQUETE, R. (org.). 1997. Flórula da APA Cairuçu, Parati, RJ: espécies vasculares. Instituto de Pesquisas Jardim Botânico do Rio de Janeiro, Rio de Janeiro.

MARTINELLI, G., MARTINS, E., MORAES, M., LOYOLA, R. & AMARO, R (org.). 2018. Livro vermelho da flora endêmica do Estado do Rio de Janeiro. Jardim Botânico do Rio de Janeiro, Secretaria de Estado do Ambiente, Andrea Jakobsson Estúdio, Rio de Janeiro.

MARTINELLI, G. & MORAES, M.D. (org.) 2013. Livro vermelho da flora do Brasil. Andrea Jakobsson, Instituto de Pesquisas Jardim Botânico do Rio de Janeiro, Rio de Janeiro.

MAURENZA, D., BOCAYUVA, M., POUGY, N., MARTINS, E. & MARTINELLI, G. (org.). 2018. Lista da flora das Unidades de Conservação estaduais do Rio de Janeiro. Andrea Jakobsson Estúdio, Rio de Janeiro.

MELLO, J.H.F., MOULTON, T.P., RAÍCES, D.S.L. & BERGALLO, H.G. 2015. About rats and jackfruit trees: modeling the carrying capacity of a Brazilian Atlantic Forest spiny-rat *Trinomys dimidiatus* (Günther, 1877) – Rodentia, Echimyidae – population with varying jackfruit tree (*Artocarpus heterophyllus* L.) abundances. Brazilian Journal of Biology 75(1):208-215.

MENDES, T.S. 2017. Florística e fitossociologia de uma mata secundária em Vila Dois Rios, Ilha Grande, Angra dos Reis, Rio de Janeiro, Brasil. Monografia de graduação, Universidade do Estado do Rio de Janeiro, São Gonçalo.

METZGER, J.P. 2006. Como lidar com regras pouco óbvias para conservação da biodiversidade em paisagens fragmentadas. Nature Conservation 4(2):11-23.

MMA. 2022. Portaria nº 148, de 7 de junho de 2022. https://in.gov.br/en/web/dou/-/portaria-mma-n-148-de-7-de-junho-de-2022-406272733 (last access on 27/06/2022)

MOREIRA, N.S., COSTA, W.S., ROSA, P.R.A., PIERRE, R.M., TIRADO, M.S., CASTILHORI, M.F., REIS, R.C.C., MANAO, C.YG. & CALLADO, C.H. 2021. Estudo de público da exposição circuito plantas exóticas da Vila Dois Rios em Ilha Grande - Angra dos Reis, Rio de Janeiro - Brasil. Revista Interagir (UERJ) 31:24-40.

MUELLER-DOMBOIS, D. & ELLENBERG, H. 1974. Aims and methods of vegetation ecology. John Wiley & Sons, New York.

NUNES-FREITAS, A.F., ROCHA-PESSÔA, T.C., COGLIATTI-CARVALHO, L. & ROCHA, C.F.D. 2006. Bromeliaceae da restinga da Reserva Biológica Estadual da Praia do Sul: composição, abundância e similaridade da comunidade. Acta Botanica Brasilica 20(3):709-717.

NUNES-FREITAS, A.F., ROCHA-PESSÔA, T.C., DIAS, A.S., ARIANI, C.V. & ROCHA, C.F.D. 2009. Bromeliaceae da Ilha Grande, RJ: revisão da lista de espécies. Biota Neotropica 9(2):213-219. https://doi.org/10.1590/S1676-06032009000200020 (last access on 16/08/2021)

OLIVEIRA-FILHO, A.T & FONTES, M.A.L. 2000. Patterns of floristic differentiation among Atlantic forests in Southeastern Brazil and the influence of climate. Biotropica 32(4b):793-810.

OLIVEIRA, R.R. 2002. Ação antrópica e resultantes sobre a estrutura e composição da Mata Atlântica na Ilha Grande, RJ. Rodriguésia 53(82):33-58.

OLIVEIRA, R.R. 2015. Fruto da terra e do trabalho humano: paleoterritórios e diversidade da Mata Atlântica no Sudeste brasileiro. Revista de História Regional 20(2): 277-299.

OLIVEIRA, R.R. & COELHO NETTO, A.L. 1996. O rastro do homem na floresta – a construção da paisagem da Reserva Biológica Estadual da Praia do Sul a partir das intervenções antrópicas. Albertoa 10(4):110-118.

OLIVEIRA, R.R. & COELHO NETTO, A.L. 2001. Captura de nutrientes atmosféricos pela vegetação na Ilha Grande, RJ. Pesquisas, Botânica 51: 31-49.

OLIVEIRA, R.R. & FERNANDEZ, A.C.F. 2016. Entre roças e florestas: passado e presente na Mata Atlântica do estado do Rio de Janeiro. Revista Brasileira de Pós-Graduação 13(32):777-802.

OLIVEIRA, R.R., SOLÓRZANO, A., SALES, G.P.S., BEUCLAIR, M. & SCHEEL-YBERT, R. 2013. Ecologia histórica de populações da carrapeta (*Guarea guidonia* (L.) Sleumer) em florestas de encosta do Rio de Janeiro. Pesquisas, Botânica 64:323-339.

PEDERNEIRAS, L.C., COSTA, A.F., ARAUJO, D.S.D. & CARAUTA, J.P.P. 2011a. Moraceae das restingas do estado do Rio de Janeiro. Rodriguésia 62(1):77-92.

PEDERNEIRAS, L.C., COSTA, A.F., ARAUJO, D.S.D. & CARAUTA, J.P.P. 2011b. Ulmaceae, Cannabaceae e Urticaceae das restingas do estado do Rio de Janeiro. Rodriguésia 62(2):299-313.

PEDERNEIRAS, L.C., MACHADO, A.F.P., CARRIJO, T.T., VIANNA FILHO, M.D.M. & ROMANIUC NETO, S. 2012. Moraceae da Ilha Grande, Angra dos Reis, Rio de Janeiro, Brasil. Revista do Instituto Florestal 24(1):21-33.

PEREIRA, J.A.A, OLIVEIRA-FILHO, A.T & LEMOS-FILHO, J.P. 2007. Environmental heterogeneity and disturbance by humans control much of the tree species diversity of Atlantic montane forest fragments in SE Brazil. Biodiversity and Conservation 16(6):1761-1784.

PEREIRA, V.J. & KAPLAN, M.A.C. 2013. *Artocarpus*: um gênero exótico de grande bioatividade. Revista Floresta e Ambiente 20(1):1-15.

PESSOA, S.V.A. & ARAUJO, D.S.D. 2020. Tree species richness and composition in a fragmented landscape of the Brazilian lowland Atlantic Forest. Rodriguésia 71: e02842017.

PRADO, R.M. 2003. Tensão no paraíso: aspectos da intensificação do turismo na Ilha Grande. Caderno Virtual de Turismo 3(1):1-9.

RAÍCES, D.S.L., FERREIRA, P.M., MELLO, J.H.F. & BERGALLO, H.G. 2017. Smile, you are on camera or in a live trap! The role of mammals in dispersion of jackfruit and native seeds in Ilha Grande State Park, Brazil. Nature Conservation Research 2(4):78-89.

RAÍCES, D.S.L., PESSÔA, F.S., LUZ, J.L., JORDÃO-NOGUEIRA, T., ESBÉRARD, C.E.L. & BERGALLO, H.G. 2008. Feeding behaviour of the bat *Phyllostomus hastatus* (Pallas 1767) in jackfruit *Artocarpus heterophyllus* Lamarck (Moraceae), in Ilha Grande, Rio de Janeiro State, Brazil. Revista Brasileira de Zoociências 10(3):265–267.

RAMOS, Y.B.M., COE, H.H.G., SILVA, A.L.C. & SOUSA, L.O.F. 2015. Caracterização das formações vegetais da Ilha Grande, RJ, e a importância de sua preservação. In Anais do XVI Simpósio Brasileiro de Geografia Física Aplicada (C.M.S. Aquino, coord.). UFPI, UESPI, Teresina, p.3445-3451.

RAMUZ, P.F. 1998. Os caminhos do turismo na Ilha Grande. Geo UERJ 3:111-120.

RIBAS, L.A. 2015. Comunidades de trepadeiras em gradientes sucessionais de Floresta Atlântica em Ilha Grande, Angra dos Reis, RJ. Tese de doutorado, Instituto de Pesquisas Jardim Botânico do Rio de Janeiro, Rio de Janeiro.

RIBAS, L.A., BARROS, A.A.M. & VABO, G.A.M. 2010. Atividades antrópicas na Ilha Grande (Angra dos Reis, RJ, Brasil) acompanhadas pela introdução de plantas exóticas invasoras. In Anais do 1º Simpósio Internacional de História Ambiental e Migrações (E.S. Nodari, M. Gerhardt & S.P. Moretto, org.). LABIMHA, UFSC, Florianópolis, p.650-669.

RIBEIRO, G.P., BERGALLO, H.G., SANTOS, A.W., LOPES, R.S. & PARMA, R.G. 2012. Mapeamento digital na Ilha Grande em apoio a inventários rápidos RAPELD (componente PELD – Pesquisas Ecológicas de Longa Duração). In Anais do IV Simpósio Brasileiro de Ciências Geodésicas e Tecnologias da Geoinformação A.F.T. Carneiro & D.C. Silva, coords.). UFPE, Recife, p.1-9.

RIBEIRO, J.R., BOGGIONE, G.A. & SILVA, M.V.A. 2009. Diagnose da cobertura vegetal de Ilha Grande no município de Angra dos Reis – RJ, pós presídio, utilizando técnicas de geoprocessamento. In Anais do XIV Simpósio Brasileiro de Sensoriamento Remoto (J.C.N. Epiphanio & L.S. Galvão, ed.). INPE, São José dos Campos, p.1497-1504.

RIBEIRO, M., MORI, S.A., NEGRÃO, R., MESSINA, T. & WIMMER, F. 2018. Lecythidaceae. In Livro vermelho da flora endêmica do Estado do Rio de Janeiro (G. Martinelli, E. Martins, M. Moraes, R. Loyola & R. Amaro, org.). Jardim Botânico do Rio de Janeiro, Secretaria de Estado do Ambiente, Andrea Jakobsson Estúdio, Rio de Janeiro, p.295-297.

ROCHA, C.F.D. 2018. Biodiversidade das ilhas cariocas. In Ilhas Cariocas (D. Zee, org.). Andrea Jakobsson Estúdio, Rio de Janeiro, p.98-135.

ROCHA, C.F.D., BERGALLO, H.G., VAN SLUYS, M., ALVES, M.A.S. & JAMEL, C.E. 2007. The remnants of restinga habitats in the Brazilian Atlantic Forest of Rio de Janeiro state, Brazil: habitat loss and risk of disappearance. Brazilian Journal of Biology 67(2):263-273.

RODRIGUES, M.J.G. 2021. Análise anatômica das palmeiras-imperiais na Ilha Grande, Angra dos Reis, Rio de Janeiro, Brasil. Dissertação de mestrado, Universidade do Estado do Rio de Janeiro, Rio de Janeiro.

ROSA, L.P.G. 2013. Florística e fitossociologia da Floresta Atlântica montana no Parque Estadual da Ilha Grande, RJ. Dissertação de mestrado, Universidade do Estado do Rio de Janeiro, Rio de Janeiro.

ROSA, L.P.G. 2017. Melastomataceae da Ilha Grande, Angra dos Reis, Rio de Janeiro, Brasil: diversidade, taxonomia e correlações com variáveis edáficas. Tese de doutorado, Universidade do Estado do Rio de Janeiro, Rio de Janeiro.

SALGADO, C.M. & VASQUEZ, N.D. 2009. Clima. In O ambiente da Ilha Grande (M. Bastos & C.H. Callado, org.). UERJ, CEADS, Rio de Janeiro, p. 7-20.

SANTIAGO, A.M.A., GUIMARÃES, C., NOGUEIRA, I., SANTOS, M.S. & SANT'ANNA, T. 2009. História da Ilha Grande e patrimônio cultural material e imaterial. In O ambiente da Ilha Grande (M. Bastos & C.H. Callado, org.). UERJ, CEADS, Rio de Janeiro, p.299-370.

SANTO, I.E. 2016. Diversidade e distribuição de Sapindaceae arbustivo-arbóreas na Ilha Grande, Angra dos Reis, RJ, Brasil. Dissertação de mestrado, Universidade Federal do Rio de Janeiro, Rio de Janeiro.

SANTOS, M.S. 2009. Os porões da república: a barbárie nas prisões da Ilha Grande: 1894-1945. Garamond, Rio de Janeiro.

SCARANO, F.R. 2002. Structure, function and floristic relationships of plant communities in stressful habitats marginal to the Brazilian Atlantic rainforest. Annals of Botany - London 90(4):517-524.

SHARROCK, S., HOFT, R. & DIAS, B.F.S. 2018. An overview of recent progress in the implementation of the Global Strategy for Plant Conservation - a global perspective. Rodriguésia 69(4):1489-1511.

SOUSA, R.S. 2014. Espécie-chave cultural: uma análise dos critérios de identificação e de preditores socioeconômicos. Tese de doutorado em Botânica, Universidade Federal Rural de Pernambuco.

SOUZA, M.C. & MORIM, M.P. 2008. A new species of *Eugenia* (Myrtaceae) from south-eastern Brazil. Botanical Journal of the Linnean Society 158(2):306-308.

SWAINE, M.D. & WHITMORE, T.C. 1988. On the definition of ecological species groups in tropical rain forests. Vegetatio 75(1-2):81-86.

TABARELLI, M. & MANTOVANI, W. 1997. Colonização de clareiras naturais na floresta atlântica no Sudeste do Brasil. Brazilian Journal of Botany 20(1):57-66.

TABARELLI, M. & MANTOVANI, W. 1999. A regeneração de uma floresta tropical montana após corte e queima (São Paulo-Brasil). Revista Brasileira de Biologia 59(2):239-250.

TAVARES, P.D., UZÊDA, M.C. & PIRES, A.S. 2019. Biodiversity conservation in agricultural landscapes: the importance of the matrix. Revista Floresta e Ambiente 26(4): e20170664.

TESSLER, M.G. & GOYA, S.C. 2005. Processos costeiros condicionantes do litoral brasileiro. Revista do Departamento de Geografia USP 17:11-23.

THE WORLD FLORA ONLINE. 2021. https://wfo-about.rbge.info/plant-list/taxon/wfo-9949999999-2021-12 (last access on 10/12/2021)

THIERS, B. 2021. Index Herbariorum: a global directory of public herbaria and associated staff. http://sweetgum.nybg.org/ih/ (last access on 10/01/2021)

VIANNA FILHO, M.D.M., MANÃO, C.Y.G., BASTOS, M. & CALLADO, C.H. 2020. Threatened flora of Ilha Grande, Rio de Janeiro State, Brazil. Hoehnea 47: e772019.

VITOUSEK, P. 1997. Diversidade e invasões biológicas de ilhas oceânicas In Biodiversidade (E.O. Wilson, ed.), Nova Fronteira, Rio de Janeiro.

WHITTAKER, R.J. 1998. Island biogeography: ecology, evolution and conservation. Oxford University Press, Oxford.

ZENNI, R.D. & ZILLER, S.R. 2011. An overview of invasive plants in Brazil. Revista Brasileira de Botânica 34(3): 431-446.

ZUCARATTO, R., SANTOS, G.S., PIRES, A.S. & BERGALLO, H.G. 2020. Coalescing past and present to predict the future: historical attributes and current situation of a non-native palm on an island in the Atlantic Forest. Journal of Coastal Conservation 24(2): 20.

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