AN ANNOTATED CHECKLIST OF ATLANTIC RAINFOREST TREES IN SOUTHEASTERN BRAZIL, TINGUÁ BIOLOGICAL RESERVE, RIO DE JANEIRO

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ABSTRACT

Studies have identified the central region of the Brazilian Atlantic Forest as an area of high biodiversity and endemism. Strong anthropogenic pressure has made protected areas in Rio de Janeiro State important sites for biodiversity conservation as they contain many areas of extreme biological importance. We sought to document and qualitatively describe the arboreal species composition of the Tinguá Biological Reserve by examining the collection data of the herbaria at the Instituto de Pesquisas Jardim Botânico do Rio de Janeiro (RB) and the Universidade Federal Rural do Rio de Janeiro (RBR). The survey identified 563 species belonging to 249 genera and 77 families, including 13 new occurrences for Rio de Janeiro State, 34 endemic species for the state, 17 vulnerable species, 15 endangered species, and one critically endangered species. Our results demonstrate the importance of this environmental protection area to the conservation of many plant populations and identified the region as harboring high tree diversity—thus reinforcing its role as an important forest remnant in a fragmented landscape within a threatened biome.

Key Words: biodiversity hotspot, endemic species, threatened species, Brazilian Atlantic Forest

RESUMO

Estudos vêm apontando a região central da Floresta Atlântica brasileira como detentora de elevada diversidade e endemismo. No entanto, a forte pressão antrópica têm tornado o estado do Rio de Janeiro estratégico para a conservação da biodiversidade do bioma, com muitas áreas consideradas de extrema importância biológica. A partir da compilação de dados das coleções dos herbários do Instituto de Pesquisas Jardim Botânico do Rio de Janeiro (RB) e da Universidade Federal Rural do Rio de Janeiro (RBR), este trabalho objetiva conhecer e descrever qualitativamente a composição de espécies arborescentes da Reserva Biológica do Tinguá. O levantamento totalizou 563 espécies,

pertencentes a 249 gêneros e 77 famílias, com registro de 13 novas ocorrências para o estado do Rio de Janeiro, 34 espécies endêmicas para o estado, 17 espécies vulneráveis, 15 em perigo de extinção e uma criticamente ameaçada. Os resultados demonstram a importância desta unidade de conservação para a conservação de populações de plantas e apontam a região como detentora de alta diversidade de árvores, bem como reforça o papel deste remanescente no cenário fragmentado e ameaçado do bioma.

Palavras Chave: hotspot de biodiversidade, espécies endêmicas, espécies ameaçadas, Floresta Atlântica Brasileira

INTRODUCTION

The Atlantic Forest is considered one of the 35 global hotspots for conservation, one of the world's most threatened tropical forests (Mittermeier et al. 2011), and a global center for diversity and endemism of vascular plants (Guedes-Bruni et al. 2009; Murray-Smith et al. 2009). The Atlantic Forest includes a great number of distinct environments in an area of wide altitudinal and latitudinal extensions (from sea level to approximately 2700 m elevation between 3° and 30° S). It was one of the longest forests in South and Central America, covering approximately 150 million hectares (Câmara 2003; Ribeiro et al. 2009) and comprises now approximately 14 thousand plant species (Forzza et al. 2012); approximately 50% of those plants are endemic, making it one of the most biogeographically distinct areas in all of the neotropical region (Prance 1982; Mittermeier et al. 2005; Ribeiro et al. 2011). Presently, however, only about 12% of the original area of this forest is still reasonably intact, and more than 80% of the surviving forest remnants cover less than 50 ha, and only 9% of those patches are protected in nature reserves (Ribeiro et al. 2009). The principal threats to those remnant forests have been advancing agriculture, exploitation of animal and plant species, road construction, real estate speculation, and consequent urban development (Morellato & Haddad 2000; Dean 1996; Tabarelli et al. 2005). As such, this biome is referred to as a "shrinking hotspot" (Ribeiro et al. 2011; Eisenlohr et al. 2015), the "hottest hotspot" (Laurance 2009), and a "top hotspot" (Eisenlohr et al. 2013).

The central region of this rich and megadiverse Atlantic Forest is adjacent to Rio de Janeiro State and comprises a focal point for proactive biodiversity conservation. Many sites in this area have been designated "of extreme Biological Importance" (Rocha et al. 2003; Jenkins & Pin 2006; Costa et al. 2009). Although the entire state was once covered by this biome, only 20.9% (915,357 ha) still remains, and only 819,969 hectares (18.8%) are forested (SOS Atlantic Forest—INPE 2015). As a result of the historical occupation of this area, the largest percentage of remnant forest sites are found on hillsides and at high altitudes, while lowland and plains areas show only widely dispersed fragments (Costa et al. 2009).

The strong anthropogenic pressures experienced during the occupation of Atlantic Forest sites have caused significant changes in regional environmental conditions and in the remnant forests themselves, impeding the growth and reproduction of many native species and significantly reducing arboreal diversity (Oliveira 2002; Tabarelli et al. 2012). The Tinguá Biological Reserve (Rebio) in Rio de Janeiro State represents an excellent laboratory for investigations into arboreal diversity due to the long and documented history of human occupation in the region. This occupation largely occurred without any real control, with urban developmental often pressing the reserve itself. The area served as an important communication route between the coastal areas of Rio de Janeiro State and the landlocked state of Minas Gerais at the end of the 17th century until the 18th century during the height of the regional gold mining. Economic cycles throughout the centuries, as well as political and administrative pressures, stimulated colonization of these areas, with the higher altitude sites being largely used as trade routes with relatively few permanent constructions, although some historical ruins from that period can still be found inside the Rebio, including an old trail paved with stones and a church dating to the 18th century (IBAMA/MMA 2006; Jesus 2009).

In spite of these adverse factors, a number of unique characteristics of the region, such as the presence of various types of conservation areas that form an almost continuous swath of protected lands, have favored the formation of biological corridors and mosaics of forest fragments (Sobrinho et al. 2010). These natural or semi-natural environments allow gene flow and the physical movements of the regional biota, facilitating species dispersal, the reoccupation and recovery of many sites, and the permanence of populations that require extensive areas for survival (Meztger 2003; Rocha et al. 2006). As such, the Tinguá Rebio is considered a

conservation area with high nucleating capacity that could ameliorate some consequences of existing anthropogenic pressures (IBAMA/MMA 2006).

The Tinguá Rebio was established in 1989 with the principal objectives of protecting a representative sample of the Atlantic Forest biome in Rio de Janeiro State and other natural resources (such as the regional hydrological basin), fostering the development of scientific research projects, and promoting environmental education. The reserve makes up part of the Serra do Mar Biodiversity Corridor and the Central Mosaic of the Fluminense Atlantic Forest (together with other nearby conservation areas) (Ayres et al. 2005). The Tinguá Rebio is the largest biological reserve in Rio de Janeiro State and the third-largest in the southeastern region of Brazil (ICMBio 2016), comprising 26,260 ha.

Within this context, a better understanding of the regional flora (as well as the processes that support, impact, or threaten it) is a first step indispensable tool for subsidizing and perfecting proactive conservation strategies and actions for the restoration and maintenance of local diversity. As such, the present study sought to qualitatively describe the arboreal species composition of the Tinguá Rebio by evaluating materials deposited in herbarium collections at the Instituto de Pesquisas do Jardim Botânico do Rio de Janeiro (RB) and the Universidade Federal Rural do Rio de Janeiro (RBR).

MATERIALS AND METHODS

Study area.—The Tinguá Rebio is a full-protection federal conservation area located in Rio de Janeiro State, Brazil (created by Federal Decree Nº. 97.780, on 23 May 1989). The reserve occupies an area representing approximately 8% of the total protected forest area in that state. Located between the Serra do Mar Range and the coastal lowlands (22°22'20", 22°45'00" S; 43°05'40", 43°40'00" W), it includes portions of the municipalities of Nova Iguaçu, Duque de Caxias, Petrópolis, Miguel Pereira, Queimados, and Japeri (IBAMA/MMA 2006) (Fig. 1).

The local vegetation is predominantly forest, with alpine fields (difficult to access) on mountain tops such as the Tinguá Peak with its exposed rock formations and thin, dry soils. The phytogeographical classification of the vegetation there is Dense Ombrophilous Forest (Veloso 1991). The physiognomic-floristic classification of this vegetation cover, utilizing the terminology proposed by Veloso et al. (1991), distinguishes four sub-formations: Submontane Forest, Montane Forest, High Montane Forest, and Alpine Fields. The area is well-preserved, principally due to the protection of mountain streams that supply water to human populations in the region. This is currently one of the few forested areas in the Baixada Fluminense region, making the Tinguá Rebio strategic from a socio-economic point of view and crucial to the preservation of the Atlantic Forest biome.

The regional climate is classified as type Cwb in the Köppen system (tropical humid), with cool and rainy summers, although the mountain peaks become quite dry during the dry season. Mean annual temperatures vary between 13 and 23°C, and mean annual rainfall is between 1500 and 2600 mm, but unevenly distributed through the year, with maximum precipitation during December and February (IBAMA/MMA 2006). The landscape is generally quite steep and irregular, with scarps cut by torrential rivers. Topographically, the peak of the Serra do Mar—the Tinguá Massive—is an imposing and rugged geological monument reaching 1600 m in altitude (IBAMA/MMA 2006). The regional soils include red and yellow dystrophic argisols and latosols, red eutrophic argisols, and haplic eutrophic cambisols (IBGE 2014).

Data collection and analyses.—In terms of our inventory, all self-supporting woody individuals more than 3 m tall were considered trees. The methodologies utilized during field sampling were diverse, and included techniques such as random walks and permanent plots. Fertile material collected was deposited in the herbaria of the Instituto de Pesquisas Jardim Botânico do Rio de Janeiro (RB) and/or the Universidade Federal Rural do Rio de Janeiro (RBR).

Additional information was obtained from the Jabot databank (http://jabot.jbrj.gov.br/v2/consulta.php), using as search filters the words "Rebio Tinguá," as well as the names of the municipalities surrounding it; direct searches were also made in the collections of the RBR herbarium.

Fig. 1. Localization of the Tinguá Biological Reserve, Rio de Janeiro State, Brazil.

The botanical material was identified with current literature, herbarium collections, and, when necessary, consultations with specialists. The species were identified using Souza and Lorenzi (2008). The classification of the species according to their conservation status was based on Martinelli and Moraes (2013).

The species were separated into three categories according to variation in geographic distributions (Rio de Janeiro, Atlantic Forest, and Brazil). Species with geographic distribution citated only in Rio de Janeiro were considered endemic to that state; Atlantic Forest endemics were those species whose occurrences were restricted to that phytogeographic domain; species with exclusive occurrence in Brazil were considered endemic to that country. These classifications were based on data available in the Species List of the Brazilian Flora (Flora do Brasil 2016). The endemic species of Rio de Janeiro State were also considered in terms of their rarity in that state, based on seven forms of rarity proposed by Rabinowitz et al. (1986), where geographic distribution constitutes one of the criteria for attributing rarity to a given taxon. As such, the species were separated into rare endemics, i.e., endemics with restricted distributions (when they occur in only a few localities), or endemic species with wide distribution (when they are well-distributed throughout different regions of the state).

Species richness was compared using nine publications by different authors undertaken in similar vegetation formations throughout the Serra do Mar Biodiversity Corridor in the states of São Paulo, Paraná, and Rio de Janeiro.

RESULTS

The survey identified 563 species of trees and nine species of tree ferns belonging to 249 genera and 77 families (Appendix 1). Among the richest families were: Myrtaceae (78 species), Leguminosae (70), Lauraceae (51), Rubiaceae (47), Melastomataceae (27), Sapotaceae (19), Sapindaceae (16), Euphorbiaceae (14), Annonaceae (14), and Monimiaceae (12), which, together, accounted for 61.8% of the total local species richness. The other 67 families were represented by less than 12 species each and 27 families were represented by just a single species (Appendix 1).

The genera with the greatest species richness were: *Eugenia* (29), *Ocotea* (24), *Miconia* (14), *Mollinedia* (12), *Myrcia* and *Calyptranthes* (10), *Inga* (10), *Marlierea,* and *Psychotria* (8). Of the other genera, fully 144 were represented by only a single species (Appendix 1).

The first specimen collected was the species *Daphnopsis coriacea* Taub (Thymelaeaceae), originally collected by the French botanist Auguste François Marie Glaziou (1828–1906) in 1877. Starting in the 1990s, there was a significant increase in the numbers of species recorded in the region—as a result of studies undertaken by researchers from the Universidade Federal Rural do Rio de Janeiro and the Instituto de Pesquisas Jardim Botânico do Rio de Janeiro.

Five exotic species were encountered in the area: *Psidium guajava* L., *Syzygium jambos* (L.) Alston (Myrtaceae), *Persea americana* Mill. (Lauraceae), *Annona muricata* L. (Annonaceae), and *Sambucus nigra* L. (Adoxaceae) (Appendix 1).

Our study identified 13 new state records or occurrences for Rio de Janeiro State (Table 1). In terms of the conservation status of the species identified in the area, 33 species were classified as threatened in different risk categories (one being critically endangered, 15 endangered, and 17 considered vulnerable); 103 species were classified into less endangered categories (15 near threatened, and 88 least concern) (Table 2). *Pouteria bapeba* T.D. Penn. (Sapotaceae) was classified as critically endangered. In the endangered category, *Ocotea odorifera* (Vell.) Rohwer (Lauraceae), *Pradosia kuhlmannii* Toledo (Sapotaceae), and *Tabebuia cassinoides* (Lam.) DC (Bignoniaceae) should be mentioned. The vulnerable category included the species *Cedrela odorata* L. (Meliaceae), *Euterpe edulis* Mart. (Arecaceae), and *Roupala sculpta* Sleumer (Proteaceae), among others.

The 563 species encountered in the Tinguá Rebio and verified using the *Flora do Brasil* (2016), showed 371 species endemic to Brazil, 277 endemic to the Atlantic Forest, and 34 species endemic to Rio de Janeiro State. These results demonstrate the high degree of endemism found in the local flora, with 65.9% of the species encountered being considered endemic to Brazil and 49.2% endemic to the Atlantic Forest; more than 70% of the

Table 1. New records or occurrences of arboreal species for Rio de Janeiro State encountered in the Tinguá Biological Reserve, Rio de Janeiro State, Brazil. Conservation status: **CR**=critically endangered; **EN**=endangered; **VU**=vulnerable; **NT**=near threatened; **LC**=least concern; **NE**=not evaluated; Geographic distribution: abbreviations referred to the states of Brazil; RS=Rio Grande do Sul, SC=Santa Catarina, PR=Paraná, SP=São Paulo, MG=Minas Gerais, ES=Espírito Santo, MT=Mato Grosso, MS=Mato Grosso do Sul, GO=Goiás, PE=Pernambuco, BA=Bahia, AL=Alagoas, AM=Amazonas, PA=Pará, TO=Tocantins, AP=Amapá, AC=Acre.

New ocorrences	Status	Geographic distribution	
Euphorbiaceae	*Sebastiania brasiliensis* Spreng.	NE	GO,MT,MS,ES,MG,SP,PR,RS,SC
Lauraceae	*Cryptocaria moschata* Nees & Mart.	NE	TO,AL,BA,PE,GO,MT,ES,MG,SP,PR,SC,RS
Leguminosae	*Stryphnodendron polyphyllum* Mart.	NE	BA,MA,GO,MT,MS,MG
Magnoliaceae	*Magnolia amazonica* (Ducke) Govaerts	NE	AC,PA
Monimiaceae	*Mollinedia eugeniifolia* Perkins	EM	SC
Myrtaceae	*Calyptranthes concinna* DC.	LC	SP,PR,SC,RS
Myrtaceae	*Eugenia batingabranca* Sobral	NE	ES,MG,SP
Myrtaceae	*Eugenia brevistyla* D. Legrand	LC	SP,PR,SC,RS
Myrtaceae	*Marlierea obscura* O. Berg	NE	ES,MG
Rubiaceae	*Cordiera concolor* (Cham.) Kuntz	NE	AM,PA,TO,BA,PE,GO,MT,MS,MG,SP,PR,SC
Rubiaceae	*Faramea coerulea* (Nees & Mart.) DC.	NT	AL,BA
Rubiaceae	*Psychotria contracta* Müll.Arg.	NE	AM,AP
Sapotaceae	*Pouteria bapeba* T.D. Penn.	CR	BA,ES

Table 2. Conservation status of arboreal species encountered in the Tinguá Biological Reserve, Rio de Janeiro State, Brazil. **CR**=critically endangered; **EN**=endangered; **VU**=vulnerable; **NT**=near threatened; **LC**=least concern; **NE**=not evaluated.

Status	Number of species
CR	1
EN	15
VU	17
NT	15
LC	88
NE	436

species endemic to Rio de Janeiro State could be considered rare in this state due to their limited geographic distributions. The evaluations of the species endemic to the state, in terms of their risks of extinction, identified four species as endangered [*Mezilaurus navalium* (Allemão) Taubert ex Mez, Lauraceae; *Unonopsis riedeliana* R.E. Fr., Annonaceae; *Mollinedia longicuspidata* Perkins, Monimiaceae; and *Rudgea macrophylla* Benth., Rubiaceae] and two as vulnerable (*Inga mendoncaei* Harms and *Tachigali beaurepairei* (Harms) L.G. Silva & H.C. Lima, Leguminosae). Among the new occurrences was a critically endangered species (*Pouteria bapeba* T.D. Penn., Sapotaceae), another considered endangered (*Mollinedia eugeniifolia* Perkins, Monimiaceae), and one near threatened (*Faramea coerulea* (Nees & Mart.) DC., Rubiaceae) (Table 3; Appendix 2).

The richness of arboreal species encountered in the study area (563 species) stands out in comparison with other surveys undertaken in the same phytophysiognomy, as being higher than studies that included greater diversity of plant formations (Table 4).

DISCUSSION

The most representative families in the Tinguá Rebio forest were characteristic of the arboreal flora in Atlantic Forest areas in southeastern Brazil (Oliveira-Filho & Fontes 2000). Numerous studies have reported Myrtaceae, Leguminosae, Lauraceae, and Rubiaceae among the richest families in that biome (Kurtz & Araujo 2000; Peixoto et al. 2004; Rodrigues 2004; Guedes-Bruni et al. 2006; Souza et al. 2007). Additionally, the roles of species of Myrtaceae, Lauraceae, Rubiaceae, and Sapotaceae as key sources for food reserves for the Atlantic Forest fauna have been repeatedly emphasized, and they are considered viable indicators of the conservation status of forest sites (Tabarelli & Mantovani 1999). Earlier studies that evaluated the shrub-arboreal strata in

TABLE 3. Endemic species of Rio Janeiro State encountered in the Tinguá Biological Reserve, Rio de Janeiro State, Brazil, with their conservation status and frequency in that state. **CR**=critically endangered; **EN**=endangered; **VU**=vulnerable; **NT**=near threatened; **LC**=least concern; **NE**=not evaluated.

Species	Status	Occurrence	
Annonaceae	*Duguetia microphylla* (R.E. Fr.) R.E. Fr.	NE	restricted
Annonaceae	*Unonopsis riedeliana* R.E. Fr.	EN	restricted
Aquifoliaceae	*Ilex buxifolia* Gardner	NE	restricted
Boraginaceae	*Cordia latiloba* I.M. Johnst.	NE	wide
Calophyllaceae	*Kielmeyera insignis* Saddi	NE	restricted
Clusiaceae	*Tovomita glazioviana* Engl.	NE	wide
Dichapetalaceae	*Stephanopodium estrellense* Baill.	NE	wide
Lauraceae	*Beilschmiedia angustifolia* Kosterm.	NE	restricted
Lauraceae	*Cinnamomum glaziovii* (Mez) Kosterm.	NE	wide
Lauraceae	*Mezilaurus navalium* (Allemão) Taub. ex Mez	EN	restricted
Lauraceae	*Persea microphylla* Mez	NE	restricted
Leguminosae	*Inga mendoncaei* Harms	VU	wide
Leguminosae	*Moldenhawera polysperma* (Vell.) Stellfeld	NE	wide
Leguminosae	*Pseudopiptadenia inaequalis* (Benth.) Rauschert	NE	wide
Leguminosae	*Tachigali beaurepairei* (Harms) L.G. Silva & H.C. Lima	VU	restricted
Leguminosae	*Tachigali duckei* (Dwyer) Oliveira-Filho	NE	restricted
Melastomataceae	*Meriania glabra* (DC.) Triana	NE	wide
Melastomataceae	*Miconia eichleri* Cogn.	LC	wide
Meliaceae	*Trichilia* aff. *luciae* Barreiros	NE	restricted
Monimiaceae	*Mollinedia heteranthera* Perkins	NE	restricted
Monimiaceae	*Mollinedia longicuspidata* Perkins	EN	restricted
Myrtaceae	*Calyptranthes aromatica* A. St.-Hil.	NE	restricted
Myrtaceae	*Calyptranthes caudata* Gardner	NE	restricted
Myrtaceae	*Calyptranthes ursina* Barroso & Peixoto	NE	restricted
Myrtaceae	*Eugenia magnifica* Spring ex Mart.	NE	wide
Myrtaceae	*Eugenia pulcherrima* Kiaersk.	NE	restricted
Ochnaceae	*Ouratea stipulata* (Vell.) Engl.	NE	restricted
Proteaceae	*Roupala gracilis* Meisn.	NE	restricted
Rubiaceae	*Rudgea macrophylla* Benth.	EN	wide
Rubiaceae	*Rustia gracilis* K. Schum.	NE	restricted
Rubiaceae	*Simira walteri* Silva Neto & Callado	NE	restricted
Rutaceae	*Almeidea limae* I.M.Silva	NE	restricted
Sapindaceae	*Cupania schizoneura* Radlk.	NE	restricted
Sapindaceae	*Matayba grandis* Radlk.	NE	restricted
Sapotaceae	*Aspidosperma compactinervium* Kuhlm.	NE	wide
Thymelaeaceae	*Funifera brasiliensis* (Raddi) Mansf.	NE	restricted
Vochysiaceae	*Qualea gestasiana* A. St.-Hil.	NE	restricted

the same locality indicated the same pattern of family richness (Jesus 2009; Lima 2012). When abundance is considered, however, a different pattern emerges, with representatives of the families Arecaceae [principally due to the abundance of *Euterpe edulis* Mart. (1824: 33)] and Nyctaginaceae [*Guapira opposita* (Vell.) Reitz] showing high importance values within the community (Jesus 2009; Lima 2012).

Results consistent with floristic patterns recorded for tree genera in studies undertaken in other Atlantic Forest areas (Oliveira Filho & Fontes 2000; Zau 2010) were observed in the present investigation, with genera characterized by high species richness (such as *Ocotea* and *Eugenia*) showing high diversity.

A number of species identified in the Tinguá Rebio shows wide distributions in different Atlantic Forest formations in southeastern Brazil, and are therefore considered 'supertramp species' (Oliveira-Filho & Fontes 2000): *Alchornea glandulosa* Poepp. & Endl., *A. triplinervia* (Spreng.) Müll.Arg., *Andira fraxinifolia* Benth., *Aspidosperma parvifolium* A.DC., *Cabralea canjerana* (Vell.) Mart., *Cariniana estrellensis* (Raddi) Kuntze, *Casearea sylvestris* Sw., *Cordia sellowiana* Cham., *Cupania vernalis* Cambess., *Endlicheria paniculata* (Spreng.) J.F. Macbr., *Erythroxylum citrifolium* A. St.-Hil., *Eugenia florida* DC., *Guapira opposita* (Vell.) Reitz, *Guarea*

Table 4. Arboreal species richness encountered in Atlantic Forest sites in Brazil.

Locality	Area (ha)	Number of species	Formation
This study	26.000	563	submontane and montane
Parque Estadual da Serra do Mar, SP [1]	332.000	562	montane, submontane, lowlands, pioneer formation (restinga)
Parque Estadual Carlos Botelho, SP[2]	37.640	443	submontane and montane
Estação Ecológica Estadual do Paraíso, RJ[3]	4.920	408	montane
Reserva Ecológica de Macaé de Cima, RJ[4]	7.200	389	submontane, lowlands and alluvial sites
Parque Estadual da Serra da Tiririca,RJ[5]	2.077	329	montane
Reserva Natural do Rio Cachoeira, PR[6]	8.600	306	montane, submontane, lowlands, pioneer formations
Reserva Florestal do Morro Grande, SP[7]	10.870	260	submontane
Parque Estadual da Ilha Grande, RJ[8]	19.300	187	submontane
Vale da Ribeira, Cananéia, SP[9]	63	177	montane, submontane

1- Joly et al. 2012, 2- Lima et al. 2012, 3- Pessoa et al. ined., 4- Lima & Guedes Bruni 1997, 5- Barros 2008, 6- Borgo et al. 2011, 7-Catharino 2006, 8- Callado et al. 2009, 9-Urbanetz et al. 2010.

guidonea (L.) Sleumer, *Hymenaea courbaril* L., *Jacaratia spinosa* (Aubl.) A.DC., *Luhea divaricata* Mart. & Zucc., *Matayba elaeagnoides* Radlk., *M. guianensis* Aubl., *Myciaria floribunda* (H. West ex Willd.) O. Berg, *Nectandra oppositifolia* Nees, *Pera glabrata* (Schott) Poepp. ex Baill , *Piptadenia gonoacantha* (Mart.) J.F. Macbr., *Sapium glandulosum* (L.) Morong, *Tapirira guianensis* Aubl., and *Zanthoxylum rhoifolium* Lam.

In spite of some species considered to have a wide distribution, anthropogenic pressures in many landscapes in the Atlantic Forest have resulted in habitat losses and fragmentation, with the consequent isolation of plant and animal populations in small habitat remnants. Numerous studies have identified variations in the abundances of species in those remnants and probable difficulties in maintaining viable populations in light of severe alterations of those local environments (Finotti et al. 2012; Pessoa & Araujo 2014). It is known that the loss or reduction of species diversity results in losses of ecological functions and equilibrium in community dynamics (Isbel et al. 2011).

The exotic species observed in the present study have been recorded in many anthropogenically impacted areas of Atlantic Forest, citing their edible fruits (*Psidium guajava* L., *Syzygium jambos* (L.), *Persea americana* Mill. and *Annona muricata* L.) (Carvalho et al. 2006) or their therapeutic properties (*Sambucus nigra* L.) (Scopel et al. 2007). These species are normally associated with forest edges, roadsides, access roads, construction sites, and gallery forests (IBAMA/MMA 2006), although earlier surveys undertaken along forest edges in our research area did not identify any exotic arboreal species. This may reflect the fact that the surveys were undertaken in localities of restricted access (Jesus 2008; Lima 2012).

The Atlantic Forest region is known for its high levels of biodiversity and endemism (BFG 2015). Of the Angiosperms identified in Atlantic Forest areas, 49.5% are endemics, of which approximately 55% are trees. While most of the flora of the Serra do Mar Range is not considered endemic (as it includes numerous species widely distributed throughout neotropical forest formations) (Scaramuzza et al. 2011), the mountains of Rio de Janeiro State are considered one of the 14 major centers of Brazilian plant endemism and diversity (Guedes-Bruni & Lima 1997). The high numbers of endemic species encountered in the area reflect the floristic richness of the most significant families found there, with Myrtaceae, Lauraceae, Leguminosae, Rubiaceae, Melastomataceae, and Euphorbiaceae being among the families that contribute most to the high diversity and endemism of seed bearing plants in Brazil (Vattimo-Gil 1959; BFG 2015). Another factor that contributes to the high endemism observed in the region is its mountainous landscape—which impedes plant colonization and dispersal and creates distinct abiotic conditions that are accentuated by local and regional climatic patterns (Scaramuzza et al. 2011).

Evaluations of the factors considered influencing the current conservation status of many of the plant species in the area (following Wilcove et al. 2000) indicate that habitat loss and degradation constitute the greatest risk factors, followed by competition with exotic species and exploitation by humans. A good example

is *Pouteria bapeba* T.D. Penn., whose original center of occurrence (the states of Espírito Santo and Bahia) was intensely degraded by the establishment of large eucalyptus plantations (Martinelli & Moraes 2013). As a result, its populations were reduced by approximately 80%. The fact that the study area constitutes a newly discovered locality for this species could indicate stability or newly established populations.

Among the endemic species of Rio de Janeiro State, four are considered endangered. Three of the species—*Unonopsis riedeliana* R.E. Fr. (Annonaceae), *Rudgea macrophylla* Benth. (Rubiaceae), and *Mollinedia longicuspidata* Perkins (Monimiaceae)—are only infrequently encountered in herbarium collections. These species and their populations have greatly diminished in the region due to loss of habitat, quality of habitat, urban expansion, and fragmentation (Martinelli & Moraes 2013). The fourth species—*Mezilaurus navalium* (Allemão) Taub. ex Mez (Lauraceae), the only species of the genus that occurs in southeastern Brazil—has been heavily exploited since colonial times for its wood (still widely used in civil and naval construction, furniture making, and in the fabrication of hand tools, as a substitute for European oak). In addition to the extensive exploitation of this species, its habitat has been greatly reduced and degraded over long periods of time—in fact it was considered extinct for various decades and had not been collected for 40 years (1947–1987). *Inga mendoncaei* Harms and *Tachigali beaurepairei* (Harms) L.G. Silva & H.C. Lima (Leguminosae) are considered vulnerable to extinction. The former species is only encountered in the mountains of Rio de Janeiro State (generally at altitudes above 700 m) and is susceptible to anthropogenic impacts such as burning and habitat degradation. The latter species is considered vulnerable due to the degradation of its native habitat as a result of deforestation. Current analyses, however, suggest that stable subpopulations still grow in large continuous areas of Atlantic Forest in Rio de Janeiro State but this species must be closely monitored to ascertain if subpopulations are truly stable and no longer at risk of extinction (Morais & Martinelli 2013).

The highest categories of conservation risk (CR, EN, and VU) indicate highly threatened species. Thirty-two species encountered in the Tinguá Rebio are registered as officially threatened at the national level; 432 species, on the other hand, have not yet even been evaluated in terms of their conservation status. Efforts directed toward these evaluations will depend on government programs focusing on the evaluations, implementation, and maintenance of proactive conservation strategies. In light of the enormous richness and diversity of the Atlantic Forest, and the many threats to its continued existence, the continuity and expansion of evaluation and conservation programs are fundamental, and should be adapted as important state priorities.

The high floristic richness reported here for the Tinguá Rebio corroborates other studies that identified the biological importance of the Serra do Mar Biodiversity Corridor. A number of studies have identified the northern region of the Serra do Mar Range, especially in Rio de Janeiro State, as one of the areas of greatest biodiversity in the Atlantic Forest, with high plant and animal diversity and exceptional endemism indices (Guedes-Bruni & Lima 1997; Bergallo et al. 2000; Costa et al. 2000). The recognition of this high diversity and endemism has aided in the establishment of high priority conservation areas within that Atlantic Forest corridor. These areas represent localities or regions with important, even unique, natural attributes that are considered critical to maintaining regional biodiversity (MMA 2007). It is important to note that the protected area nearest to the Tinguá Rebio, with high species richness, is the Serra do Mar State Park (with 562 identified species); the Park contains an even greater variety of plant and geological formations, including montane, submontane areas, lowlands, and pioneer formations. Variations in altitude are invariably associated with biotic variations, as landscape and climatic changes imply gradual species substitutions or changes in their abundance (Oliveira-Filho & Fontes 2000).

The richness of its arboreal species, new occurrences, the degree of endemism, and the numbers of species threatened with extinction demonstrate the importance of the Tinguá Biological Reserve as a valuable remnant of Atlantic Forest in Brazil, and it must be conserved within a scenario of fragmentation and anthropogenic threats to that biome. The species richness encountered in the Tinguá Rebio identifies it as containing one of the richest arboreal floras in the Atlantic Forest—and our results can support and strengthen conservation strategies designed to protect species and populations, aid future research concerning its floristic diversity and structure, and aid in the restoration and conservation of this central portion of the Atlantic Forest.

APPENDIX 1

List of the arboreal species of the Tinguá Biological Reserve, Rio de Janeiro State, Brazil. Family/species is followed by voucher, conservation status, and endemic location. Abbreviations: *****=exotic species; conservation status: **CR**=critically endangered; **EN**=endangered; **VU**=vulnerable; **NT**=near threatened; **LC**=least concern; **NE**=not evaluated. Endemism: **RJ**=endemic species to Rio de Janeiro State; **BR**=endemic species to Brazil; **AF**=endemic species to the Atlantic Forest; **W.V.**=without voucher.

Achariaceae
Carpotroche brasiliensis (Raddi) A. Gray—RBR17840, NE, AF/BR

Adoxaceae
**Sambucus nigra* L.—RB443562, NE, BR

Anacardiaceae
Anacardium occidentale L.—RB443610, NE
Astronium graveolens Jacq.—RB443574, LC
Schinus terebinthifolius Raddi—RB443628, NE
Tapirira guianensis Aubl.—w.v., NE

Annonaceae
Annona cacans Warm.—RBR21579, LC
Annona dolabripetala Raddi—RB360206, NE, AF/BR
**Annona muricata* L.—RB443564, NE
Duguetia microphylla (R.E. Fr.) R.E. Fr.—RB554901, NE, AF/BR
Guatteria australis A. St.-Hil.—RB443579, LC, BR
Guatteria campestris R.E. Fr.—w.v., LC, AF/BR
Guatteria ferruginea A. St.-Hil.—RB359760, NE, AF/BR
Guatteria latifolia R.E. Fr.—RB426340, NE, AF/BR
Guatteria sellowiana Schltdl.—RB419641, LC, BR
Unonopsis riedeliana R.E. Fr.—RB646475, EN, AF/BR
Xylopia brasiliensis Spreng.—RB646470, NT, AF/BR
Xylopia frutescens Aubl.—RB358775, NE
Xylopia langsdorfiana A. St.-Hil. & Tul.—RB440528, NE, AF/BR
Xylopia sericea A. St.-Hil.—RB373290, NE

Apocynaceae
Aspidosperma parvifolium A.DC.—RBR26042, NE
Aspidosperma polyneuron Müll.Arg.—RB555357, NT
Aspidosperma ramiflorum Müll.Arg.—RBR26043, LC
Geissospermum laeve (Vell.) Miers—RB419733, NE
Geissospermum vellosii Allemão—RB555355, NE, BR
Himatanthus bracteatus (A. DC.) Woodson—RB359765, NE, AF/BR
Malouetia cestroides (Nees ex Mart.) Müll.Arg.—RB613532, LC, BR
Tabernaemontana catharinensis A.DC.—RB373302, NE
Tabernaemontana laeta Mart.—RB561782, NE, BR

Aquifoliaceae
Ilex buxifolia Gardner—RB377140, NE, AF/BR
Ilex congonhinha Loes.—RB370022, NE, AF/BR
Ilex dumosa Reissek—w.v., NE

Araliaceae
Oreopanax capitatus (Jacq.) Decne. & Planch.—RB361743, NE
Schefflera angustissima (Marchal) Frodin—RB359751, NE, AF/BR
Schefflera longipetiolata (Pohl ex DC.) Frodin & Fiaschi—RBR26048, NE, AF/BR

Arecaceae
Astrocaryum aculeatissimum (Schott) Burret—RBR25757, LC, AF/BR
Bactris caryotaefolia Mart.—RBR25756, NE, AF/BR
Euterpe edulis Mart.—RBR8180, VU
Geonoma elegans Mart.—RBR25753, NE, AF/BR
Geonoma pohliana Mart.—RBR25751, NE, BR
Geonoma schottiana Mart.—RBR25754, LC, AF/BR

Asteraceae
Critoniopsis stellata (Spreng.) H. Rob.—w.v., NE, AF/BR
Moquiniastrum floribundum (Cabrera) G. Sancho—RB443581, NE
Moquiniastrum polymorphum (Less.) G. Sancho—RB432601, NE
Stifftia chrysantha J.C. Mikan—RB432600, NE
Verbesina glabrata Hook. & Arn.—RB627384, NE
Vernonanthura discolor (Spreng.) H. Rob.—RB554906, NE
Vernonanthura divaricata (Spreng.) H. Rob.—RB627379, NE
Vernonanthura puberula (Less.) H. Rob.—RB359771, NE, AF

Bignoniaceae
Adenocalymma ternatum (Vell.) Mello ex Bureau & K. Schum—RB369574, NE, AF/BR
Cybistax antisyphilitica (Mart.) Mart.—RB361450, NE
Handroanthus chrysotrichus (Mart. ex DC.) Mattos—w.v., NE
Handroanthus heptaphyllus (Vell.) Mattos—w.v., LC
Jacaranda micrantha Cham.—RBR21963, LC, AF/BR
Jacaranda puberula Cham.—RB668151, LC, BR
Sparattosperma leucanthum (Vell.) K. Schum.—RBR21965, NE
Tabebuia cassinoides (Lam.) DC.—RB377163, EN, AF/BR

Bixaceae
Bixa orellana L.—RB443605, NE

Boraginaceae
Cordia latiloba I.M. Johnst.—w.v., NE, AF/BR
Cordia sellowiana Cham.—RB359746, NE, BR
Cordia trichotoma (Vell.) Arráb. ex Steud.—RB339525, NE

Burseraceae
Protium warmingianum Marchand—w.v., NE
Protium widgrenii Engl.—RB360249, NE, AF/BR

Calophyllaceae
Kielmeyera insignis Saddi—RB369772, NE, AF/BR

Cardiopteridaceae
Citronella paniculata (Mart.) R.A. Howard—RB646471, NE

Caricaceae
Jacaratia heptaphylla (Vell.) A.DC.—RB363933, NE, AF
Jacaratia spinosa (Aubl.) A.DC.—RB377157, LC

Celastraceae
Maytenus ardisiaefolia Reissek—RB363918, NE, AF/BR
Maytenus brasiliensis Mart.—RBR28482, LC, AF/BR
Maytenus evonymoides Reissek—w.v., NE
Maytenus gonoclada Mart.—RB470163, NE
Maytenus subalata Reissek—RB377156, NE, AF/BR

Chloranthaceae
Hedyosmum brasiliense Mart. ex Miq.—RB646463, NE

Chrysobalanaceae
Couepia venosa Prance—RBR22257, NE, AF/BR
Hirtella hebeclada Moric. ex DC.—RB424057, NE, BR
Licania hoehnei Pilg.—w.v., NE
Licania kunthiana Hook.f.—w.v., NE
Licania octandra (Hoffmanns. ex Roem. & Schult.) Kuntze—RBR22261, NE
Licania riedelii Prance—RBR22263, NE
Parinari excelsa Sabine—RB646474, NE, AF/BR

Clethraceae
Clethra scabra var. *laevigata* (Meisn.) Sleumer—RBR26012, NE, AF/BR

Clusiaceae
Chrysochlamis saldanhae (Engl.) Oliveira Filho—RB440511, NE
Clusia criuva subsp. *parviflora* Vesque—RB377152, LC, AF/BR

Clusia lanceolata Cambess.—RB360168, NE, AF/BR
Garcinia gardneriana (Planch. & Triana) Zappi—RB335340, NE
Tovomita fructipendula (Ruiz & Pav.) Cambess—RBR26017, NE
Tovomita glazioviana Engl.—RB376643, NE, AF/BR
Tovomitopsis paniculata (Spreng.) Planch. & Triana—RB57522, NE, AF/BR

Combretaceae
Buchenavia kleinii Exell—RB628709, LC, AF/BR
Terminalia januariensis DC.—RBR26021, LC, AF/BR

Connaraceae
Connarus rostratus (Vell.) L.B. Sm.—RB528977, LC, AF/BR

Cunoniaceae
Lamanonia ternata Vell.—RB363919, NE, BR
Weinmannia humilis Engl.—RB377063, NE, AF/BR
Weinmannia paulliniifolia Pohl ex Ser.—RB377064, NE, BR

Cyatheaceae
Alsophila setosa Kaulf.—w.v., NE, AF
Alsophila sternbergii (Sternb.) D.S. Conant—w.v., NE, BR
Cyathea atrovirens (Langsd. & Fisch.) Domin—w.v., NE, BR
Cyathea corcovadensis (Raddi) Domin—w.v., LC, AF/BR
Cyathea delgadii Sternb.—w.v., NE
Cyathea dichromatolepis (Fée) Domin—w.v., NE, AF/BR
Cyathea hirsuta C.Presl—w.v., NE, AF/BR
Cyathea leucofolis Domin—w.v., NE, AF/BR
Cyathea villosa Willd.—w.v., NE

Dichapetalaceae—w.v.
Stephanopodium estrellense Baill.—RB377131, NE, AF/BR

Elaeocarpaceae
Sloanea guianensis (Aubl.) Benth.—w.v., NE
Sloanea hirsuta (Schott) Planch. ex Benth.—RB50600, LC, AF/BR

Erythroxylaceae
Erythroxylum citrifolium A. St.-Hil.—RB359757, NE
Erythroxylum coelophlebium Mart.—RB57515, LC, AF/BR
Erythroxylum cuspidifolium Mart.—RB661668, NE, AF/BR
Erythroxylum pulchrum A. St.-Hil.—RB613248, LC, AF/BR

Euphorbiaceae
Actinostemon concolor (Spreng.) Müll.Arg.—RB528095, NE
Actinostemon verticillatus (Klotzsch) Baill.—RB346957, NE, AF/BR
Alchornea glandulosa Poepp. & Endl.—w.v., NE
Alchornea triplinervia (Spreng.) Müll.Arg.—RB646467, NE
Croton celtidifolius Baill.—RB432610, NE, AF/BR
Croton macrobothrys Baill.—RB438144, NE, AF/BR
Croton organensis Baill.—RB360171, NE, AF/BR
Margaritaria nobilis L.f.—RBR22464, LC, BR
Manihot grahamii Hook.—RBR28484, NE
Pausandra morisiana (Casar.) Radlk.—RB57518, NE, AF/BR
Sapium glandulosum (L.) Morong—RB377124, NE
Sebastiania brasiliensis Spreng.—w.v., NE
Senefeldera verticillata (Vell.) Croizat—RBR22468, NE, AF/BR
Tetrorchidium rubrivenium Poepp.—RBR26974, LC

Hypericaceae
Vismia martiana Mart.—RB359872, LC, BR

Lacistemataceae
Lacistema pubescens Mart.—RB364434, NE

Lamiaceae
Vitex mexiae Moldenke—RB369771, NE, BR

Lauraceae
Aiouea saligna Meisn.—RB363931, NE, BR
Aniba firmula (Nees & Mart.) Mez—w.v., NE, BR
Beilschmiedia angustifolia Kosterm.—RB358787, NE, AF/BR
Beilschmiedia emarginata (Meisn.) Kosterm.—w.v., NE, AF/BR
Beilschmiedia taubertiana (Schwacke & Mez) Kosterm.—RB57525, NE, AF/BR
Cinnamomum glaziovii (Mez) Kosterm.—RBR25971, NE, AF/BR
Cryptocaria moschata Nees & Mart.—RB649293, NE, BR
Cryptocarya mandioccana Meisn.—RBR18027, NE, AF/BR
Cryptocarya micrantha Meisn.—RB48095, NE, AF/BR
Cryptocarya riedeliana P.L. Moraes—RB648630, NE
Cryptocarya saligna Mez—RB554907, NE
Endlicheria paniculata (Spreng.) J.F. Macbr.—RB359780, NE
Licaria armeniaca (Nees) Kosterm.—RB362970, NE
Licaria guianensis Aubl.—RB629493, NE
Mezilaurus navalium (Allemão) Taub. ex Mez—RB358786, EN, AF/BR
Nectandra membranacea (Sw.) Griseb.—RB363921, NE
Nectandra oppositifolia Nees—RB119282, NE, BR
Nectandra puberula (Schott) Nees—RB443613, NE
Nectandra reticulata (Ruiz & Pav.) Mez—RB363924, NE
Ocotea aciphylla (Nees & Mart.) Mez—w.v., NE
Ocotea aniboides (Meisn.) Mez—RB646486, NE, AF/BR
Ocotea catharinensis Mez—RB568370, VU
Ocotea diospyrifolia (Meisn.) Mez—w.v., NE
Ocotea dispersa (Nees et Mart.) Nees—RB364302, NE, AF/BR
Ocotea divaricata (Nees) Mez—RB423360, NE, AF/BR
Ocotea domatiata Mez—RB628014, NE, AF/BR
Ocotea elegans Mez—RBR25993, NE, AF/BR
Ocotea glaziovii Mez—RB369766, NE, BR
Ocotea indecora (Schott) Mez—RB363931, NE, AF/BR
Ocotea insignis Mez—RB369428, NE, AF/BR
Ocotea lancifolia (Schott) Mez—w.v., LC
Ocotea laxa (Nees) Mez—RBR18043, LC, AF/BR
Ocotea mandioccana A. Quinet—RB648042, NE, AF/BR
Ocotea notata (Nees & Mart.) Mez—RB629484, NE, AF/BR
Ocotea odorifera (Vell.) Rohwer—RB377115, EN, BR
Ocotea puberula (Rich.) Nees—RB377113, NE
Ocotea pulchella (Nees & Mart.) Mez—RB377116, NE
Ocotea silvestris Vattimo-Gil—RBR25999, NE, BR
Ocotea tabacifolia (Meisn.) Rohwer—RBR18042, EN, BR
Ocotea teleiandra (Meisn.) Mez—w.v., NE, AF/BR
Ocotea vaccinioides (Meisn.) Mez—w.v., NE, AF/BR
Ocotea velutina (Nees) Rohwer—RB646484, NE, BR
Ocotea villosa Kosterm.—RB646478, NE, AF/BR
**Persea americana* Mill.—RB443565, NE
Persea fulva L.E. Kopp var. *fulva*—RB377111, NE
Persea major (Meisn.) L.E.Koop—RB335341, NE
Persea microphylla Mez—RB555434, NE, AF/BR
Persea willdenovii Kosterm.—RB555400, NE, BR
Rhodostemonodaphne macrocalyx (Meisn.) Rohwer ex Madriñán—RB360691, NE, BR
Urbanodendron bahiense (Meisn.) Rohwer—RB48094, VU, AF/BR
Urbanodendron verrucosum (Nees) Mez—RB362977, LC, AF/BR

Lecythidaceae
Cariniana estrellensis (Raddi) Kuntze—RBR22448, NE
Cariniana legalis (Mart.) Kuntze—RBR25941, EN, AF/BR
Lecythis lanceolata Poir.—RB424061, LC, AF/BR
Lecythis pisonis Cambess.—RB443572, NE, BR

Leguminosae
Abarema langsdorffii (Benth.) Barneby & J.W. Grimes—RB358788, NE, BR
Abarema villosa Iganci & M.P.Morim—RB438130, NE, BR
Albizia polycephala (Benth.) Killip ex Record—RB478728, NE, BR
Andira fraxinifolia Benth.—RB322322, NE, BR
Andira ormosioides Benth.—RB434233, NE, AF/BR

Apuleia leiocarpa (Vogel) J.F. Macbr.—RB419640, VU
Bauhinia forficata Link subsp. *forficata*—RB360205, NE, AF
Cassia ferruginea (Schrad.) Schrad. ex DC.—RB626920, NE
Centrolobium robustum (Vell.) Mart. ex Benth.—RB435353, NE, AF
Chamaecrista ensiformis (Vell.) H.S.Irwin & Barneby—RB354507, NE
Copaifera lucens Dwyer—RB322279, NE
Copaifera trapezifolia Hayne—RB322277, NE, AF
Dahlstedtia pinnata (Benth.) Malme—RB358793, NE, AF/BR
Dalbergia foliolosa Benth.—RB544678, NE, AF/BR
Dalbergia frutescens (Vell.) Britton—RB626924, NE
Dalbergia nigra (Vell.) Allemão ex Benth.—RB322325, VU, AF/BR
Dimorphandra exaltata Schott—RB322280, NE, AF/BR
Enterolobium glaziovii (Benth.) Mesquita—RB360188, NE, AF/BR
Erythrina verna Vell.—RB358794, NE, BR
Exostyles venusta Schott—RBR26351, NE, AF/BR
Hymenaea altissima Ducke—RB322283, NE, AF/BR
Hymenaea courbaril L.—RB322281, LC
Inga bullata Benth.—RB354514, NT, AF/BR
Inga capitata Desv.—w.v., NE
Inga edulis Mart.—RB363834, NE
Inga flagelliformis (Vell.) Mart.—RB419732, NE
Inga lanceifolia Benth.—RB478900, LC, AF/BR
Inga marginata Willd.—RB450963, NE
Inga mendoncaei Harms—RB544677, VU, AF/BR
Inga sessilis (Vell.) Mart.—RB574925, NE, BR
Inga striata Benth.—RB358791, NE
Inga tenuis (Vell.) Mart.—RB322301, NE, AF/BR
Machaerium brasiliense Vogel—RB544948, NE
Machaerium cantarellianum Hoehne—RB668087, NE, AF/BR
Machaerium hirtum (Vell.) Stellfeld—RB322333, NE
Machaerium nyctitans (Vell.) Benth.—RB359774, LC
Machaerium oblogifolium Vogel—RB544948, NE, BR
Moldenhawera polysperma (Vell.) Stellfeld—RB613520, NE, AF/BR
Muellera filipes (Benth.) M.J. Silva & A.M.G. Azevedo—w.v., NE, AF/BR
Myrocarpus frondosus Allemão—RB419637, LC
Ormosia fastigiata Tul.—RB434236, NE, BR
Peltogyne angustiflora Ducke—RB322286, NE, AF/BR
Peltophorum dubium (Spreng.) Taub.—RB422435, NE
Piptadenia gonoacantha (Mart.) J.F. Macbr.—RB363843, LC
Piptadenia paniculata Benth.—RB419634, NE, BR
Platycyamus regnellii Benth.—RB440526, NE, BR
Platymiscium floribundum Vogel var. *floribundum*—RB423363, NE, BR
Platymiscium pubescens Micheli—RB438155, NE
Pseudopiptadenia contorta (DC.) G.P. Lewis & M.P. Lima—RB442311, NE, BR
Pseudopiptadenia inaequalis (Benth.) Rauschert—RB358792, NE, AF/BR
Pseudopiptadenia schumanniana (Taub.) G.P. Lewis & M.P. Lima—RB322317, NE, AF/BR
Pseudopiptadenia warmingii (Benth.) G.P. Lewis & M.P. Lima—RB322319, NE, AF/BR
Pterocarpus rohrii Vahl—RB423368, NE
Schizolobium parahyba (Vell.) Blake var. *parahyba*—RB358816, NE, AF/BR
Senegalia grandistipula (Benth.) Seigler & Ebinger—RB354508, NE, AF/BR
Senegalia martiusiana (Steud.) Seigler & Ebinger—RB437974, NE, BR
Senna macranthera var. *macranthera*(DC. ex Collad.) H.S. Irwin & Barneby—RB438154, NE
Senna multijuga (Rich.) H.S.Irwin & Barneby subsp. *multijuga*—RB406736, NE
Stryphnodendron polyphyllum Mart.—RB478728, NE, BR
Swartzia apetala Raddi—RB613527, NE, BR
Swartzia flaemingii Raddi var. *flaemingii*—RB419735, LC, BR
Swartzia myrtifolia var. *elegans* (Schott) R.S. Cowan—RB378621, LC, AF/BR
Tachigali beaurepairei (Harms) L.G. Silva & H.C. Lima—RB419648, VU, AF/BR
Tachigali duckei (Dwyer) Oliveira-Filho—RB438147, NE, AF/BR
Tachigali paratyensis (Vell.) H.C. Lima—RB574839, NE, AF/BR
Tachigali pilgeriana (Harms) Oliveira-Filho—RB438158, NT, AF/BR
Tachigali urbaniana (Harms) L.G. Silva & H.C. Lima—RB434234, NE, AF/BR
Vatairea heteroptera (Allemão) Ducke—RB359761, NE, AF/BR
Zollernia ilicifolia (Brongn.) Vogel—RB359870, NE

Loganiaceae
Strychnos acuta Progel—w.v., NE, AF/BR

Lythraceae
Lafoensia vandelliana Cham. & Schltdl.—RB555422, NE

Magnoliaceae
Magnolia amazonica (Ducke) Govaerts—RB364320, NE
Magnolia ovata (A. St.-Hil.) Spreng.—RB731507, LC, BR

Malpighiaceae
Barnebya dispar (Griseb.) W.R. Anderson & B. Gates—RB363922, NT, AF/BR
Bunchosia maritima (Vell.) J.F. Macbr.—RBR25623, LC, AF/BR
Byrsonima laxiflora Griseb.—w.v., NE, BR
Byrsonima ligustrifolia A.Juss.—w.v., NE, AF/BR
Byrsonima sericea DC.—w.v., NE
Heteropterys intermedia (A. Juss.) Griseb.—RB363932, NE, AF

Malvaceae
Callianthe rufinerva (A. St. Hil.) Donnel—RB643782, NE, BR
Eriotheca pentaphylla (Vell. & K. Schum.) A. Robyns—w.v., NE, AF/BR
Luehea conwentzii K. Schum.—RBR25824, LC, AF/BR
Luehea divaricata Mart. & Zucc.—RBR26116, NE
Pachira glabra (Pasq.) A. Robins—RBR21932, NE
Quararibea turbinata (Sw.) Poir.—RB363916, NE

Melastomataceae
Henriettea glabra (Vell.) Penneys, F.A. Michelangeli, Judd, & Almeda—RB360212, NE, AF/BR
Leandra acutiflora (Naudin) Cogn.—RB629395, NE, BR
Leandra melastomoides Raddi—RB376818, NE
Leandra quinquedentata (DC.) Cogn.—RB376819, NE, BR
Leandra strigilliflora (Naudin) Cogn.—RB439725, NE, AF/BR
Leandra variabilis Raddi—RB439718, NE, AF/BR
Leandra vesiculosa Cogn.—RB376820, NE, AF/BR
Meriania glabra (DC.) Triana—RB629188, NE, AF/BR
Miconia brasiliensis (Spreng.) Triana—RB555009, NE, AF/BR
Miconia budlejoides Triana—RB555407, NE, AF/BR
Miconia calvescens DC.—RB120917, NE
Miconia chartacea Triana—RB376823, NE, BR
Miconia cinnamomifolia (DC.) Naudin—RB424058, NE, AF/BR
Miconia cubatanensis Hoehne—RB478893, NE, BR
Miconia eichleri Cogn.—RB555002, LC, AF/BR
Miconia holosericea (L.) DC.—RB555411, NE
Miconia latecrenata (DC.) Naudin—RB472163, NE, BR
Miconia paniculata (DC.) Naudin—RB622759, LC
Miconia pusilliflora (DC.) Naudin—w.v., NE, BR
Miconia sellowiana Naudin—RB438152, NE, BR
Miconia staminea (Desr.) DC.—w.v., NE, AF/BR
Miconia tristis Spring—RB596555, NE, BR
Mouriri arborea Gardner—RB632411, NE, AF/BR
Mouriri chamissoana Cogn.—RB646482, NE, AF/BR
Tibouchina arborea (Gardner) Cogn.—RB359759, NE, AF/BR
Tibouchina estrellensis (Raddi) Cogn.—w.v., NE, AF/BR

Tibouchina gardneriana (Triana) Cogn.—RB376814, LC, AF/BR
Tibouchina schenckii Cogn.—RB419106, NT, AF/BR

Meliaceae
Cabralea canjerana (Vell.) Mart.—RB362961, NE, BR
Cedrela odorata L.—RB443619, VU
Guarea guidonia (L.) Sleumer—RB376828, NE
Guarea kunthiana A.Juss.—RB369442, NE
Guarea macrophylla Vahl.—RB554994, NE
Trichilia casaretti C.DC.—RB369569, LC
Trichilia lepidota Mart.—RB613249, LC
Trichilia silvatica C.DC.—RB273487, LC
Trichilia luciae Barreiros—RB335971, NE, AF/BR

Monimiaceae
Mollinedia eugeniifolia Perkins—RBR26060, EN, AF/BR
Mollinedia fruticulosa Perkins—RB555432, NE, AF/BR
Mollinedia heteranthera Perkins—RB360140, NE, AF/BR
Mollinedia lamprophylla Perkins—w.v., NT, AF/BR
Mollinedia longicuspidata Perkins—RB555417, EN, AF/BR
Mollinedia longifolia Perkins—RB364487, NE, AF/BR
Mollinedia oligantha Perkins—RB555421, NE, AF/BR
Mollinedia ovata Ruiz & Pav.—RB47970, LC
Mollinedia puberula Perkins—w.v., NE
Mollinedia salicifolia Perkins—w.v., NT, AF/BR
Mollinedia schottiana (Spreng.) Perkins—RB362957, NE, AF/BR
Mollinedia triflora (Spreng.) Tul.—RB555409, NE, AF/BR

Moraceae
Clarisia racemosa Ruiz & Pav.—RB369769, NE
Cousapoa microcarpa (Schott) Rizzini—RBR25688, NE, BR
Ficus adhatodifolia Schott in Spreng—RB359778, NE
Ficus clusiifolia Schott—RBR25680, NE
Ficus luschnathiana (Miq.) Miq.—RB360251, NE
Ficus mariae C.C.Berg, Emygdio & Carauta—RBR25725, NE
Ficus organensis (Miq.) Miq.—w.v., NE, AF/BR
Ficus pertusa L.f.—RBR25728, NE
Ficus puchella Schott—RBR26118, LC
Helicostylis tomentosa (Poepp. & Endl.) Rusby—RB424063, LC
Sorocea guilleminiana Gaudich.—RB443639, LC

Myristicaceae
Virola bicuhyba (Schott ex Spreng.) Warb.—RBR554986, EN, AF/BR
Virola gardneri (A.DC.) Warb.—RB443637, NE, AF/BR

Myrtaceae
Calyptranthes aromatica A. St.-Hil.—RB362415, NE, AF/BR
Calyptranthes brasiliensis Spreng.—RB478886, NE
Calyptranthes caudata Gardner—RB647675, NE, AF/BR
Calyptranthes fusiformis M.L. Kawas.—RB646489, VU, AF/BR
Calyptranthes grandifolia O. Berg—s.n., NE, AF/BR
Calyptranthes lanceolata O. Berg—RBR4634, NE, AF/BR
Calyptranthes langsdorfii O. Berg—RBR4639, NE, AF/BR
Calyptranthes lucida Mart. ex DC.—RBR26199, NE
Calyptranthes strigipes O. Berg—RB426121, NE, AF/BR
Calyptranthes ursina Barroso & Peixoto—RB376798, NE, AF/BR
Campomanesia guaviroba (DC.) Kiaersk.—RB373293, NE
Campomanesia phaea (O. Berg) Landrum—s.n., LC, AF/BR
Eugenia arenaria Cambess.—RB646481, NE, AF/BR
Eugenia astringens Cambess.—w.v., NE, AF/BR
Eugenia badia O. Berg—RB362420, NE, AF/BR
Eugenia batingabranca Sobral—RB362427, NE, AF/BR
Eugenia brasiliensis Lam.—RB432603, LC, AF/BR
Eugenia excelsa O. Berg—RB629480, LC
Eugenia fusca O. Berg—RB360193, NE, AF/BR
Eugenia handroi (Mattos) Mattos—RB359753, NE, AF/BR
Eugenia involucrata DC.—RB360189, NE
Eugenia macahensis O. Berg—RB554999, NE, AF/BR
Eugenia macrobracteolata Mattos—RB431482, EN, AF/BR
Eugenia magnifica Spring ex Mart.—RB362428, NE, AF/BR
Eugenia mosenii (Kausel) Sobral—RB424060, NE, AF/BR
Eugenia neoglomerata Sobral—RB426127, NE, AF/BR
Eugenia oblongata O. Berg—RB362438, NE, AF/BR
Eugenia pisiformis Cambess.—w.v., LC, AF/BR
Eugenia prasina O. Berg—RB431840, LC, BR
Eugenia pruinosa D. Legrand—RB369768, EN, AF/BR
Eugenia pruniformis Cambess.—w.v., NE, BR
Eugenia pulcherrima Kiaersk.—RBR27880, NE, AF/BR
Eugenia punicifolia (Kunth) DC.—RB555419, NE, BR
Eugenia rostrata O. Berg—w.v., NE, AF/BR
Eugenia speciosa Cambess.—RB622758, NE
Eugenia sulcata Spring ex Mart.—RB555433, NE, AF/BR
Eugenia supraaxillaris Spring—RB358813, NE, AF/BR
Eugenia umbrosa O. Berg—RB362433, NE, AF/BR
Eugenia uniflora L.—RB443612, NE
Eugenia vattimoana Mattos—RB360871, VU, AF/BR
Eugenia xanthoxyloides Cambess.—RB555414, NE, AF/BR
Marlierea excoriata Mart.—RB362424, NE, BR
Marlierea glabra Cambess.—RB360508, NE, AF/BR
Marlierea obscura O. Berg—RB360219, NE, BR
Marlierea racemosa (Vell.) Kiaersk.—RBR29122, NE, AF/BR
Marlierea silvatica (O. Berg) Kiaersk.—w.v., NE, AF/BR
Marlierea suaveolens Cambess.—w.v., LC, AF/BR
Marlierea subacuminata Kiaersk.—RB376804,, AF/BR
Marlierea tomentosa Cambess.—RB362436, NE, AF/BR
Myrceugenia miersiana (Gardner) D. Legrand & Kausel—w.v., LC, AF/BR
Myrceugenia myrcioides (Cambess.) O. Berg—RB363937, LC, AF/BR
Myrceugenia ovalifolia (O. Berg) Landrum—RB647680, NE, AF/BR
Myrcia bicolor Kiaersk.—w.v., NE, AF/BR
Myrcia guianensis (Aubl.) DC.—w.v., LC
Myrcia laxiflora Cambess.—RB360194, NE, AF/BR
Myrcia multiflora (Lam.) DC.—RBR26213, NE
Myrcia pubescens DC.—RB376810, NE, BR
Myrcia pubipetala Miq.—RB362432, LC, AF/BR
Myrcia spectabilis DC.—w.v., NE, BR
Myrcia splendens (Sw.) DC.—RB321319, NE, BR
Myrcia subsericea A. Gray—RB363910, NE, AF/BR
Myrcia tenuivenosa Kiaersk.—RB360191, NE, AF/BR
Myrcia tijucensis Kiaersk.—w.v., LC, AF/BR
Myrciaria disticha O. Berg—w.v., NE, AF/BR
Myrciaria floribunda (H. West ex Willd.) O. Berg—RB646493, LC
Myrciaria glazioviana (Kiaersk.) G.M. Barroso ex Sobral—RB443627, NE, AF/BR
Neomitranthes amblymitra (Burret) Mattos—RB555428, VU, AF/BR
Neomitranthes glomerata (D. Legrand) D. Legrand—w.v., LC, AF/BR
Neomitranthes warmingiana (Kiaersk.) Mattos—RB647678, NE, AF/BR
Pimenta pseucaryophyllus (Gomes) Landrum—RB646485, NE, BR
Plinia edulis (Vell.) Sobral—RB648628, VU, BR
Plinia pseudodichasiantha (Kiaersk.) G.M. Barroso ex Sobral—w.v., NE, AF/BR
Plinia rivularis (Cambess.) Rotman—RB57533, NE
**Psidium guajava* L.—RB443617, NE
Psidium guineense Sw.—RB443576, NE
Siphoneugena densiflora O. Berg—RB554874, LC, BR
**Syzygium jambos* (L.) Alston—RB362434, NE

Nyctaginaceae
Guapira hirsuta (Choisy) Lundell—RB376786, LC, BR
Guapira nitida (Mart. ex J.A. Schmidt) Lundell—RB301101, LC, AF/BR
Guapira opposita (Vell.) Reitz—RB364437, NE, AF/BR

Ochnaceae
Ouratea semiserrata (Mart. & Ness) Engl.—w.v., NE, BR
Ouratea stipulata (Vell.) Engl.—RB363927, NE, AF/BR

Olacaceae
Cathedra rubricaulis Miers—RB648623, NE, AF/BR
Heisteria silvianii Schwacke—RB358800, NE, BR
Tetrastylidium grandifolium (Baill.) Sleumer—RB646490, NE, AF/BR

Pentaphylacaceae
Ternstroemia brasiliensis Cambess.—RB423272, LC, BR

Peraceae
Pera glabrata (Schott) Poepp. ex Baill.—RBR28905, NE

Phyllanthaceae
Hieronyma alchorneoides Allemão—RB360227, NE
Phyllanthus umbratus Müll.Arg.—RBR26875, NE, AF/BR

Phytolaccaceae
Gallesia integrifolia (Spreng.) Harms—RB450961, NE, BR

Picramniaceae
Picramnia ciliata Mart.—RBR26103, NE, BR
Picramnia glazioviana Engl.—RB555008, NE, BR
Picramnia ramiflora Planch.—RBR29373, NE, BR

Piperaceae
Piper arboreum Aubl. var. *arboreum*—RB373029, NE
Piper truncatum Vell.—w.v., LC, AF/BR

Poaceae
Aulonemia amplissima (Nees) McClure—RB440515, NE, AF

Podocarpaceae
Podocarpus sellowii Klotzsch ex Endl.—RB376874, LC

Polygonaceae
Coccoloba glaziovii Lindau—RB554887, NE, AF/BR

Primulaceae
Cybianthus brasiliensis (Mez) G.Agostini—RB376783, NE, BR
Cybianthus fuscus Mart.—RB358798, NE
Myrsine coriacea (Sw.) R.Br. ex Roem. & Schult.—RB426345, NE
Myrsine guianensis (Aubl.) Kuntze—w.v., NE
Myrsine hermogenesii (Jung-Mend. & Bernacci) M.F. Freitas & Kin.-Gouv.—RB648629, NE, AF/BR
Myrsine lancifolia Mart.—RB376784, NE, BR
Myrsine parvula (Mez) Otegui—w.v., NE
Myrsine squarrosa (Mez) M.F. Freitas & Kin.-Gouv.—RB413717, NE, BR
Stylogyne lhotzkyana (A.DC.) Mez—RB648622, NE, AF/BR

Proteaceae
Roupala gracilis Meisn.—RB554892, NE, AF/BR
Roupala longepetiolata Pohl—RB648635, NE, AF/BR
Roupala sculpta Sleumer—RB443587, VU, AF/BR

Quiinaceae
Quiina glazovii Engl.—RB648607, NE

Rosaceae
Prunus brasiliensis (Cham. & Schltdl.) D.Dietr.—w.v., NE

Rubiaceae
Alseis floribunda Schott—RB376879, NE
Amaioua intermedia Mart. ex Schult. & Schult.f.—w.v., NE
Bathysa australis (A. St.-Hil.) K. Schum.—RB376895, LC
Bathysa gymnocarpa K. Schum.—RB363914, NE, AF/BR
Bathysa mendoncaei K. Schum.—RBR26085, NE, AF/BR
Bathysa nicholsonii K. Schum.—RBR26147, NE, AF/BR
Bathysa stipulata (Vell.) C. Presl—RB48103, NE, AF/BR
Chomelia brasiliana A. Rich.—RB311583, NE, BR
Cordiera concolor (Cham.) Kuntz—RB648634, NE
Coussarea accedens Müll.Arg.—RB363913, NE, AF/BR
Coussarea meridionalis var. *porophylla* (Vell.) M. Gomes—RB432606, NE, AF/BR
Coussarea nodosa (Benth.) Müll.Arg.—RB373296, LC, BR
Coussarea verticillata Müll.Arg.—RB493406, NE, AF/BR
Faramea coerulea (Nees & Mart.) DC.—RB554880, NT, AF/BR
Faramea involucellata Müll.Arg.—RB272132, NE, AF/BR
Faramea martiana Müll.Arg.—RB360917, NE, AF/BR
Faramea pachyantha Müll.Arg.—RB360923, NE, AF/BR
Faramea truncata (Vell.) Müll.Arg.—w.v., NE, AF/BR
Guettarda viburnoides Cham. & Schltdl.—RB555420, NE
Ixora schottiana Müll.Arg.—RB646444, NE, AF/BR
Palicourea macrobotrys (Ruiz & Pav.) Schult.—RBR25860, NE
Posoqueria acutifolia Mart.—RB360888, NE, BR
Pasoqueria latifolia (Rudge) Schult.—RBR25859, LC
Posoqueria longiflora Aubl.—RB311577, NE
Psychotria contracta Müll.Arg.—RB311600, NE
Psychotria glaziovii Müll.Arg.—RB632404, NE, AF/BR
Psychotria leiocarpa Cham. & Schltdl.—RB311601, NE
Psychotria nuda (Cham. & Schltdl.) Wawra—RB346305, NE, AF/BR
Psychotria pubigera Schltdl.—RB48098, NE, AF/BR
Psychotria stachyoides Benth.—RB370021, NE, BR
Psychotria suterella Müll.Arg.—RB629468, NE, AF/BR
Psychotria vellosiana Benth.—RB579518, NE
Randia armata (Sw.) DC.—RBR25882, NE
Rudgea coronata (Vell.) Müll.Arg.—RB40202, LC, AF/BR
Rudgea jasminioides (Cham.) Müll.Arg.—RB423358, NE
Rudgea macrophylla Benth.—RB311576, EN, AF/BR
Rudgea recurva Müll.Arg.—RB363925, NE, AF/BR
Rudgea vellerea Müll.Arg.—RB364431, NT, AF/BR
Rustia angustifolia K. Schum.—RB363915, EN, AF/BR
Rustia formosa (Cham. & Schltdl.) Klotzsch—RB362979, NE, BR
Rustia gracilis K. Schum.—RBR25896, NE, AF/BR
Schizocalyx cuspidatus (A. St.-Hil.) Kainul. & B. Bremer—RBR26284, NE, BR
Simira glaziovii (K. Schum.) Steyerm.—RB376877, NE, AF/BR
Simira pikia (K. Schum.) Steyerm.—RB364295, NE, AF/BR
Simira viridiflora (Allemão & Saldanha) Steyerm.—RB352383, NE, AF/BR
Simira walteri Silva Neto & Callado—RB460108, NE, AF/BR
Tocoyena sellowiana (Cham. & Schltdl.) K. Schum.—RB311584, LC, BR

Rutaceae
Almeidea limae I.M.Silva—RB630513, NE, AF/BR
Conchocarpus fontanesianus (A. St.-Hil.) Kallunki & Pirani—RB120939, NE, AF/BR
Galipea laxiflora Engl.—RBR25793, NE, AF/BR
Hortia brasiliana Vand. ex DC.—RB443630, NT
Pilocarpus giganteus Engl.—RBR7601, NT, AF/BR
Zanthoxylum rhoifolium Lam.—RB443575, NE

Salicaceae
Banara serrata (Vell.) Warb.—RB648611, NE, BR
Casearia arborea (Rich.) Urb.—w.v., NE
Casearia commersoniana Cambess.—RBR6958, NE, BR
Casearia obliqua Spreng.—RBR25949, NE, BR
Casearia pauciflora Cambess.—RB413423, LC, AF/BR
Casearia sylvestris Sw.—w.v., NE

Sapindaceae
Allophylus edulis (A. St.-Hil. et al.) Hieron. ex Niederl.—w.v., NE
Allophylus melanopholeus Radlk.—RB478888, NE, AF/BR
Allophylus petiolulatus Radlk.—RB376881, NE
Allophylus racemosus Sw.—RB426137, NE
Cupania concolor Radlk.—RB478889, VU, AF/BR
Cupania furfuracea Radlk.—RB555423, VU, AF/BR

Cupania ludowigii Somner & Ferrucci—RB336744, NE, AF/BR
Cupania oblongifolia Mart.—RB376907, NE, BR
Cupania racemosa (Vell.) Radlk.—RB376885, NE, BR
Cupania schizoneura Radlk.—RB554853, NE, AF/BR
Cupania vernalis Cambess.—RB359754, NE
Matayba elaeagnoides Radlk.—RB373308, NE
Matayba grandis Radlk.—RB554989, NE, AF/BR
Matayba guianensis Aubl.—w.v., NE
Matayba obovata R. Coelho, Souza, & Ferrucci—RB364492, NE, AF/BR
Matayba sylvatica (Casar.) Radlk.—RB646464, NE, AF/BR

Sapotaceae
Aspidosperma compactinervium Kuhlm.—RB636641, NE, AF/BR
Chrysophyllum flexuosum Mart.—RBR25819, LC, AF/BR
Chrysophyllum gonocarpum (Mart. & Eichler ex Miq.) Engl.—RBR26135, NE
Chrysophyllum viride Mart. & Euchler—w.v., NT, AF/BR
Diploon cuspidatum (Hoehne) Cronquist—RB554883, NE
Ecclinusa ramiflora Mart.—w.v., NE
Manilkara salzmannii (A. DC.) H.J. Lam—RBR28055, NE, BR
Manilkara subsericea (Mart.) Dubard—RB358799, LC, AF/BR
Micropholis compta Pierre in Urb.—RB555427, NT, AF/BR
Micropholis crassipedicellata (Mart. & Eichler) Pierre—w.v., LC, AF/BR
Pouteria bapeba T.D. Penn.—RB646469, CR, AF/BR
Pouteria caimito (Ruiz & Pav.) Radlk.—RB335183, NE
Pouteria coelomatica Rizzini—RB335185, VU, AF/BR
Pouteria gardneri (Mart. & Miq.) Baehni—RB629467, NE
Pouteria glomerata (Miq.) Radlk.—RB555013, LC
Pouteria guianensis Aubl.—w.v., NE
Pradosia kuhlmannii Toledo—RB336786, EN, AF/BR
Pradosia lactescens (Vell.) Radlk.—RB336762, LC, AF/BR
Sarcaulus brasiliensis (A.DC.) Eyma—RB555018, NE

Simaroubaceae
Simarouba amara Aubl.—w.v., NE

Siparunaceae
Siparuna brasiliensis (Spreng.) A.DC.—RB359775, LC, BR
Siparuna guianensis Aubl.—RB443582, NE
Siparuna reginae (Tul.) A.DC.—RB376775, LC

Solanaceae
Aureliana fasciculata (Vell.) Sendtn. var. *fasciculata*—RB48106, LC, AF/BR
Aureliana tomentosa Sendtn.—RB364310, NE, BR
Metternichia princeps J.C. Mikan—w.v., NE, AF/BR
Solanum castaneum Carvalho—RB359779, NE, AF/BR
Solanum leucodendron Sendtn.—RB360211, LC, AF/BR
Solanum paniculatum L.—RB443607, NE
Solanum pilulíferum Dunal—RB373310, NE, AF/BR
Solanum pseudoquina A. St.-Hil.—RB440510, LC
Solanum swartzianum Roem. & Schult.—RB376922, NE

Symplocaceae
Symplocos falcata Brand—RB376925, LC, AF/BR

Theaceae
Laplacea fructicosa (Schrad.) Kobuski—RB646472, LC

Thymelaeaceae
Daphnopsis coriacea Taub.—RB183448, NE, BR
Daphnopsis aff. *alpestris* (Gardner) Benth. & Hook.f.—RB376929, NE, AF/BR
Daphnopsis martii Meisn.—RB376928, NE, AF/BR
Funifera brasiliensis (Raddi) Mansf.—RB120953, NE, AF/BR

Urticaceae
Cecropia glaziovii Snethl.—RBR26124, NE, AF/BR
Cecropia hololeuca Miq.—RB443551, NE, BR
Cecropia pachystachya Trécul—w.v., NE
Pourouma guianensis Aubl. ssp. *guianensis*—RB57531, NE

Verbenaceae
Citharexylum myrianthum Cham.—RB51064, NE

Vochysiaceae
Qualea gestasiana A. St.-Hil.—RB629476, NE, AF/BR
Vochysia laurifolia Warm.—RB607385, NE, BR
Vochysia oppugnata (Vell.) Warm.—RB359776, NE, BR

APPENDIX 2

List of the arboreal species critically endangered, endangered and vulnerable of the Tinguá Biological Reserve, Rio de Janeiro State, Brazil. Conservation status: **CR**=critically endangered; **EN**=endangered; **VU**=vulnerable.

Family	Species	Conserv
Arecaceae	*Euterpe edulis* Mart.	VU
Bignoniaceae	*Tabebuia cassinoides* (Lam.) DC.	EN
Lauraceae	*Mezilaurus navalium* (Allemão) Taub. ex Mez	EN
	Ocotea catharinensis Mez	VU
	Ocotea odorifera (Vell.) Rohwer	EN
	Ocotea tabacifolia (Meisn.) Rohwer	EN
	Unonopsis riedeliana R.E. Fr.	EN
	Urbanodendron bahiense (Meisn.) Rohwer	VU
Lecythidaceae	*Cariniana legalis* (Mart.) Kuntze	EN
Leguminosae	*Apuleia leiocarpa* (Vogel) J.F. Macbr.	VU
	Dalbergia nigra (Vell.) Allemão ex Benth.	VU
	Inga mendoncaei Harms	VU
	Tachigali beaurepairei (Harms) L.G. Silva & H.C. Lima	VU
Meliaceae	*Cedrela odorata* L.	VU
Monimiaceae	*Mollinedia eugeniifolia* Perkins	EN
	Mollinedia longicuspidata Perkins	EN
Myristicaceae	*Virola bicuhyba* (Schott ex Spreng.) Warb.	EN

APPENDIX 2 *(continued)*

List of the arboreal species critically endangered, endangered and vulnerable of the Tinguá Biological Reserve, Rio de Janeiro State, Brazil. Conservation status: **CR**=critically endangered; **EN**=endangered; **VU**=vulnerable.

Family	Species	Conserv
Myrtaceae	*Calyptranthes fusiformis* M.L. Kawas.	VU
	Eugenia macrobracteolata Mattos	EN
	Eugenia pruinosa D. Legrand	EN
	Eugenia vattimoana Mattos	VU
	Neomitranthes amblymitra (Burret) Mattos	VU
	Plinia edulis (Vell.) Sobral	VU
Proteaceae	*Roupala sculpta* Sleumer	VU
Rubiaceae	*Rudgea macrophylla* Benth.	EN
	Rustia angustifolia K. Schum.	EN
Sapindaceae	*Cupania concolor* Radlk.	VU
	Cupania furfuracea Radlk.	VU
Sapotaceae	*Pouteria bapeba* T.D. Penn.	CR
	Pouteria coelomatica Rizzini	VU
	Pradosia kuhlmannii Toledo	EN

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