

FLORISTIC CHARACTERIZATION OF IBURA NATIONAL FOREST, SERGIPE, BRAZIL

CARACTERIZAÇÃO FLORÍSTICA DA FLORESTA NACIONAL DO IBURA, SERGIPE, BRASIL

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ABSTRACT: The aim of this study was to obtain information on the floristic composition and dispersal syndromes of the Ibura National Forest and carry out an analysis of similarity with other floristic surveys in the state of Sergipe. For this purpose, bimonthly sampling was carried out from September 2012 to December 2014. Total of 328 species were recorded, of which 324 were angiosperms belonging to 82 families, followed by three species of ferns and lycophytes and one species of Gymnosperm. Sixty-seven new species were recorded for the state of Sergipe. The richest families in species were Fabaceae, Myrtaceae, Rubiaceae, Asteraceae, Euphorbiaceae and Malvaceae. Regarding the dispersal syndromes, the dominance of zoochoric dispersal was observed, followed by autochoric and anemochoric dispersal. Among the tree and shrub species, the zoochoric syndrome was predominant (70%), while herbaceous species showed predominance of autochoric species (49%), and climber species have a more equitable proportion among the syndromes (38% autochoric, 32% anemochoric and 30% zoochoric). The Ibura National Forest presented relatively low levels of similarity with other sites located in the Atlantic Forest, possibly influenced by its isolation and distance between fragments. As we found in the Ibura National Forest, the dominance of zoochoric species was also observed in other studies conducted in the Atlantic Forest. The results of this study indicate that the Ibura National Forest is refuge to a high diversity of plant species of the Atlantic Forest, being a fairly heterogeneous area, which is still understudied.

KEYWORDS: Atlantic Forest. Brazilian northeast. Diversity. Flora.

INTRODUCTION

The Atlantic Forest is one of the 34 global biodiversity hotspots (MITTERMEIER et al., 2004). This domain has an estimated number of 20000 species of vascular plants (PINTO et al., 2006), of which 6663 (49%) are considered to be endemic (STEHMANN et al., 2009). Originally, the Atlantic Forest extended continuously along the Brazilian coast, penetrating into eastern Paraguay and northeastern Argentina in its southern portion (TABARELLI et al., 2005), and was considered the second largest tropical rainforest in the American continent. Currently, if we include all the fragments of native forest above 3 hectares and the non-forest formations such as salt marshes and mangroves, only 15% of the Atlantic Forest remains (FUNDAÇÃO SOS MATA ATLÂNTICA, 2014), covering a variety of climatic zones and vegetation formations of the tropical to subtropical regions (TABARELLI et al., 2005).

With regard to conservation, the largest and most important remnants are usually associated with full protection conservation units, mainly located on the coast of the states of Santa Catarina, Paraná, São Paulo, Rio de Janeiro, Bahia and the mountain

region of Espírito Santo, corresponding to less than 2% of the biome's area (PINTO et al., 2006).

In the state of Sergipe, it is estimated that only 9% of the original area of the Atlantic Forest remains (FUNDAÇÃO SOS MATA ATLÂNTICA; INPE, 2002). The state has only nine conservation units for the Atlantic Forest biome and not all native vegetation fragments are included in these units (SOUZA; LANDIM, 2007).

Among the conservation units of the state of Sergipe, the Serra de Itabaiana National Park (7966 ha), Santa Isabel Biological Reserve (2766 ha), and Mata do Junco Wildlife Refuge (600 ha) are noted for being among the largest units of the state (MENDES; GOMES; ALVEZ, 2010; SOUZA-ALVES et al., 2014; OLIVEIRA; LANDIM, 2014). But the vast majority of remnants are still in private areas, such as Mata do Crasto, located in the southern region. The latter is considered the most representative and preserved fragment of Atlantic Forest of the state, covering an area of approximately 1000 ha (LANDIM et al., 2015).

Floristic studies are starting points for understanding biological ecosystems to advance our knowledge about the complex dynamic behavior of plant communities (MARANGON; SOARES;

FELICIANO, 2003). Besides the species composition, the understanding of the functional structure of each forest remnant, such as of the set of dispersal syndromes (PRADO-JÚNIOR et al. 2014), is essential to define its conservation status, which is reflected, among other factors, in the complexity of animal-plant interactions (VAN DER PIJL, 1982).

The Sergipe fragments are a refuge to a wide diversity of flora and fauna including some endangered species, such as *Campomanesia viatoris* (Myrtaceae) (LANDIM; LANDRUM, 2002), *Manilkara maxima*, *Pouteria macahensis* and *Pouteria nordestinensis* (Sapotaceae) (PRATA; FARIAS; LANDIM, 2015), which reinforces the importance of studying them. Despite advances in floristic studies in the last decade, so far, few remnants have been systematically inventoried in the state of Sergipe (VICENTE et al., 2005; MENDES; GOMES; ALVEZ, 2010; SANTOS, 2011; SOUZA-ALVES et al., 2014; PRATA et al., 2013; LANDIM et al., 2015).

Studies of flora are considered fundamental for basing any activities regarding the use, recovery and conservation of tropical forests (RIBAS et al., 2003). This study was developed to inventor the

floristic composition and characterizing the dispersal syndromes of the Ibura National Forest and assessing its similarity to other floristic surveys in the state. Considering that the Ibura National Forest does not yet have a management plan, this study could also potentially contribute to its development.

MATERIAL AND METHODS

Study area

Before the creation of the Ibura National Forest (FLONA Ibura), this area was used to support the development of livestock farming in the state of Sergipe (Horto Ibura) and later to support recovery projects of degraded areas. It was transformed into a sustainable conservation unit by September 2005.

The Ibura National Forest (10°83'86.0" W, 37°13'42.0" S) covers an area of approximately 145 ha and is located in the municipality of Nossa Senhora do Socorro, in the state of Sergipe. It is classified as semideciduous forest, at medium and advanced stages of regeneration, associated with mangroves (Figure 1) (BRASIL, 2005).

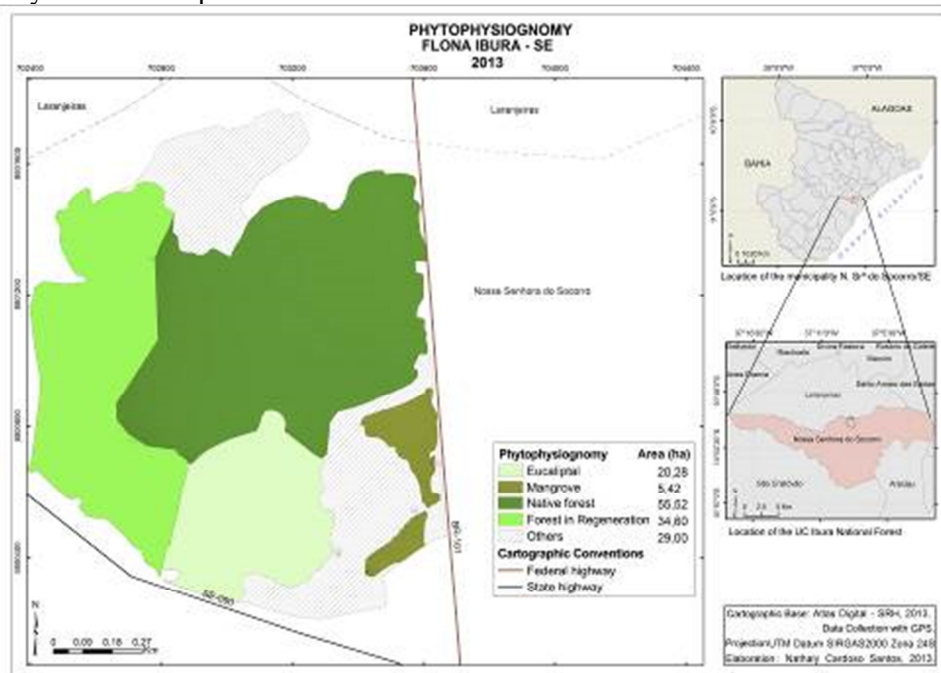


Figure 1. Location of the study area, Ibura National Forest, in the municipality of Nossa Senhora do Socorro, state of Sergipe, Brazil.

In general, the vegetation of the Ibura National Forest is quite peculiar, having a history of deforestation for eucalyptus plantation, introduction of exotic species and anthropic pressure. It presents four main vegetation types: (i) a preserved forest area (on the margins of the BR101 highway) with a

canopy in an advanced state of succession when compared to the other subareas; (ii) an area under regeneration, with an understory in secondary succession stage mixed with an old abandoned eucalyptus plantation; (iii) a mangrove area along the margins of Cotinguiba River, with a small spot

on the east margin of the BR101 highway ; (iv) an open area, characterized by sparse grasses and shrubs. Several trails were also found surrounding the area and inside it, some of which were approximately 5m wide.

Floristic survey

To study the vegetation structure and composition of a particular type of vegetation, it is important that the sample is representative, namely that the procedures and methods used for forest measurement are compatible with the vegetation, and cover a significant portion of its flora. Initially, a visit for recognition of the area was conducted. This led to the choice of a method for obtaining data on floristic characterization that included random sampling along the edge of the forest and along existing trails inside the forest. Sampling was carried out twice a month, from September 2012 to December 2015.

In the field, the species collected were categorized as shrubs, trees, herbaceous, climber, epiphyte and semiparasites (GONÇALVES; LORENZI, 2011). The definition of the dispersal syndromes (anemochoric, autochoric, epizoochoric, hydrocholic and zoochoric) was based on the external morphology of the fruits and seeds (VAN DER PIJL, 1982; SARAVY et al., 2003).

The collected material was pressed in the field, according to Martins-da-Silva et al. (2014) and identified through specialized literature, assistance from experts, and comparisons to pre-existing herbarium specimens. It was subsequently deposited in the Herbarium ASE - Federal University of Sergipe.

Analyses

From the Jaccard similarity index, a cluster analysis was performed using the unweighted pair group method with arithmetic mean (UPGMA). As some of the studies that were used for the comparison did not sampled herbaceous species of Atlantic Forest (SOUZA-ALVES et al., 2014; VICENTE et al., 2005; OLIVEIRA et al., 2013; LANDIM et al., 2015) and Caatinga (SILVA; PRATA; MELLO, 2013; FONSECA, 1991; FERREIRA, 2011; NOGUEIRA-JÚNIOR, 2011; MACHADO; PRATA; MELLO, 2012), in this analysis only tree and shrub species were considered. The analyses were performed using the program PAST (HAMMER; HARPER; RYAN, 2001). The composition of tree and shrub species at the Ibura National Forest were compared with other

floristic studies in the state of Sergipe carried out both in the Atlantic Forest and in the Caatinga (Table 1).

RESULTS

The study area presented a total of 328 species, of which 324 were Angiosperms belonging to 82 families; three were species of ferns from three families and one was a Gymnosperm. Of this total, the 11 families with the greatest species richness were Fabaceae (standing out with 50 species in 30 genera), followed by Myrtaceae (20 species in 7 genera), Rubiaceae (15 species in 11 genera), Asteraceae (14 species in 14 genera), Euphorbiaceae (13 species in 9 genera), Malvaceae (12 species in 8 genera), and Orchidaceae (12 species in 12 genera). These families comprised approximately 26% of the species found (Appendix 1).

Among the 324 species of Angiosperms sampled in the Ibura National Forest, 286 are native species, 14 exotic species, 18 naturalized species and six cultivated species (Appendix 1). Among the native species, 22 are endemic to the Atlantic Forest and to the northeast of Brazil (Caatinga and Cerrado), according to the classification of the List of the Brazilian Flora (LSBF; <http://floradobrasil.jbrj.gov.br/>).

Among the sampled species, one of the genus *Zanthoxylum* (Rutaceae) has not been described before our fieldwork. This new species is endemic of Sergipe (see GROppo; ERBERT, 2015) (Figure 2). Moreover, the presence of *Catasetum uncatum* Rolfe (Orchidaceae) in the study area, categorized as “Near Threatened” (LSBF; <http://floradobrasil.jbrj.gov.br/>), as well as 79 new cases of native species for the state of Sergipe, among them *Annona montana* (Anonaceae), *Cayaponia tayuya* (Cucurbitaceae), *Cupania oblongifolia* and *Paullinia revoluta* (Sapindaceae), *Diospyros inconstans* (Ebenaceae), *Drymonia serrulata* (Gesneriaceae), *Inga laurina* and *Swartzia dipetala* (Fabaceae), *Passiflora mansoi* (Passifloraceae), *Piper amalago* (Piperaceae) and *Varronia globosa* (Boraginaceae) are important findings for the state ((Appendix 1; Figure 2). Three native species of ferns were also recorded: *Lygodium venustum* (Lygodiaceae), *Serpocaulon* sp (Polypodiaceae) and *Vittaria lineata* (Pteridaceae), being the first record of the occurrence of the genera for the state (Appendix 1).

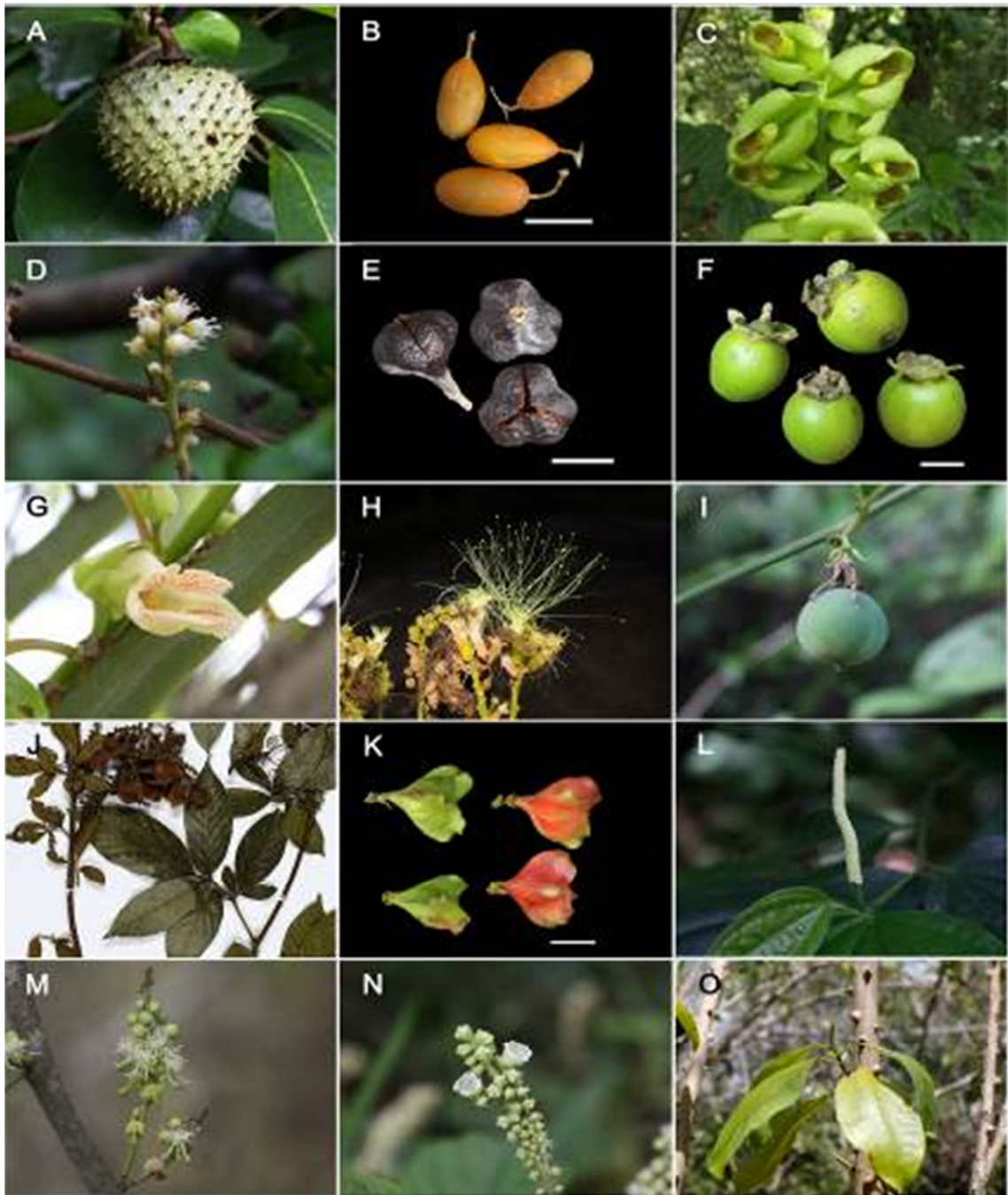


Figure 2. Some of the new occurrences of species found in the Ibura National Forest, state of Sergipe, Brazil. A: *Annona montana* (Fruit). B: *Cayaponia tayuya* (Fruits). C: *Catasetum uncatum* (Near Threatened) (Flower). D and E: *Cupania oblongifolia* (Flowers and Fruits). F: *Diospyrus inconstans* (Fruits). G: *Drymonia serrulata* (Flower). H: *Inga laurina* (Flower). I: *Passiflora mansoi* (Fruit). J and K: *Paullinia revolute* (Fruits). L: *Piper amalago* (Inflorescence). M: *Swartzia dipetala* (Flowers). N: *Varronia globosa* (Flowers). O: *Zanthoxylum* sp (New Species). Scales bars = 20 mm in B, E, 10 mm in F, K. Photos by J.P. Santana.

In some areas of the Ibura National Forest, some exotic species were predominant, such as *Pinus caribaea* (Pinaceae), *Mangifera indica* (Anacardiaceae), *Artocarpus heterophyllus* e *Ficus cf. nitida* (Moraceae), *Terminalia catappa*

(Combretaceae) and *Musa paradisiaca* (Musaceae). The herbaceous habit dominated, with 124 species, followed by shrubs (74), trees (66), climber (51), semiparasites (11), one parasite and one epiphyte habits (Appendix 1).

Seed dispersal by animals was most observed (48%; 156 spp), followed by autochoric dispersal (25%; 83 spp), anemochoric dispersal (23%; 74 spp) and epizoochoric, hydrochoric and others dispersal (4%; 15 spp). Among the tree species (66 spp), 45 spp (69%) are zoochoric, 12 (19%) autochoric and 8 (12%) anemochoric. This proportion is similar to that presented by shrub species, 58 (79%) zoochoric, followed by autochoric (8; 12%) and anemochoric (7 spp; 8%). On the other hand, herbaceous (124 spp) showed predominance of autochoric species (42% autochoric, 29% anemochoric and 29% zoochoric) and climber species (51 spp) had a more equitable proportion between the syndromes (38% autochoric, 32% anemochoric and 30% zoochoric). Together, tree and shrub represent 67% species zoochoric in the FLONA Ibura.

Among the eleven richest families, six are characterized as zoochoric by having fleshy mesocarp that attracts wildlife, enabling dispersal, such as Myrtaceae (18), Fabaceae (15), Rubiaceae (14), Boraginaceae (7), Sapindaceae (7) and Euphorbiaceae (6). The families Fabaceae (31), Malvaceae (8), Euphorbiaceae (8) and some Acanthaceae (4) are mostly autochoric,

characterized by the presence of species with dry pericarp, while Asteraceae (13), Orchidaceae (12), Cyperaceae (8) and Apocynaceae (8) have mostly anemochoric species (Appendix 1).

Some families showed more than one type of syndrome, such as Euphorbiaceae with zoochoric and autochoric species, followed by Malvaceae with three types of syndromes and Fabaceae, with four types of syndromes (zoochoric, autochoric, anemochoric and epizoochoric), with dominance of autochoric (31 species) and zoochoric (15) species (Appendix 1).

Comparing the floristic composition with inventories already carried out in the state, the similarity showed two large clusters, the first belongs to the Atlantic Forest (AF) (11-24%) and the other to the Caatinga (CA) (18-41%). Species richness of the Ibura National Forest, grouped with other studies located on the site of the Atlantic Forest (AF), however they presented relatively low similarity levels (11-19%). The site that showed the highest similarity to the Ibura National Forest was the Piauitinga River Basin (4), municipality of Salgado, (with 19%) and Serra de Itabaiana PN (5) (with 15%) (Figure 3; Table 1).

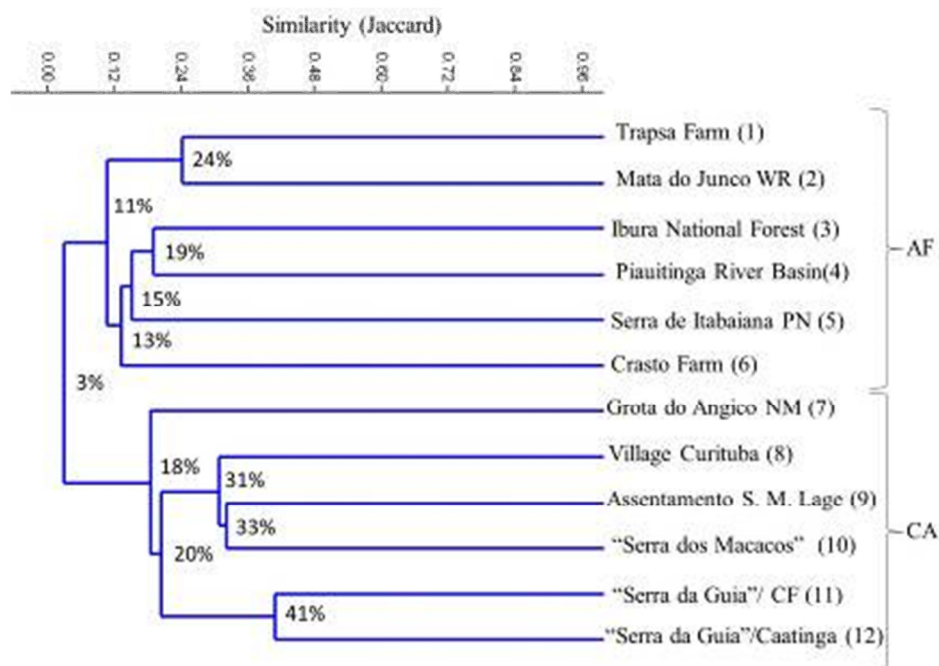


Figure 3. Cluster analysis based on the Jaccard floristic similarity index of tree and shrub species in the state of Sergipe. Numerical codes are the same as those in Table 2. Legend: AF = Atlantic Forest; CA = Caatinga.

Table 1. Data used in the Cluster analysis, based on floristic similarity (Jaccard index) of sites sampled in Sergipe, Brazil.

Code	Locality	Municipality	Richness	Selected Species	Coordinates	References
1	Trapsa Farm	Itaporanga d'Ajuda	83	83	11°12'00.0" S, 37°14'00.0" W	SOUZA-ALVES et al. 2014.
2	Mata do Junco Wildlife Refuge	Capela	42	42	10°32'00.0" S, 37°03'30.0" W	SOUZA-ALVES et al., 2014.
3	Ibura National Forest	Nossa Senhora do Socorro	328	128	10°83'86.0" W, 37°13'42.0" S	Current Study
4	Piauitinga River Basin	Salgado	101	80	11°09'57.0" S, 37°32'51.0" W	OLIVEIRA et al., 2013.
5	Serra Itabaiana National Park	Itabaiana	114	92	10°45'07.0" S, 37°20'28.0" W	VICENTE et al., 2005.
6	Crasto Farm	Santa Luzia do Itanhy	324	178	11°22'00.0" S, 37°25' W	LANDIM et al., 2015.
7	Grota do Angico Natural Monument	Canindé	174	42	09°39'56.0" S, 37°41'06.9" W	SILVA; PRATA; MELLO, 2013.
8	Village Curituba	Poço Redondo e Canindé		38	09°51'00.0" S, 37°37'00.0" W	FONSECA, 1991.
9	Assentamento Santa Maria da Lage	Poço Verde	176	63	10°42'11.0" S, 38°11'06.0" W	FERREIRA, 2011.
10	"Serra dos Macacos"	Tobias Barreto	93	53	10° 52'52.0" S; 37°59'12.0" W	NOGUEIRA-JÚNIOR, 2011.
11	"Serra da Guia"/ Cloud Forest	Poço Redondo	284	68	09°58'00.0" S, 37°52'00.0" W	MACHADO; PRATA; MELLO, 2012.
12	"Serra da Guia"/ Caatinga	Poço Redondo	238	56	09°58'00.0" S, 37°52'00.0" W	MACHADO; PRATA; MELLO, 2012.

DISCUSSION

The families with greater richness of species found at the Ibura National Forest (Fabaceae, Myrtaceae, Rubiaceae, Asteraceae and Euphorbiaceae) are similar to those found in other surveys conducted in the Atlantic Forest of the state of Sergipe (VICENTE et al., 2005; SANTOS, 2011; MENDES; GOMES; ALVEZ, 2010; SOUZA-ALVES et al., 2014; LANDIM et al., 2015). The Ibura National Forest is also distinguished by the high species richness of native and endemic species in the state, even within a smaller area, when compared to the previously mentioned studies.

About 24% of the native species found in FLONA Ibura (79 spp.) are considered new records for the state of Sergipe. This set of new records for the state can be divided into four categories, according to their distribution areas known: (i) *Swartzia dipetala* (Fabaceae) and *Parodiolyra ramosissima* (Poaceae), with known distribution limited to the Bahia Atlantic Forest remnants; (ii) *Angelonia biflora* (Angeloniaceae), previously

recorded from Pernambuco to Ceará; (iii) species with distributions remnants of Bahia and states of the Southeast and South of Brazil (11 species); (iv) and species distribution areas between the neighboring states Sergipe (10 species) (LSBF; <http://floradobrasil.jbrj.gov.br/>). These endemic species, as well as the new taxon *Zanthoxylum sp.* (Rutaceae), need of conservation action, because besides the limited distribution, they occur in only few state fragments.

These 79 new cases records contribute to increase the knowledge about species distribution in the state, together with, PRATA et al. (2013), found 494 species in the first volume of the botanical series: Flora de Sergipe; SOUZA-ALVES et al. (2014) recorded 125 species (34 species being new records) and LANDIM et al. (2015) found 321 species, 129 of these being considered new occurrences for the Atlantic Forest of the state. It is important to note that this scenario has changed in recent years with the result of recent publications, where the number of species occurring in the state

has been gradually updated, as well as records of occurrence.

The presence of endemic species, as well as those in the “near threatened” category, emphasizes the importance of existing conservation units and reinforces the urgency of protecting new areas of vegetation in the state (ANDERSON, 1994; MAURER, 1994).

The high number of exotic species in FLONA (Table 2) can be connected to local historical factors such as the removal of native vegetation for eucalyptus plantation and anthropogenic actions carried out in the vicinity and in the study area. The introduction of exotic species can also be related to the former use of the space. Data on exotic species are worrying, since we have no studies in the area to find out whether they are causing damages or are bringing benefits to the native species.

Similar to the results found in the Ibura National Forest, the dominance of zoochoric species was also observed in other studies conducted in the Atlantic Forest (REYS et al., 2005; MOREIRA; QUEIROZ; PIGOZZO, 2009; OLIVEIRA et al., 2011; MOURA; DUARTE; LEMOS, 2011). The dominance of zoochoric species in rainforests is favored by the precipitation factor, enabling the development of edible fruits, favoring the dispersal by fauna (HOWE; SMALLWOOD, 1982). Within this group, the morphological variations and strategies to attract the disperser vary between species, nutrients and the amount of seeds, which contribute to the establishment of plant populations (PIZO, 2002).

The species cluster showed two main locations (CA and FA) for the two biomes that occur in the state, showing that species are key factors in the characterization of both. The species composition of the analyzed fragments showed relatively low levels of similarity, even those belonging to the same biome or those that are considerably close to each other. Furthermore, this low similarity is probably being influenced by the distance between fragments, and historical levels of degradation. FAHRIG (2003) mentions that the isolation of areas causes loss of species richness, decreases interaction, limits the population distribution, abundance, dispersion and, genetic exchanges.

The results of this study indicate that the Ibura National Forest is a refuge to a high diversity of plant species of the Atlantic Forest, being a fairly heterogeneous area, still under studied. The data reinforce the need and importance of conservation units for the preservation of regional biodiversity and highlight the need of a management plan and analysis of the exotic species in the area.

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RESUMO: O objetivo deste estudo foi obter informações sobre a composição florística, as proporções entre as síndromes de dispersão das espécies ocorrentes na Floresta Nacional Ibura e realizar uma análise de similaridade com outros levantamentos florísticos no estado. Para isto, foi realizada uma amostragem bimestral a partir de setembro de 2012 a dezembro de 2014. Foram registradas 328 espécies, das quais 317 são Angiospermas pertencentes a 82 famílias, seguido de três espécies de samambaias e Licófitas e uma espécie de Gimnosperma. Sessenta e sete novas ocorrências foram registradas para o estado de Sergipe. As famílias mais ricas em espécies foram, Fabaceae, Myrtaceae, Rubiaceae, Asteraceae, Euphorbiaceae e Malvaceae. Quanto às síndromes de dispersão, observou-se a dominância da dispersão zoocórica, seguida por autocórica e anemocórica. Entre as espécies arbóreas e arbustivas, houve a dominância da síndrome zoocórica (70%), em espécies herbáceas a síndrome autocórica (49%), e em espécies trepadeiras uma proporção mais equilibrada entre as síndromes (38% autocórica, 32% anemocórica e 30% zoocórica). A Floresta Nacional do Ibura apresentou níveis relativamente baixos de similaridade com outros sítios localizados na Mata Atlântica, possivelmente influenciados por isolamento e distância entre os fragmentos. Os resultados deste estudo indicam que a Floresta Nacional do Ibura é um refúgio de uma grande diversidade de espécies vegetais da Mata Atlântica, sendo uma área bastante heterogênea, que ainda é pouco estudada.

PALAVRAS CHAVES: Floresta Atlântica. Nordeste brasileiro. Diversidade. Flora.

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[Appendix and Captions]**Appendix 1** - List of families with the highest number of species in the Ibura National Forest, state of Sergipe.

Legend: Habit = Habitat, Epi = epiphytic, Her = herbaceous, Shr = Shrub, Tre = tree, Clim = climber. Dispr = Dispersal, Anem = Anemochoric, Aut = Autochoric, Zoo = Zoochoric, Orig = Origin, Natur = Naturalized, Exot = Exotic, End = Endemic, M. Atla = Atlantic Forest, M. Atla SE, Atlantic Forest Sergipe, Nord = Northeast, Caat = Caatinga, V= Voucher (ASE), (*)= new records for the Atlantic Forest of Sergipe, (<>)= new taxon for the Atlantic Forest.

Ferns						
Family/Species	Habitat	Dispr	Origin	End	Collector/Number (ASE)	V.(ASE)
Lygodiaceae						
<i>Lygodium venustum</i> Sw.	Her	Anem	Native	-	T.R.Silva 68	27050
Polypodiaceae						
<i>Serpocaulon</i> sp.*	Her	Anem	Native	-	J.P.Santana 152	30730
Pteridaceae						
<i>Vittaria lineata</i> (L.) Sw.*	Epi	Ane	Native	-	J.P.Santana 469	36289
Gymnosperm						
Family/Species	Habitat	Dispr	Origin	End	Collector/Number (ASE)	V.(ASE)
Pinaceae						
<i>Pinus caribaea</i> Morelet	Tre	Anem	Exot	-	G.Viana 3576	3576
Angiosperms						
Family/Species	Habitat	Dispr	Origin	End	Collector/Number (ASE)	V.(ASE)
Acanthaceae						
<i>Dielliptera</i> sp	Her	-	Native	-	J.P. Santana 99	29965
<i>Ruellia bahiensis</i> (Nees) Morong*	Her	Aut	Native	-	J.P.S.Santos 82	29655
<i>Ruellia ochroleuca</i> Mart. ex Nees*	Her	Aut	Native	-	T.R.Silva 04	25281
<i>Ruellia humilis</i> Nutt.	Her	Aut	Native	-	J.P.S.Santos 20	26122
<i>Sanchezia</i> sp	Her	Aut	-	-	J.P.S.Santos 03	26097
<i>Thunbergia alata</i> Bojer ex Sims*	Her	Aut	Natur	-	G.S.Freire 03	25288
Aizoaceae						
<i>Sesuvium portulacastrum</i> L.	Her	-	Native	-	J.P.S.Santos 75	29389
Alstroemeriaceae						
<i>Bomarea edulis</i> (Tussac) Herb.	Clim	-	Native	-	J.P.Santana 107	29973
Amaranthaceae						
<i>Alternanthera tenella</i> Colla	Her	-	Native	-	J.P.Santana 85	29658
<i>Eucharis</i> sp.*	Her	-	Natur	-	J.P.Santana 118	29984
Anacardiaceae						
<i>Schinus terebinthifolius</i> Raddi	Shr	Zooc	Native	-	T.R.Silva 106	27630
<i>Spondias mombin</i> L.	Shr	Zooc	Native	-	J.P.Santana 170	30748
<i>Tapirira guianensis</i> Aubl.	Tre	Zooc	Native	-	T.R.Silva 128	28213
Angeloniaceae						
<i>Angelonia biflora</i> Benth.*	Her	-	Native	-	T.R.Silva 126	28211
Annonaceae						
<i>Annona montana</i> Macfad*	Shr	Zooc	Native	-	T.R.Silva 118	27642
<i>Duguetia gardneriana</i> Mart.	Shr	Zooc	Native	-	J.P.S.Santos 11	26105
Apocynaceae						
<i>Allamanda cathartica</i> L.	Her	Aut	Native	-	J.P.S.Santos 38	26142
<i>Cryptostegia grandiflora</i> Roxb.	Clim	Ane	Natur	-	J.P.Santana 64	29053
<i>Himatanthus obovatus</i> (Müll. Arg.) Woodson	Tre	Ane	Native	-	T.R.Silva 58	26994
<i>Mandevilla hirsuta</i> (Rich.) K. Schum.	Clim	Ane	Native	-	E.M.Carneiro 92	1446
<i>Mandevilla scabra</i> (Hoffmanns. ex Roem. & Schult.) K. Schum.	Clim	Ane	Native	-	J.P.S.Santos 07	26101
<i>Matelea ganclinosa</i> (Vell.) Rapini	Clim	Ane	Native	-	J.P.Santana 81	29654
<i>Rauwolfia ligustrina</i> Willd. ex Roem. & Schult.	Shr	Ane	Native	-	J.P.Santana 80	29653
<i>Tabernaemontana</i> sp.	Shr	Ane	Native	-	T.R.Silva 56	26992
<i>Temnadenia violacea</i> (Vell.) Miers	Clim	Ane	Native	-	T.R.Silva 127	28212
Araceae						
<i>Anthurium</i> sp.	Her	Zooc	Native	-	T.R.Silva 124	28209
<i>Caladium bicolor</i> (Aiton) Vent.*	Her	Zooc	Native	-	J.P.Santana 63	29051
<i>Spathicarpa</i> sp.*	Her	Zooc	Native	-	T.R.Silva 148	29055

<i>Syngonium vellozianum</i> Schott*	Clim	Zooc	Native	-	T.R.Silva 115	27639
Araliaceae						
<i>Scheffera morotoni</i> (Aubl.) Maguire, Steyerl. & Frodin	Tre	Zooc	Native	-	J.P.Santana 607	37730
Arecaceae						
<i>Allagoptera caudescens</i> (Mart.) Kuntze	Tre	Zooc	Native	-	J.P.Santana 283	33414
<i>Cocos nucifera</i> L.	Tre	Zooc	Native	-	-	-
<i>Elaeis guineensis</i> Jacq.	Tre	Zooc	Natur	-	-	-
<i>Syagrus coronata</i> (Mart.) Becc.	Shr	Zooc	Native	-	J.P.Santana 287	33418
<i>Zomicarpa pythonium</i> (Mart.) Schott	Her	Zooc	Native	-	-	-
Aristolochiaceae						
<i>Aristolochia birostris</i> Duch.	Clim	-	Native	-	J.P.S.Santos 32	26135
Asteraceae						
<i>Albertinia brasiliensis</i> Spreng.	Shr	Ane	Native	-	T.R.Silva 136	28428
<i>Centratherum punctatum</i> Cass.	Her	Ane	Native	-	G.S.Freire 06	25291
<i>Eclipta prostrata</i> (L.) L.	Her	Ane	Native	-	J.P.Santana 70	29378
<i>Emilia sonchifolia</i> (L.) DC. ex Wight	Her	Ane	Native	-	J.P.Santana 132	30606
<i>Galinsoga quadriradiata</i> Ruiz & Pav.*	Her	Ane	Native	-	J.P.Santana 265	32568
<i>Melanthera latifolia</i> (Gardner) Cabrera	Her	Ane	Native	-	T.R.Silva 110	27634
<i>Mikania</i> sp.	Clim	Ane	Native	-	J.P.Santana 86	29390
<i>Porophyllum ruderale</i> (Jacq.) Cass.*	Her	Ane	Native	-	J.P.Santana 131	30605
<i>Pterocaulon virgatum</i> (L.) DC.*	Her	Ane	Native	-	T.R.Silva 120	28205
<i>Sphagnetocola trilobata</i> (L.) Pruski.	Her	Ane	Native	-	J.P.S.Santos 01	26092
<i>Tilesia baccata</i> (L.) Pruski	Her	Zooc	Natur	-	J.P.Santana 51	29038
<i>Tridax procumbens</i> L.*	Her	Ane	Native	-	T.R.Silva 91	27376
<i>Verbesina macrophylla</i> (Cass.) S.F. Blake*	Her	Ane	Native	-	T.R.Silva, 157	29387
<i>Vernonanthura</i> sp.	Shr	Ane	Native	-	J.P.S.Santos 02	26095
Bignoniaceae						
<i>Bignonia corymbosa</i> (Vent.) L.G.Lohmann	Clim	Ane	Native		J.P.Santana 273	33404
<i>Fridericia conjugata</i> (Vell.) L.G.Lohmann*	Clim	Ane	Native		J.P.Santana 274	33405
<i>Handroanthus vellosi</i> (Toledo) Mattos.*	Tre	Ane	Native	M. Atla	T.R.Silva 85	27370
<i>Lundia corymbifera</i> (Vahl) Sandwith*	Clim	Ane	Native	-	J.P.S.Santos 25	26127
<i>Tecoma stans</i> (L.) Juss. ex Kunth.	Shr	Ane	Natur	-	-	
Boraginaceae						
<i>Cordia pilosa</i> M.Stapf & Taroda	Her	Zooc	Native	M. Atla	T.R.Silva 114	27638
<i>Cordia superba</i> Cham.	Shr	Zooc	Native	-	J.P.Santana 110	29976
<i>Cordia taguahyensis</i> Vell.	Her	Zooc	Native	-	J.P.S.Santos 40	28435
<i>Cordia toqueve</i> Aubl.	Tre	Zooc	Native	-	T.R.Silva 152	29060
<i>Myriopus rubicundus</i> (Salzm. ex DC.) Luebert*	Her	Zooc	Native	-	J.P.Santana 113	29979
<i>Myriopus salzmannii</i> (DC.) Diane & Hilger*	Her	Zooc	Native	-	J.P.Santana 172	30838
<i>Varronia curassavica</i> Jacq.	Shr	Zooc	Native	-	T.R.Silva 65	27001
<i>Varronia globosa</i> Jacq.*	Shr	Zooc	Native	-	J.P.Santana 111	29977
Burseraceae						
<i>Protium heptaphyllum</i> (Aublet) Marchand	Tre	Zooc	Native	-	J.P.Santana 149	30727
Cactaceae						
<i>Epiphyllum phyllanthus</i> L.	Epi	Zooc	Native	-	T.R.Silva 146	29052
Cannabaceae						
<i>Celtis iguanaea</i> (Jacq.) Sarg.	Shr	Zooc	Native	-	T.R.Silva 99	27622
<i>Trema micrantha</i> (L.) Blume	Shr	Zooc	Native	-	T.R.Silva 159	30847
Cannaceae						
<i>Canna paniculata</i> Ruiz & Pav.	Her	Aut	Native	-	J.P.Santana 79	29652
Capparaceae						
<i>Cynophalla flexuosa</i> (L.) J. Presl	Tre	Zooc	Native	-	J.P.Santana 71	11093
<i>Hemiscola aculeata</i> (L.) Raf.	Shr	Zooc	Native	-	J.P.Santana 117	29983
Chrysobalanaceae						
<i>Hirtella racemosa</i> Lam.	Shr	Zooc	Native	-	T.R.Silva 70	27052
<i>Licania rigida</i> Benth.*	Tre	Zooc	Native	-	T.R.Silva 64	27000
<i>Licania tomentosa</i> (Benth.) Fritsch*	Tre	Zooc	Native	M. Atla	T.R.Silva 63	26999
Clusiaceae						
<i>Clusia nemorosa</i> G.Mey.	Tre	Zooc	Native	-	T.R.Silva 117	27641
Combretaceae						
<i>Conocarpus erectus</i> L.	Tre	Ane	Native	-	T.R.Silva 111	27635
<i>Laguncularia racemosa</i> L.	Tre	Hidr	Native	-	T.R.Silva 107	27631
Commelinaceae						

<i>Commelina erecta</i> L.	Her	Aut	Native	-	T.R.Silva 138	28430
<i>Commelina benghalensis</i> L.	Her	Aut	Native	-	J.P.S.Santos 18	26120
<i>Dichorisandra hexandra</i> (Aubl.) Kuntze ex Hand.-Mazz.	Her	Aut	Native	-	J.P.Santana 254	32657
Convolvulaceae						
<i>Evolvulus nummularius</i> (L.) L.*	Clim	Ane	Native	-	J.P.Santana 74	29385
<i>Ipomoea bahiensis</i> Willd. ex Roem. & Schult.	Clim	Ane	Native	-	J.P.Santana 119	30593
<i>Ipomoea nil</i> (L.) Roth	Clim	Ane	Natur	-	T.R.Silva 11	25304
<i>Ipomoea eriocalyx</i> Meisn	Clim	Ane	Native	-	T.R.Silva 17	26109
<i>Ipomoea indica</i> (Burmi. f.) Merr.	Clim	Ane	Native	-	T.R.Silva 44	25451
<i>Jacquemotia blanchetii</i> Moric.	Clim	Aut	Native		J.P.Santana 272	33403
<i>Merremia cissoides</i> (Lam.) Hallier f.	Clim	Aut	Native	-	J.P.Santana 258	32561
<i>Merremia macrocalyx</i> (Ruiz et Pavon) O'Donell.	Clim	Aut	Native	-	J.P.S.Santos 04	26098
Costaceae						
<i>Costus spicatus</i> (Jacq.) Sw.	Shr	Zooc	Natur	-	J.P.S.Santos 31	26134
Cucurbitaceae						
<i>Cayaponia tayuya</i> (Vell.) Cogn.*	Clim	Zooc	Native	-	GAGC 307	27046
<i>Melothria pendula</i> L.	Clim	Zooc	Native	-	J.P.Santana 168	30746
<i>Momordica charantia</i> L.	Clim	Zooc	Natur	-	T.R.Silva 46	25453
Cyperaceae						
<i>Cyperus ligularis</i> L.	Her	Ane	Native	-	T.R.Silva 98	27621
<i>Eleocharis</i> sp.	Her	Ane	Native	-	J.P.Santana 184	32291
<i>Fimbristylis dichotoma</i> (L.) Vahl	Her	Ane	Native	-	J.P.Santana 185	32292
<i>Kyllinga brevifolia</i> Rottb.	Her	Ane	Native	-	T.R.Silva 142	28434
<i>Kyllinga odorata</i> Vahl	Her	Ane	Native	-	T.R.Silva 154	29382
<i>Rhynchospora cephalotes</i> (L.) Vahl	Her	Ane	Native	-	J.P.Santana 166	30744
<i>Scleria gaertneri</i> Raddi	Her	Ane	Native	-	T.R.Silva 135	28427
<i>Scleria</i> sp.	Her	Ane	Native	-	J.P.Santana 186	32293
Dioscoreaceae						
<i>Dioscorea piperifolia</i> Humb & Bonpl. ex Willd.	Her	Ane	Native	-	J.P.Santana 77	29650
<i>Dioscorea subhastata</i> Vell.	Her	Ane	Native	-	J.P.Santana 253	32656
Ebenaceae						
<i>Diospyros inconstans</i> Jacq.*	Shr	Zooc	Native	-	J.P.Santana 269	33400
Eriocaulaceae						
<i>Paepalanthus myocephalus</i> (Mart.) Körn.	Her	Ane	Native	Nord	J.P.Santana 169	30747
Erythroxylaceae						
<i>Erythroxylum citrifolium</i> A. St. - Hil	Shr	Zooc	Native	-	J.P.Santana 260	32563
<i>Erythroxylum subrotundum</i> A.St. Hil	Shr	Zooc	Native	-	J.P.Santana 340	34809
<i>Erythroxylum</i> sp	Shr	Zooc	Native	-	J.P.Santana 332	34802
<i>Erythroxylum passerinum</i> Mart.	Shr	Zooc	Native	-	J.P.Santana 392	35131
Euphorbiaceae						
<i>Actinostemon verticillatus</i> (Klotsch) Baill	Shr	Zooc	Native	M. Atla	J.P.Santana 182	30850
<i>Aleurites moluccanus</i> (L.) Willd.	Shr	Zooc	native		T.R.Silva 108	27632
<i>Croton fuscescens</i> Spreng.	Her	Zooc	Native	-	G.D.Freire 08	25293
<i>Croton glandulosus</i> L.	Her	Aut	Native	-	T.R.Silva 144	29037
<i>Croton hirtus</i> L. Her	Her	Aut	Native	-	J.P.Santana 54	29041
<i>Croton triqueter</i> Lam.	Her	Zooc	Native	-	T.R.Silva 137	28429
<i>Croton heliotropifolius</i> Kunth.	Her	Zooc	Native	-	T.R.Silva 15	26096
<i>Dalechampia brasiliensis</i> Lam.*	Clim	Aut	Native	-	J.P.Santana 181	30849
<i>Dalechampia peckoltiana</i> Mull. Arg.	Clim	Aut	Native	-	J.P.Santana 347	34817
<i>Euphorbia hirta</i> Millsp	Her	Aut	Native	-	J.P.Santana 126	30600
<i>Microstachys corniculata</i> (Vahl) Griseb.	Her	Aut	Native	-	J.P.Santana 175	30841
<i>Sapium glandulosum</i> (L.) Morong	Shr	Zooc	Native	-	T.R.Silva 123	28208
<i>Tragia volubilis</i> L.*	Clim	Aut	Native	-	T.R.Silva 74	27056
Fabaceae						
<i>Aeschynomene marginata</i> Benth.	Tre	-	Native	-	J.P.Santana 67	29049
<i>Andira nitida</i> Mart. ex Benth.	Tre	Zooc	Native	M. Atla	T.R.Silva 113	27637
<i>Bauhinia forficata</i> Link.*	Shr	Aut	Native	-	T.R.Silva 34	25441
<i>Bowdichia virgilioides</i> Kunth.	Tre	Ane	Native	-	J.P.S.Santos 22	26124
<i>Caesalpinia echinata</i> Lam.*	Shr	Aut	Native	M. Atla	T.R.Silva 97	27620
<i>Calopogonium mucunoides</i> Desv.	Clim	Aut	Native	-	J.P.Santana 139	30717
<i>Canavalia brasiliensis</i> Mart. ex Benth.	Clim	Aut	Native	-	J.P.Santana 139	30721
<i>Cassia grandis</i> L. f.	Tre	Aut	Native	-	J.P.S.Santos 23	26125
<i>Centrosema brasilianum</i> (L.) Benth.	Clim	Aut	Native	-	J.P.S.Santos 33	30725

<i>Centrosema sagittatum</i> (Humb. & Bonpl. ex Willd.) Brandegee*	Clim	Aut	Native	-	J.P.Santana 147	26136
<i>Chamaecrista desvauxii</i> (Collad.) Killip	Her	Aut	Native	-	J.P.Santana 68	29376
<i>Chamaecrista ensiformis</i> (Vell.) H.S.Irwin & Barneby	Tre	Aut	Native	-	T.R.Silva 122	28207
<i>Chamaecrista hispida</i> (Vahl) H.S. Irwin & Barneby	Her	Aut	Native	-	J.P.S.Santos 42	28437
<i>Chamaecrista nictitans</i> (L.) Moench	Her	Aut	Native	-	J.P.Santana 148	30726
<i>Clitoria fairchildiana</i> R.A. Howard	Tre	Aut	Native	-	T.R.Silva 55	26991
<i>Crotalaria spectabilis</i> Roth	Her	Aut	Natur	-	T.R.Silva 01	25278
<i>Dalbergia sp.</i>	Tre	Aut	Native	-	T.R.Silva 133	28218
<i>Desmodium incanum</i> DC.	Her	Epiz	Natur	-	T.R.Silva 57	26993
<i>Dioclea sp</i>	Shr	Aut	Native	-	T.R.Silva 89	27374
<i>Dioclea virgata</i> (Rich.) Amshoff.	Shr	Aut	Native	-	J.P.S.Santos 15	26114
<i>Enterolobium contortisiliquum</i> (Vell.) Morong.*	Tre	Zooc	Native	-	J.P.S.Santos 30	26133
<i>Inga capitata</i> Desv.	Tre	Zooc	Native	-	J.P.Santana 174	30840
<i>Inga cayennensis</i> Sagot ex Benth.	Tre	Zooc	Native	-	T.R.Silva 77	27059
<i>Inga laurina</i> (Sw.) Willd.*	Tre	Zooc	Native	-	T.R.Silva 51	26987
<i>Leucaena leucocephala</i> (Lam.) de Wit	Shr	Aut	Natur	-	T.R.Silva 84	27369
<i>Lonchocarpus sericeus</i> (Poir.) Kunth ex DC.*	Shr	Aut	Native	-	J.P.Santana 134	30608
<i>Machaerium hirtum</i> (Vell.) Stellfeld	Tre	Ane	Native		J.P.Santana 265	33396
<i>Mimosa pudica</i> L.*	Her	Aut	Native	-	T.R.Silva 79	27061
<i>Mimosa arenosa</i> (Willd.) Poir.	Shr	Aut	Native	-	E.M.Carneiro 154	1635
<i>Mimosa tenuiflora</i> (Willd.) Poir.	Shr	Aut	Native	-	J.P.S.Santos 24	26126
<i>Pithecellobium dulce</i> (Roxb.) Benth.	Tre	Zooc	Natur	-	-	-
<i>Platypodium elegans</i> Vogel*	Tre	Ane	Native	-	J.P.Santana 53	29040
<i>Rhynchosia minima</i> (L.) DC.*	Clim	Aut	Native	-	T.R.Silva 66	27048
<i>Rhynchosia phaseoloides</i> (Sw.) DC.*	Clim	Aut	Native	-	T.R.Silva 73	27055
<i>Senegalia giganthocarpa</i> (G.P.Lewis) Seigler & Ebinger*	Tre	Aut	Native	M. Atla	J.P.Santana 173	30839
<i>Senna cana</i> (Nees & C. Mart.) H. S. Irwin & Barneby.	Shr	Zooc	Native	-	T.R.Silva 36	25443
<i>Senna macranthera</i> (DC. ex Collad.) H.S. Irwin & Barneby	Shr	Zooc	Native	-	J.P.S.Santos 50	28445
<i>Senna georgica</i> H.S.Irwin & Barneby*	Arb	Zooc	Native	-	J.P.S.Santos 09	26103
<i>Senna obtusifolia</i> (L.) H.S. Irwin & Barneby	Arb	Zooc	Native	-	T.R.Silva 05	25282
<i>Stylosanthes viscosa</i> (L.) Sw.	Her	Aut	Native	-	J.P.Santana 129	30603
<i>Swartzia acutifolia</i> Vogel*	Tre	Zooc	Native		T.R.Silva 02	25279
<i>Swartzia dipetala</i> Willd. ex Vogel*	Shr	Zooc	Native	M. Atla	J.P.Santana 146	30724
<i>Vigna sp.*</i>	Clim	Aut	Native	-	J.P.Santana 140	30718
<i>Zornia latifolia</i> Sm.	Her	Aut	Native	-	J.P.Santana 122	30596
Gentianaceae						
<i>Coutoubea spicata</i> Aubl.	Her	Ane	Native	-	J.P.Santana 249	32652
<i>Schultesia guianensis</i> (Aubl.) Malme	Epi	Aut	Native	-	J.P.Santana 275	33406
Gesneriaceae						
<i>Codonanthe mattos-silvae</i> Chautens.	Epi	Zooc	Native		J.P.Santana 133	30607
<i>Drymonia serrulata</i> (Jacq.) Mart.*	Epi	Zooc	Native	M. Atla	T.R.Silva 121	28206
Heliconiaceae						
<i>Heliconia psittacorum</i> L.	Epi	Zooc	Native	-	G.S.Freire 05	25290
Hypericaceae						
<i>Vismia guianensis</i> (Aubl.) Pers.	Shr	Zooc	Native	-	T.R.Silva 62	26998
Hypoxidaceae						
<i>Hypoxis decumbens</i> L.	Her	Aut	Native	-	J.P.Santana 58	29046
Iridaceae						
<i>Cipura paludosa</i> Aubl.	Her	Aut	Native	-	T.R.Silva 03	25280
Lamiaceae						
<i>Aegiphila vitelliniflora</i> Walp.*	Shr	Zooc	Native	-	J.P.Santana 151	30729
<i>Ocimum gratissimum</i> L.	Her	Aut	Natur	-	J.P.S.Santos 45	28440
<i>Vitex rufescens</i> A.Juss.	Her	Aut	Native	-	T.R.Silva 81	27063
Lauraceae						
<i>Ocotea glomerata</i> (Nees) Mez	Tre	Aut	Native	-	J.P.Santana 155	30733
Lecythidaceae						
<i>Couroupita guianensis</i> Aubl.*	Tre	Aut	Native	-	-	-
<i>Eschweilera ovata</i> (Cambess.) Miers.	Tre	Zooc	Native		T.R.Silva 104	27627

<i>Eschweilera sp</i>	Tre	Zooc	Native	-	T.R.Silva 32	26150
Loganiaceae						
<i>Spigelia anthelmia</i> L.	Her	Epiz	Native	-	J.P.Santana 145	30723
Lythraceae						
<i>Cuphea aperta</i> Koehne.	Her	Aut	Native	-	J.P.S.Santos 48	28443
<i>Cuphea carthagenensis</i> (Jacq.) J.F.Macbr.*	Her	Aut	Native	-	J.P.S.Santos 14	30722
<i>Cuphea racemosa</i> (L. f.) Spreng.	Her	Aut	Native	-	J.P.Santana 144	29980
<i>Cuphea sp.</i>	Her	Aut	Native	-	J.P.Santana 114	26112
Malpighiaceae						
<i>Byrsonima sericea</i> DC.	Tre	Zooc	Native	-	T.R.Silva 155	29383
<i>Stigmaphyllon blanchetii</i> C.E. Anderson	Clim	Ane	Native	-	J.P.S.Santos 17	25285
Malvaceae						
<i>Abutilon ramiflorum</i> A.St.-Hil.*	Her	Aut	Native	-	J.P.Santana 150	30728
<i>Apeiba tibourbou</i> Aubl.	Shr	Zooc	Native	-	T.R.Silva 41	25448
<i>Corchorus hirtus</i> L.	Her	Aut	Native	-	J.P.Santana 125	30599
<i>Guazuma ulmifolia</i> Lam.	Shr	Zooc	Native	-	T.R.Silva 82	25295
<i>Pavonia cancellata</i> (L.) Cav.	Clim	Aut	Native	-	T.R.Silva 37	25444
<i>Sida ciliaries</i> Small	Her	Aut	native		J.P.Santana 104	29970
<i>Sida linifolia</i> Cav.	Her	Aut	Native	-	J.P.Santana 128	30602
<i>Sida spinosa</i> L.*	Her	Aut	Native	-	J.P.Santana 127	30601
<i>Triumfetta semitriloba</i> Jacq.*	Her	Epiz	Native	-	J.P.Santana 130	30604
<i>Waltheria viscosissima</i> A. St.-Hil.	Her	Aut	Native	-	T.R.Silva 71	27053
<i>Waltheria indica</i> L.	Her	Aut	Native	-	T.R.Silva 92	27377
Marantaceae						
<i>Goepertia villosa</i> (Lodd. ex Sweet) Borchs. & S. Suárez	Her	-	Native	-	J.P.Santana 153	30731
<i>Maranta noctiflora</i> Regel & Korn.	Her	Aut	Native	M. Atla	J.P.Santana 100	29966
Melastomataceae						
<i>Aciotis sp.*</i>	Her	Zooc	Native	-	J.P.Santana 177	29656
<i>Clidemia hirta</i> (L.) D. Don	Her	Zooc	Native	-	J.P.Santana 338	25292
<i>Miconia albicans</i> (Sw.) Triana	Shr	Zooc	Native	-	J.P.Santana 333	34803
Meliaceae						
<i>Guarea guidonia</i> (L.) Sleumer	Tre	Zooc	Native	-	J.P.Santana 142	30720
Menispermaceae						
<i>Cissampelos glaberrima</i> A. St.-Hil.*	Clim	Zooc	Native	-	T.R.Silva 160	30848
<i>Cissampelos sympodialis</i> Eichler	Clim	Zooc	Native	-	J.P.Santana 263	32566
<i>Hyperbaena sp.</i>	Clim	-	Native	-	J.P.Santana 264	32567
Moraceae						
<i>Artocarpus heterophyllus</i> Lam.	Tre	Zooc	Natur	-	T.R.Silva 40	25447
<i>Maclura tinctoria</i> (L.) D.Don ex Steud.*	Tre	Zooc	Native	-	T.R.Silva 130	28215
<i>Sorocea hilarii</i> Gaudich.*	Tre	Zooc	Native	-	J.P.Santana 266	33397
Myrtaceae						
<i>Campomanesia aromatica</i> (Aubl.) Griseb.	Shr	Zooc	Native	-	J.P.Santana 326	34796
<i>Campomanesia dichotoma</i> (O.Berg) Mattos	Tre	Zooc	Native	-	J.P.Santana 555	37676A
<i>Campomanesia ilhoensis</i> Mattos	Shr	Zooc	Native	Nord	J.P.Santana 154	30732
<i>Eugenia aff. puniceifolia</i> Kunth.	Tre	Zooc	Native	-	Gage 305	27628
<i>Eugenia astringens</i> Cambess.	Shr	Zooc	Native	M. Atla	J.P.Santana 259	32562
<i>Eugenia brejoensis</i> Mazine	Tre	Zooc	Native	M. Atla	J.P.Santana 247	32650
<i>Eugenia hirta</i> O. Berg	Shr	Zooc	Native	M. Atla	J.P.Santana 156	30734
<i>Eugenia schottiana</i> O. Berg	Shr	Zooc	Native	-	J.P.Santana 261	32564
<i>Eugenia sp.</i>	Shr	Zooc	Native	-	J.P.Santana 141	30719
<i>Marlierea excoriata</i> Mart.	Shr	Zooc	Native	-	J.P.Santana 255	32658
<i>Myrcia splendens</i> (Sw.) DC.	Shr	Zooc	Native	-	J.P.Santana 268	27372
<i>Myrcia tomentosa</i> (Aubl.) DC.	Shr	Zooc	Native	-	J.P.Santana 436	36570
<i>Myrciaria floribunda</i> (West. ex Willd.) O. Berg	Shr	Zooc	Native	-	J.P.Santana 251	32654
<i>Psidium decussatum</i> DC.	Tre	Zooc	Native	-	J.P.Santana 157	30735
<i>Psidium guineense</i> Sw.	Shr	Zooc	Native	-	T.R.Silva 72	27054
<i>Psidium sp</i>	Shr	Zooc	Native	-	J.P.Santana 288	33419
<i>Psidium guajava</i> L.	Shr	Zooc	Native	-	T.R.Silva 38	25445
<i>Syzygium cumini</i> (L.) Skeels	Tre	Zooc	Natur	-	T.R.Silva 59	26995
Nyctaginaceae						
<i>Bougainvillea spectabilis</i> Willd.*	Shr	Ane	Native	-	T.R.Silva 103	27626
Nymphaeaceae						
<i>Nymphaea pulchella</i> DC.	Her	Hidr	Native	-	J.P.Santana 163	30741

Onagraceae						
<i>Ludwigia octovalvis</i> (Jacq.)	Her	Aut	Native	-	J.P.Santana 256	32659
Orchidaceae						
<i>Alatiglossum barbatum</i> (Lindl.)	Her	Ane	Native	-	J.P.Santana 135	30609
<i>Campylocentrum crassirhizum</i> Hoehne	Epi	Ane	Native	-	J.P.Santana 106	29972
<i>Catasetum uncatum</i> Rolfe.	Epi	Ane	Native	M. Atla	T.R.Silva 29	26147
<i>Cyrtopodium holstii</i> L.C. Menezes	Her	Ane	Native	-	J.P.S.Santos 44	28439
<i>Dimerandra emarginata</i> (G.Mey.) Hoehne	Epi	Ane	Native	-	J.P.Santana 178	30844
<i>Epidendrum strobiliferum</i> Rchb.f.*	Epi	Ane	Native	-	J.P.Santana 180	30846
<i>Habenaria trifida</i> Kunth	Her	Ane	Native	-	J.P.S.Santos 43	28438
<i>Leochilus labiatus</i> (Sw.) kuntze.*	Epi	Ane	Native	-	J.P.Santana 282	33413
<i>Oeceoclades maculata</i> (Lindl.) Lindl.	Her	Ane	Natur	-	J.P.Santana 78	29651
<i>Polystachya estrellensis</i> Rchb.f.	Epi	Ane	Native	-	J.P.Santana 57	29045
<i>Sacoila lanceolata</i> (Aubl.) Garay	Her	Ane	Native	-	J.P.S.Santos 46	28441
<i>Vanilla palmarum</i> (Salzm. ex Lindl.) Lindl.	Clim	Ane	Native	-	T.R.Silva 53	26989
Oxalidaceae						
<i>Oxalis barrelieri</i> L.*	Her	Aut	Native	-	J.P.Santana 123	30597
Passifloraceae						
<i>Passiflora foetida</i> L.	Clim	Zooc	Native	-	J.P.Santana 167	30745
<i>Passiflora mansoi</i> (Mart.) Mast.*	Clim	Zooc	Native	-	J.P.Santana 112	29978
<i>Passiflora silvestris</i> Vell.	Clim	Zooc	Native	-	J.P.Santana 164	25284
Phytolaccaceae						
<i>Petiveria alliacea</i> Lin.*	Her	-	Native	-	J.P.Santana 55	29042
<i>Rivina humilis</i> L.	Her	Zooc	Native	-	J.P.S.Santos 19	26121
Piperaceae						
<i>Peperomia pellucida</i> (L.) Kunth	Her	-	Native	-	J.P.Santana 248	32651
<i>Peperomia magnoliifolia</i> (Jacq.) A. Dietr.	Her	-	Native	-	J.P.Santana 97	29963
<i>Piper amalago</i> L.*	Shr	Zooc	Native	-	J.P.S.Santos 34	25303
Plantaginaceae						
<i>Stemodia foliosa</i> Benth.	Her	Aut	Native	-	J.P.Santana 60	29048
Poaceae						
<i>Pappophorum pappiferum</i> (Lam.)*	Her	Ane	Native	-	J.P.Santana 124	30598
<i>Parodiolyra ramosissima</i> (Trin.)*	Her	Zooc	Native	M. Atla	D.A.Campos 114	25297
<i>Paspalum maritimum</i> Trin.	Her	Aut	Native	-	T.R.Silva 102	27625
<i>Setaria parviflora</i> (Poir.) Kerguelen	Her	Ane	Native	-	J.P.Santana 121	30595
<i>Urochloa brizantha</i> (Hochst. ex A. Rich.) R.D. Webster. Webster	Her	Ane	Natur	-	T.R.Silva 139	28431
Polygalaceae						
<i>Securidaca diversifolia</i> (L.) S.F. Blake.	Clim	Ane	Native	-	T.R.Silva 86	27371
Pontederiaceae						
<i>Heteranthera oblongifolia</i> C. Mart. ex Roem. & Schult.	Her	Hidr	Native	-	J.P.Santana 171	30749
<i>Heteranthera reniformis</i> Ruiz & Pav.	Her	Hidr	Native	-	J.P.Santana 176	30842
Rhamnaceae						
<i>Ziziphus joazeiro</i> Mart.	Shr	Zooc	Native	-	-	-
Rubiaceae						
<i>Borreria humifusa</i> Mart.	Her	Aut	Native	M. Atla	J.P.Santana 161	30739
<i>Chiococca alba</i> (L.) Hitchc.	Her	Zooc	Native	-	J.P.Santana 76	29649
<i>Chomelia pubescens</i> Cham. & Schltdl.*	Shr	Zooc	Native	-	J.P. Santana 327	29381
<i>Chomelia obtusa</i> Cham. & Schltdl.	Shr	Zooc	Native	-	T.R.Silva 24	27383
<i>Coutarea hexandra</i> (Jacq.) Schum.	Shr	Zooc	Native	-	T.R.Silva 150	29057
<i>Emmeorrhiza umbellata</i> (Spreng.) K. Schum.	Her	Zooc	Native	-	T.R.Silva 76	27058
<i>Genipa americana</i> L.	Tre	Zooc	Native	-	T.R.Silva 39	25446
<i>Guettarda sericea</i> Muell	Shr	Zooc	Native	Caat	J.P.Santana 160	30738
<i>Psychotria bracteocardia</i> (DC.) Müll. Arg.	Her	Zooc	Native	-	J.P.Santana 84	29657
<i>Psychotria capitata</i> Ruiz & Pavan	Her	Zooc	Native	-	T.R.Silva 119	28204
<i>Psychotria carthagenensis</i> Jacq.	Her	Zooc	Native	-	J.P.Santana 159	30737
<i>Randia armata</i> (Sw.) DC.	Her	Zooc	Native	-	J.P.Santana 116	29982
<i>Sabicea grisea</i> Cham. & Schltdl.	Clim	Zooc	Native	-	J.P.Santana 108	29974
<i>Tocoyena formosa</i> (Cham. & Schltdl.) K. Schum.	Shr	Zooc	Native	-	T.R.Silva 112	25289
Rutaceae						
<i>Ertela trifolia</i> (L.) Kuntze	Her	Aut	Native	-	T.R.Silva 69	27051
<i>Zanthoxylum sp.<></i>	Shr	Zooc	Native	M. Atl SE	J.P.Santana 109	29975
Salicaceae						

<i>Casearia guianensis</i> (Aubl.) Urb.*	Arb	Zooc	Native	-	J.P.Santana 408	36543
<i>Casearia sylvestris</i> Sw.	Shr	Zooc	Native	-	T.R.Silva 06	25283
<i>Prockia crucis</i> P. Browne ex L.	Shr	Zooc	Native	-	J.P.Santana 62	29050
Santalaceae						
<i>Phoradendron piperoides</i> HBK	Hem	Zooc	Native	-	J.P.Santana 72	29380
Sapindaceae						
<i>Allophylus edulis</i> (A. St.-Hil., Cambess. & A. Juss.) Radlk.	Tre	Zooc	Native	-	T.R.Silva 149	29056
<i>Allophylus racemosus</i> Sw.*	Shr	Zooc	Native	-	J.P.Santana 73	29384
<i>Cupania impressinervia</i> Acev.-Rodr.	Tre	Zooc	Native	M. Atla	T.R.Silva 48	25455
<i>Cupania oblongifolia</i> Mart.*	Tre	Zooc	Native	-	J.P.S.Santos 12	26990
<i>Matayba guianensis</i> Aubl.*	Tre	Zooc	Native	-	J.P.Santana 271	33402
<i>Paullinia pinnata</i> L.	Clim	Zooc	Native	-	T.R.Silva 101	27624
<i>Paullinia revoluta</i> Radlk.*	Clim	Zooc	Native	-	J.P.Santana 101	29967
<i>Serjania communis</i> Cambess.*	Clim	Ane	Native	-	J.P.Santana 281	33412
<i>Serjania salzmänniana</i> Schltr.	Clim	Ane	Native	-	T.R.Silva 80	27062
Sapotaceae						
<i>Pouteria grandiflora</i> (A.DC.) Baehni	Tre	Zooc	Native	M. Atla	J.P.Santana 103	29969
<i>Sideroxylon obtusifolium</i> (Roem & Schutt) Penn.	Shr	Zooc	Native	-	T.R.Silva 105	27629
Solanaceae						
<i>Aureliana fasciculata</i> (Vell) Sendth*	Shr	Zooc	Native	-	J.P.Santana 115	29981
<i>Brunfelsia uniflora</i> (Pohl) D. Dom.*	Tre	Zooc	Native	-	J.P.Santana 285	33416
<i>Solanum paludosum</i> Moric.	Her	Zooc	Native	-	D.A.Campos 116	25299
<i>Solanum rhytidoandrum</i> Sendtn.*	Her	Zooc	Native	-	J.P.Santana 65	29058
<i>Solanum sp.</i>	Her	Zooc	Native	-	J.P.Santana 102	29968
Trigoniaceae						
<i>Trigonia nivea</i> Cambess. var. <i>nivea</i>	Shr	Ane	Native	-	D.A.Campos 111	25294
Turneraceae						
<i>Turnera subulata</i> Sm.	Clim	Zooc	Native	-	T.R.Silva 49	25456
Urticaceae						
<i>Cecropia pachystachya</i> Trécul	Tre	Zooc	Native	-	J.P.Santana 299	33420
Verbenaceae						
<i>Lantana achyranthifolia</i> Desf.*	Her	Zooc	Native	-	J.P.S.Santos 05	26100
<i>Lantana camara</i> L.	Her	Zooc	Native	-	J.P.S.Santos 35	25298
<i>Lantana canescens</i> Kunth.	Her	Zooc	Native	-	J.P.S.Santos 08	26102
<i>Lantana radula</i> Sw.*	Her	Zooc	Native	-	D.A.Campos 113	25296
<i>Priva bahiensis</i> P.DC.	Her	Aut	Native	Nord	J.P.Santana 59	29047
<i>Stachytarpheta cayennensis</i> Vahl	Her	Aut	Native	-	T.R.Silva 27	26145
Violaceae						
<i>Pombalia calceolaria</i> (L.) Paula-Souza	Her	Aut	Native	-	J.P.Santana 52	29039
Angiosperms/Exotic and Grown						
Family/Species	Habitat	Dispr	Origin	End	V.(ASE)	
Anacardiaceae						
<i>Mangifera indica</i> L.	Tre	Zooc	Exot	-	-	-
Arecaceae						
<i>Roystonea oleracea</i> (Jacq.) O.F. Cook.	Tre	Zooc	Exot	-	-	-
Asparagaceae						
<i>Sansevieria trifasciata</i> Prain	Her	Zooc	Exot	-	-	-
Combretaceae						
<i>Terminalia catappa</i> L.	Tre	Zooc	Exot	-	-	-
Fabaceae						
<i>Acacia auriculiformis</i> A. Cunn. ex Benth.	Tre	Zooc	Exot	-	T.R.Silva 116	27640
<i>Acacia mangium</i> Willd.	Tre	Zooc	Exot	-	J.P.S.Santos 37	26141
<i>Adenantha pavonina</i> L.	Tre	Aut	Exot	-	J.P.Santana 56	29043
<i>Delonix regia</i> (Bojer ex Hook.) Raf.	Tre	Aut	Cult	-	T.R.Silva 96	27385
<i>Tamarindus indica</i> L.	Shr	Zooc	Cult	-	-	-
Malvaceae						
<i>Hibiscus mutabilis</i> L.	Tre	-	Cult	-	T.R.Silva 100	27623
Moraceae						
<i>Ficus nitida</i> Thunb.	Tre	Zooc	Exot	-	T.R.Silva 20	26113
Moringaceae						
<i>Moringa oleifera</i> Lam.	Tre	Ane	Exot	-	T.R.Silva 88	27373
Myrtaceae						

<i>Eucalyptus torelliana</i> F. Muell	Tre	Aut	Exot	-	-	-
<i>Eucalyptus citriodora</i> Hook.	Tre	Aut	Exot	-	G.Viana 913	3744
Oleaceae						
<i>Jasminum azoricum</i> L.	Clim	Zooc	Exot	-	J.P.Santana 165	30743
Rubiaceae						
<i>Ixora coccinea</i> L.	Her	Zooc	Cult	-	T.R.Silva 83	27368
Sapotaceae						
<i>Manilkara zapota</i> (L.) P.Royen	Tre	Zooc	Cult	-	J.P.Santana 262	32565
Solanaceae						
<i>Cestrum nocturnum</i> L.	Her	Zooc	Exot	-	T.R.Silva 52	26988
Zingiberaceae						
<i>Alpinia zerumbet</i> (Pers.) B.L. Burtt & R.M. Sm.	Her	Zooc	Cult	-	T.R.Silva 35	25442