













Flora of Baturité, Ceará: a Wet Island in the Brazilian Semiarid

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Abstract

The biota of the humid mountain ranges of the Brazilian semiarid is still poorly understood. In order to fill this scientific gap, we carried out an extensive survey along altitudinal ranges (400m – 1,000 m) on both the windward and the leeward slopes of the Baturité Mountain Range, in the state of Ceará state. We registered 400 plant species and 92 families. The Myrtaceae (36 spp.), Fabaceae (25 spp.), Rubiaceae (20 spp.) and Bromeliaceae (15 spp.) families predominated on the windward slope; while Fabaceae (19 spp.), Myrtaceae (14 spp.) and Euphorbiaceae (11 spp.) were the most abundant on the leeward slope. As we expected, the species richness of trees, shrubs, subshrubs, epiphytes and terrestrial herbs was positively correlated with the altitude ($R^2 > 0.60$). Above 800 m, we registered 273 species exclusive to the windward slope, 81 exclusive to the leeward slope, and 46 shared species. Therefore, management actions must consider the spatial heterogeneity, distribution and taxa richness.

Keywords: Deciduous Tropical Forest, Evergreen Tropical Forest, Semideciduous Tropical Forest, Steppic Savanna.

1. INTRODUCTION AND OBJECTIVES

The mountain ranges in the semiarid domain of Northeastern Brazil stand out from the surrounding flattened landscape expressing a climatic exception (Mantovani et al., 2017; Moro et al., 2015). They occupy approximately 5% of the northeastern surface, being scattered throughout the states of Ceará, Rio Grande do Norte, Paraíba, Pernambuco, Alagoas and Bahia

(Souza & Oliveira, 2006). On windward slopes and at higher altitudes, the climate is cooler and wetter, whereas drier climates occur on leeward slopes and at lower altitudes (Nimer, 1989). This climatic variation leads to a spatially heterogeneous flora along the altitudinal gradient, consequently increasing the local species richness (Ferraz & Rodal, 2006; Homeier et al., 2010).

Evergreen and Semideciduous Forests have been commonly reported along this altitudinal gradient (Rodal & Sales, 2008;

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Silva & Figueiredo, 2013). Since this flora is a remnant of the Brazilian Atlantic Rain Forest (Barbosa et al., 2004), these mountain ranges have been considered a priority for the conservation of Brazilian biodiversity (Lopes et al., 2017; MMA, 2000). Especially in the Brazilian Northeast, the mountainous areas are critically important for the preservation of regional ecosystems, because they represent natural refuges for biota (Silva et al., 2014).

Thirty-five percent (35%) of the mountain ranges are located within Ceará State (Sobrinho, 1971), but information on its biota composition is still incipient (Bétard et al., 2007; Kamimura et al., 2017; Lima & Mansano, 2011). Plant cover and soils of most local wetlands have suffered from intensive and chronic anthropogenic disturbances (Souza & Oliveira, 2006). Therefore, reports on floristic composition are crucial for implementing sustainable use actions, since the biodiversity degradation on the Baturité Mountain Range has been happening since the colonial period (Mantovani, 2006; Oliveira et al., 2006). Our study shows the need for registering, cataloguing and presenting the biodiversity of such peculiar environments. Thus, we aim to analyze the plant composition and species richness along the altitudinal gradient on the windward and leeward slopes of Baturité Mountain Range, in Ceará State. We also intend to spread information on the local flora and on the protected areas of Northeastern Brazil.

2. MATERIALS AND METHODS

2.1. Study site

The Baturité Mountain Range is a residual relief with an extension of 800 km² and moderate altitudes (800 – 1,115 m). It is a Precambrian crystalline complex located in the northeast of Ceará State, 70 km from the coast (Bétard et al., 2007; Souza & Oliveira, 2006). From the elevation of 600 m up, the mountain range is a strict protected area, the APA de Baturité. The first protected area was established by state law no. 20,956, on September 18, 1990, which was later altered by state law no. 27,290, on December 15, 2003. Currently, it encompasses 32,690 hectares.

Both the altitude and the geographical position favor an orographic effect at the top and on the windward slope (north-eastward) of the mountain, whereby a humidity of > 1,000 mm × year⁻¹ is carried by South Atlantic trade winds. On the leeward slope (westward), the precipitation is below 1,000 mm × year⁻¹ (Mantovani, 2006; Santos et al., 2012; Souza & Oliveira, 2006). In order to register the local species composition and richness, we selected three well-conserved areas on each slope, at the following altitudinal ranges: 400 – 600 m a.s.l., 600 – 800 m a.s.l. and above 800 m a.s.l. We chose these areas in order to comprise the climatic and physiognomic variations along the altitudinal range on both slopes (Table 1).

Table 1. Location and characterization of the studied areas on the Baturité Mountain Range, Ceará State, Brazil.

Location – municipality – coordinates	Vegetation* – altitude – slope – precipitation	Soil type (Oliveira et al., 2006)	Species richness per GF**
Salva-Vidas Guaramiranga 4° 15' 32" S 38° 58' 1,3" W	FSS – SDSF 400 – 600 m Leeward 608 mm	Cambic eutrophic red argisol	tre = 29; shr = 16; subshr = 01; vi = 01; th = 01; eh = 01; hm = 00
Jardim Mulungu 4° 17' 10" S 39° 00' 3,8" W	SDMF 600 – 800 m Leeward 1,130 mm	Abruptic eutrophic yellow argisol	tre = 66; shr = 19; subshr = 04; vi = 02; th = 10; eh = 00; hm = 00
Lagoa Guaramiranga 4° 12' 21" S 38° 58' 16" W	SEMF > 800 m Leeward 1,646 mm	Humic sandy soil	tree = 105; shr = 30; subshr = 04; vi = 06; th = 19; eh = 14; hm = 01
Arvoredo Guaramiranga 4° 13' 50" S 38° 55' 54" W	SEMF > 800 m Windward 1,646 mm	Dystrophic yellow Argisol	tre = 84; shr = 28; subshr = 05; vi = 00; th = 20; eh = 10; hm = 00
Sinimbu Guaramiranga 4° 17' 49" S 38° 55' 59" W	SEMF 600 – 800 m Windward 1,471 mm	Dystrophic yellow latosol	tre = 74; shr = 21; subshr = 00; vi = 08; th = 15; eh = 06; hm = 02
Taveiras Baturité 4° 17' 54" S 38° 55' 10" W	SSSF 400 – 600 m Windward 1,079 mm	Typical dystrophic haplic Tb Cambisol	tre = 77; shr = 14; subshr = 01; vi = 00; th = 05; eh = 05; hm = 03

* FSS: Forested Steppic Savanna “caatinga”; SDSF: Seasonal Deciduous Submountain Forest “dry forest”; SDMF: Seasonal Deciduous Mountain Forest “dry forest”; SEMF: Seasonal Evergreen Mountain Forest “humid mountain forest”; SSSF: Seasonal Semideciduous Submountain Forest “humid mountain forest” (according IBGE, 2012). ** GF: growth form; tre: tree; shr: shrub; subshr: subshrub; vi: vine; th: terrestrial herb; eh: epiphytic herb; hm: hemiparasite.

The Forested Steppic Savanna (FSS; “Caatinga”) is composed of a thorny deciduous vegetation, predominant at lower altitudes. Along the altitudinal range, the FSS is gradually replaced by a forest vegetation along the altitudinal range. On the windward slope, there are: i) a Seasonal Semideciduous Submountain Forest (SSSF) 400 – 600 m; and ii) a Seasonal Evergreen Mountain Forest (SEMF) above 600 m. On the leeward slope, there are: i) a transition from the FSS to the SDSF (Seasonal Deciduous Submountain Forest) 400 – 600 m; ii) a Seasonal Deciduous Mountain Forest (SDMF) 600 – 800 m; and iii) a Seasonal Evergreen Mountain Forest (SEMF) above 800 m (see Table 1).

2.2. Data collection

In order to list the plants, we sampled 200 quadrants in each of the six areas, according to the procedures suggested by Araújo et al. (2006). In addition, we completed our list researching the samples of the EAC Herbarium of the Universidade Federal do Ceará. We also revised and updated the taxonomic identifications with the aid of specialists from the following herbaria: EAC, PEUFR, IPA and CEPEC. The taxonomic classification that we used follows the APG IV system (2016). The names of botanical families, genera, species and authorships were confirmed in the International Plant Names Index (Royal Botanic Gardens, Kew et al., 2015) and in the list of Brazilian Flora 2020 (JBRJ, 2016).

To categorize the vegetation physiognomy, we used Whittaker’s classification of plant growth forms (1975). The growth forms are adequate indicators of communities, since they can reflect global and local climatic conditions. We adjusted Whittaker’s (1975) system as following: i) trees: > 3 m-height woody plants; ii) shrubs: > 3 m-height woody plants with main branches developing at approximately 50 cm above ground; iii) subshrubs: < 2 m-height plants with a woody main stem and herbaceous secondary branching; iv) terrestrial herbs: land plants with herbaceous aerial stems; v) epiphytes: plants with herbaceous stems that use other plants as support; vi) vines: plants with prolonged stems that twine around a substrate; and vii) hemiparasites: photosynthetic plants that withdraw sap from their host plants.

We obtained precipitation data from the Fundação Cearense de Meteorologia e Recursos Hídricos (FUNCEME, 2017), at the following local stations, close to our studied areas: Baturité-n22, Pacoti-n105, Guaramiranga-54, Mulungu-n98 and Caridade-n31. Data showed a seasonal rainfall regime with precipitation concentrated from January to May, driven by the Intertropical Convergence Zone. However, stations located at distinct altitudes and different mountain slopes showed remarkable differences in the annual rainfall regime.

Greater precipitation was found in the northeastern slope and at higher portions of the mountain range. The soil classification of the studied areas followed that of Oliveira et al. (2006). Altitudinal ranges and coordinates were measured in the field with a GPS navigation device (Table 1).

2.3. Data analysis

We organized our list by family, species, vernacular name, growth form, altitudinal range, phytophysiognomy and collector number. Samples are deposited at EAC. We estimated the global richness, as well as the richness at family and species levels, and by phytophysiognomy. We analyzed the relationship between species richness, growth form (dependent variable), and altitude (independent or predictive variable) through a simple linear regression using the Bioestat 5.0 Software (Ayres et al., 2007)

3. RESULTS AND DISCUSSION

We registered 400 morphospecies distributed within 92 families. A total of 23 taxa (13%) were identified only to the genus due to the lack of or inadequacy of reproductive organs. The families with greatest species richness were Myrtaceae (43 spp.), Fabaceae (38 spp.), Euphorbiaceae (21 spp.), Rubiaceae (20 spp.), Melastomataceae (14 spp.), and Bromeliaceae, Erythroxylaceae and Orchidaceae, with 10 species each (Appendix A). The high richness of vascular plants confirms the documented pattern for mountainous areas of the Brazilian semiarid: they are more diverse than the surrounding Caatinga, since they contain a mix of Caatinga and Atlantic Forest species (Carnaval et al., 2009; Leite et al., 2016; Lopes et al., 2017). In addition, the richness of 400 species of vascular plants, found on the Baturité Mountain Range, is higher than the species richness registered for other similar Brazilian forests, e.g., Pau-Ferro Ecological Reserve, with 309 species, in Paraíba State (Barbosa et al., 2004), Brejo Madre de Deus, with 293 species, in Pernambuco State (Nascimento et al., 2012) and Meruoca Sierra, with 100 species, in Ceará State (Silva & Figueiredo, 2013), highlighting the importance of this montane forests for the conservation of tropical biodiversity.

Our results show that the richness increases towards the top of the mountain, and that it is greater on the windward slope at the Evergreen Forest. We registered a total of 255 species (64%) and 69 families (75%) at higher altitudes, above 800 m in the Baturité Mountain Range – joined data from Arvoredo and Lagoa sites. On the windward slope, below 800 m—on Sinimbu and Taveiras sites together—, we registered 175 species (44%) and 62 families (67%); whereas, on the leeward slope,

below 800 m—on Jardim and Salva-Vidas sites together—, we registered 127 species (32%) and 50 families (54%) (Appendix A). Such differences reflect the combined effects of ocean winds, altitudinal variation and position of the slope. These results also corroborate the pattern documented by Lopes et al. (2008), Lima et al. (2011), Kamimura et al., (2017) and BFG (2015), that indicates dry forests have significantly less species and families compared to humid-forests.

In the Seasonal Evergreen Forest located both on the windward and leeward slopes—above 600 m and 800 m, respectively (Table 1)—, the most diverse families were Myrtaceae (36 spp.), Fabaceae (25 spp.), Rubiaceae (20 spp.), Bromeliaceae (15 spp.), Melastomataceae (14 spp.), Euphorbiaceae (13 spp.) and Orchidaceae (10 spp.). On the leeward slope, where a Seasonal Deciduous Forest and a Forested Steppic Savanna predominate, Fabaceae (19 spp.), Myrtaceae (14 spp.) and Euphorbiaceae (11 spp.) were the most diverse families. In the Fabaceae family, the subfamilies presented distinct species richness on windward and leeward slopes. In the former, Mimosoideae (8 spp.) and Faboideae (7 spp.) predominated, whereas in the latter the most representative were Mimosoideae (13 spp.) and Caesalpinioideae (11 spp.).

In the Baturité Mountain Range leeward slope, where Deciduous Forests and Forested Savannas were the most representative (see Alcoforado-Filho et al., 2003; Cestaro & Soares, 2004; Ferraz et al., 2004), the subfamilies Mimosoideae and Caesalpinioideae, predominated. Even though Myrtaceae was among the most diverse families on the leeward slope, its richness was higher on the windward slope. Furthermore, most of its species (84%) occur above 600 m, indicating that the richness of Myrtaceae in the Brazilian semiarid is more associated with areas with higher water availability than with the surrounding Caatinga. The area of occurrence of Myrtaceae in the Evergreen Forest, both on the windward and on the leeward slopes, above 600 m and 800 m, respectively, confirms the pattern reported by Peixoto & Gentry (1990), also observed in the Atlantic Domain as a whole. Furthermore, Myrtaceae, Fabaceae, Rubiaceae, Bromeliaceae, Melastomataceae, Euphorbiaceae and Orchidaceae are abundant in Tropical Rainforests as well, including lowland and highland Seasonal Evergreen Forests in the States of Pernambuco and Paraíba (Rodal & Nascimento, 2002; Andrade & Rodal, 2004; Barbosa et al., 2004; Ferraz & Rodal, 2006; Nascimento et al., 2012; Rodal & Sales, 2008). Species and family similarities to this type of forest are likely associated with water availability on the soil, from rainfall or dew.

Aspidosperma pyriforme Mart., *Bauhinia cheilantha* (Bong.) Steud., *Cordia glazioviana* (Taub.) Gottschling & J. S. Mill., *Croton blanchetianus* Baill., and *Mimosa caesalpiniiifolia* Benth. occurred below 600 m on the windward slope. These taxa are

commonly found in the Caatinga. Some species are strictly distributed in wetter areas, above 800 m on the windward slope and above 600 m on the leeward slope, such as: *Albizia polycephala* (Benth.) Killip ex Record, *Apeiba tibourbou* Aubl., *Byrsonima crista* A. Juss., *Cassia ferruginea* (Schrad.) Schrad. ex DC. var. *ferruginea*, *Cupania racemosa* (Vell.) Radlk., *Guazuma ulmifolia* Lam., *Inga marginata* Willd., *Myrciaria ferruginea* O.Berg, *Ouratea polygyna* Engl., *Podocarpus sellowii* Klotzsch ex. Endl., *Pouteria macrophylla* (Lam.) Eyma, *Vismia guianensis* (Aubl.) Choisy and *Zanthoxylum rhoifolium* Lam. We note that *Podocarpus sellowii* was found at one collecting site only (Arvoredo). At lower altitudes of the windward slope, some exclusive species occurred, such as: *Alchornea glandulosa* subsp. *iricurana* (Casar.) Secco, *Attalea speciosa* Mart. ex Spreng., *Casearia grandiflora* Cambess., *Chrysophyllum gonocarpus* (Mart. & Eichler ex Miq.) Engl., *Coccoloba parimensis* Benth., *Coussarea contracta* (Walp.) Müll.Arg. var. *contracta*, *Oreopanax capitatus* (Jacq.) Decne. & Planch., *Parkia pendula* (Willd.) Benth. ex Walp., *Protium warmingianum* Marchand., *Pseudobombax marginatum* (A.St.-Hil.) A. Robyns and *Zizyphus undulata* Reissek.

Concerning growth forms, the studied flora was composed of 214 trees (54%), 82 shrubs, 49 terrestrial herbs, 23 epiphytic herbs, 18 vines, 10 subshrubs and 4 hemiparasites. There was a positive correlation between altitude and richness of trees, shrubs, subshrubs, epiphytic herbs and terrestrial herbs ($R^2 > 0.60$ and $p < 0.05$). However, for vines and hemiparasites, the correlation was not statistically significant (Figure 1). The richness of tree species is one of the most striking characteristics of the Tropical Forest typologies, a pattern documented in other Brazilian Atlantic forests (BFG, 2015; Nascimento et al., 2012).

The species richness and composition found in our study showed that, on the windward slope above 600 m, and on the leeward slope above 800 m, the flora is more similar. In contrast, below these altitudinal levels, on both slopes, the flora differed. The positive correlation between diversity and altitude is likely a response to greater water availability in higher elevations of the altitudinal gradient. The mountains of Northeastern Brazil are relatively low, with some altitudes of approximately 1,000 m a.s.l. However, they have a more favorable water balance, milder temperatures, and lower rates of evapotranspiration and evening condensation than the lower area of the countryside depression (Mantovani et al., 2017; Moro et al., 2015; Souza & Oliveira, 2006). This may explain why the plant species richness in the semiarid domain of Northeastern Brazil increases with higher altitudes.

It is also worth mentioning that the greater richness of epiphytic herbs (18 out of 23 species) at altitudes above 800 m reflects a higher humidity. According to Gentry (1988), there is a positive correlation between diversity and

precipitation in the Neotropical Region. In addition, our results are in accordance with those found in other studies on the Mountain Forests of Pernambuco State (Ferraz et al., 1998; Ferraz et al., 2003; Rodal & Nascimento, 2002). According to Ferraz et al. (2004) and Lopes et al. (2008),

under similar climatic and edaphic regimes, the Evergreen and the Semideciduous Montane Forests can be found closely associated in Northeastern Brazil, but demonstrate different floristic and structural compositions. Thus, protection efforts must contemplate both humid and dry forest areas.

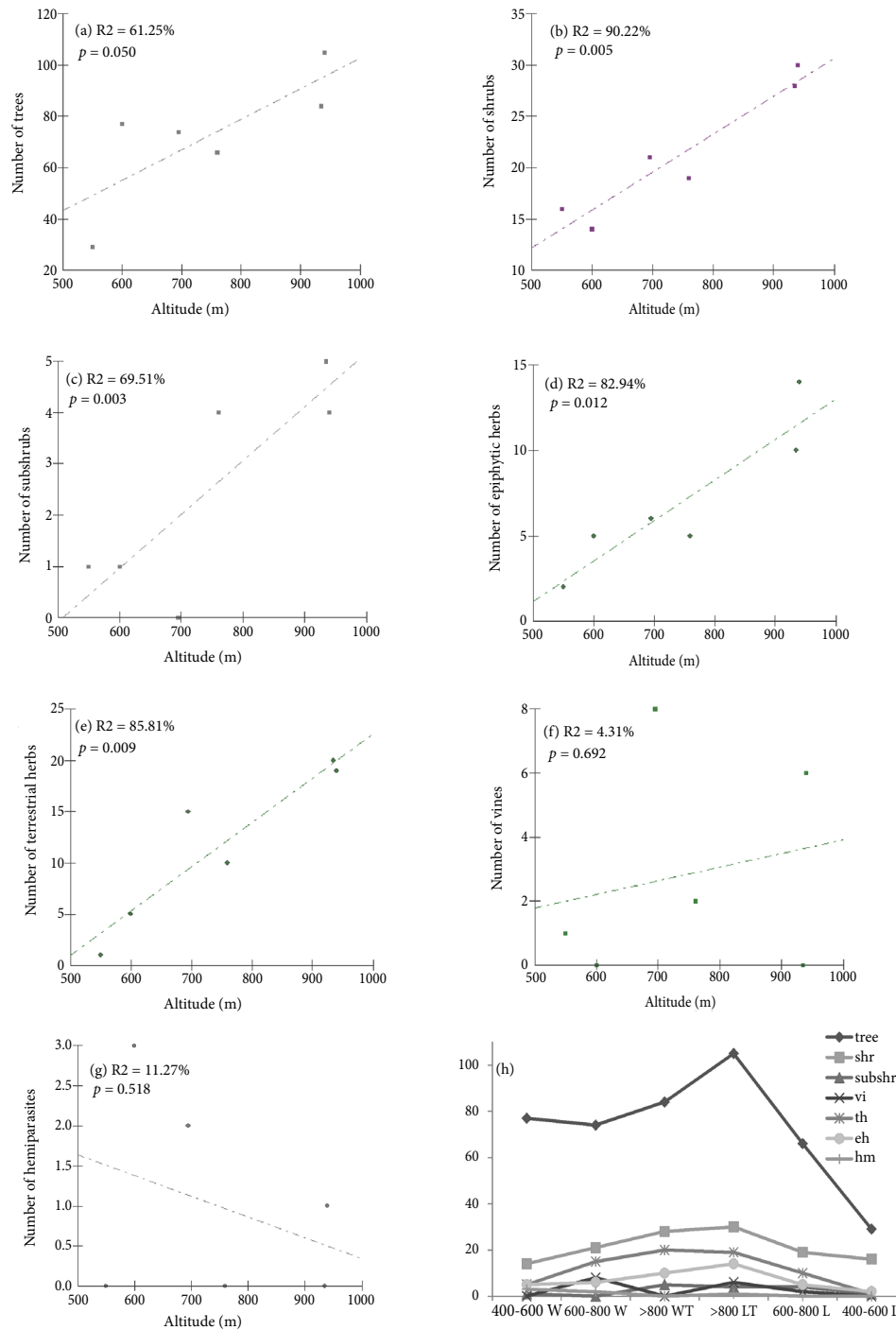


Figure 1. Linear regression of altitude and number of plants of each growth form [(a), (b), (c), (d), (e), (f), (g)] and dispersion diagrams (h) of plants.

shr: shrub; subshr: subshrub; vi: vine; th: terrestrial herb; eh: epiphytic herb; hm: hemiparasite; W: windward; L: leeward; T: top.

4. CONCLUSION

In conclusion, 273 species (68%) were found exclusively at the top of the mountain and on the windward slope; 81 species (20%) were exclusively found on the leeward slope; and 46 species (12%) were found on both slopes, with a total of 400 species on the Baturité Mountain Range, in Ceará State. Our results highlight that the management actions, the restoration of degraded areas and the establishment of integral conservation on the Baturité Mountain Range must consider the spatial heterogeneity described in our work; that is, the differential plant distribution and richness both along the altitudinal gradient and between slope positions. Adequate conservation efforts should consider the total richness and the local heterogeneity.

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Appendix A. List of families and species registered at distinct altitudinal levels on the Baturité Mountain Range, Ceará, Brazil.

FAMILY/SPECIES/AUTHOR	VN	GF	WINDWARD				ALTITUDE				C
			TOP		LEEWARD		LEEWARD		LEEWARD		
			TAV	SIN	ARV	LAG	600-800	400-600	JAR	SAL	
1. Acanthaceae											
<i>Dicliptera ciliaris</i> Juss.		subshr			x						V. Gomes, 912.2
<i>Justicia aequilabris</i> (Nees) Lindau		subshr				x					V. Gomes, 562.2
<i>Justicia</i> sp.		shr							x		V. Gomes, 2109-8
<i>Ruellia bahiensis</i> (Nees) Morong		subshr						x			V. Gomes, 398
2. Alstroemeriaceae											
<i>Bomarea edulis</i> (Tussac) Herb.		th						x			V. Gomes, 1271
3. Amaranthaceae											
<i>Alternanthera brasiliana</i> L.		th							x		V. Gomes, 2109-1
<i>Cyathula achyranthoides</i> (Kunth) Moq.		th					x				V. Gomes, 737
<i>Iresine diffusa</i> Humb. & Bonpl. ex Willd.	Cabeça-branca	th						x			V. Gomes, 744
4. Amaryllidaceae											
<i>Hippeastrum stylosum</i> Herb.	Açucena	th						x			F. S. Araújo, 1612
5. Anacardiaceae											
<i>Astronium fraxinifolium</i> Schott	Gonçalo-alves	tre					x				M.A.Figueiredo, 18463
<i>Myracrodruon urundeuva</i> Allemão	Aroeira	tre							x		L.W.Lima-Verde, 3526
<i>Thyrsodium spruceanum</i> Benth.	Cajazeira-brava	tre				x		x			V. Gomes, 1113
6. Annonaceae											
<i>Cymbopetalum brasiliense</i> (Vell.) Benth. ex Baill.	Gitó-da-mata	shr				x					V. Gomes, 766
<i>Duguetia riedeliana</i> R.E.Fr.	Ata-brava	tre							x		V. Gomes, 936
<i>Guatteria pogonopus</i> Mart.	Sabonete	shr					x				V. Gomes, 1274
<i>Xylopia frutescens</i> Aubl.	Imbiriba	tre						x			A. Silveira, 470
<i>Xylopia sericea</i> A.St.-Hil.	Imbiriba	tre						x			A. Silveira, 144
7. Apocynaceae											
<i>Aspidosperma multiflorum</i> A.DC.	Piquiá	tre							x		V. Gomes, 61-3
<i>Aspidosperma pyrifolium</i> Mart.	Pereiro	tre							x		V. Gomes, 2109-4
<i>Aspidosperma ulei</i> Markgr.	Piquiá	tre								x	V. Gomes, 5-32
<i>Blepharodon bicolor</i> Decne.		vi						x			A. Silveira, 744
<i>Condylocarpon isthmicum</i> (Vell.) A.DC.		vi						x			V. Gomes, 1029
<i>Macoubea</i> sp.		vi						x			A. Silveira, 948
8. Aquifoliaceae											
<i>Ilex sapotifolia</i> Reissek	Pinho-branco, Pereira	tre						x			V. Gomes, 1011-03
9. Araceae											
<i>Anthurium scandens</i> (Aubl.) Engl.		eh							x		V. Gomes, 1129
<i>Anthurium sinuatum</i> Benth. ex Schott		th							x		V. Gomes 1205-9

Appendix A. Continued...

FAMILY/SPECIES/AUTHOR	VN	GF	TOP					ALTITUDE				
			400-600 TAV	600-800 SIN	> 800B ARV	> 800S LAG	600-800 JAR	400-600 SAL	400-600 C			
9. Araceae												
<i>Monstera adansonii</i> var. <i>klotzchiana</i> (Schott) Madison		th			x				x			V. Gomes, 2209-1
<i>Monstera praetermissa</i> E.G.Gonç. & Temponi		eh		x								V. Gomes, 780
<i>Philodendron pedatum</i> (Hook) Kunth		th						x				V. Gomes, 902-1
<i>Philodendron ornatum</i> Schott		th						x				V. Gomes, 902-2
<i>Anthurium pentaphyllum</i> (Aubl.) G. Don		th							x			V. Gomes, 1026
10. Araliaceae												
<i>Oreopanax capitatus</i> (Jacq.) Decne. & Planch.	Piroá	tre	x									V. Gomes, 2704-2
<i>Schefflera morototoni</i> (Aubl.) Maguire et al. var. <i>morototoni</i>	Gargaúba	tre	x		x				x			V. Gomes, 1003
11. Araceae												
<i>Attalea speciosa</i> Mart. ex Spreng.	Babaçu	tre	x									Lima, J. R., 1127
<i>Geonoma pohliana</i> Mart.	Palmeirinha-da-serra, Guaricana	tre			x			x				V. Gomes, 663
<i>Syagrus comosa</i> (Mart.) Mart.	Coco-babão, Catolé	tre							x			V. Gomes, 4-278
12. Asteraceae												
<i>Cyrtomyra scorpioides</i> (Lam.) H. Rob.	Assa-peixe	subshr	x									L.W. Lima-Verde, 3479-8
<i>Gynnanthemum amygdalinum</i> (Delile) Sch.Bip. ex Walp.	Boldo	shr						x				A. Silveira, 388
<i>Trichogoniopsis adenantha</i> (DC.) R.M.King & H. Rob.		th										A. Silveira, 969
<i>Vernonanthura brasiliiana</i> (L.) H. Rob.	Catirina	shr							x			A. Silveira, 459
<i>Wedelia alagoensis</i> Baker	Camará-de-flecha	subshr									x	V. Gomes, 6-2
13. Balanophoraceae												
<i>Langsdorffia hypogaea</i> Mart.		th							x			V. Gomes, 707-1
14. Begoniaceae												
<i>Begonia reniformis</i> Dryand.	Begônia	th										A. Silveira, 300
15. Bignoniaceae												
<i>Handroanthus impetiginosus</i> Mattos	Pau-d'arco-roxo	tre			x				x			A. Silveira, 863
<i>Handroanthus serratifolius</i> (A.H. Gentry) S. Grose	Pau-d'arco-amarelo	tre	x		x				x			V. Gomes, 597
<i>Jacaranda brasiliiana</i> (Lam.) Pers.	Caroba	tre	x		x				x			A. Silveira, 219
<i>Lundia cordata</i> (Vell.) DC.	Cipó-de-cesta	vi										A. Silveira, 295
<i>Lundia</i> sp.		vi			x							V. Gomes, 894
16. Bixaceae												
<i>Cochlospermum vitifolium</i> (Willd.) Spreng.	Pacoté	tre							x			L. W. Lima-Verde, 3515
17. Boraginaceae												
<i>Cordia alliodora</i> (Ruiz & Pav.) Cham.		tre								x		V. Gomes, 4-338
<i>Cordia anabaptista</i> Cham.	Freijó	tre								x		V. Gomes, 495
<i>Cordia glazioviana</i> (Taub.) Gottschling & J.S. Mill.	Pau-branco-louro	tre									x	L. W. Lima-Verde, 3492

Appendix A. Continued...

FAMILY/SPECIES/AUTHOR	VN	GF	WINDWARD										ALTITUDE									
			TOP					LEEWARD					TOP					LEEWARD				
			TAV	SIN	ARV	LAG	SAL	400-600	600-800	> 800B	ARV	LAG	JAR	SAL	400-600	600-800	> 800B	ARV	LAG	JAR	SAL	C
17. Boraginaceae																						
<i>Cordia rufescens</i> A.DC.		tre																				A. Silveira, 355
<i>Cordia taguayhensis</i> Vell.		tre																				A. Silveira, 817
<i>Cordia toqueve</i> Aubl.		tre																				V. Gomes, 1235
<i>Cordia trichotoma</i> (Vell.) Arráb. ex Steud.	Freijó	tre																				A. Silveira, 1605
18. Bromeliaceae																						
<i>Aechmea aquilega</i> (Salisb.) Griseb.	Croatá	eh	x																			V. Gomes, 546
<i>Aechmea bromelifolia</i> (Rudge) Baker	Croatá	eh																				V. Gomes, 712
<i>Guzmania lingulata</i> (L.) Mez	Croatá	eh																				A. Silveira, 1029
<i>Guzmania monostachia</i> (L.) Rusby ex Mez	Croatá	eh																				V. Gomes, 307
<i>Racinaea spiculosa</i> (Griseb.) M.A.Spencer & L.B.Sm.	Croatá	eh																				V. Gomes, 0607-15
<i>Tillandsia juncea</i> (Ruiz & Pav.) Poirét.	Croatá	eh																				V. Gomes, 899
<i>Tillandsia recurvata</i> (L.) L.	Croatá	eh																				V. Gomes, 2109-9
<i>Tillandsia stricta</i> Sol. var. <i>stricta</i>	Croatá	eh	x																			V. Gomes, 2209-11
<i>Vriesea oleosa</i> Leme	Croatá	eh																				V. Gomes, 726
<i>Vriesea rodigasiana</i> E. Morren	Croatá	eh																				V. Gomes, 376
19. Burseraceae																						
<i>Commiphora leptophloea</i> (Mart.) J. B. Gillett	Imburana	tre																				A. Silveira, 947
<i>Protium heptaphyllum</i> (Aubl.) Marchand subsp. <i>heptaphyllum</i>	Almécga	tre	x																			V. Gomes, 1120
<i>Protium warmingianum</i> Marchand.	Almécga	tre																				V. Gomes, 887
20. Cactaceae																						
<i>Cereus jamaicaru</i> DC. subsp. <i>jamaicaru</i>	Cardeiro, Mandacaru	shr																				V. Gomes, 4-399
<i>Epiphyllum phyllanthus</i> (L.) Haw.		eh																				V. Gomes, 625
<i>Hylocereus setaceus</i> (Salm - Dyck) R. Bauer		vi																				Lima-Verde, 3472
<i>Pereskia aculeata</i> Mill.		vi																				Lima-Verde, 3596
<i>Pilosocereus catingicola</i> subsp. <i>salvadorensis</i> (Werderm.) Zappi	Cardeiro	shr																				V. Gomes, 5-277
<i>Rhipsalis baccifera</i> (J.M.Muell.) Stearn. subsp. <i>baccifera</i>	Chororongó	eh																				A. Silveira, 406
21. Capparaceae																						
<i>Cynophalla flexuosa</i> (L.) J.Presl.	Feijão-bravo	tre																				V. Gomes, 1160
22. Caricaceae																						
<i>Jacaratia spinosa</i> (Aubl.) A.DC.	Jacaratiá	tre	x																			A. Castro, 30996
23. Celastraceae																						
<i>Maytenus distichophylla</i> Mart. ex Reissek	Folha-dura	tre																				V. Gomes, 442
<i>Maytenus erythroxyla</i> Reissek	Jerimum	tre																				A. Silveira, 851
<i>Maytenus gonoclada</i> Mart.	Folha-dura	tre																				V. Gomes, 912
<i>Maytenus impressa</i> Reissek		tre	x																			V. Gomes, 2009

Appendix A. Continued...

FAMILY/SPECIES/AUTHOR	VN	GF	WINDWARD					ALTITUDE					C	
			TOP					LEEWARD						
			400-600 TAV	600-800 SIN	> 800B ARV	> 800S LAG	600-800 JAR	400-600 SAL						
23. Celastraceae														
<i>Maytenus obtusifolia</i> Mart.	Jerimum	tre	x	x	x	x	x	x	x	x				V. Gomes, 2704-5
<i>Maytenus schumanniana</i> Loes.	Jerimum	tre												V. Gomes, 1-273
<i>Maytenus</i> sp.		tre	x											
24. Chrysobalanaceae														
<i>Hirtella racemosa</i> var. <i>hexandra</i> (Willd. ex Roem. & Schult.) Prance		shr		x										V. Gomes, 779
<i>Licania</i> sp.		tre									x			V. Gomes, 924
25. Clusiaceae														
<i>Clusia dardanoi</i> G.Mariz & Maguire	Gitó-da-mata	tre									x			V. Gomes, 1144
<i>Clusia nemorosa</i> G.Mey.	Orelha-de-burro	tre	x								x			A. Silveira, 815
<i>Garcinia gardneriana</i> (Planch. & Triana) Zappi	Bacupari	tre	x								x			V. Gomes, 1014
26. Combretaceae														
<i>Buchenavia tetraphylla</i> (Aubl.) R.A.Howard.	Amarêlão	tre		x							x			A. Silveira, 182
27. Commelinaceae														
<i>Aneilema brasiliense</i> C.B.Clarke		th												V. Gomes, 1305-9
<i>Commelina benghalensis</i> L.		th												V. Gomes, 665
<i>Dichorisandra hexandra</i> (Aubl.) Kuntze ex Hand.-Mazz.		th												V. Gomes, 1270
28. Costaceae														
<i>Costus spiralis</i> (Jacq.) Roscoe		th	x											V. Gomes, 666
29. Cyperaceae														
<i>Becquerelia cymosa</i> Brongn.		th												V. Gomes, 798
<i>Cyperus cf. ligularis</i> L.		th												V. Gomes, 719
<i>Rhynchospora cephalotes</i> (L.) Vahl		th												V. Gomes, 336
<i>Scleria latifolia</i> Sw.		th												A. Silveira, 78
30. Dilleniaceae														
<i>Dolioscarpus dentatus</i> (Aubl.) Standl. subsp. <i>dentatus</i>		vi												V. Gomes, 776
31. Elaeocarpaceae														
<i>Sloanea garckeana</i> K.Schum.		shr												V. Gomes, 883
32. Erythroxylaceae														
<i>Erythroxylum affine</i> A.St.-Hil.		tre	x											A. Silveira, 809
<i>Erythroxylum citrifolium</i> A. St.-Hil.		tre												A. Silveira, 418
<i>Erythroxylum macrochaetum</i> Miq.	Café-bravo	shr												V. Gomes, 1002-1
<i>Erythroxylum mucronatum</i> Benth.		tre	x											V. Gomes, 112
<i>Erythroxylum pulchrum</i> A.St.-Hil.		tre												V. Gomes, 1093
<i>Erythroxylum simonis</i> Plowman		shr												V. Gomes, 1095

Appendix A. Continued...

FAMILY/SPECIES/AUTHOR	WINDWARD		ALTITUDE										
	VN	GF	TOP					LEEWARD					C
			400-600 TAV	600-800 SIN	> 800B ARV	> 800S LAG	600-800 JAR	400-600 SAL					
32. Erythroxylaceae													
<i>Erythroxylum squamatatum</i> Sw.		shr	x	x								A. Silveira, 111	
<i>Erythroxylum subrotundum</i> A.St.-Hil.		shr				x						V. Gomes, 209-6	
<i>Erythroxylum tenue</i> Plowman		shr					x					A. Silveira, 317	
<i>Erythroxylum</i> sp.1		shr								x		A. Silveira, 923	
33. Euphorbiaceae													
<i>Acalypha</i> sp.		shr						x				V. Gomes, 739	
<i>Acalypha villosa</i> Jacq.		shr				x						A. Silveira, 427	
<i>Actinostemon concolor</i> (Spreng.) Müll. Arg.		tre					x					A. Silveira, 807	
<i>Actinostemon klotzschii</i> (D.Dr.) Pax		shr							x			A. Silveira, 580	
<i>Actinostemon verticillatus</i> (Klotzsch) Baill.		shr							x			A. Silveira, 549	
<i>Alchornea glandulosa</i> subsp. <i>iricurana</i> (Casar.) Secco		tre				x						A. Silveira, 891	
<i>Aparisthium cordatum</i> (A.Juss.) Baill.		tre						x				V. Gomes, 774	
<i>Bernardia tamanduana</i> (Baill.) Müll. Arg.		shr						x				V. Gomes, 738	
<i>Croton argyroglossus</i> Baill.		tre							x			V. Gomes, 698	
<i>Croton blanchetianus</i> Baill.		tre								x		V. Gomes 1102-4	
<i>Croton floribundus</i> Spreng.		tre				x		x				A. Silveira, 739	
<i>Croton</i> sp. 1		tre				x	x					V. Gomes, 1138	
<i>Croton</i> sp. 2		shr									x	V. Gomes, 1-3	
<i>Hieronyma oblonga</i> (Tul.) Müll Arg.		tre						x				A. Silveira, 442	
<i>Jatropha mollissima</i> (Pohl) Baill.		shr								x		A. Silveira, 611	
<i>Manihot carthaginensis</i> subsp. <i>glaziovii</i> (Müll Arg.) Allem.		tre				x		x		x		A. Silveira, 873	
<i>Sapium obovatum</i> Klotzsch ex Müll. Arg.		tre							x			A. Silveira, 854	
<i>Sebastiania commersoniana</i> (Baill.) L.B.Sm. & Downs		shr								x		V. Gomes, 0404-1	
<i>Sebastiania jacobinensis</i> (Müll.Arg.) Müll.Arg.		tre								x		A. Silveira, 849	
<i>Sebastiania macrocarpa</i> Müll.Arg.		shr				x				x		V. Gomes, 2009-5	
<i>Tragia volubilis</i> L.		vi									x	A. Silveira, 742	
34. Fabaceae													
34.1 Caesalpinioideae													
<i>Bauhinia</i> cf. <i>cheilantha</i> (Bong.) Steud.		shr									x	V. Gomes, 402	
<i>Bauhinia</i> sp.		shr				x				x		V. Gomes, 5-217	
<i>Cassia ferruginea</i> (Schrad.) Schrad. ex DC. var. <i>ferruginea</i>		tre							x			M.A.Figueiredo, 15951	
<i>Cassia grandis</i> L. f.		tre							x			M. A. Figueiredo, 11711	
<i>Chamaecrista duckeana</i> (P. Bezerra & Afr. Fern.) H.S. Irwin & Barneby		th									x	V. Gomes, 548	

Appendix A. Continued...

FAMILY/SPECIES/AUTHOR	VN	GF	TOP			ALTITUDE					C	
			TAV	600-800	SIN	ARV	LAG	JAR	600-800	400-600		SAL
34.1 Caesalpinioidae												
<i>Chamaecrista zygochloides</i> var. <i>colligans</i> (H.S.Irwin & Barneby) H.S.Irwin & Barneby		shr							x		x	J.R.Lima, 862
<i>Chamaecrista</i> sp.		subshr										
<i>Copaifera langsdorffii</i> Desf.	Pau-d'óleo	tre	x	x			x					A. Silveira, 943
<i>Hymenaea eriotryne</i> Benth.	Jatobá	tre	x				x					A. Silveira, 884
<i>Libidibia ferrea</i> (Mart. ex Tul.) L.P.Queiroz var. <i>ferrea</i>	Jucá, Pau-ferro	tre						x				V. Gomes, 6-54
<i>Libidibia ferrea</i> var. <i>leiostachya</i> (Benth.) L.P.Queiroz	Pau-ferro	tre						x				A. Silveira, 951
<i>Poincianella bracteosa</i> (Tul.) L.P.Queiroz	Catingueira	tre						x			x	V. Gomes, 1162
<i>Senna quinqueangulata</i> (Rich.) H.S.Irwin & Barneby	Besouro	tre					x					V. Gomes, 5-411
<i>Senna splendida</i> (Vogel) H.S.Irwin & Barneby	São-João	shr						x				A. Silveira, 362
34.2 Faboideae												
<i>Andira cf. nitida</i> Mart. ex Benth.		tre							x			V. Gomes, 850
<i>Desmodium procumbens</i> (Mill.) Hitchc.		th					x					M.A.Figueiredo, 17662
<i>Dioclea grandiflora</i> Mart. ex Benth.	Mucunã	vi		x			x					V. Gomes, 0903-2
<i>Dioclea virgata</i> (Rich.) Amshoff	Mucunã	vi					x					L.W. Lima-Verde, 110
<i>Lonchocarpus sericeus</i> (Poir.) Kunth ex DC.	Ingá-brava	tre	x				x					M.A.Figueiredo, 15938
<i>Machaerium hirtum</i> (Vell.) Stelfeld	Chifre-de-bode	tre	x					x				A. Silveira, 1001
<i>Myroxylon peruiferum</i> L.f.	Bálsamo	tre							x			V. Gomes, 4-778
<i>Ormosia</i> sp.		tre	x	x			x					V. Gomes, 1-221
<i>Platymiscium floribundum</i> Vogel		tre	x						x			V. Gomes, 907-1
34.3 Mimosoideae												
<i>Abarema jupunba</i> (Willd.) Britton & Killip var. <i>jupunba</i>		tre	x	x			x					J.R.Lima, 385
<i>Albizia polycephala</i> (Benth.) Killip ex Record	Camuzé	tre	x	x			x					A. Silveira, 348
<i>Anadenanthera colubrina</i> var. <i>cebil</i> (Griseb.) Altschul	Calumbi	tre							x		x	L.W.Lima-Verde, 3570
<i>Chloroleucon dumosum</i> (Benth.) G.P. Lewis	Arapiraca	tre							x			A. Silveira, 867
<i>Inga bollandii</i> Sprague & Sandwith	Ingáí	tre	x	x				x				A. Silveira, 357
<i>Inga ingoides</i> (Rich.) Willd.	Ingá	tre	x	x			x					V. Gomes, 329
<i>Inga laurina</i> (Sw.) Willd.	Ingá	tre						x				V. Gomes, 4-751
<i>Inga marginata</i> Willd.	Ingá	tre							x			M.R.Oliveira, 20976
<i>Mimosa arenosa</i> (Willd.) Poir. var. <i>arenosa</i>	Sabiá	tre							x		x	L.W.Lima-Verde, 3621
<i>Mimosa caesalpinifolia</i> Benth.	Visgueiro	tre							x			V. Gomes, 4
<i>Parkia pendula</i> (Willd.) Benth. ex Walp.	Saia-velha	tre								x		A. Silveira, 379
<i>Piptadenia stipulacea</i> (Benth.) Ducke	Espinheiro, Espinheiro-preto	tre							x			V. Gomes, 436
<i>Senegalia polyphylla</i> (DC.) Britton & Rose	Unha-de-gato	shr							x			V. Gomes, 4-773
<i>Senegalia riparia</i> (Kunth) Britton & Killip		shr									x	V. Gomes, 5-689

Appendix A. Continued...

FAMILY/SPECIES/AUTHOR	VN	GF	TOP		ALTITUDE															
			400-600 TAV	600-800 SIN	800B > 800S ARV	800S > 800S LAG	600-800 JAR	400-600 SAL	C											
43. Lythraceae																				
<i>Lafoensia pacari</i> A.St.-Hil.		tre								x										V. Gomes, 2009-13
44. Malpighiaceae																				
<i>Bunchosia acuminata</i> Dobson		tre		x					x											V. Gomes, 1303-5
<i>Byrsonima crispa</i> A.Juss.	Murici	tre							x											A. Silveira, 206
<i>Byrsonima sericea</i> DC.	Murici	tre	x						x											V. Gomes, 1112
<i>Byrsonima stipulacea</i> A.Juss.	Murici	tre							x											M. A. Figueiredo, 17050
<i>Heteropterys tricanthera</i> A.Juss.		vi		x																V. Gomes, 1102-3
<i>Tetrapterys mucronata</i> Cav.	Canela-brava	vi		x																A. Silveira 436
45. Malvaceae																				
<i>Apeiba tibourbou</i> Aubl.		tre	x						x											A. Silveira, 861
<i>Callianthe bezerrae</i> (Monteiro) Donnel	Jangada, Pau-de-jangada	subshr							x											M.A. Figueiredo, 349
<i>Ceiba glaziovii</i> (Kuntze) K.Schum.	Barriguda	tre								x										V. Gomes, 508-3
<i>Helicteres baruensis</i> Jacq.	Maria-preta	shr																		V. Gomes, 1102-5
<i>Helicteres velutina</i> K.Schum.	Maria-preta	shr								x										V. Gomes, 795
<i>Helicteres</i> sp.		shr																		V. Gomes, 1102-6
<i>Pseudobombax marginatum</i> (A.St.-Hil.) A. Robyns	Imbiratanha	tre	x																	V. Gomes, 1103-6
<i>Sida urens</i> L.		th								x										M. A. Figueiredo, 15249
46. Marantaceae																				
<i>Calathea cylindrica</i> (Roscoe) K.Schum.	Bananinha	th																		V. Gomes, 2604-4
<i>Calathea</i> sp.	Bananinha-de-salão	th	x						x											A. Silveira, 972
<i>Ischnosiphon puberulus</i> Loes.	Taquari	th	x						x											V. Gomes, 1119
<i>Maranta leuconeura</i> E. Morren	Baratinha	th																		A. Silveira, 971
47. Marcgraviaceae																				
<i>Norantea guianensis</i> Aubl.		shr																		V. Gomes, 903
48. Melastomataceae																				
<i>Aciotis</i> sp.		th																		V. Gomes, 778
<i>Clidemia debilis</i> Crueg.	Lava-mato	shr																		V. Gomes, 2604-3
<i>Clidemia dentata</i> D.Don	Lacre-branco	shr																		A. Silveira, 161
<i>Clidemia hirta</i> (L.) D.Don		shr																		V. Gomes, 2704-2
<i>Miconia affinis</i> DC.		shr	x						x											A. Silveira, 903
<i>Miconia alata</i> (Aubl.) DC.	Canela-de-veado	tre	x						x											A. Silveira, 404
<i>Miconia</i> aff. <i>caudigera</i> DC.	Lacre-branco	shr																		A. Silveira, 353
<i>Miconia holosericea</i> (L.) DC.		tre																		V. Gomes, 767
<i>Miconia hypoleuca</i> (Benth.) Triana		shr	x																	V. Gomes, 1109
<i>Miconia minutiflora</i> (Bonpl.) DC.	Lacre-branco	shr																		A. Silveira, 10

Appendix A. Continued...

FAMILY/SPECIES/AUTHOR	WINDWARD			ALTITUDE							C	
	VN	TOP		LEEWARD								
		GF	TAV	400-600	600-800	> 800B	> 800S	LAG	JAR	400-600		SAL
53. Myrtaceae												
<i>Eugenia</i> sp. 3			x									V. Gomes, 775
<i>Marlieria</i> sp1			x									V. Gomes, 1176
<i>Marlieria</i> sp2						x						V. Gomes, 1-207
<i>Myrcia alagoensis</i> O. Berg			x		x							V. Gomes, 1041
<i>Myrcia multiflora</i> (Lam.) DC.			x		x							V. Gomes, 935
<i>Myrcia pubiflora</i> DC.			x									V. Gomes, 875
<i>Myrcia rostrata</i> DC.			x		x							V. Gomes, 1147
<i>Myrcia splendens</i> (Sw.) DC.		Folha-miúda	x		x							V. Gomes, 1197
<i>Myrcia sylvatica</i> (G.Mey.) DC.		Folha-miúda-preta	x		x							A. Silveira, 458
<i>Myrcia tomentosa</i> (Aubl.) DC.		Goiabinha	x		x							A. Silveira, 387
<i>Myrcia</i> sp. 1					x				x			V. Gomes, 2009-23
<i>Myrcia</i> sp. 2		Cabacinha			x							V. Gomes, 1152
<i>Myrcia</i> sp. 3					x							V. Gomes, 2-561
<i>Myrcia</i> sp. 4					x							V. Gomes, 2-230
<i>Myrcia</i> sp. 5					x							V. Gomes, 2-798
<i>Myrcia</i> sp. 6			x		x							A. Silveira, 999
<i>Myrciaria ferruginea</i> O.Berg								x				A. Silveira, 808
<i>Myrciaria</i> sp1								x				A. Silveira, 338
<i>Myrciaria</i> sp2			x		x							V. Gomes, 1205
<i>Myrciaria</i> sp3								x				A. Silveira, 923
<i>Myrciaria tenella</i> (DC) O. Berg		Sangue de boi						x				V. Gomes, 1216
<i>Psidium guianense</i> Sw.										x		V. Gomes, 1228
<i>Psidium sartorianum</i> (O.Berg.) Nied.												V. Gomes, 0206-15
<i>Siphoneugenia</i> sp.								x				A. Silveira 779
<i>Syzygium jambos</i> (L.) Alston												V. Gomes, 695
54. Nyctaginaceae												
<i>Guapira</i> sp.		João-mole								x		V. Gomes, 1-462
<i>Neea obovata</i> Spruce ex. Heimerl		João-mole								x		V. Gomes, 1153
55. Ochnaceae												
<i>Ouratea hexasperma</i> (A.St.-Hil.) Baill.		Cajuzinho								x		A. Silveira, 399
<i>Ouratea polygyna</i> Engl.		Cajuzinho										V. Gomes, 726-1
56. Olacaceae												
<i>Heisteria blanchetiana</i> (Engl.) Sleumer			x									V. Gomes, 20-6
<i>Heisteria perianthomega</i> (Vell.) Sleumer		Mium-de-sangue-branco	x							x		A. Silveira, 973
<i>Schoepfia obliquifolia</i> Turcz.											x	V. Gomes, 764

Appendix A. Continued...

FAMILY/SPECIES/AUTHOR	WINDWARD				ALTITUDE				C	
	VN	GF	TOP	LEEWARD	400-600 TAV	600-800 SIN	> 800B ARV	600-800 LAG		400-600 JAR
56. Olacaceae <i>Ximenesia americana</i> L.		tre					x			V. Gomes, 4-449
57. Oleaceae <i>Chionanthus</i> sp.		tre				x				V. Gomes, 462
58. Opiliaceae <i>Agonandra brasiliensis</i> Miers. ex Benth. & Hook.f.	Juá-mirim	tre							x	V. Gomes, 72
59. Orchidaceae <i>Alatiglossum barbatum</i> (Lindl.) Baptista		eh				x				V. Gomes, 523
<i>Catasetum macrocarpum</i> Rich. ex Kunth		eh			x					V. Gomes, 1009-1
<i>Epidendrum armeniacum</i> Lindl.		eh				x				V. Gomes, 0607-3
<i>Epidendrum nocturnum</i> Jacq.		eh	x							V. Gomes, 299
<i>Gongora quinquerivis</i> Ruiz & Pav.		eh				x				V. Gomes, 3031
<i>Notylia lyrata</i> S. Moore		eh				x				V. Gomes, 2209-16
<i>Polystachia concreta</i> (Jacq.) Garay & Sweet		eh	x			x			x	A. Silveira, 897
<i>Prescottia stachyodes</i> (Sw.) Lindl.		th			x	x				V. Gomes, 716
<i>Specklinia trifida</i> (Lindl.) F.Barros		eh			x	x				V. Gomes, 621
<i>Trichocentrum fuscum</i> Lindl.		eh				x				V. Gomes, 716
60. Oxalidaceae <i>Oxalis alstonii</i> Lourteig.		th						x		A. Silveira, 804
61. Passifloraceae <i>Mitostemma brevifilis</i> Gontsch.	Maracujá-suspiro	vi				x				A. Silveira, 741
62. Peraceae <i>Pera glabrata</i> (Schott) Poepp. ex Baill.	Casquim	tre				x				V. Gomes, 991
63. Phyllanthaceae <i>Phyllanthus acutifolius</i> Poir. ex Spreng.		subshr						x		A. Silveira, 855
64. Phytolaccaceae <i>Hillertia latifolia</i> (Lam.) H. Walter		th						x		A. Silveira, 829
65. Piperaceae <i>Picramnia gardneri</i> Planch. <i>Picramnia glazioviana</i> Engl.		tre				x				V. Gomes, 488 V. Gomes, 922
66. Piperaceae <i>Piper aduncum</i> L. <i>Piper arboreum</i> Aubl. <i>Piper ovatum</i> Vahl. <i>Peperomia circinnata</i> Link		shr shr subshr th				x x x				A. Silveira, 463 A. Silveira, 390 V. Gomes, 0707-3 V. Gomes, 0707-2

Appendix A. Continued...

FAMILY/SPECIES/AUTHOR	VN	GF	WINDWARD						ALTITUDE						
			TAV	400-600	600-800	SIN	> 800B	ARV	LAG	JAR	SAL	LEEWARD	C		
67. Plumbaginaceae															
<i>Plumbago scandens</i> L.		subshr										x			V. Gomes, 735
68. Poaceae															
<i>Merostachys</i> sp.	Taquara	th										x			V. Gomes, 1124
<i>Olyra latifolia</i> L.		th										x			V. Gomes, 15-3
<i>Parodiolyra micrantha</i> (Kunth) Davidse & Zuloaga		th										x			V. Gomes, 545
69. Podocarpaceae															
<i>Podocarpus sellowii</i> Klotzsch ex. Endl.		tre										x			A. Silveira, 239
70. Polygalaceae															
<i>Acanthocladius albicans</i> A.W.Benn.	Ameixa	shr										x			V. Gomes, 793
<i>Polygala paniculata</i> L.	Vique	th										x			A. Silveira, 447
71. Polygonaceae															
<i>Coccoloba parimensis</i> Benth.		tre									x				A. Silveira, 729
<i>Coccoloba</i> sp.1.		tre		x											V. Gomes, 1197
<i>Coccoloba</i> sp. 2.		shr											x		A. Silveira, 494
<i>Ruprechtia laxiflora</i> Meisn.	Tubibeira	tre											x		A. Silveira, 924
72. Portulacaceae															
<i>Talinum paniculatum</i> (Jacq.) Gaertn.		th											x		A. Silveira, 953
73. Proteaceae															
<i>Roupala</i> sp.	Carne-de-vaca; Rabugem	tre										x			V. Gomes, 729
74. Rhamnaceae															
<i>Colubrina glandulosa</i> Perkins	Sabiaguaba	shr		x							x				V. Gomes, 1205-1
<i>Ziziphus undulata</i> Reissek	Juá-mirim	tre		x											V. Gomes, 6-26
75. Rosaceae															
<i>Prunus myrtifolia</i> (L.) Urb.	Pau-de-soinho	tre		r											V. Gomes, 2209-3
76. Rubiaceae															
<i>Alseis floribunda</i> Schott	Guabiraba	tre		x								x			A. Silveira, 850
<i>Amaioua intermedia</i> Mart. ex Schult. & Schult. f	Casquim	tre		x								x			V. Gomes, 1087
<i>Chiococca alba</i> (L.) Hitchc.		shr										x			M.A.Figueiredo, 16670
<i>Coussarea contracta</i> (Walp.) Müll.Arg. var. <i>contracta</i>	Folha-dura	tre		x											V. Gomes, 6-42
<i>Coutarea hexandra</i> (Jacq.) K.Schum.	Quina-quina	tre										x			A. Silveira, 909
<i>Faramea hyacinthina</i> Mart.	Folha-dura	tre		x								x			V. Gomes, 1003-5
<i>Faramea</i> sp. 1	Violeta, Folha-dura	tre		x								x			V. Gomes, 916
<i>Faramea</i> sp. 2	Folha-dura	tre		x								x			A. Silveira, 774
<i>Gonzalagunia dicocca</i> Cham. & Schldl.	Canela-de-juriti	th		x								x			V. Gomes, 1048
<i>Guettarida angelica</i> Mart. ex Müll.Arg.	Espinho-branco	shr		x								x			A. Silveira, 721

Appendix A. Continued...

FAMILY/SPECIES/AUTHOR	VN	GF	ALTITUDE																		
			WINDWARD					LEEWARD													
			TOP	400-600	600-800	> 800B	> 800S	600-800	400-600	C											
TAV	SIN	ARV	LAG	JAR	SAL																
76. Rubiaceae																					
<i>Hamelia patens</i> Jacq.		th																			A. Silveira, 827
<i>Palicourea guianensis</i> Aubl.	Sombrião, Erva-de-rato-grande	shr																			V. Gomes 1103
<i>Palicourea margravii</i> A.St.-Hil.		shr																			V. Gomes, 1205-7
<i>Psychotria bracteocardia</i> (DC.) Müll.Arg.	Sorriso-de-viúva	th																			V. Gomes, 0902-1
<i>Psychotria capitata</i> Ruiz & Pav.		shr																			A. Silveira, 759
<i>Psychotria carthagenensis</i> Jacq.		shr																			A. Silveira, 767
<i>Psychotria colorata</i> (Willd. ex Schult.) Müll. Arg.	Erva-de-rato-falsa	shr																			A. Silveira, 734
<i>Psychotria deflexa</i> DC.		shr																			A. Silveira, 733
<i>Psychotria hoffmannseggiana</i> (Willd. ex Schult.) Müll. Arg.		shr																			A. Silveira, 742
<i>Randia armata</i> (Sw.) DC.	Veludo-preto	tre																			V. Gomes, 1102-4
77. Rutaceae																					
<i>Esenbeckia grandiflora</i> Mart.		tre																			A. Silveira, 811
<i>Pilocarpus spicatus</i> A.St.-Hil.		tre																			A. Silveira, 845
<i>Rauia</i> sp.		tre																			V. Gomes, 772
<i>Zanthoxylum petiolare</i> A.St.-Hil & Tul.	Limãozinho	tre																			V. Gomes, 466
<i>Zanthoxylum rhoifolium</i> Lam.	Limãozinho	tre																			A. Silveira, 908
78. Salicaceae																					
<i>Banara guianensis</i> Aubl.	Farinha-seca	tre																			V. Gomes, 1125
<i>Casearia commersoniana</i> Cambess.		shr																			V. Gomes, 0607-1
<i>Casearia grandiflora</i> Cambess.		shr																			V. Gomes, 1114
<i>Casearia sylvestris</i> Sw.		shr																			A. Silveira, 826
<i>Casearia</i> sp. 1		shr																			V. Gomes, 2-753
<i>Casearia</i> sp. 2		shr																			V. Gomes, 6-263
<i>Prockia crucis</i> P.Browne ex L.		shr																			A. Silveira, 726
<i>Xylosma ciliatifolia</i> (Clos) Eichler	Espinho-de-judeu	shr																			V. Gomes, 0306-1
79. Santalaceae																					
<i>Phoradendron crassifolium</i> (Pohl ex DC.) Eichler		hm																			V. Gomes, 727
<i>Phoradendron mucronatum</i> (DC.) Krug & Urb.		hm																			V. Gomes, 2009-14
<i>Phoradendron</i> sp. 1		hm																			V. Gomes, 1130
<i>Phoradendron</i> sp. 2		hm																			A. Silveira, 975
80. Sapindaceae																					
<i>Allophylus edulis</i> (A.St.-Hil. et al.) Hieron. ex Niederl.		shr																			A. Silveira, 822
<i>Aparisthium cordatum</i> (A.Juss.) Baill.	Piroá	tre																			V. Gomes, 774
<i>Cupania impressinervia</i> Acev.-Rodr.		tre																			Araújo, F. S. 1604
<i>Cupania racemosa</i> (Vell.) Radlk.	Cajueiro-bravo	tre																			V. Gomes, 736

Appendix A. Continued...

FAMILY/SPECIES/AUTHOR	VN	GF	ALTITUDE									
			WINDWARD					LEEWARD				
			TOP	600-800	> 800B	600-800	600-800	400-600	400-600	400-600	C	
			TAV	SIN	ARV	LAG	JAR	SAL	SAL			
80. Sapindaceae												
<i>Cupania longifolia</i> Benth.	Cajueiro-bravo	tre	x		x						V. Gomes, 0902-1	
<i>Paullinia uloptera</i> Radlk.		vi					x				V. Gomes, 441	
<i>Serjania hebecarpa</i> Benth.		vi			x						V. Gomes, 751	
81. Sapotaceae												
<i>Chrysophyllum flexuosum</i> Mart.		tre			x						V. Gomes, 580	
<i>Chrysophyllum gonocarpum</i> (Mart. & Eichler ex Miq.) Engl.	Jitô	tre	x								V. Gomes, 1204-3	
<i>Chrysophyllum</i> sp.	Folha-dura	tre			x						A. Silveira, 982	
<i>Manilkara rufula</i> (Miq.) H.J.Lam	Maçaranduba	tre	x	x	x	x	x				A. Silveira, 537	
<i>Micropholis</i> aff. <i>guyanensis</i> (A.DC.) Pierre		tre			x						V. Gomes, 504	
<i>Pouteria bangii</i> (Rusby) T.D.Penn.	Engasga-vaca	tre			x						V. Gomes, 0206-3	
<i>Pouteria macrophylla</i> (Lam.) Eyma		tre			x						V. Gomes, 1002-1	
<i>Pouteria peduncularis</i> (Mart. & Eichler ex Miq.) Baehni		tre			x						A. Silveira, 108	
<i>Pouteria venosa</i> (Mart.) Baehni subsp. <i>venosa</i>		tre			x						V. Gomes, 1002-15	
82. Schoepfiaceae												
<i>Schoepfia brasiliensis</i> A.DC.		tre		x							V. Gomes, 764	
83. Simaroubaceae												
<i>Simarouba amara</i> Aubl.	Paraíba	tre	x	x	x	x					A. Silveira, 1112	
84. Siparunaceae												
<i>Siparuna guianensis</i> Aubl.	Sabonete	shr				x					V. Gomes, 1116	
85. Smilacaceae												
<i>Smilax</i> sp.	Japecanga	vi			x	x					V. Gomes, 1028	
86. Solanaceae												
<i>Acnistatus arborescens</i> (L.) Schltdl.		shr				x		x			V. Gomes, 1002-52	
<i>Brunfelsia uniflora</i> (Pohl) D.Don		shr			x	x					A. Silveira, 749	
<i>Cestrum axillare</i> Vell.	Dominguinho	shr			x						Araújo, F.S. 1608	
<i>Cestrum schlehtendallii</i> G.Don.	Dominguinho	shr			x						V. Gomes, 1003	
<i>Solanum caavurana</i> Vell.		shr		x	x						A. Silveira, 772	
<i>Solanum campaniforme</i> Roem. & Schult.	Caninana	shr		x							A. Silveira, 426	
<i>Solanum paniculatum</i> L.		shr						x			A. Silveira, 491	
<i>Solanum rhytidandrums</i> Sendtn.	Boldo, Jurubeba-preta	shr			x	x					V. Gomes, 1102-5	
87. Sterculiaceae												
<i>Basiloxylon brasiliensis</i> (All.) K. Schum.	Piroá	tre	x		x						V. Gomes, 1103-1	
<i>Guazuma ulmifolia</i> Lam.	Mutamba-brava	tre				x					V. Gomes, 2-289	
88. Symplocaceae												
<i>Symplocos nitens</i> (Pohl) Benth.		tre						x			V. Gomes, 1143	

Appendix A. Continued...

FAMILY/SPECIES/AUTHOR	VN	GF	TOP			ALTITUDE					C	
			400-600 TAV	600-800 SIN	> 800B ARV	LEEWARD						
						600-800 JAR	> 800S LAG	> 800B ARV	> 800S LAG	400-600 SAL		
89. Thymelaeaceae												
<i>Daphnopsis racemosa</i> Griseb.	Embira-branca	shr	x	x	x	x	x	x				V. Gomes, 1106
90. Urticaceae												
<i>Cecropia palmata</i> Willd.	Embaúba, Torém	tre	x	x	x							A. Silveira, 11
<i>Urera baccifera</i> (L.) Gaudich. ex Wedd.	Urtiga	tre	x									V. Gomes, 1203-5
91. Verbenaceae												
<i>Lantana camara</i> L.	Camará	shr									x	A. Silveira, 732
<i>Lantana radula</i> Sw.	Camará	shr									x	V. Gomes, 2109-5
92. Zingiberaceae												
<i>Renealmia chrysostricha</i> Petersen	Colônia-brava	th							x			V. Gomes, 455

VN: vernacular name; GF: growth form; ter: tree; shr: shrub; subshr: subshrub; vi: vine; th: terrestrial herb; eh: epiphytic herb; hm: hemiparasite; C: main collector's name and number; x: present species. Surveyed sites: TAV: Taveiras; SIN: Sinimbu; ARV: Arvoredo; LAG: Lagoa; JAR: Jardim; SAL: Salva-Vidas.