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A floristic survey of angiosperm species occurring at three landscapes of the Central Amazon *várzea*, Brazil

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Abstract: The Amazonian floodplains harbor highly diverse wetland forests, with angiosperms adapted to survive extreme floods and droughts. About 14% of the Amazon Basin is covered by floodplains, which are fundamental to river productivity, biogeochemical cycling and trophic flow, and have been subject to human occupation since Pre-Colombian times. The botanical knowledge about these forests is still incomplete, and current forest degradation rates are much higher than the rate of new botanical surveys. Herein we report the results of three years of botanical surveys in floodplain forests of the Central Amazon. This checklist contains 432 tree species comprising 193 genera and 57 families. The most represented families are Fabaceae, Myrtaceae, Lauraceae, Sapotaceae, Annonaceae, and Moraceae representing 53% of the identified species. This checklist also documents the occurrence of approximately 236 species that have been rarely recorded as occurring in white-water floodplain forests.

Key words: white-water floodplain forests; angiosperms; floristic survey; Amazonian wetlands; Brazil

INTRODUCTION

The floodplains of major Amazonian rivers cover about 400,000 km², and *várzea* (white-water floodplain) forests are the most prevalent floodplain habitat in the Amazon Basin (Melack and Hess 2011; Junk et al. 2011). *Várzea* forests have fewer plant species than the better-known upland Amazonian forests, but are still the most diverse floodable forests in the world (Wittmann et al. 2006). Still, only about 200 plots (ter Steege et al. 2013), comprising 90 ha of *várzea* forests, have been inventoried to date (Wittmann et al. 2011). From these inventories, about 100 to 200 thousand trees have been tagged, measured and identified, resulting in the identification of approximately 1000 tree species (Wittmann et al. 2006; Wittmann et al. 2011). Although most of these species are shared with upland environments (Wittmann et al. 2013), there are noticeable differences between upland and *várzea* populations, arising from the morphological, physiological and ecological adaptations needed to survive flood-prone environments (Parolin et al. 2004).

The annual flood pulse of major Amazonian rivers imposes a strong seasonality to the floodplain (Junk et al. 1989), and *várzea* forests remain flooded for up to half of the year (Ferreira-Ferreira et al. 2014). From at least 10 million years BP to the present (Latrubesse and Franzinelli 2002), the flood pulse has provided, in synergy with fluvial processes (Salo et al. 1986; Kalliola et al. 1991; Ward et al. 2002), the dynamic characteristic of the floodplain landscape, contributing to environmental heterogeneity among localities (Irion and Kalliola 2010). The result is a complex mosaic of herbaceous-dominated vegetation (i.e., wet grasslands), shrub/tree-dominated vegetation (i.e., *chavascal*) and dense forests (Ferreira-Ferreira et al. 2014), with trees up to 45 m high and a large variety of life forms.

Herein we provide a checklist of tree species occurring at three *várzea* landscapes of the Central Amazon, and compare this list with the two most complete lists available for *várzea* forests in the literature (Albernaz et al. 2012; Wittmann et al. 2013), emphasizing the knowledge gaps in species occurrence and distribution for this environment.

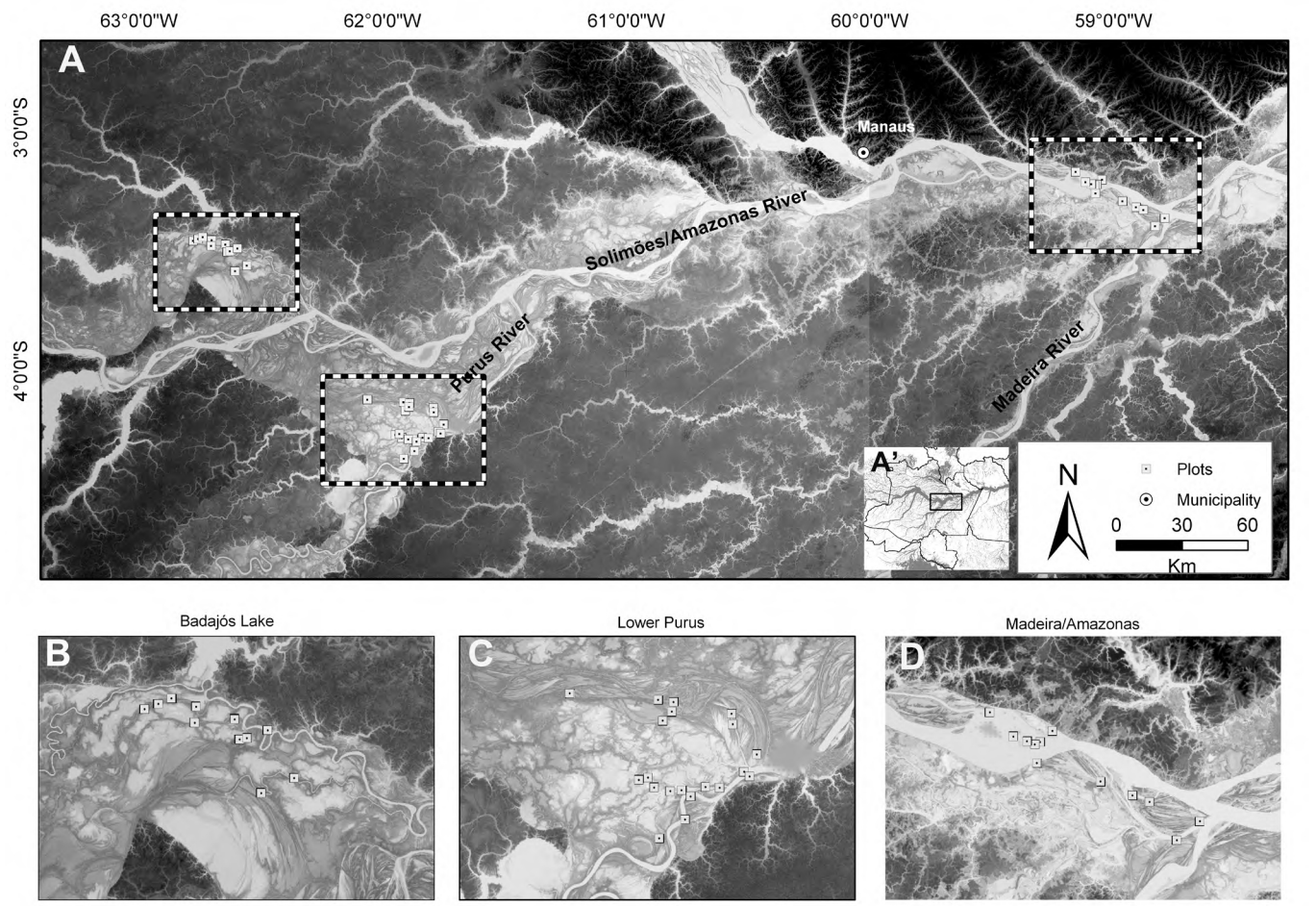

Figure 1. (**A**) Distribution of three study landscapes within the Central Amazon region, (**A'**) between the town of Coari and the Madeira River mouth, Amazonas state, Brazil. Details of the three landscapes of *várzea* forest where botanical collections were done: (**B**) Badajós Lake; (**C**) Lower Purus; and (**D**) Madeira/Amazonas confluence.

MATERIALS AND METHODS

Study site

We studied three landscapes along the Solimões-Amazonas River floodplain, in the Central Amazon basin, each comprising approximately 900 km² (30 × 30 km; Figure 1). The Central Amazon has a tropical equatorial climate, with total annual precipitation ranging from 2,000 to 2,600 mm, averaging 200 mm during the wettest month (usually occurring in the first quarter of the year). Mean annual temperature is approximately 27°C, while minimum and maximum daily temperatures vary between 22 and 33°C (INMET 2014).

The Badajós Lake landscape is located at the northern margin of the Solimões River, close to the towns of Codajás and Coari, Amazonas State (Figure 1B). This landscape is characterized by two major *ria lakes*, connected to the Solimões mainstream through channels draining an extensive floodplain area. The hydrological regime in this floodplain is influenced by the Solimões River stage, except for relatively high sites that do not flood every year. Data from the Codajás hydrological station at the Solimões River shows water levels rising between December and April, peaking between May and August, receding during September and October and usually reaching the lowest levels during November (Figure 2A).

The lower Purus River landscape includes a protected area of approximately 8,000 km², the Piagaçu-Purus Sustainable Development Reserve (PP-SDR), located approximately 60 km above the confluence of the Purus and Solimões Rivers (Figure 1C). This landscape has originated from the avulsion of the Solimões River channel circa 1,000 years BP (Latrubesse and Franzinelli 2002), and is characterized by a network of channels connecting the numerous lakes to the Purus River. The Lower Purus River hydrological regime measured at the Beruri hydrological station is well correlated with the Negro River regime (Figures 2B and 2C; ANA 2014), with water levels rising between February and May, peaking between June and July, and receding during August and September, reaching the lowest levels between October and November (Figure 2B; ANA 2014).

The Madeira River landscape is located at the southern margin of the Amazonas River, near the towns of Itacoatiara and Autazes, Amazonas state (Figure 1D). This landscape consists mostly of open water bodies, large channels and relatively few lakes. The hydrological regime is correlated with water levels

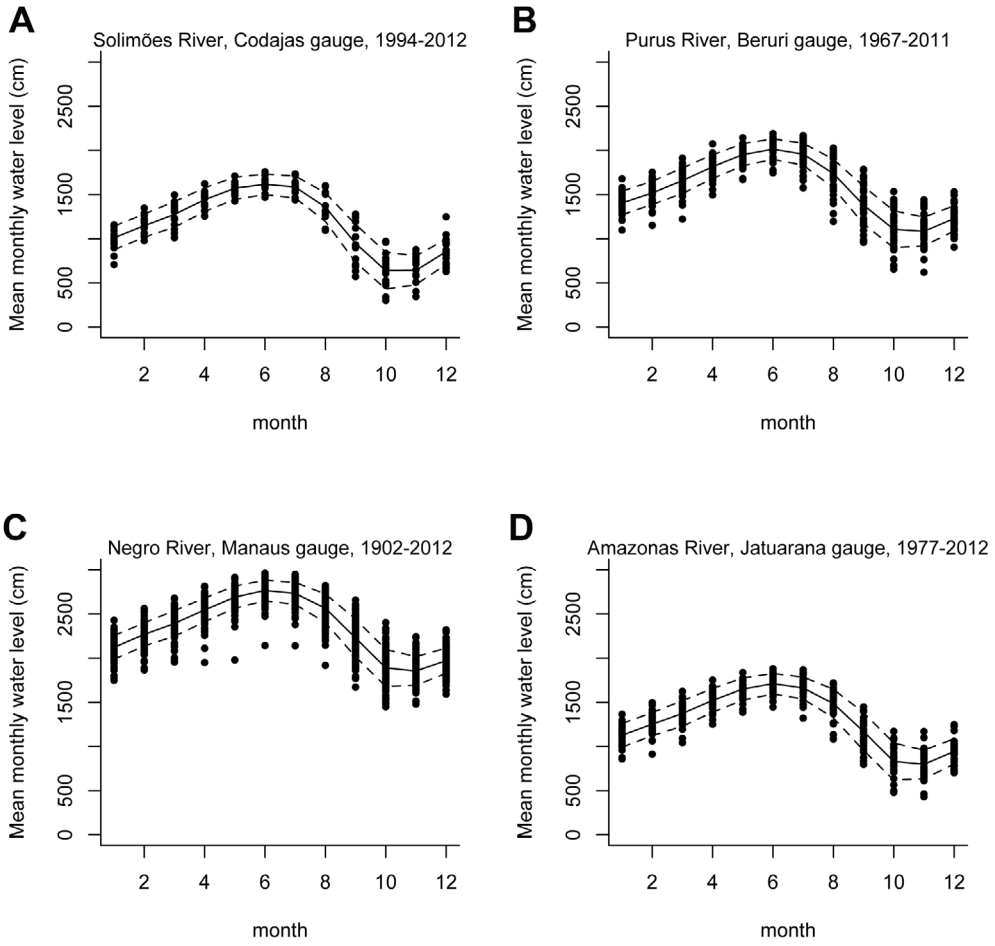

Figure 2. Hydrological regime measured by hydrological stations in the (**A**) Solimões; (**B**) Purus; (**C**) Negro and (**D**) Amazonas rivers, Central Amazon, Brazil. Months were ordered from 1–12 (January to December); black dots show the average river levels for each year; continuous line shows the average trend of the hydrological regime over multiple years and dashed lines show confidence intervals. Source: ANA (2013).

measured at the Jatuarana hydrological station, about 150 km upstream of the Madeira confluence, and is influenced by both the Amazonas and the Madeira River hydrological regimes. Flood amplitudes are close to 10 m between high and low water seasons (Figure 2D), and the timing of the hydrological stages are similar to those measured at Codajás, Beruri and Manaus river hydrological stations.

Data collection

We made all botanical collections in floodplain forests, following two separate methods: opportunistic surveys and traditional forest inventories. The two methods had different collection efforts in each landscape, so we standardized effort in terms of voucher specimens produced (number of exsiccates). The Lower Purus River was the landscape with the highest collection effort (1,123 exsiccates), 1.5 times higher than the Badajós landscape (777 exsiccates), and three times higher than the Madeira landscape (378 exsiccates).

We made opportunistic surveys on various fieldwork expeditions, differing in the number of days and timing of the surveys in each landscape. These surveys were carried out prior to the forest plot inventories establishment to provide a baseline for landscape and species recognition. Given that most species are flowering and fruiting during the high and receding water seasons, we carried out all opportunistic surveys in this period, strictly collecting species with fertile structures for which we had no previous collections. Forest inventories were then made in all three landscapes, comprising 15.8 ha distributed in 43 plots of 150 × 25 m (0.375 ha); 11 plots in the Badajós landscape, 20 plots in the Lower Purus River, and 12 plots in the Madeira landscape (see Figure 1 for plot distribution). We placed plots in different forest patches to account for local vegetation variability and to obtain a comprehensive representation of the flooding gradient among sample plots (for a more detailed description of sampling design see Luize et al. 2015). We recorded the geographical coordinates and flooding status of each collected specimen, and provided this information in their respective voucher labels.

We identified plants to the species level by (1) using field guides (Ribeiro et al. 1999; Wittmann et al. 2010), (2) comparing with vouchers from the INPA (Instituto Nacional de Pesquisas da Amazônia) herbarium and from digital databases of the Missouri Botanical Garden (Tropicos 2014) and New York Botanical Garden (NYBG

2014) and (3) consulting botanists and field technicians from INPA with extensive expertise in Amazon flora identification.

We deposited all voucher species at the INPA or EAFM (Instituto Federal de Educação, Ciência e Tecnologia do Amazonas) herbaria; vouchers from opportunistic surveys with fertile structures were deposited mainly at INPA, while vouchers collected in the inventory plots, most of them without fertile structures, were deposited at the EAFM herbarium. The present checklist follows the APG-III classification. We cross-checked all species names with the Missouri Botanical Garden (Tropicos 2014), New York Botanical Garden (NYBG 2014), and The Plant List (The Plant List 2013) databases, maintaining accepted names and excluding synonyms from the final list.

RESULTS

A total of 2,478 voucher specimens were collected, of which 222 could not be identified at the species level and were excluded from this checklist. The 2,256 voucher specimens identified comprised 19 orders, 57 families, 193 genera and 432 species (Table 1). Families with the largest representation were (percent of voucher specimens identified): Fabaceae (15%); Myrtaceae (10%); Lauraceae (8%); Annonaceae (6%); Sapotaceae (6%); and Chrysobalanaceae (5%), which together represent 86% of all identified voucher specimens. Regarding the number of species in each family, Fabaceae (73 spp.); Myrtaceae (39 spp.); Lauraceae (33 spp.); Sapotaceae (23 spp.); Annonaceae (22 spp.); Moraceae (22 spp.); and Rubiaceae (20 spp.) comprised 53% (232 species) of the 432 species identified.

We found 159, 53 and 31 species occurring exclusively at the Lower Purus, Badájos, and Madeira landscapes, respectively. Lower Purus and Badájos shared 150 species; Lower Purus and Madeira shared 72 species; Badájos and Madeira shared 48 species; and all three landscapes shared only 40 species. In terms of frequency of collection, 33% of the species were collected only once, 17% were collected twice, and 50% were collected three or more times. *Oxandra riedeliana* R.E. Fr. was the species with the largest number of voucher specimens collected (59 vouchers).

DISCUSSION

We have produced a comprehensive checklist of trees occurring in white-water *várzea* floodplain forests of the Central Amazon. This checklist increases our knowledge of flood-tolerant species that can live in these seasonal forests, but we still have large knowledge gaps for tree species occurring in Amazonian forests. As an example, approximately one third of the species collected in our study is likely to be represented by fewer than five voucher specimens deposited in herbarium collections (Hopkins 2007; Feeley 2015). This scarcity of records limits species distribution modeling, which could help understand the present and future distributions of these species according to changes in land use and regional climate. As an example, 33% of the species listed by us have been recorded only once, preventing an analysis of their ecological preferences or geographical distribution. We collected 10 species classified as endemic to white-water floodplain forests, according to the classification by Wittmann et al. (2013).

Despite the increasing availability of worldwide biodiversity data, there are still many regional "data voids" where species and habitats remain poorly represented in herbarium collections (Feeley 2015). Furthermore, most botanical collections lack fertile structure records, making it difficult for specialists to confirm taxonomical identification. During the effort to generate the present checklist we collected the *holotypus* of *Calyptranthes irregularis* Sobral, M.A.D. Souza & B. Luize (Sobral et al. 2015). We also collected a *Glandonia* species with uncertain identification, currently under examination by expert authorities (I. Reis, personal communication). It is therefore fundamental that Amazonian researchers focus on the collection of reproductive voucher specimens, to increase the number of records in reference botanical database and facilitate botanical identification of angiosperms. It is also necessary that herbarium collections send duplicates of deposited voucher specimens to specialists in each genus and family, to guarantee that species identification is accurate and updated.

The two most recent and comprehensive lists of *várzea* tree species for the Amazon were reported by Albernaz et al. (2012), listing 542 taxa (species and morphospecies), and by Wittmann et al. (2013), listing 658 species. The present checklist adds 236 species to these previous lists which have probably been rarely sampled in *várzea* forests elsewhere. In comparison to the list by Albernaz et al. (2012), 101 species are common to both lists, while the present checklist adds 331 species. In regard to the study by Wittmann et al. (2013), 170 species are common to both lists, 488 were present only in Wittmann et al. (2013), and 262 species are added by the present list. These differences are not limitations of the previous studies, given the methodological differences. Wittmann et al. (2013) listed only species that have occurred in at least two distinct floristic inventories performed by at least two distinct authors, thereby excluding less sampled species. Albernaz et al. (2012) sampled especially high várzea forests along the Solimões-Amazonas River during the Pró-Várzea Project.

Methodological differences may also explain why botanical families previously reported by Wittmann et al. (2011), as the most important for *várzea* forests do not match the most represented families in the present

checklist (e.g., Myrtaceae, Lauraceae and Annonaceae). For the present work, we heavily focused our collection effort on taxonomic groups that are highly diversified and relatively hard to recognize and identify during fieldwork (e.g., Fabaceae, Myrtaceae and Sapotaceae). Many of the most representative families in *várzea* forests have species that are easily recognized in the field and/or have few species per genus (e.g., Malvaceae, Euphorbiaceae and Salicaceae). Although we have observed these species during inventories (Luize et al. 2015), we did not make vouchers for many of them, preventing their inclusion in the present work. Even so, our checklist still confirms the occurrence of approximately 236 tree species that have not been reported by the major *várzea* species lists currently available in the literature, suggesting that these species are still poorly sampled. Although the present study only reports voucher species, we recommend that researchers make an effort to regularly collect and georeference the records of all species, including common and easily recognizable species, as these observations are paramount to support species distribution modeling and improve our understanding of the relationship between species occurrence and environmental conditions. Improving our knowledge about the *várzea* flora is the first necessary step to formalize management strategies for the sustainable use of these wetland forests, while preserving the functioning of the Amazonian ecosystem.

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Table 1. Checklist of angiosperms collected by B.G. Luize in *várzea* forests of three floodplain landscapes in the Central Amazon, Brazil. The landscapes were: (B) Badajós Lake; (P) Lower Purus River; and (M) Madeira/Amazonas. Lack of records are denoted as (-). Total refers to the number of voucher specimens deposited. *Species listed by Albernaz et al. (2012) can be found in Supporting Information Appendix S1 (Table S2) of the referred publication; species also found by us are denoted as (1) in the appropriate column. **Species listed by Wittmann et al. (2013) can be found in Appendix 3 of Supplementary material E7723 of the referred publication; species also found by us are denoted as (1) on the appropriate column; (VE) refers to "*Amazonian white-water-floodplain endemics, defined as tree species ecologically restricted to white-water forests and geographically restricted to the Amazon basin. This class excludes all species that had at least one occurrence in non-Amazonian white-water floodplains*" (Wittmann et al. 2013). Family and species are alphabetically ordered for each order.

Order/Family		Species	Landscapes B	P	M	Total	Voucher number INPA-Herbarium	Voucher number EAFM-Herbarium	Albernaz et al. 2012*	Wittmann et al. 2013**
Asterales										
Asteraceae										
	1	*Tessaria integrifolia* Ruiz & Pav.	-	-	1	3		8936		1
Boraginales										
Boraginaceae										
	1	*Cordia lanciloba* Killip	1	1	-	5	231717; 234448	8192; 9540		
	2	*Cordia multispicata* Cham.	-	-	1	6		8918		
	3	*Cordia nodosa* Lam.	-	1	-	1	231726		1	1
	4	*Cordia sellowiana* Cham.	1	-	-	2		9659		

Continued

Table 1. *Continued.*

Order/Family		Species	Landscapes B	P	M	Total	Voucher number INPA-Herbarium	Voucher number EAFM-Herbarium	Albernaz et al. 2012*	Wittmann et al. 2013**
Brassicales										
Capparaceae										
	1	*Crateva benthamii* Eichler	1	1	1	7	231671; 242960	8716; 8912	1	1
Caricaceae										
	1	*Jacaratia spinosa* (Aubl.) A. DC.	1	-	-	2	243030; 243055			
Caryophyllales										
Nyctaginaceae										
	1	*Guapira opposita* (Vell.) Reitz	-	1	-	2	231605			
	2	*Neea floribunda* Poepp. & Endl.	1	1	-	3	231628; 242988			1
	3	*Neea oppositifolia* Ruiz & Pav	1	-	1	20		9028; 9516		1
	4	*Neea spruceana* Heimerl	1	1	1	23		8168; 8963; 9347		1
Polygonaceae										
	1	*Coccoloba densifrons* Mart. *ex* Meisn.	-	1	-	1	240116			1
	2	*Coccoloba mollis* Casar.	-	1	-	1	231629			1
	3	*Coccoloba ovata* Benth.	1	1	-	4		8126; 9710		1
	4	*Coccoloba parimensis* Benth.	1	1	-	4		8689; 9877		
	5	*Symmeria paniculata* Benth.	1	1	-	7	240139	8421	1	1
	6	*Triplaris americana* L.	-	-	1	1		9107		1
	7	*Triplaris pachau* Mart.	-	1	-	3		8242		
	8	*Triplaris surinamensis* Cham.	1	1	1	6	231702	9000; 9430	1	VE
Proteaceae										
	1	*Panopsis sessilifolia* (Rich.) Rich.	-	1	-	1		8618		
Celastrales										
Celastraceae										
	1	*Hippocratea volubilis* L.	-	1	-	1	231578			
	2	*Salacia cordata* (Miers) Mennega	-	1	-	1	231654			
	3	*Salacia elliptica* (Mart. *ex* Schult.) G. Don	-	1	-	1	240142			
	4	*Salacia impressifolia* (Miers) A.C. Sm.	-	1	-	4		8009	1	
	5	*Tontelea fluminensis* (Peyr.) A.C. Sm.	1	-	-	2		9684		
Ericales										
Ebenaceae										
	1	*Diospyros guianensis* (Aubl.) Gürke	-	1	-	1	231678		1	1
	2	*Diospyros poeppigiana* A. DC.	-	1	-	2	234430			1
	3	*Diospyrus bullata* A.C. Sm.	1	1	-	4		8042; 9767		
	4	*Diospyrus carbonaria* Bernoist	-	1	-	2		8644		
	5	*Diospyrus cavalcantei* Sothers	1	1	-	19		8465; 9511		
Lecythidaceae										
	1	*Couroupita subsessilis* Pilg.	-	1	1	3	231724	9035	1	VE
	2	*Eschweilera albiflora* (DC.) Miers	1	1	-	18	231618; 242932	8901; 9316	1	1
	3	*Eschweilera gigantea* (R. Knuth) J.F. Macbr.	-	-	1	21		8915		
	4	*Eschweilera ovalifolia* (DC.) Nied.	1	1	1	11	231709	8476; 8945; 9332		1
	5	*Eschweilera parviflora* (Aubl.) Miers	1	1	-	7		8251; 9561		1
	6	*Eschweilera pedicellata* (Rich.) S.A. Mori	1	1	-	3		8606; 9955		
	7	*Eschweilera wachenheimii* (Benoist) Sandwith	-	1	-	3		8143		
	8	*Gustavia augusta* L.	1	1	1	11	231582	8617; 9140; 9503	1	1
	9	*Gustavia hexapetala* (Aubl.) Sm.	1	1	-	4	242989	8503; 9393	1	1
	10	*Gustavia poeppigiana* O. Berg	1	1	-	11		8154; 9409		
Pentaphylacaceae										
	1	*Ternstroemia dentata* (Aubl.) Sw.	-	1	-	5	231620	8215		
Primulaceae										
	1	*Cybianthus guyanensis* (A. DC.) Miq.	-	1	-	1	231713			
Sapotaceae										
	1	*Chrysophyllum argenteum* Jacq.	-	1	-	1	240109		1	1
	2	*Chrysophyllum cainito* L.	-	1	-	1	231732			
	3	*Chrysophyllum sparsiflorum* Klotzsch *ex* Miq.	1	1	-	2	231585; 243000			
	4	*Ecclinusa guianensis* Eyma	-	1	1	2		8654		
	5	*Manilkara inundata* (Ducke) Ducke	1	1	-	6	234432	8041; 9380		

Continued

Table 1. *Continued.*

Order/Family		Species	Landscapes B	P	M	Total	Voucher number INPA-Herbarium	Voucher number EAFM-Herbarium	Albernaz et al. 2012*	Wittmann et al. 2013**
	6	*Micropholis egensis* (A. DC.) Pierre	1	1	1	17	231738; 243054	8239; 9716; 9943	1	1
	7	*Micropholis splendens* Gilly *ex* Aubrév.	1	1	-	15		8033		
	8	*Pouteria ambelaniifolia* (Sandwith) T.D. Penn.	-	1	-	3		8752		
	9	*Pouteria anomala* (Pires) T.D. Penn.	-	1	-	1		8077	1	
	10	*Pouteria bilocularis* (H.J.P. Winkl.) Baehni	-	-	1	2		9085		
	11	*Pouteria cuspidata* (A. DC.) Baehni	1	1	-	7		8096; 9335	1	1
	12	*Pouteria elegans* (A. DC.) Baehni	1	1	1	36	231667; 243023	8065; 9371		1
	13	*Pouteria filipes* Eyma	1	1	-	5		8026; 9387		
	14	*Pouteria fimbriata* Baehni	1	-	-	1		9377		
	15	*Pouteria glomerata* (Miq.) Radkl.	-	1	-	2	231750	8145	1	1
	16	*Pouteria hispida* Eyma	-	1	-	1		8489		
	17	*Pouteria macrophylla* (Lam.) Eyma	1	1	-	7		9702; 8454		1
	18	*Pouteria minima* T.D. Penn.	-	1	-	3		8018		
	19	*Pouteria pallens* T.D. Penn.	-	1	1	3		9100		
	20	*Pouteria reticulata* (Engl.) Eyma	-	1	-	3		8032		1
	21	*Pouteria stipulifera* T.D. Penn.	1	1	-	16		8005; 9353		
	22	*Pradosia decipiens* Ducke	-	1	-	1		8148		
	23	*Sarcaulus brasiliensis* (A. DC.) Eyma	-	1	-	4	234441			1
Fabales										
Fabaceae										
	1	*Abarema longipedunculata* (H.S. Irwin) Barneby & J.W. Grimes	1	1	1	10	231663	8269; 9084		
	2	*Acacia loretensis* J.F. Macbr.	-	-	1	1		9135		
	3	*Acacia riparia* Kunth	-	1	-	1	231599			
	4	*Acosmium nitens* (Vogel) Yakovlev	1	1	-	4	231637	8663	1	1
	5	*Albizia subdimidiata* (Splitg.) Barneby & J.W. Grimes	-	1	-	2	231737			1
	6	*Alexa grandiflora* Ducke	-	1	1	4		8252; 9092		
	7	*Andira unifoliolata* Ducke	1	1	-	4		8458		
	8	*Batesia floribunda* Spruce *ex* Benth.	1	1	1	20		8114; 8959; 9071; 9273		
	9	*Campsiandra comosa* Benth.	1	1	1	5	231625; 243038			1
	10	*Campsiandra laurifolia* Benth.	1	1	-	4		8254		1
	11	*Cassia leiandra* Benth.	1	1	-	2	231565; 243036		1	VE
	12	*Cassia spruceana* Benth.	1	1	1	31		8012; 8188; 9020		
	13	*Chamaecrista negrensis* (H.S. Irwin) H.S. Irwin & Barneby	1	-	-	4		9620		
	14	*Clitoria amazonum* Mart. *ex* Benth.	-	1	-	4	231598	8720		VE
	15	*Crudia amazonica* Spruce *ex* Benth.	-	1	-	1	231596		1	1
	16	*Crudia glaberrima* (Steud.) J.F. Macbr.	-	1	-	1	231655			
	17	*Cynometra bauhiniifolia* Benth.	1	1	-	8	242961	8209	1	1
	18	*Dalbergia multiflora* B. Heyne & Wall.	-	1	-	2		8146	1	
	19	*Derris denudata* (Benth.) Ducke	1	1	1	17		8175		
	20	*Dialium guianense* (Aubl.) Sandwith	1	-	-	1		9360	1	1
	21	*Dioclea huberi* Ducke	1	-	-	1	243009			
	22	*Erythrina fusca* Lour.	-	-	1	3		9015; 9260		
	23	*Hydrochorea corymbosa* (Rich.) Barneby & J.W. Grimes	1	1	1	15	231647	8561; 8933; 9146	1	1
	24	*Inga capitata* Desv.	1	1	-	2	243002	8174		1
	25	*Inga cayennensis* Sagot *ex* Benth.	1	1	1	17		8375	1	
	26	*Inga cinnamomea* Spruce *ex* Benth.	-	1	-	1	231617			1
	27	*Inga gracilifolia* Ducke	-	-	1	2		9307	1	1
	28	*Inga grandiflora* Ducke	1	1	-	11	242971	8784	1	
	29	*Inga laurina* (Sw.) Willd.	-	1	-	1		8754	1	
	30	*Inga longiflora* Spruce *ex* Benth.	-	-	1	1		8974	1	1
	31	*Inga macrophylla* Humb. & Bonpl. *ex* Willd.	-	1	-	2		8522		
	32	*Inga marginata* Willd.	-	1	-	1		8878	1	1
	33	*Inga melinonis* Sagot	-	1	-	1		8788		1
	34	*Inga paraensis* Ducke	-	1	-	1		8070	1	
	35	*Inga pezizifera* Benth.	1	1	-	2		8471; 9639		
	36	*Inga rhynchocalyx* Sandwith	1	1	-	2		8076		
	37	*Inga rubiginosa* (Rich.) DC.	1	1	-	8		8545		1

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Table 1. *Continued.*

Order/Family		Species	Landscapes B	P	M	Total	Voucher number INPA-Herbarium	Voucher number EAFM-Herbarium	Albernaz et al. 2012*	Wittmann et al. 2013**
	38	*Inga sertulifera* DC.	-	1	-	1	231579			
	39	*Inga splendens* Willd.	-	1	-	2		8815		1
	40	*Inga suberosa* T.D. Penn.	-	1	-	1		8100		
	41	*Inga thibaudiana* DC.	1	1	-	6		8804		1
	42	*Inga umbellifera* (Vahl) Steud.	1	1	1	6		9105		
	43	*Inga umbratica* Poepp. & Endl.	-	1	1	8		9106	1	
	44	*Inga velutina* Willd.	-	1	-	1	231604			1
	45	*Inga vera subsp. eriocarpa* (Benth.) J. León	1	-	-	1	242998			
	46	*Lecointea amazonica* Ducke	1	1	-	3		8060	1	1
	47	*Machaerium aristulatum* (Spruce *ex* Benth.) Ducke	1	-	-	1	242983			
	48	*Machaerium leiophyllum* (DC.) Benth.	1	-	-	1	243039			
	49	*Macrolobium acaciifolium* (Benth.) Benth.	1	1	1	6	231688	9022; 9116	1	1
	50	*Macrolobium bifolium* (Aubl.) Pers.	1	1	-	3		8806	1	1
	51	*Ormosia macrocalyx* Ducke	1	1	-	9	231566	8196	1	1
	52	*Paramachaerium ormosioides* (Ducke) Ducke	-	1	-	1	231690		1	1
	53	*Platymiscium ulei* Harms	-	-	1	2		8957	1	VE
	54	*Pterocarpus amazonicus* Huber	1	-	-	1	242944	8093	1	
	55	*Pterocarpus amazonum* (Mart. *ex* Benth.) Amshoff	1	1	1	27	231571; 243007			1
	56	*Senegalia loretensis* (J.F. Macbr.) Seigler & Ebinger	1	-	-	1	243004			
	57	*Stryphnodendron guianense* (Aubl.) Benth.	-	1	1	3		8770; 9208	1	
	58	*Swartzia acuminata* Willd. *ex* Vogel	1	-	-	1	243037			1
	59	*Swartzia auriculata* Poepp.	-	1	-	2	231581			
	60	*Swartzia cuspidata* Spruce *ex* Benth.	1	-	-	1	242992			
	61	*Swartzia ingifolia* Ducke	1	-	1	8		8940; 9099	1	
	62	*Swartzia oblanceolata* Sandwith	-	-	1	1		9313		
	63	*Swartzia tomentifera* (Ducke) Ducke	-	-	1	1		9149		
	64	*Tachigali physophora* (Huber) Zarucchi & Herend.	1	1	-	7	240112			
	65	*Tachigali venusta* Dwyer	1	-	-	1		9322		1
	66	*Vatairea guianensis* Aubl.	1	1	1	6		8374; 9006	1	1
	67	*Vouacapoua pallidior* Ducke	-	1	-	3		8446		
	68	*Zygia cataractae* (Kunth) L. Rico	-	1	-	1		8348		1
	69	*Zygia cauliflora* (Willd.) Killip	-	1	1	12		8201; 9240	1	1
	70	*Zygia inaequalis* (Humb. & Bonpl. *ex* Willd.) Pittier	1	1	-	13	243052	8177		1
	71	*Zygia juruana* (Harms) L. Rico	1	1	1	18		8008; 9197		1
	72	*Zygia latifolia* (L.) Fawc. & Rendle	1	-	-	1		9788		1
	73	*Zygia ramiflora* (F. Muell.) Kosterm.	-	-	1	1		8989		
Gentianales										
Apocynaceae										
	1	*Himatanthus sucuuba* (Spruce *ex* Müll. Arg.) Woodson	1	-	-	1	243014			1
	2	*Malouetia tamaquarina* var. *lancifolia* Müll. Arg.	-	1	-	2	231577			1
	3	*Rhabdadenia macrostoma* (Benth.) Müll. Arg.	1	-	-	1	243012			
	4	*Tabernaemontana markgrafiana* J.F. Macbr.	1	1	1	13		8062; 9372; 9403		
Rubiaceae										
	1	*Amaioua guianensis* Aubl.	1	1	-	3		8318; 9513	1	
	2	*Borojoa claviflora* (K. Schum.) Cuatrec.	-	-	1	1		8965		
	3	*Bothriospora corymbosa* (Benth.) Hook. f.	-	1	1	5		8323		1
	4	*Calycophyllum spruceanum* (Benth.) Hook. f. *ex* K. Schum.	-	-	1	1		8952	1	1
	5	*Chomelia malaneoides* Müll. Arg.	-	-	1	1		9216		
	6	*Chomelia tenuiflora* Benth.	-	1	-	3	234434	8181		
	7	*Coussarea ampla* Müll. Arg.	-	1	-	1		8791		
	8	*Coussarea hirticalyx* Standl.	-	1	-	2	231601			
	9	*Coussarea revoluta* Steyerm.	-	1	-	1		8684		
	10	*Duroia genipoides* Hook. f. *ex* K. Schum.	1	1	-	3	231570; 243053			
	11	*Duroia gransabanensis* Steyerm.	1	1	1	10		8080; 9213; 9655		
	12	*Faramea sessiliflora* Aubl.	-	1	-	1	240125			
	13	*Ferdinandusa goudotiana* K. Schum.	-	1	-	2		8190		
	14	*Ferdinandusa speciosa* (Pohl) Pohl	-	1	-	2		8585		
	15	*Genipa spruceana* Steyerm.	-	1	-	1	240145			

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Table 1. *Continued.*

Order/Family		Species	Landscapes B	P	M	Total	Voucher number INPA-Herbarium	Voucher number EAFM-Herbarium	Albernaz et al. 2012*	Wittmann et al. 2013**
	16	*Kutchubaea sericantha* Standl.	-	-	1	1		9042		
	17	*Psychotria hoffmannseggiana* (Willd. *ex* Schult.) Müll.Arg.	-	1	-	1	240110			
	18	*Psychotria capillacea* (Müll. Arg.) Standl.	1	-	-	1	243035			
	19	*Rudgea lanceifolia* Salisb.	1	1	-	2	231627	9449		
	20	*Sickingia tinctoria* (Kunth) K. Schum.	1	1	1	10		8010; 9211; 9359	1	1
Lamiales										
Bignoniaceae										
	1	*Crescentia amazonica* Ducke	-	-	1	2		9262	1	1
	2	*Tabebuia ochracea* (Cham.) St	-	1	-	1		8513		
Verbenaceae										
	1	*Vitex cymosa* Bertero *ex* Spreng.	1	-	-	1	242957		1	1
Laurales										
Lauraceae										
	1	*Aniba burchelli* Koesterm.	-	-	1	2		9231		
	2	*Aniba ferrea* Kubitzki	-	1	-	1		8820		
	3	*Aniba guianensis* Aubl.	-	1	-	1	231630		1	1
	4	*Aniba jenmanii* Mez	-	1	-	1		8305		
	5	*Aniba riparia* (Nees) Mez	-	1	1	18		8748; 8924		
	6	*Aniba santalodora* Ducke	-	1	1	3		8210; 9207		
	7	*Aniba terminalis* Ducke	1	1	-	8		8257		
	8	*Dicypellium manausense* W.A. Rodrigues	1	1	-	6		8296		
	9	*Endlicheria anomala* (Nees) Mez	1	1	-	24	231624; 243010	8363	1	
	10	*Endlicheria punctulata* (Mez) C.K. Allen	-	-	1	1		9267		
	11	*Licaria cannella* (Meisn.) Kosterm.	-	1	-	3		8214	1	
	12	*Licaria martiniana* (Mez) Kosterm.	1	1	1	10		8390; 9057; 9507		
	13	*Licaria rodriguesii* H.W. Kurz	-	1	-	5		8108		
	14	*Nectandra amazonum* Nees	1	1	-	5	234429; 242987		1	1
	15	*Nectandra cuspidata* Nees & Mart.	-	-	1	3		8931		
	16	*Nectandra hihua* (Ruiz & Pav.) Rohwer	-	-	1	5		9268		1
	17	*Ocotea aciphylla* (Nees & Mart.) Mez	-	1	-	1		8575		1
	18	*Ocotea amazonica* (Meisn.) Mez	1	-	-	4		9367		
	19	*Ocotea cernua* (Nees) Mez	1	1	-	9	231632; 243022	8068; 9342		1
	20	*Ocotea cinerea* van der Werff	1	1	-	35		8006; 9421		
	21	*Ocotea cujumary* Mart.	1	1	-	2		8696; 9450	1	
	22	*Ocotea cymbarum* Kunth	-	1	-	3		8004	1	1
	23	*Ocotea floribunda* (Sw.) Mez	-	1	-	5		8085		
	24	*Ocotea leucoxylon* (Sw.) Laness.	-	1	-	2		8538		
	25	*Ocotea longifolia* Kunth	-	1	-	7		8086		
	26	*Ocotea marginata* (Nees) Palacky	-	1	-	1		8075		
	27	*Ocotea neblinae* C.K. Allen	1	1	-	4		8637; 9568		1
	28	*Ocotea nigrescens* Vicent.	1	-	-	1		9839		
	29	*Ocotea olivacea* A. C. Sm.	1	-	-	1		9817		
	30	*Ocotea percurrens* Vicent.	1	-	-	1		9664		
	31	*Ocotea puberula* (Rich.) Nees	-	1	1	10		8029; 8983		
	32	*Ocotea scabrella* van der Werff	-	1	1	2		8669; 9265		
	33	*Paraia bracteata* Rohwer, H.G. Richt. & van der Werff	1	1	-	2		8552; 9785		
Magnoliales										
Annonaceae										
	1	*Annona hypoglauca* Mart.	1	1	-	7	231756	8275; 9869	1	1
	2	*Diclinanona calycina* (Diels) R.E. Fr.	1	1	-	6		8123; 9992		
	3	*Duguetia chrysea* Mass	-	1	-	2	231722			
	4	*Duguetia riparia* Huber	-	1	-	1		8020		
	5	*Duguetia spixiana* Mart.	-	1	-	2	231665			1
	6	*Duguetia stelechantha* (Diels) R.E. Fr.	-	1	-	1		8180		
	7	*Duguetia ulei* (Diels) R.E. Fr.	-	1	-	1		8457		
	8	*Fusaea longifolia* (Aubl.) Saff.	-	1	-	5		8685	1	
	9	*Guatteria decurrens* R. E. Fr.	-	-	1	1		9082		

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Table 1. *Continued.*

Order/Family		Species	Landscapes B	P	M	Total	Voucher number INPA-Herbarium	Voucher number EAFM-Herbarium	Albernaz et al. 2012*	Wittmann et al. 2013**
	10	*Guatteria foliosa* Benth.	-	1	1	8	240108	8059; 9200		
	11	*Guatteria inundata* Mart.	-	1	-	4	231697			1
	12	*Guatteria olivacea* R.E.Fr.	-	1	-	11	234458	8027	1	
	13	*Guatteria procera* R.E.Fr.	-	1	-	6		8069		
	14	*Guatteria scytophylla* Diels	1	1	-	3		8067		
	15	*Oxandra espintana* (Spruce *ex* Benth.) Baill.	-	1	-	1	231707			
	16	*Oxandra riedeliana* R.E. Fr.	1	1	1	59	234451	8412; 9281; 9453		1
	17	*Pseudoxandra lucida* R.E. Fr.	-	1	-	1	234478			
	18	*Tetrameranthus duckei* R.E. Fr.	1	-	-	1		10006		
	19	*Unonopsis guatterioides* (A. DC.) R.E. Fr.	1	1	-	5	231694; 242995			1
	20	*Unonopsis williamsii* R.E. Fr.	1	1	-	13		8023		
	21	*Xylopia calophylla* R.E. Fr.	-	1	1	6		8030; 9002	1	1
	22	*Xylopia spruceana* Benth. *ex* Spruce	-	1	-	1		8889		1
Myristicaceae										
	1	*Iryanthera juruensis* Warb.	1	1	-	16	231656	9771		1
	2	*Iryanthera laevis* Markgr.	1	-	-	2		9425		
	3	*Virola calophylla* (Spruce) Warb.	1	1	1	10	234464	8053; 8994; 9567	1	
	4	*Virola elongata* (Benth.) Warb.	-	1	-	4	231639		1	1
	5	*Virola pavonis* (A. DC.) A.C. Sm.	1	-	-	1		9385		1
	6	*Virola surinamensis* (Rol. *ex* Rottb.) Warb.	-	1	-	3		8138	1	1
Malpighiales										
Calophyllaceae										
	1	*Calophyllum brasiliense* Cambess.	-	1	1	5		8800; 9019	1	1
	2	*Caraipa grandifolia* Mart.	1	1	-	9	231666	9337		1
	3	*Caraipa heterocarpa* Ducke	-	1	-	3		8300		
	4	*Haploclathra paniculata* (Mart.) Benth.	1	-	-	2		9967		
Caryocaraceae										
	1	*Caryocar edule* Casar.	-	1	1	4		8554; 8978		
	2	*Caryocar microcarpum* Ducke	-	1	-	1	234474			1
Chrysobalanaceae										
	1	*Couepia guianensis* Aubl.	1	1	-	3		8016; 9903		
	2	*Couepia paraensis* (Mart. & Zucc.) Benth. *ex* Hook. f.	1	1	-	19	231619; 243042	8222		
	3	*Hirtella hispidula* Miq.	1	1	-	6		8449; 9465		
	4	*Licania caudata* Prance	1	-	-	1		9723		
	5	*Licania coriacea* Benth.	-	1	-	1		8366		
	6	*Licania heteromorpha* Benth.	1	1	-	26	231661; 243032			1
	7	*Licania hypoleuca* Benth.	1	1	-	13		8248; 9649		
	8	*Licania lata* J.F. Macbr	1	1	-	17		8258; 9650		
	9	*Licania laxiflora* Fritsch	-	1	-	3		8495		
	10	*Licania longistyla* (Hook. f.) Fritsch	-	1	-	1		8309	1	1
	11	*Licania macrophylla* Benth.	-	1	-	2		8007	1	1
	12	*Licania micrantha* Miq.	-	1	-	1	231616			
	13	*Licania niloi* Prance	1	-	-	2		9957		
	14	*Licania pallida* Spruce *ex* Sagot	1	1	-	8	231586; 242935			
	15	*Licania sprucei* (Hook. f.) Fritsch	1	1	-	5		8706; 9924		
	16	*Licania unguiculata* Prance	-	1	-	1		8894		
	17	*Parinari excelsa* Sabine	1	1	-	3	234444; 243047		1	1
	18	*Parinari montana* Aubl.	1	-	-	2		9433		
	19	*Parinari parvifolia* Sandwith	1	1	-	3		8751; 10000		
Clusiaceae										
	1	*Garcinia acuminata* Planch. & Triana	1	1	1	8		8055; 9080; 9384		
	2	*Garcinia gardneriana* (Planch. & Triana) Zappi	1	1	-	4	243028	8090		
	3	*Garcinia madruno* (Kunth) Hammel	-	1	-	1	234469			1
	4	*Rheedia floribunda* (Miq.) Planch. & Triana	-	1	-	3	231653			
	5	*Tovomita acutiflora* M. S. Barros & G. Mariz	1	1	-	4	231589; 242982			
	6	*Tovomita choisyana* Planch. & Triana	1	1	-	7	231651; 242994	9330		
	7	*Tovomita grata* Sandwith	1	-	-	1		9705		

Continued

Table 1. *Continued.*

Order/Family		Species	Landscapes B	P	M	Total	Voucher number INPA-Herbarium	Voucher number EAFM-Herbarium	Albernaz et al. 2012*	Wittmann et al. 2013**
	8	*Tovomita humilis* Ducke	-	1	-	2	231747			
	9	*Tovomita umbellata* Benth.	1	-	-	1		9950		1
Dichapetalaceae										
	1	*Tapura juruana* (Ule) Rizzini	-	1	-	15	234433	8487		1
Erythroxylaceae										
	1	*Erythroxylum kapplerianum* Peyr.	1	1	-	6	240137; 242942	8829		1
Euphorbiaceae										
	1	*Alchornea discolor* Poepp.	1	1	-	5		8672; 9514		1
	2	*Conceveiba guianensis* Aubl.	1	-	1	2	243017			
	3	*Croton lanjouwiansis* Jabl.	-	1	-	3		8624		
	4	*Glycydendron amazonicum* Ducke	-	1	-	3		8127	1	1
	5	*Hevea spruceana* (Benth.) Müll. Arg.	1	1	1	6	231594; 242956	9104; 9641	1	1
	6	*Hura crepitans* L.	1	1	-	2		8139; 9358	1	1
	7	*Mabea nitida* Spruce *ex* Benth.	-	1	1	3	231753	9214		1
	8	*Mabea occidentalis* Benth.	-	1	-	1	231613			
	9	*Mabea paniculata* Spruce *ex* Benth.	1	1	-	2	240131			
	10	*Mabea speciosa* Müll. Arg.	1	-	1	4		9418		
	11	*Mabea subsessilis* Pax & K. Hoffm.	-	1	-	4		8715	1	
	12	*Mabea taquari* Aubl.	-	1	-	2	231635			
	13	*Pera glabrata* (Schott) Poepp. *ex* Baill.	-	1	1	9		8467; 9229		
	14	*Sapium glandulosum* (L.) Morong	1	1	1	7		8039; 9234; 9820	1	1
	15	*Sapium marmieri* Huber	-	1	-	2		8046	1	1
	16	*Sapium obovatum* Klotzsch *ex* Müll. Arg.	-	1	-	1	234445			
Humiriaceae										
	1	*Sacoglottis ceratocarpa* Ducke	-	1	-	6		8904		
	2	*Sacoglottis guianensis* Benth.	-	1	-	2	240129			1
Hypericaceae										
	1	*Vismia gracilis* Hieron.	1	1	-	4		8808; 9762		
	2	*Vismia japurensis* Reichardt	-	1	-	1	240141			
	3	*Vismia macrophylla* Kunth	1	1	1	5		8137; 9014; 9761		1
Ixonanthaceae										
	1	*Cyrillopsis paraensis* Kuhlm.	-	1	-	1		8796		
Lacistemataceae										
	1	*Lacistema aggregatum* (P.J. Bergius) Rusby	-	1	-	5	231731	8183		1
	2	*Lacistema grandifolium* Schnizl.	1	-	-	9		9376		
Malpighiaceae										
	1	*Byrsonima densa* (Poir.) DC.	-	1	-	1	231563			
	2	*Byrsonima japurensis* A. Juss.	1	1	-	14	231708; 242962		1	
	3	*Glandonia macrocarpa* Griseb.	1	1	1	8	240114	8948; 9612		
	4	*Heteropterys orinocensis* (Kunth) A. Juss.	1	-	-	3	242966			
Ochnaceae										
	1	*Ouratea castaneifolia* (DC.) Engl.	-	1	-	1		8144		
	2	*Ouratea cearensis* (Tiegh.) Sastre	1	1	-	5	231562; 242970			
	3	*Ouratea discophora* Ducke	-	1	-	1	231574			
	4	*Ouratea odora* Poepp. *ex* Engl.	-	1	-	2		8667		
	5	*Quiina rhytidopus* Tul.	1	1	-	10		8620; 9644	1	1
Picrodendraceae										
	1	*Piranhea trifoliata* Baill.	1	1	-	5	231677; 243048		1	1
Phyllantaceae										
	1	*Amanoa oblongifolia* Müll. Arg.	-	1	-	2	234457		1	1
	1	*Discocarpus brasiliensis* Klotzsch	1	1	-	57	234449	9530		VE
Putranjivaceae										
	1	*Drypetes amazonica* Steyerm.	-	1	-	1	231710		1	1
	2	*Drypetes variabilis* Uittien	1	1	1	34		8200; 9095; 9666		1
Salicaceae										
	1	*Banara arguta* Briq.	-	1	-	2	231745		1	
	2	*Banara guianensis* Aubl.	1	1	1	6		8563; 9254; 9628		1

Continued

Table 1. *Continued.*

Order/Family		Species	Landscapes B	P	M	Total	Voucher number INPA-Herbarium	Voucher number EAFM-Herbarium	Albernaz et al. 2012*	Wittmann et al. 2013**
	3	*Banara nitida* Spruce *ex* Benth.	-	1	-	2	234453			1
	4	*Casearia aculeata* Jacq.	-	1	-	2	231597		1	1
	5	*Homalium guianense* (Aubl.) Oken	1	1	-	7		8447; 9629		1
	6	*Homalium racemosum* Jacq.	1	1	-	14	231557; 242950	8344		
	7	*Laetia corymbulosa* Spruce *ex* Benth.	1	1	1	23	231657; 243051		1	VE
	8	*Laetia cupulata* Spruce *ex* Benth.	-	1	1	8		8646; 9114		
	9	*Salix martiana* Leyb.	-	-	1	1		9293		VE
	10	*Xylosma benthamii* (Tul.) Triana & Planch.	1	-	1	3		9138; 9676		1
Violaceae										
	1	*Amphirrhox surinamensis* Eichler	-	1	-	4		8608	1	
	2	*Leonia crassa* L.B. Sm. & A. Fernández	-	1	-	1	231686			1
	3	*Leonia glycycarpa* Ruiz & Pav.	1	1	1	11	231584	9192; 9388		1
	4	*Rinorea macrocarpa* L.B. Sm. & A. Fernández	-	1	-	1	231712			
Malvales										
Malvaceae										
	1	*Guazuma ulmifolia* Lam.	-	-	1	8		8955	1	1
	2	*Luehea cymulosa* Spruce *ex* Benth.	1	1	1	10	231560; 243026		1	1
	3	*Pachira insignis* (Sw.) Sw. *ex* Savigny	-	-	1	3		8990		1
	4	*Pseudobombax munguba* (Mart.) Dugand	-	1	1	2		9063		1
	5	*Quararibea ochrocalyx* (K. Schum.) Vischer	-	1	-	2		8104	1	1
	6	*Sterculia apetala* (Jacq.) H. Karst.	-	1	-	1		8142		1
Thymelaeaceae										
	1	*Schoenobiblus daphnoides* Mart.	-	1	-	1		8826		
Myrtales										
Combretaceae										
	1	*Buchenavia grandis* Ducke	1	1	-	5		8671; 9604		
	2	*Buchenavia guianensis* (Aubl.) Alwan & Stace	1	-	-	2		9722		
	3	*Buchenavia oxycarpa* (Mart.) Eichler	-	1	-	2	231762		1	
	4	*Buchenavia tetraphylla* (Aubl.) R.A. Howard	1	1	-	2		8734		
	5	*Terminalia amazonia* (J.F. Gmel.) Exell	1	1	-	3		8151; 9317		1
Melastomataceae										
	1	*Miconia spichigeri* Wurdack	-	1	-	1		8849		
	2	*Mouriri acutiflora* Naudim	1	-	-	1		9778	1	1
	3	*Mouriri collocarpa* Ducke	1	-	-	1		9674		
	4	*Mouriri duckeana* Morley	1	1	-	2		8582; 9851		
	5	*Mouriri ficoides* Morley	1	1	-	7		8355; 9334		
	6	*Mouriri grandiflora* DC.	-	1	-	5		8112		1
	7	*Mouriri guianensis* Aubl.	1	1	-	2	234479; 243050			1
	8	*Mouriri nigra* (DC.) Morley	-	1	-	4		8266		1
	9	*Mouriri trunciflora* Ducke	1	1	-	10		8171; 9416		
Myrtaceae										
	1	*Calyptranthes bipennis* O. Berg	1	-	-	1	242939			
	2	*Calyptranthes crebra* McVaugh	1	1	-	4	231564; 242964			1
	3	*Calyptranthes cuspidata* DC.	-	1	-	1		8652		
	4	*Calyptranthes forsteri* O.Berg	1	-	-	1		9818		1
	5	*Calyptranthes irregularis* Sobral, M.A.D. Souza & B. Luize	1	1	-	3	231676; 242940; 243025			
	6	*Calyptranthes macrophylla* O. Berg	-	1	-	3	234446			
	7	*Calyptranthes paniculata* Ruiz & Pav.	-	1	-	1	231729			
	8	*Calyptranthes polyantha* O. Berg	1	1	-	6	231631; 242963			
	9	*Calyptranthes spruceana* O.Berg	1	1	-	2	231607			
	10	*Eugenia agathopoda* Diels	-	1	-	1		8792		
	11	*Eugenia biflora* (L.) DC.	1	1	-	47		8740; 9345		
	12	*Eugenia citrifolia* Poir.	1	1	-	5		8019		
	13	*Eugenia cupulata* Amshoff	-	1	-	1		8802		
	14	*Eugenia cuspidifolia* DC.	-	1	1	11		8389; 9206		
	15	*Eugenia diplocampta* Diels	-	1	-	5		8649		
	16	*Eugenia ferreiraeana* O. Berg	-	1	-	6		8588		

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Order/Family		Species	Landscapes B	P	M	Total	Voucher number INPA-Herbarium	Voucher number EAFM-Herbarium	Albernaz et al. 2012*	Wittmann et al. 2013**
	17	*Eugenia florida* DC.	1	1	1	14		9346		1
	18	*Eugenia illepida* McVaugh	-	1	-	2		8907		
	19	*Eugenia inundata* DC.	-	1	-	1	234483			
	20	*Eugenia longiracemosa* Kiaersk.	-	1	-	1		8362		
	21	*Eugenia marowynensis* Miq.	-	1	-	1	234459			1
	22	*Eugenia omissa* Mc Vaugh	-	1	-	2		8727		
	23	*Eugenia pseudopsidium* Jacq.	1	1	-	29		8186; 9375		
	24	*Eugenia punicifolia* (Kunth) DC.	-	1	-	2		8707		
	25	*Eugenia stylaris* McVaugh	-	1	-	4		8529		
	26	*Eugenia tapacumensis* O. Berg	1	1	1	7		8217; 9204; 9707		
	27	*Myrcia aliena* McVaugh	1	-	-	1		9390		
	28	*Myrcia amazonica* DC.	-	1	-	2		8660		
	29	*Myrcia citrifolia* (Aubl.) Urb.	1	-	-	1		9913		
	30	*Myrcia floribunda* Miq.	-	1	-	1		8597		
	31	*Myrcia gigas* McVaugh	-	-	1	1		9162		
	32	*Myrcia paivae* O. Berg	-	1	1	5		8022; 9191		
	33	*Myrcia rufipila* McVaugh	1	1	-	10		8178; 9475		
	34	*Myrcia servata* McVaugh	1	-	-	2		9373; 9872; 9442		
	35	*Myrcia splendens* (Sw.) DC.	1	1	-	12		8071		
	36	*Myrcia subsericea* A. Gray	-	-	1	1		9067		
	37	*Plinia involucrata* (O. Berg) McVaugh	-	1	-	1	240127			
	38	*Psidium acutangulum* DC.	1	1	-	17	240144		1	1
	39	*Syzygium cumini* (L.) Skeels	1	-	-	3		10048		
Oxalidales										
Connaraceae										
	1	*Rourea amazonica* (Baker) Radlk.	1	1	-	13	231569; 242959	8326		
Elaeocarpaceae										
	1	*Sloanea fendleriana* Benth.	1	-	-	1	243019			
	2	*Sloanea floribunda* Spruce *ex* Benth.	-	1	-	2	231736			1
	3	*Sloanea garckeana* K. Schum.	-	1	-	1	234484		1	
	4	*Sloanea guianensis* (Aubl.) Benth.	-	1	-	7	231719			1
	5	*Sloanea latifolia* (Rich.) K. Schum.	1	1	1	15		8220; 9190; 10026		
	6	*Sloanea pubescens* Benth.	-	1	1	7		8860; 8946		
	7	*Sloanea rufa* Planch. *ex* Benth.	-	1	-	2		8453		
	8	*Sloanea schomburgkii* Spruce *ex* Benth.	1	1	-	10		8263; 10019		
Picramniales										
Picramniaceae										
	1	*Picramnia latifolia* Tul.	-	1	-	1	231727			
Rosales										
Moraceae										
	1	*Brosimum guianense* (Aubl.) Huber	-	1	-	3	231767		1	1
	2	*Brosimum lactescens* (S. Moore) C.C. Berg	1	1	-	19	231767			1
	3	*Ficus catappifolia* Kunth & Bouché	1	-	-	1	231649			
	4	*Ficus insipida* Willd.	-	-	1	5		8972		
	5	*Ficus maxima* Mill.	-	1	1	3		8769; 9075		1
	6	*Ficus obtusifolia* Kunth	1	-	-	1		9981		
	7	*Ficus pakkensis* Standl.	-	1	1	2		8427; 9227		
	8	*Ficus popenoei* Standl.	1	-	-	1		9392		
	9	*Ficus subapiculata* (Miq.) Miq	1	1	1	3		8900; 9964		
	10	*Ficus trigona* L.f.	1	1	-	4		8343; 9965	1	1
	11	*Ficus trigonata* L.	-	1	-	1	231716			
	12	*Helicostylis scabra* (J.F. Macbr.) C.C. Berg	1	1	-	6		8634; 9844		1
	13	*Helicostylis tomentosa* (Poepp. & Endl.) Rusby	1	-	-	1		9427		
	14	*Maclura tinctoria* (L.) D. Don *ex* Steud.	-	1	1	4		9126	1	1
	15	*Maquira coriacea* (H. Karst.) C.C. Berg	1	1	-	11		8850; 9389	1	1
	16	*Naucleopsis ternstroemiiflora* (Mildbr.) C.C. Berg	-	1	1	7		8015; 9027		1
	17	*Pseudolmedia laevigata* Trécul	1	1	-	4		8044; 10022		1
	18	*Sorocea duckei* W.C. Burger	1	-	1	2	242931		1	VE
	19	*Sorocea guilleminiana* Gaudich.	1	1	-	8		8549; 10034	1	

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Table 1. *Continued.*

Order/Family		Species	Landscapes B	P	M	Total	Voucher number INPA-Herbarium	Voucher number EAFM-Herbarium	Albernaz et al. 2012*	Wittmann et al. 2013**
	20	*Sorocea muriculata* Miq.	-	-	1	1		9074		1
	21	*Sorocea pubivena* Hemsl.	1	-	1	4		9305		
	22	*Trymatococcus amazonicus* Poepp. & Endl.	-	1	1	3		8387		1
Rhamnaceae										
	1	*Colubrina glandulosa* Perkins	1	1	-	8		8182; 9490		
Urticaceae										
	1	*Cecropia latiloba* Miq.	-	-	1	1		9013	1	1
Santalales										
Olacaceae										
	1	*Aptandra tubicina* (Poepp.) Benth. *ex* Miers	-	1	-	2		8084		1
	2	*Chaunochiton kappleri* (Sagot *ex* Engl.) Ducke	-	1	-	1		8496		
	3	*Heisteria acuminata* (Bonpl.) Engl.	1	1	-	8	231623; 242943		1	1
	4	*Minquartia guianensis* Aubl.	-	1	-	1		8161	1	1
Sapindales										
Anacardiaceae										
	1	*Spondias mombin* L.	-	1	1	5	231728		1	1
	2	*Tapirira guianensis* Aubl.	-	1	-	1		8797		1
	3	*Tapirira retusa* Ducke	-	1	-	1		8811		
Burseraceae										
	1	*Protium strumosum* D.C. Daly	1	-	-	2		9975		
Meliaceae										
	1	*Guarea guidonia* (L.) Sleumer	-	1	1	9		8092; 9251	1	1
	2	*Guarea pubescens* (Rich.) A. Juss.	1	-	-	1	243003			
	3	*Trichilia cipo* (A. Juss.) C. DC.	1	-	1	2		9243	1	1
	4	*Trichilia guianensis* Klotzsch *ex* C. DC.	-	1	-	2	234439			
	5	*Trichilia martiana* C. DC.	-	1	-	2	234436			
	6	*Trichilia pleeana* (A. Juss.) C. DC.	-	1	1	5		8054; 9096		1
	7	*Trichilia poeppigii* C. DC.	-	1	-	1	234438			
	8	*Trichilia rubra* C. DC.	1	1	-	4		8028; 9926		1
Rutaceae										
	1	*Zanthoxylum compactum* (Huber *ex* Albuq.) P.G. Waterman	-	1	-	5	231608	8701	1	1
Sapindaceae										
	1	*Allophylus amazonicus* (Mart.) Radlk.	1	1	-	5	231572		1	1
	2	*Cupania scrobiculata* Rich.	-	1	1	19	231593			
	3	*Matayba macrostylis* Radlk.	1	1	-	5	231698; 243046		1	
	4	*Matayba purgans* (Poepp.) Radlk.	1	1	1	30		8233; 9032; 9731		
	5	*Paullinia alata* G. Don	1	-	-	1	243024			
	6	*Talisia firma* Radlk.	-	1	-	1		8763		
Simaroubaceae										
	1	*Simaba guianensis* Aubl.	1	1	-	4		8674; 9443		1