

Arboreal Eudicotyledons, Universidade Federal Rural do Rio de Janeiro Botanical Garden, state of Rio de Janeiro, Brazil

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ABSTRACT: The Universidade Federal Rural do Rio de Janeiro (Federal Rural University of Rio de Janeiro) Botanical Garden (JB/UFRRJ) has a green area occupied mostly by sparsely planted arboreal species, in addition to a small area of regenerating forest and plantations. In consideration of the Brazilian federal rules for botanical gardens, the collection of the Arboretum was studied systematically: collection of complete samples, herborization and identification of the species by accepted botanical methods. The occurrence of native species from different Brazilian phytogeographic domains and common names were verified. A total of 125 species of arboreal Eudicotyledons, belonging to 30 families were registered, of which Fabaceae, Bignoniaceae, Malvaceae, Myrtaceae and Anacardiaceae were the richest ones. Species in danger of extinction and others with biological, ecological or economic value are represented, demonstrating the importance of the area to flora conservation.

INTRODUCTION

Botanical collections, living or preserved, are essential to our knowledge of biodiversity (Barbosa and Peixoto 2003) as those found in botanical gardens, which maintain registered collections of living plants used in scientific research, conservation, exhibition and education (Wyse-Jackson 1999). Because of their access to a great number of professionals in training, botanical gardens associated with universities have a fundamental function in the education and training of students, especially in the areas of floristic knowledge and conservation (Peixoto 1991).

The Universidade Federal Rural do Rio de Janeiro Botanical Garden (JB/UFRRJ) was created three decades ago especially to provide education and research opportunities (Guimarães 1982). Today, its expanded mission includes environmental education, extension activities to diffuse scientific understanding to the local community and leisure (Miranda and Colombini 2009). Student training in different activities including plant collection, cultivation or other kinds of floristic knowledge has been fundamental to their formation and is one of the priority actions.

In the JB/UFRRJ native tree species, especially of the Atlantic Rain Forest, and other rare, ornamental or biologically important species are represented (Peixoto 1991). Past unpublished studies have catalogued about 546 arboreal specimens, belonging to 32 families, of which Fabaceae (Leguminosae) was the richest in species number.

Brazilian botanical gardens are regulated by specific federal legislation that obligates them to maintain a local live plant collection that has been scientifically identified,

organized and registered. The purpose of this work was to update the identification of the arboreal eudicotyledonous trees represented in the Botanical Garden, their occurrence in Brazilian phytogeographic domains and their common names.

MATERIALS AND METHODS

The UFRRJ Botanical Garden is located on the university campus, in the municipality district of Seropédica, in the West Zone of Rio de Janeiro state. Its area comprises 16.5 ha, at the coordinates 22°55'41" S and 42°58'54" W (Miranda and Colombini 2009), at a mean elevation 27 m. Most of its grounds is occupied by sparsely planted arboreal species, but additionally, there is a small forest fragment undergoing natural regeneration, areas of different plant cultures, greenhouses, administration facilities and a lake.

The fieldwork was done monthly during the period of August 2006 to September 2008, when arboreal specimens with a "CAP" (CBH, circumference at breast high) equal or greater than 15 cm were sampled and properly preserved with the usual herborization techniques and included in the Botanical Garden Herbaria (RBE), with duplicates in the Botanical Department (RBR), both from this university. The preparation of taxonomic identification material, the observation of species phenology and the elaboration of a data bank are other activities in development and that are also important to establish a possible conservation collection, as recommended to Botanic Gardens (CONAMA, 2000).

Taxonomic classification follows APG (2003) and species identification was done by reference to the specialized bibliography, comparison with material of

the RBE and RBR Herbaria and, eventually, consultation by specialists. Species were recognized in a wide sense, without subspecies or varieties, with the names and authors verified by electronic consultation with the Missouri Botanical Garden (2010) and The International Plant Name Index (2010) data banks. Common names are those used locally.

The distribution of the species in Brazilian phytogeographic domains (Amazon Forest, “Caatinga”, “Cerrado” or Atlantic Rain Forest) follows Oliveira-Filho and Scolforo (2008); for the species not included in this reference, Carvalho (2003; 2006), Oliveira-Filho (2006) and Lorenzi (1999; 2002; 2009) were consulted in that order. Other relevant references about the species were also listed.

RESULTS AND DISCUSSION

The UFRRJ’s Botanical Garden eudicotyledonous trees are listed by family in Table 1, including their common names, RBE Herbarium register number, their occurrence in Brazilian phytogeographic domains, or their indication as exotic, and other relevant references for the species.

In the local arboretum, 125 species, belonging to 105 genera and 30 botanical families are represented. The richest families are Fabaceae (Leguminosae), with *ca.* 35 % of the total species (43), followed by Bignoniaceae (12), Malvaceae (10), Myrtaceae (8) and Anacardiaceae (7) (Figure 1). In regard to the Fabaceae, species like “pau-brasil” (*Caesalpinia echinata*), “sibipiruna” (*Caesalpinia pluvirosa*), “copaiba” (*Copaifera langsdorffii*), “guapuruvu” (*Schizolobium parahyba*), “cássia-rosa” (*Cassia grandis*) and “jatobá” (*Hymenaea courbaril*), among others, are notable for their economic or biological significance.

Among all the species, 94 (*ca.* 75 %) are native to Brazil. Most of them have wide distribution, occurring

in more than one Brazilian phytogeographic domain and 14 (*ca.* 11 %) occur in the four major ones (Amazon Forest, “Caatinga”, “Cerrado” and Atlantic Rain Forest), like “ipê-roxo” (*Handroanthus impetiginosus*), “pitangueira” (*Eugenia uniflora*) and “pau-d’alho” (*Gallesia integrifolia*). Regarding native species, 79 (*ca.* 85 %) occur in the Atlantic Rain Forest and 17 (*ca.* 14 %) are limited to this phytogeographic domain, like “pau-ferro” (*Caesalpinia ferrea*), “chichá” (*Sterculia chicha*), “araçá” (*Psidium cattleianum*) and “oiti” (*Licania tomentosa*).

Exotic species are represented especially by economically or ornamentally important ones, like “flamboyant” (*Delonix regia*), “cinamomo” (*Melia azedarach*), “mogno-africano” (*Khaya grandifoliola*), “amoreira” (*Morus alba*) and others.

“Pau-brasil”, the national tree of Brazil, called “ibirapitanga” (red wood) by the native people (Ormindo 2008), is in danger of extinction in its natural habitat (MMA 2008). This species is locally represented by many individuals in different phases of development. The “jacarandá” or “jacarandá-caviúna” (*Dalbergia nigra*), is another species of the Atlantic Rain Forest in danger of extinction (MMA 2008) and is also represented. Other notable species are those with rare occurrence, like “maçaranduba” (*Manilkara subsericea*) (Oliveira-Filho and Scolforo 2008) and “oiticica” (*Licania rigida*) (Lorenzi 2009), species with restricted distribution, like “pau-rei” (*Pterygota brasiliensis*) (Ormindo 2008) and “peroba” (*Aspidosperma parvifolium*) (Oliveira-Filho and Scolforo 2008), or climax species like “jequitibá-branco” (*Cariniana estrellensis*), “jeniparana” (*Gustavia augusta*) and “mogno” (*Swietenia macrophylla*) (Oliveira-Filho and Scolforo 2008), among others with ecological importance. These data demonstrate that the UFRRJ Botanical Garden has an important function in the conservation of native species, especially from the Atlantic Rain Forest.

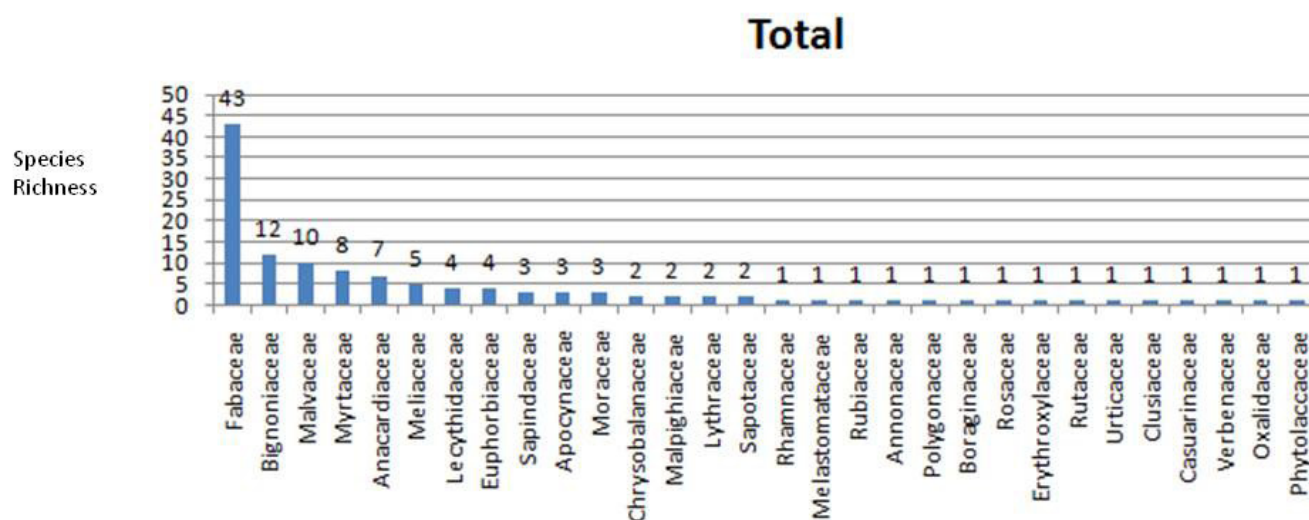


FIGURE 1. Species-rich families of Eudicotyledonous trees in the “Universidade Federal Rural do Rio de Janeiro” Botanical Garden, Seropédica, RJ, Brazil.

TABLE 1. Eudicotyledonous trees of the Universidade Federal Rural do Rio de Janeiro Botanical Garden, Seropédica, RJ, Brazil. (AM= Amazon Forest; CA= "Caatinga"; CE= "Cerrado"; MA= Atlantic Rain Forest; EX= exotic species. Additional references: 1= Carvalho 2003; 2006; 2008; 2= Carvalho 2007; 3= Guimarães et al. 1993; 4= IBGE 2002; 5= Koch and Kinoshita 2005; 6= Lorenzi 1999; 2002; 2009; 7= Lorenzi et al. 2003; 8= Louppe 2008; 9= Mansano and Lima 2007; 10= Marchiori 1997; 11= Neves and Carauta 2004; 12= Oliveira-Filho 2006; 13= Oliveira-Filho and Scolforo 2008; 14= Ormino 2008; 15= Prance 1972; 16= Rossi 1994; 17= Siqueira 1992.

FAMILY AND SPECIES	COMMON NAME	Nº RBE	PHYTOGEOGRAPHIC DOMAIN	REFERENCES
Anacardiaceae				
<i>Anacardium occidentale</i> L.	cajeueiro	2605	CE	4,6,13
<i>Astronium graveolens</i> Jacq.	gonçalo-alves	2249	AM,CE,MA	6,12,13
<i>Mangifera indica</i> L.	mangueira	59	EX	7,14
<i>Myracrodruon urundeuva</i> Allemao	aroeira-do-sertão	2248	CA,CE,MA	4,6,12,13
<i>Schinopsis brasiliensis</i> Engl.	braúna-parda	2251	AM,CA,CE,MA	6,13
<i>Schinus terebinthifolius</i> Raddi	aroeira	2599	CE,MA	6,12,13,16
<i>Spondias venulosa</i> Mart. ex Engl.	cajá-grande	2247	CE,MA	6,13
Annonaceae				
<i>Annona montana</i> Macfad.	araticum-açu	2252	AM,CA,CE,MA	4,12,13
Apocynaceae				
<i>Aspidosperma parvifolium</i> A.DC.	peroba	85	CE,MA	6,13
<i>Tabernaemontana hystrix</i> (Steud.) A.DC.	leiteira	2254	CE,MA	5,12,13
<i>Thevetia peruviana</i> (Pers.) K.Schum.	chapéu-de-napoleão	2253	EX	17
Bignoniaceae				
<i>Cybistax antisyphilitica</i> (Mart.) Mart.	ipê-verde	2256	AM,CA,CE,MA	6,12,13
<i>Kigelia pinnata</i> (Jacq.) DC.	boca-de-sapo	2257	EX	7
<i>Jacaranda brasiliana</i> (Lam.) Pers.	árvore-talismã	2255	AM,CA,CE,MA	6,13
<i>Sparattosperma leucanthum</i> (Vell.) K. Schum.	cinco-chagas	353	AM,CE,MA	6,13
<i>Spathodea nilotica</i> Seem	espatódea	2261	EX	7
<i>Handroanthus chrysotrichus</i> (Mart. ex DC.) Mattos	ipê-amarelo	2259	CE,MA	6,12,13,14
<i>Handroanthus heptaphyllus</i> (Mart.) Mattos	ipê-rosa	2260	CE,MA	6,13,14
<i>Handroanthus impetiginosus</i> (Mart. ex DC.) Mattos	ipê-roxo	358	AM,CA,CE,MA	6,12,13
<i>Handroanthus ochraceus</i> (Cham.) Mattos	ipê	2617	AM,CA,CE,MA	6,13
<i>Tabebuia avellenadae</i> Lorentz ex Griseb.	ipê-roxo	2607	CE,MA	6
<i>Tabebuia roseo-alba</i> (Ridl.) Sandwith	ipê-branco	2258	AM,CA,CE,MA	6,12,13
<i>Tecoma stans</i> (L.) Juss. ex Kunth.	ipê-de-jardim	2608	EX	7
Boraginaceae				
<i>Cordia superba</i> Cham.	babosa-branca	2262	CA,CE,MA	6,13,14
Casuarinaceae				
<i>Casuarina equisetifolia</i> J.R. & G.Forst.	casuarina	973	EX	7
Chrysobalanaceae				
<i>Licania rigida</i> Benth	oiticica	2263	CA,MA	6,15
<i>Licania tomentosa</i> (Benth.) Fritsch	oiti	2264	MA	6,12,13,14
Clusiaceae				
<i>Calophyllum inophyllum</i> L.	tamanu	2270	EX	7
Erythroxylaceae				
<i>Erythroxylum pulchrum</i> A.St.-Hil.	arco-de-pipa	2269	CA,CE,MA	12,13
Euphorbiaceae				
<i>Aleurites moluccana</i> (L.) Willd.	nogueira-do-iguapi	2267	EX	7
<i>Hevea brasiliensis</i> (Willd. ex A. Juss.) Mull. Arg.	seringueira	2268	AM	6,14
<i>Hura crepitans</i> L.	açacu	2265	AM	3,6,14
<i>Joannesia princeps</i> Vell.	boleira	2266	CE,MA	6,12,13
Lecythidaceae				
<i>Cariniana estrellensis</i> (Raddi) Kuntze	jequitibá-branco	2272	CA,CE,MA	6,12,13,14
<i>Couroupita guianensis</i> Aubl.	abricó-de-macaco	2274	AM	6,14
<i>Gustavia augusta</i> L.	jeniparana	2271	AM,MA	6,13,14
<i>Lecythis pisonis</i> Cambess.	sapucaia	2273	AM,CE,MA	6,12,13,14
Fabaceae				
<i>Acacia auriculiformis</i> A. Cunn. ex Benth.	acácia-australiana	1349	EX	7
<i>Acacia mangium</i> Willd.	acácia-australiana	1351	EX	7
<i>Albizia lebbek</i> (L.) Benth.	coração-de-negro	1342	EX	7,1

TABLE 1. CONTINUED.

FAMILY AND SPECIES	COMMON NAME	Nº RBE	PHYTOGEOGRAPHIC	REFERENCES
			DOMAIN	
<i>Amburana cearensis</i> (Allemão) A.C. Sm.	cerejeira	2609	CA,CE,MA	6,13
<i>Anadenanthera colubrina</i> (Vell.) Brenan	angico-branco	1347	AM,CA,CE,MA	6,12,13
<i>Anadenanthera macrocarpa</i> (Benth.) Brenan	angico-vermelho	1350	CA,MA	1,6
<i>Bauhinia variegata</i> L.	pata-de-vaca	1358	EX	7
<i>Caesalpinia echinata</i> Lam.	pau-brasil	1361	MA	1,6,13,14
<i>Caesalpinia ferrea</i> Mart. ex Tul.	pau-ferro	1533	MA	6,12,14
<i>Caesalpinia pluviosa</i> D.C.	sibipiruna	1534	MA	6,12
<i>Cassia fistula</i> L.	canafistula	1363	EX	7,1
<i>Cassia grandis</i> L. f.	cassia-rosa	1362	AM,CA,MA	1,6
<i>Cassia leptophylla</i> Vog.	canafistula	1535	MA	6,1
<i>Cassia renigera</i> Wall. ex Benth	cassia-rosa	1084	EX	7
<i>Centrolobium tomentosum</i> Guillemin ex Benth.	araribá-rosa	1385	AM,CA,CE,MA	6,12,13,14,16
<i>Clitoria fairchildiana</i> R.A. Howard	sombreiro	1392	AM	6,10,14
<i>Choroleucom tortum</i> (Mart.) Pittier	tataré	2611	MA	6
<i>Copaifera langsdorffii</i> Desf.	copaíba	1364	CE,MA	6,12,13,16
<i>Dalbergia nigra</i> (Vell.) Allemão ex Benth	jacarandá-caviúna	1453	CE,MA	6,12,13,14
<i>Delonix regia</i> (Bojer ex Hook.) Raf	flamboyant	1365	EX	7
<i>Enterolobium contortisiliquum</i> (Vell.) Morong	orelha-de-negro	1346	CA,CE,MA	6,12,13
<i>Erythrina speciosa</i> Andrews	mulungu	1455	MA	6,12,13,14
<i>Gliricidia sepium</i> (Jacq.) Steud.	gliricidia	2582	EX	7
<i>Hymenaea courbaril</i> L.	jatobá	1366	CA,CE,MA	1,6,12,13,14
<i>Inga cylindrica</i> (Vell.) Mart.	ingá-feijão	1352	AM,CE,MA	6,12,13
<i>Inga laurina</i> (Sw.) Willd.	ingá	1353	CE,MA	6,12,13
<i>Inga sessilis</i> (Vell.) Mart.	Ingá-macaco	1343	CE,MA	6,12,13,16
<i>Leucaena leucocephala</i> (Lam.) R. de Wit	leucena	1354	EX	7
<i>Machaerium hirtum</i> (Vell.) Stellfeld	jacarandá-bico-de-pato	1476	CE,MA	6,12,13
<i>Machaerium paraguariense</i> Hassl.		2610	CA,CE	6,12,13
<i>Mimosa caesalpiniiifolia</i> Benth.	sabiá	1348	AM,CE	6,13
<i>Peltophorum dubium</i> (Spreng.) Taub.	ciafistula	2592	CA,CE,MA	1,6,12,13,14
<i>Piptadenia paniculata</i> Benth.	marmeleiro	1355	CE,MA	1,12,13
<i>Pithecellobium dulce</i> (Roxb.) Benth.	ingá-doce	1344	EX	7
<i>Platypodium elegans</i> Vogel	jacarandá-branco	1496	AM,CA,CE,MA	6,12
<i>Pterocarpus violaceus</i> Vogel.	aldrago	1697	MA	6,12
<i>Pterogyne nitens</i> Tul.	amendoim-bravo	1356	CA,CE,MA	6,12,13
<i>Samanea tubulosa</i> (Benth.) Barneby & J.W. Grimes	sete-cascas	1345	AM,CA,MA	2,6
<i>Schizolobium parahyba</i> (Vell.) S.F.Blake	guapuruvu	1369	AM,MA	1,6,12,13,14
<i>Senna siamea</i> (Lam.) H.S. Irwin & R.C. Barneby	cássia-siâmica	1367	EX	7
<i>Senna spectabilis</i> (W. Schrad.) H.S. Irwin & Barneby	são-joão	1357	AM,CE,MA	6,12,13
<i>Swartzia langsdorffii</i> Raddi.	pacová-de-macaco	1536	MA	6,14
<i>Swartzia oblata</i> Cowan	sangue-de-burro	1538	CE,MA	6,9,12,13,16
Lythraceae				
<i>Lafoensia glyptocarpa</i> Koehne	mirindiba-rosa	2276	MA	6,12,13
<i>Lagerstroemia speciosa</i> Pers.	resedá	2275	EX	7
Malpighiaceae				
<i>Byrsonima sericea</i> DC.	murici	2337	AM,CE,MA	6,12,13
<i>Malpighia glabra</i> L.	acerola	2338	EX	7
Malvaceae				
<i>Bombacopsis glabra</i> (Pasq.) A. Robyns	castanha-do-maranhão	2326	MA	6,12
<i>Ceiba speciosa</i> (A. St.-Hil.) Ravenna	paineira	2328	CA,CE,MA	6,12,13,16
<i>Guazuma ulmifolia</i> Lam.	mutamba	2329	CA,CE,MA	6,12,13
<i>Hibiscus tiliaceus</i> L.	algodão-da-praia	2330	EX	7
<i>Luehea divaricata</i> Mart.	açoita-cavalo	2331	AM,CA,CE,MA	6,12,13
<i>Pachira aquatica</i> Aubl.	monguba	2332	AM	6,12,14
<i>Pseudobombax grandiflorum</i> (Cav.) A. Robyns	embiruçu	2333	CA,CE,MA	6,12,13,16
<i>Pterygota brasiliensis</i> Allemão	pau-rei	2334	MA	6,12,13

TABLE 1. CONTINUED.

FAMILY AND SPECIES	COMMON NAME	Nº RBE	PHYTOGEOGRAPHIC	REFERENCES
			DOMAIN	
<i>Sterculia chicha</i> A. St.-Hil. ex Turpin	chichá	2335	MA	6,12,13,14
<i>Theobroma cacao</i> L.	cacau	2336	AM	6
Melastomataceae				
<i>Tibouchina granulosa</i> (Desr.) Cogn.	quaresmeira	2603	MA	6,12
Meliaceae				
<i>Cedrela odorata</i> L.	cedro	2369	CA,CE,MA	6,12,13,14
<i>Guarea guidonia</i> (L.) Sleumer	carrapeta	2370	CE,MA	4,6,12,13
<i>Khaya grandifoliola</i> C.DC.	mogno-africano	2612	EX	8
<i>Melia azedarach</i> L.	cinamomo	2371	EX	7
<i>Swietenia macrophylla</i> R.A.King	mogno	2613	AM	6,17
Moraceae				
<i>Artocarpus heterophyllus</i> Lam.	jaca-manteiga	2368	EX	7,14
<i>Ficus benjamina</i> L.	figus-benjamina	2614	EX	7
<i>Morus alba</i> L.	amoreira	1903	EX	7
Myrtaceae				
<i>Callistemon viminalis</i> (Sol. ex Gaertn) G. Don ex.Loud	rabo-de-cotia	2362	EX	7
<i>Campomanesia xanthocarpa</i> O. Berg	gabirola	1905	CA,CE,MA	6,13
<i>Eugenia brasiliensis</i> Lam.	grumixama	2366	CA,MA	6,12,13
<i>Eugenia uniflora</i> L.	pitanga	2364	AM,CA,CE,MA	6,12,13,16
<i>Psidium guajava</i> L.	goiabeira	2365	CA,CE,MA	6,12,13
<i>Psidium cattleianum</i> Sabine.	araçá	2361	MA	6,13
<i>Syzygium cumini</i> (L.) Skeels	jamelão	2367	EX	7
<i>Syzygium malaccense</i> (L.) Merr. & L. M. Perry	jambo	2363	EX	7,14
Oxalidaceae				
<i>Averrhoa carambola</i> L.	carambola	2360	EX	7
Phytolaccaceae				
<i>Galesia integrifolia</i> (Spreng.) Harms.	pau-d'alho	2356	AM,CA,CE,MA	3,4,6,13
Polygonaceae				
<i>Triplaris americana</i> L.	pau-formiga	2027	CA,CE,MA	6,13
Rhamnaceae				
<i>Colubrina glandulosa</i> Perkins	sobrasil	2602	AM,CE,MA	6,12,13,16
Rosaceae				
<i>Eriobotrya japonica</i> (Thunb.) Lindl.	nêspera	2354	EX	7
Rubiaceae				
<i>Genipa americana</i> L.	jenipapo	2352	AM,CA,CE,MA	6,12,13,14
Rutaceae				
<i>Metrodorea nigra</i> A.St.- Hil.		2615	CE,MA	6,13
Sapindaceae				
<i>Cupania oblongifolia</i> Mart.	camboatã	2349	CE,MA	6,12,13,16
<i>Sapindus saponaria</i> L.	saboneteiro	2350	CE	4,6,13
<i>Talisia esculenta</i> Radlk.	pitombeira	2351	CE,MA	4,6,13
Sapotaceae				
<i>Manilkara subsericea</i> (Mart.) Dubard	maçaranduba	2616	MA	6,13,14
<i>Syderoxylum obtusifolium</i> (Roem. & Schult.) T.D.Penn	quixaba	2618	AM,CE	6,12,13
Urticaceae				
<i>Cecropia lyratiloba</i> Miq.	embaúba	2358	MA	11
Verbenaceae				
<i>Gmelina arborea</i> Roxb. ex Sm.	guimelina	2359	EX	7

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