

Floristic diversity of the Cagarras Islands Natural Monument, Rio de Janeiro, Brazil

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ABSTRACT: The vascular flora was inventoried of the Cagarras Islands Natural Monument (CINM) located offshore of Rio de Janeiro, Brazil, and a total of 171 species were encountered. The families with the greatest richnesses were: Asteraceae (12 spp.), Myrtaceae (12), Fabaceae (11), Bromeliaceae (7), Cactaceae (6), Euphorbiaceae (6), and Poaceae (6). The regional vegetation was similar to restinga, although high concentrations of guano from nesting marine birds affected diversity on two islands. The threatened species *Gymnanthes nervosa* Müll. Arg. was recorded from the municipality of Rio de Janeiro for the first time since the 1940s.

INTRODUCTION

Islands have an enormous importance in terms of global biodiversity conservation, as approximately one quarter (~70,000) of all known plant species are endemic to islands. Species richness is principally determined by an island's size, its degree of geographical isolation, and present climatic conditions (Kreft *et al.* 2008). Unfortunately, island biotas are now seriously threatened by habitat losses and climate change, and are particularly sensitive to biological invasions (Serafini *et al.* 2010).

Research projects focusing on island vegetations have been relatively rare in Brazil, whether coastal (e.g., Barros *et al.* 1991; Menezes-Silva 1998; Oliveira 2002; Kemenes 2003; Bovini *et al.* 2013) or oceanic (e.g., Batistella 1996; Alves 1998, 2006; Gasparini 2004) – in spite of the fact that the identification and description of island plant communities are of fundamental importance to evaluations of their conservation statuses. The low resilience (and consequent fragility) of these environments demands special consideration and specific management policies to guarantee their conservation.

Rocky islands along the coast of Rio de Janeiro State are important landscape elements that contribute to both marine and terrestrial diversity (e.g., Bastos and Callado 2009; Moraes *et al.* 2013). These islands were linked to the mainland during the last glacial period (Wisconsin), whose maximum occurred approximately 17,000 years ago, when the sea level was approximately 110 m lower than today (Tessler and Goya 2005), which allowed greater migratory flux.

The Cagarras Archipelago is an important ecological refuge situated just off the coast from Rio de Janeiro, but its fauna and flora have been little studied until quite recently (Moraes *et al.* 2013). The islands (and surrounding marine areas) have important roles in regional tourism and receive many visitors during the summer months (Aguiar *et al.* 2013), as well as fishermen throughout the year (Moraes *et al.* 2013a). The first studies of the local flora

were undertaken by R. Oliveira in 1980 and A.S. Rodrigues in 2000, with sporadic collecting on the archipelago islands (see Rodrigues *et al.* 2007).

The present study presents a species list of the terrestrial flora of the islands of the recently created Cagarras Islands Natural Monument, to increase our knowledge of the vegetation growing there and provide subsidies for regional conservation planning.

MATERIALS AND METHODS

Study site

The Cagarras Islands National Monument (CINM) was created by Federal Law 12,229 on April 13, 2010, and is administered by the Instituto Chico Mendes de Conservação da Biodiversidade – ICMBio. The reserve is located in the municipality of Rio de Janeiro, RJ, Brazil, and comprises four large islands (Palmas, Comprida, Cagarra, and Redonda) and two smaller ones (Filhote da Redonda and Filhote da Cagarra) (Figures 1 and 2) as well as marine areas extending outward for 10 m from them, with a total area of approximately 90 ha. The islands are located between 3.8 and 8.6 km from Arpoador Point (the closest mainland area). The highest point of the CINM is located on Redonda Island (240 m above sea level) and the lowest site on Comprida Island (approximately 30 m a.s.l.).

The soils on the islands are basically residuals, but those on Cagarra and Redonda islands have high levels of phosphorus due to the huge deposits of guano left by *Fregata magnificens* (Magnificent Frigatebirds) and *Sula leucogaster* (Brown Booby). Phosphorus concentrations can reach toxic levels and limit the numbers of plant species that can prosper there (Rodrigues *et al.* 2007). According to Cunha *et al.* (2013), the CINM is the second largest roosting area of marine birds along the Brazilian coast.

Data collection

Botanical material was collected during monthly

expeditions to the four main and two smaller islands between July 2011 and February 2013, using the “walking” survey method (Filgueiras et al. 1994). Fertile plant material was dried using traditional botanical methods and incorporated into the herbarium at the Instituto de Pesquisas Jardim Botânico do Rio de Janeiro (RB). The plants were identified using the literature, as well as by comparisons with illustrations in the specialized literature and with collections deposited in the RB, R (National Museum), and GUA (INEA, Instituto Estadual do Ambiente) herbaria and, when necessary, by consulting specialists. The APG III (2009) classification system was followed.

RESULTS AND DISCUSSION

A total of 169 species belonging to 60 families were encountered in the CINM (Table 1). The most species rich families were: Asteraceae (12 species), Myrtaceae (12), Fabaceae (11), Euphorbiaceae (6), Cactaceae (6), Bromeliaceae (6), and Poaceae (6).

The vegetation of the CINM demonstrated variable physiognomies on different islands, with plant heights and densities being related to factors such as landscape declivity, substrate type, and exposition – with vegetation formations varying from herbaceous to low forests. In many areas the vegetation was typical of “restinga”

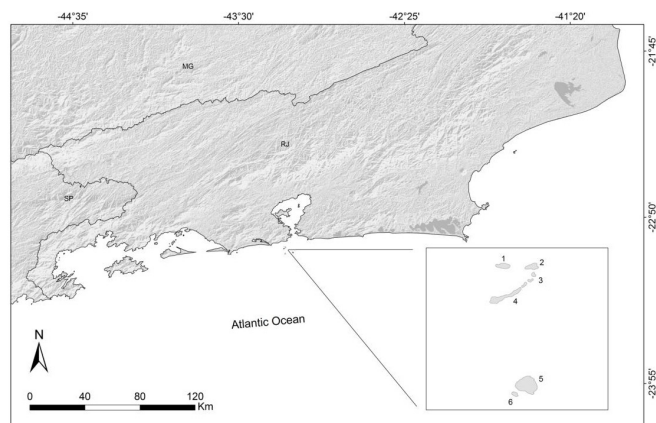


FIGURE 1. Map of study area. Detail of the CINM, RJ, Brazil; 1) Palmas Island; 2) Cagarra Island; 3) Filhote da Cagarra Island; 4) Comprida Island; 5) Redonda Island; 6) Filhote da Redonda Island.



FIGURE 2. CINM, RJ, Brazil; A) Cagarra Island; B) Palmas Island; C) Comprida Island; D) Redonda Island; E) Filhote da Redonda Island; F) Filhote da Cagarra Island (Photographs: M.G.Bovini).

(sandy, open, nearshore vegetation), showing the clumped associations typical of this environment, and abundant species such as *Abutilon esculentum* A.St.-Hil., *Clusia fluminensis* Planch. & Triana, *Hylocereus setaceus* (Salm-Dyck) R.Bauer, and *Neoregelia cruenta* (R.Graham) L.B.Sm. One of the most prominent species in island forests was *Syagrus romanzoffiana* (Cham.) Glassman (common name “jerivá”). This palm tree was widely distributed in southeastern and southern Brazil (Lorenzi et al. 2004) and in the coastal mountains of Rio de Janeiro State, and is common on the higher areas of the Palmas and Redonda islands (Figure 3).

The island vegetation grows under environmental conditions distinct from those found on the continent, as the archipelago is relatively distant from propagule sources and is not influenced by the orographic rains occurring along the mainland coast.

The numbers of species on each island was very variable (Table 1) and did not appear to be directly dependent on the sizes of the islands or on the heterogeneity of available habitats. According to Bovini et al. (2013), the presence of nesting frigatebirds and brown boobies and the consequent excesses of phosphorus in the island soils contribute to strong reductions in the floristic diversity on Cagarra and Redonda islands. As such, Comprida Island had the largest number of species (98) (Table 1), which is probably related to its relatively large size and complete absence of nesting marine birds; the second most species rich island (Palmas) likewise had no nesting birds. Cagarra Island, which has with the highest concentrations of nesting sites in the CINM, had the lowest floristic richness (23 species).

Fifteen of the species encountered were classified as being threatened with extinction to some degree according to the MMA list (2008, Annex I and II); the municipality of Rio de Janeiro (Di Maio and Silva 2000); and the site of the Centro Nacional de Conservação da Flora (CNCFlora 2013): *Allagoptera arenaria* (Gomes) Kuntze (Figure 4a), *Begonia hirtella* Link, *Alcantarea glaziouana* (Leme) J.R.Grant (Figure 4b), *Neoregelia cruenta* (R.Graham) L.B.Sm. (Figure 4c), *Tillandsia araujei* Mez, *Coleocephalocereus fluminensis* (Miq.) Backeb, *Clusia fluminensis* Planch. & Triana, *Gymnanthes nervosa* Müll. Arg., *Plinia ilhensis* G.M.Barroso, *Cattleya forbesii* Lindl., *Microgramma crispata* (Fée) R.M.Tryon & A.F.Tryon, *Rudgea minor* (Cham.) Standl., *Rudgea umbrosa* Müll. Arg., *Manilkara subsericea* (Mart.) Dubard, and *Cissus serroniana* (Glaz.) Lombardi. Following literature searches, and our consultations of herbarium collections, it was discovered that *Gymnanthes nervosa* had not been collected since the 1940s, and was only found at the highest point in the CINM on Redonda Island. Some CINM species may be seen in figure 5.

Most of the species encountered in the CINM are shared with the coastal mainland restinga ecosystems (to which they were directly connected in the recent past). However, the occurrence of *Syagrus romanzoffiana*, which is uncommon in restinga areas, is apparently related to forest formations growing on latosols on the islands not used for nesting by marine birds.

The species richness of each island appears to be principally related to the presence or absence of nesting colonies of marine birds (and the resulting accumulations



A



B

FIGURE 3. Common plant species of the CIMN, RJ, Brazil; A) *Clusia fluminensis*; B) *Syagrus romanzoffiana* (Photographs F. Moraes).

of guano and its very high concentrations of phosphorus).

The presence of species threatened with extinction on islands that are currently relatively well-protected from direct anthropogenic impacts makes this conservation area rather unique within the municipality of Rio de Janeiro.

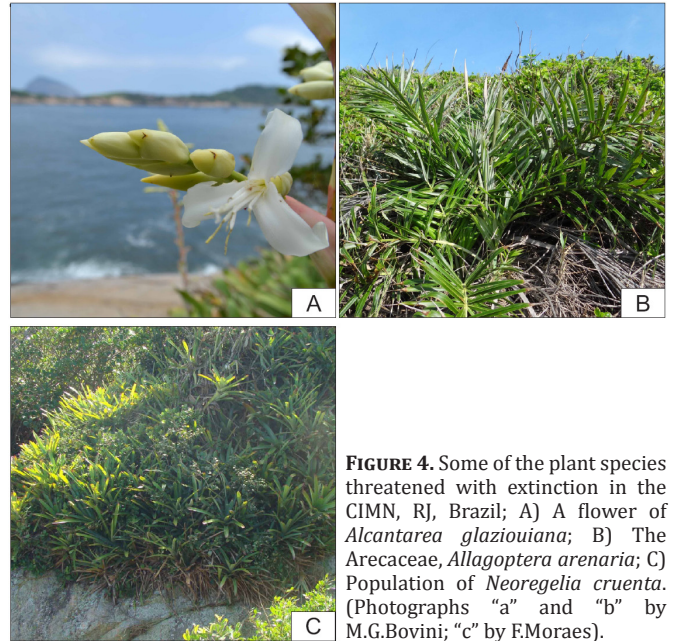


FIGURE 4. Some of the plant species threatened with extinction in the CIMN, RJ, Brazil; A) A flower of *Alcantarea glaziouiana*; B) The Areaceae, *Allagoptera arenaria*; C) Population of *Neoregelia cruenta*. (Photographs “a” and “b” by M.G.Bovini; “c” by F.Moraes).

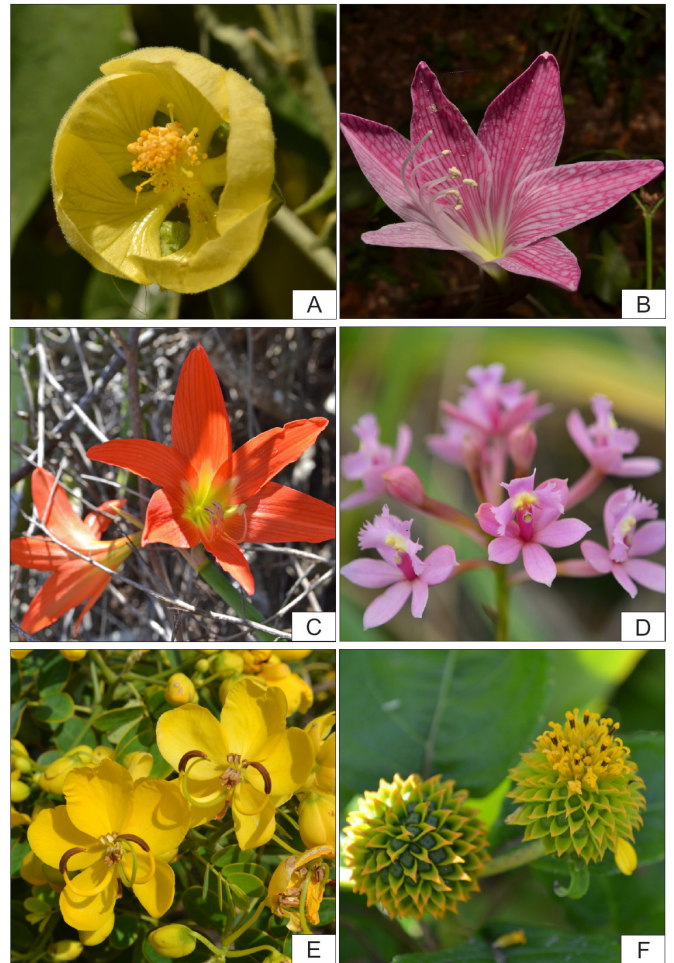


FIGURE 5. Some species of the Cagarras Islands Natural Monument; A) *Abutilon esculentum*; B) *Hypeastrum reticulatum*; C) *Hypeastrum strictum*; D) *Epidendrum reticulatum*; E) *Senna pendula*; F) *Tilesia baccata*. (Photographs F. Moraes).

TABLE 1. Species list for the Cagaras Islands Natural Monument. Ca. Cagarra Island; Co. Comprida Island; Pa. Palmas Island; Re. Redonda Island. * Observed in the field, but could not be collected due to difficult terrain, or was only encountered sterile.

FAMILIES / SPECIES	Ca	Co	Pa	Re	VOUCHER
ANGIOSPERMAS					
ACANTHACEAE					
<i>Justicia brasiliensis</i> Roth		X			RB 555751
<i>Schaueria lophura</i> Nees & Mart.		X	X		RB 554287
AIZOACEAE					
<i>Sesuvium portulacastrum</i> (L.) L.			X		RB 572067
AMARANTHACEAE					
<i>Amaranthus spinosus</i> L.				X	RB 564350
<i>Amaranthus viridis</i> L.		X		X	RB 575661
AMARYLLIDACEAE					
<i>Hippeastrum reticulatum</i> Herb.				X	RB 564989
<i>Hippeastrum striatum</i> (Lam.) Moore		X	X		RB 555195
ANACARDIACEAE					
<i>Schinus terebinthifolius</i> Raddi		X	X	X	RB 550612
APIACEAE					
<i>Apium prostratum</i> Labill.		X			RB 577843
APOCYNACEAE					
<i>Oxypetalum banksii</i> R.Br. ex Schult.		X	X		RB 550887
<i>Temnadenia odorifera</i> (Vell.) J.F.Morales		X			RB 550394
ARACEAE					
<i>Anthurium coriaceum</i> G. Don		X	X	X	RB 555882
<i>Anthurium intermedium</i> Kunth			X		RB 555191
<i>Anthurium pentaphyllum</i> (Aubl.) G.Don				X	*
ARECACEAE					
<i>Allagoptera arenaria</i> (Gomes) Kuntze		X			*
<i>Desmoncus orthacanthos</i> Mart.		X	X		RB 560922
<i>Syagrus romanzoffiana</i> (Cham.) Glassman		X	X	X	*
ASPARAGACEAE					
<i>Asparagus densiflorus</i> (Kunth) Jessop			X		*
<i>Herreria salsaparilha</i> Mart.			X	X	*
ASTERACEAE					
<i>Austroeupeatorium</i> sp.				X	RB 548092
<i>Baccharis scandens</i> (Ruiz & Pav.) Pers.			X		RB 554292
<i>Conyza bonariensis</i> (L.) Cronquist		X			RB 565371
<i>Cyrtocymura scorpioides</i> (Lam.) H.Rob.		X			RB 550609
<i>Emilia sonchifolia</i> (L.) DC. ex Wight	X	X	X		RB 550853
<i>Eupatorium</i> sp.	X				RB 547930
<i>Idiothamnus pseudogyalis</i> R.M.King & H.Rob.		X	X		RB 567424
<i>Mikania micrantha</i> Kunth		X	X		RB 550893
<i>Tilesia baccata</i> (L.f.) Pruski		X	X		RB 550389
<i>Trixis antimenorrhoea</i> (Schrank) Kuntze		X			RB 565370
Indet. sp.1			X		RB 567418
Indet. sp.2		X			RB 577855
BEGONIACEAE					
<i>Begonia hirtella</i> Link			X		RB 554314
<i>Begonia reniformis</i> Dryand.		X			RB 555846
BIGNONIACEAE					
<i>Adenocalymma bracteatum</i> (Cham.) DC.				X	RB 564338
<i>Adenocalymma marginatum</i> (Cham.) DC.			X		RB 571494
BORAGINACEAE					
<i>Tournefortia membranacea</i> (Gardner) DC.		X		X	RB 555752
<i>Varronia polycephala</i> Lam.		X	X	X	RB 550626
BROMELIACEAE					
<i>Alcantarea glaziouana</i> (Leme) J.R.Grant			X		RB 555745
<i>Bromelia antiacantha</i> Bertol.			X		*
<i>Neoregelia cruenta</i> (R.Graham) L.B.Sm.		X	X		RB 553210
<i>Pitcairnia flammea</i> Lindl.			X		RB 553619
<i>Tillandsia araujei</i> Mez	X			X	RB 579028
<i>Tillandsia stricta</i> Sol.		X		X	RB 565041

TABLE 1. CONTINUED.

FAMILIES / SPECIES	Ca	Co	Pa	Re	VOUCHER
<i>Tillandsia tricholepis</i> Baker				X	RB 571956
CACTACEAE					
<i>Brasiliopuntia brasiliensis</i> (Willd.) A.Berger		X	X	X	RB 555879
<i>Cereus fernambucensis</i> Lem.				X	RB 565040
<i>Coleocephalocereus fluminensis</i> (Miq.) Backeb.		X	X		RB 554320
<i>Hylocereus setaceus</i> (Salm-Dyck) R.Bauer		X			RB 555881
<i>Pereskia aculeata</i> Mill.	X		X		RB 555192
<i>Rhipsalis teres</i> (Vell.) Steud.				X	RB 557468
CANNABACEAE					
<i>Celtis spinosa</i> Spreng.		X		X	RB 555753
CANNACEAE					
<i>Canna indica</i> L.			X		RB 556010
CAPPARACEAE					
<i>Cynophalla hastata</i> (Jacq.) J.Presl	X	X	X	X	RB 548091
<i>Hemiscola aculeata</i> (L.) Raf.	X	X	X	X	RB 548088
<i>Monilicarpa brasiliiana</i> (Banks ex DC.) Cornejo & Iltis			X	X	RB 554234
CELASTRACEAE					
<i>Maytenus aquifolia</i> Mart.			X		RB 554301
<i>Maytenus obtusifolia</i> Mart.		X			RB 555849
CLEOMACEAE					
<i>Cleome dendroidea</i> Schult. & Schult.f.			X		RB 567420
<i>Cleome rosea</i> Vahl ex DC.				X	RB 557425
CLUSIACEAE					
<i>Clusia fluminensis</i> Planch. & Triana		X			RB 560925
<i>Clusia</i> sp.		X	X	X	*
COMMELINACEAE					
<i>Commelina erecta</i> L.	X	X		X	RB 557470
<i>Dichorisandra thyrsiflora</i> J.C.Mikan		X	X	X	RB 564332
<i>Tradescantia fluminensis</i> Vell.		X			RB 575651
CONVOLVULACEAE					
<i>Ipomoea cairica</i> (L.) Sweet		X			RB 550429
<i>Ipomoea</i> cf. <i>bahiensis</i> Willd. ex Roem. & Schult.				X	RB 537809
<i>Jacquemontia glaucescens</i> Choisy		X			RB 560900
<i>Jacquemontia heterantha</i> (Nees & Mart.) Hallier f.		X			RB 550386
<i>Merremia dissecta</i> (Jacq.) Hallier f.		X		X	RB 560919
CYPERACEAE					
<i>Cyperus meyenianus</i> Kunth	X	X		X	RB 554376
DIOSCOREACEAE					
<i>Dioscorea cinnamomifolia</i> Hook.				X	*
<i>Dioscorea laxiflora</i> Mart. ex Griseb.		X			*
<i>Dioscorea mollis</i> Kunth				X	*
<i>Dioscorea</i> sp.		X			RB 577859
ERYTHROXYLACEAE					
<i>Erythroxylum passerinum</i> Mart.			X		RB 555742
EUPHORBIACEAE					
<i>Dalechampia micromeria</i> Baill.			X		*
<i>Dalechampia scandens</i> L.		X			*
<i>Euphorbia insulana</i> Vell.			X		RB 569465
<i>Gymnanthes nervosa</i> Müll.Arg.				X	RB 564986
<i>Romanoa tamnoides</i> (A.Juss.) Radcl.-Sm.	X		X		RB 547946
<i>Sebastiania brevifolia</i> (Müll.Arg.) Müll.Arg.		X			RB 550623
FABACEAE					
<i>Canavalia rosea</i> (Sw.) DC.		X			RB 560871
<i>Centrosema brasilianum</i> (L.) Benth		X			RB 560886
<i>Cratylia hypargyrea</i> Mart. ex Benth.		X			*
<i>Dalbergia frutescens</i> (Vell.) Britton		X			*
<i>Inga maritima</i> Benth.		X			*
<i>Lonchocarpus virgilioides</i> (Vogel) Benth.		X			RB 555754
<i>Phanera microstachya</i> (Raddi) L.P.Queiroz			X		*
<i>Senegalia tenuifolia</i> (L.) Britton & Rose			X		*

TABLE 1. CONTINUED.

FAMILIES / SPECIES	Ca	Co	Pa	Re	VOUCHER
<i>Senna pendula</i> (Humb.& Bonpl.ex Willd.) H.S.Irwin & Barneby	X		X	X	RB 548046
<i>Stylosanthes viscosa</i> (L.) Sw.		X			RB 550384
<i>Vignaadenantha</i> (G.Mey.) Maréchal et al.				X	RB 571957
GESNERIACEAE					
<i>Sinningia bulbosa</i> (Ker Gawl.) Wiehler		X	X		RB 555854
<i>Sinningia speciosa</i> (Lodd.) Hiern		X			RB 577848
LOASACEAE					
<i>Aosa parviflora</i> (Schrad. ex DC.) Weigend	X			X	RB 564352
MALPIGHIACEAE					
<i>Heteropterys chrysophylla</i> (Lam.) DC.				X	*
<i>Niedenzuella acutifolia</i> (Cav.) W.R.Anderson			X		RB 555484
MALVACEAE					
<i>Abutilon esculentum</i> A.St.-Hil.		X	X	X	RB 564351
<i>Eriotheca macrophylla</i> (K.Schum.) A.Robyns		X			*
<i>Sida spinosa</i> L.		X			RB 550837
<i>Sidastrum micranthum</i> (A.St.-Hil.) Fryxell	X				RB 547942
<i>Waltheria americana</i> L.		X			RB 560883
MARANTACEAE					
<i>Maranta divaricata</i> Roscoe	X	X		X	RB 555855
MELIACEAE					
<i>Trichilia elegans</i> A.Juss.		X	X		RB 565330
MENISPERMACEAE					
<i>Odontocarya vitis</i> (Vell.) J.M.A.Braga				X	*
MOLLUGINACEAE					
<i>Mollugo verticillata</i> L.	X	X		X	RB 547939
MORACEAE					
<i>Ficus organensis</i> (Miq.) Miq.	X	X	X	X	RB 548087
<i>Sorocea guilleminiana</i> Gaudich.			X	X	RB 555741
MYRTACEAE					
<i>Eugenia bahiensis</i> DC.				X	*
<i>Eugenia selloi</i> B.D.Jacks.			X		RB 569569
<i>Eugenia umbelliflora</i> O.Berg		X			RB 550884
<i>Eugenia uniflora</i> L.		X			*
<i>Eugenia</i> sp.1				X	*
<i>Eugenia</i> sp.2		X			*
<i>Eugenia</i> sp.3			X		*
<i>Eugenia</i> sp.4			X		RB 570247
<i>Plinia ilhensis</i> G.M.Barroso		X			RB 565378
<i>Psidium guineense</i> Sw.			X		RB 576991
Indet. sp.1			X		*
Indet. sp.2		X			RB 577863
NYCTAGINACEAE					
<i>Bougainvillea spectabilis</i> Willd.	X				RB 554386
<i>Guapira opposita</i> (Vell.) Reitz		X	X	X	RB 548093
ORCHIDACEAE					
<i>Cattleya forbesii</i> Lindl.		X			*
<i>Epidendrum denticulatum</i> Barb.Rodr.		X			RB 550872
<i>Oeceoclades maculata</i> (Lindl.) Lindl.		X			RB 565372
PASSIFLORACEAE					
<i>Passiflora mucronata</i> Lam.	X	X	X	X	RB 547947
PHYTOLACCACEAE					
<i>Gallesia integrifolia</i> (Spreng.) Harms			X		RB 554245
<i>Phytolacca thyrsoflora</i> Fenzl. ex J.A.Schmidt	X	X			RB 575670
<i>Rivina humilis</i> L.			X		RB 555743
PIPERACEAE					
<i>Peperomia pereskiaefolia</i> (Jacq.) Kunth		X	X		RB 571493
PLUMBAGINACEAE					
<i>Plumbago scandens</i> L.		X			RB 577851
POACEAE					
<i>Chloris elata</i> Desv.		X			RB 449991

TABLE 1. CONTINUED.

FAMILIES / SPECIES	Ca	Co	Pa	Re	VOUCHER
<i>Digitaria insularis</i> (L.) Fedde				X	RB 564346
<i>Eleusine indica</i> (L.) Gaertn.	X	X		X	RB 560916
<i>Lasiacis ligulata</i> Hitchc. & Chase			X	X	RB 571959
<i>Megathyrsus maximus</i> (Jacq.) B.K.Simon & S.W.L.Jacobs	X	X	X	X	*
<i>Sporobolus virginicus</i> (L.) Kunth			X		RB 567429
PORTULACACEAE					
<i>Portulaca halimoides</i> L.		X			RB 550841
<i>Portulaca oleracea</i> L.		X		X	RB 557934
PRIMULACEAE					
<i>Myrsine guianensis</i> (Aubl.) Kuntze			X		RB 567426
RUBIACEAE					
<i>Borreria capitata</i> (Ruiz & Pav.) DC.		X			RB 550865
<i>Chiococca alba</i> (L.) Hitchc.			X		RB 575655
<i>Rudgea minor</i> (Cham.) Standl.				X	RB 571958
<i>Rudgea umbrosa</i> Müll.Arg.			X		RB 569461
SAPINDACEAE					
<i>Allophylus puberulus</i> (Cambess.) Radlk.		X	X	X	RB 555856
<i>Cupania oblongifolia</i> Mart.		X			*
<i>Cupania platycarpa</i> Radlk.			X	X	RB 554318
<i>Paullinia racemosa</i> Wawra			X	X	RB 564988
<i>Serjania dentata</i> (Vell.) Radlk.		X			RB 570291
SAPOTACEAE					
<i>Chrysophyllum flexuosum</i> Mart.				X	*
<i>Manilkara subsericea</i> (Mart.) Dubard		X	X		RB 550847
SMILACACEAE					
<i>Smilax quinquenervia</i> Vell.			X		*
<i>Smilax rufescens</i> Griseb.		X			RB 555755
<i>Smilax stenophylla</i> A.DC.		X	X		RB 577952
SOLANACEAE					
<i>Physalis angulata</i> L.		X			RB 560896
<i>Solanum americanum</i> Mill.		X			RB 560867
<i>Solanum scuticum</i> M.Nee		X		X	RB 560872
TALINACEAE					
<i>Talinum paniculatum</i> (Jacq.) Gaertn.	X	X	X	X	RB 548045
VERBENACEAE					
<i>Lantana camara</i> L.	X	X	X	X	RB 555853
VITACEAE					
<i>Cissus serroniana</i> (Glaz.) Lombardi			X	X	*
<i>Cissus verticillata</i> (L.) Nicolson & C.E.Jarvis			X	X	RB 564354
PTERIDOPHYTA					
ASPLENIACEAE					
<i>Asplenium douglasii</i> Hook. & Grev.		X	X		RB 567474
BLECHNACEAE					
<i>Blechnum occidentale</i> L.		X			RB 567471
DRYOPTERIDACEAE					
<i>Rumohra adiantiformis</i> (G.Forst.) Ching		X			RB 550861
LOMARIOPSISACEAE					
<i>Nephrolepis pendula</i> (Raddi) J.Sm.		X			RB 590888
POLYPODIACEAE					
<i>Microgramma crispata</i> (Fée) R.M.Tryon & A.F.Tryon				X	RB 565042
<i>Microgramma vacciniifolia</i> (Langsd. & Fisch.) Copel.		X			RB 560918
<i>Serpocaulon triseriale</i> (Sw.) A.R.Sm.		X	X		RB 554236
PTERIDACEAE					
<i>Hemionitis tomentosa</i> (Lam.) Raddi		X			RB 565379
<i>Pteris splendens</i> Kaull.		X			RB 578584

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