Check List 10(2): 366–373, 2014

ISSN 1809-127X (available at *www.checklist.org.br*)

Check List
Journal of species lists and distribution

Lists of Species

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

Massimo G. Bovini [1*], Marcos Faria [2], Rogério R. Oliveira [3] and Bruno C. Kurtz [1]

1 Instituto de Pesquisas Jardim Botânico do Rio de Janeiro. Diretoria de Pesquisa Científica. Rua Pacheco Leão 915, Horto, CEP 22460-030, Rio de Janeiro, RJ, Brazil.
2 Instituto Mar Adentro. Rua Barata Ribeiro 391/901, CEP 22040-000, Copacabana, Rio de Janeiro, RJ, Brazil.
3 Pontifícia Universidade Católica do Rio de Janeiro, Departamento de Geografia, CEP 22453-900, Rio de Janeiro, RJ, Brazil.
* Corresponding author. E-mail: *mbovini@jbrj.gov.br*

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 *Gymanthes 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 CIMN 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"

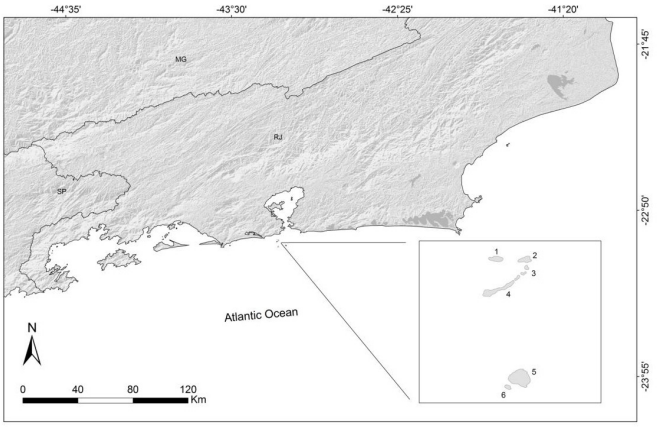

Figure 1. Map of study area. Detail of the CIMN, RJ, Brazil; 1) Palmas Island; 2) Cagarra Island; 3) Filhote da Cagarra Island; 4) Comprida Island; 5) Redonda Island; 6) Filhote da Redonda Island.

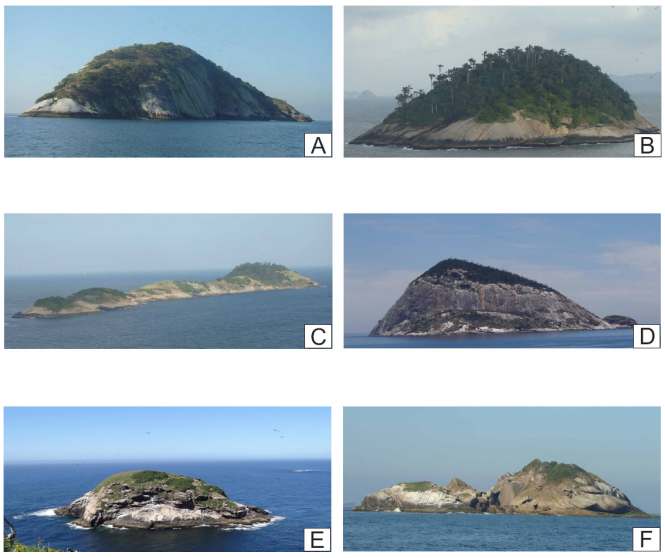

Figure 2. CIMN, RJ, Brazil; A) Cagarra Island; B) Palmas Island; C) Comprida Island; D) Redonda Island; E) Filhote da Redonda Island; F) Filhote da Cagarra Island (Photographs: M.G.Bovini).

(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 CIMN on Redonda Island. Some CIMN 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

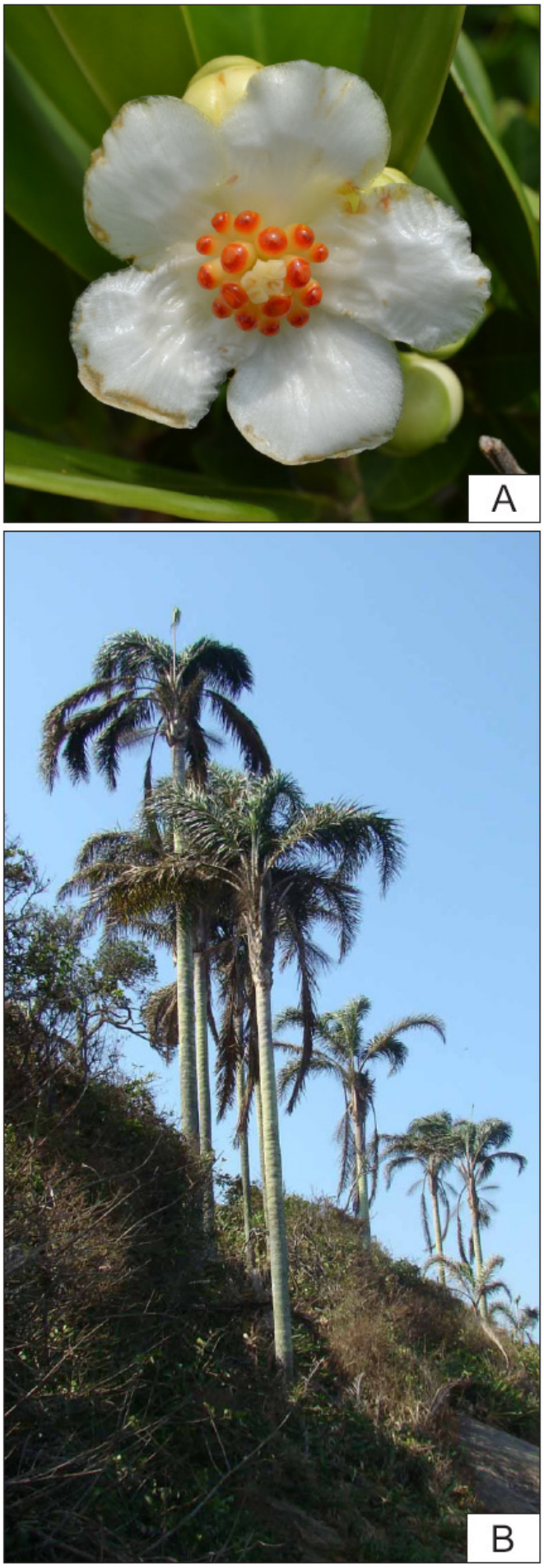

Figure 3. Common plant species of the CIMN, RJ, Brazil; A) *Clusia fluminensis*; B) *Syagrus romanzoffiana* (Photographs F. Moraes).

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.

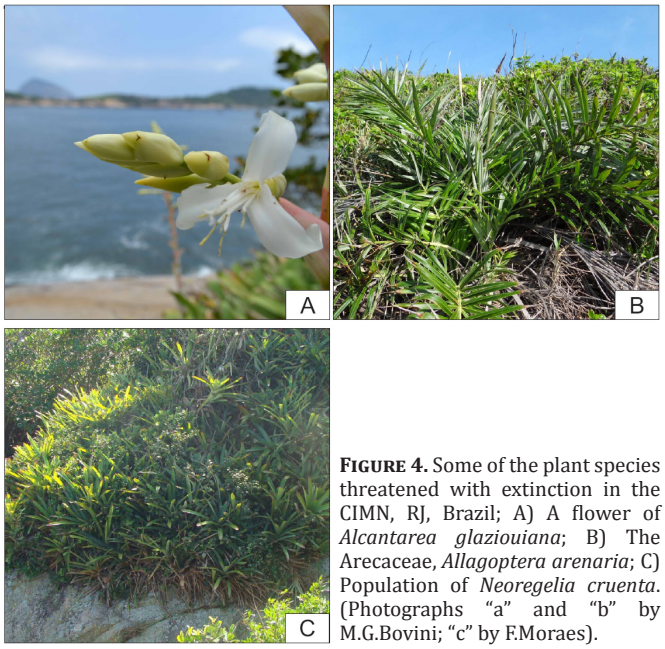

Figure 4. Some of the plant species threatened with extinction in the CIMN, RJ, Brazil; A) A flower of *Alcantarea glaziouiana*; B) The Arecaceae, *Allagoptera arenaria*; C) Population of *Neoregelia cruenta*. (Photographs "a" and "b" by M.G.Bovini; "c" by F.Moraes).

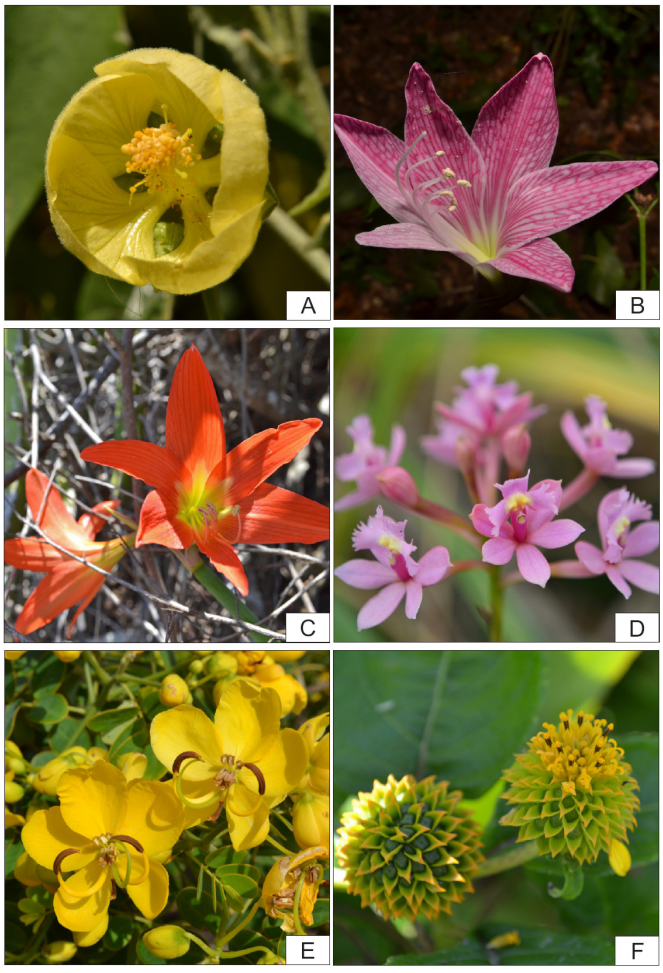

Figure 5. Some species of the Cagarras Islands Natural Monument; A) *Abutilon esculentum*; B) *Hyppeastrum reticulatum*; C) *Hyppeastrum strictum*; D) *Epidendrum reticulatum*; E) *Senna pendula*; F) *Tilesia baccata*. (Photographs F. Moraes).

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

Table 1. ***Continued.***

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

Table 1. ***Continued.***

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

Table 1. ***Continued.***

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

Acknowledgments: The authors would like to thank Angela S. Rodrigues for her support and for supplying the preliminary data for this study; the Projeto Ilhas do Rio, of Institute Mar Adentro (Programa Petrobrás Ambiental) for logistical support; Gabriel Sales for his indispensable disposition in aiding this project; and Thiago Serrano for preparing the map.

Literature Cited

Alves, R.J.V. 1998. *Ilha da Trindade e Arquipélago Martin Vaz: um ensaio geobotânico.* Rio de Janeiro: Serviço de Documentação da Marinha,

144 pp.
Alves, R.J.V. 2006. Terrestrial vascular floras of Brazil's oceanic archipelagos; pp. 83–104, in: R.J.V. Alves, and J.W.A. Castro. (org.). *Ilhas oceânicas brasileiras: da pesquisa ao manejo*. Brasília: MMA, Secretaria de Biodiversidade e Florestas.
Aguiar, A., F. Brasil and L. Rech, L. 2013. Turismo, esporte e lazer no Monumento Natural das Ilhas Cagarras; pp. 269–285. in: F. Moraes, A. Bertoncini and A. Aguiar (ed.). *História, pesquisa e biodiversidade do Monumento Natural das ilhas Cagarras.* Museu Nacional. Série Livros 48. Rio de Janeiro.
APG - Angiosperm Phylogenetic Group III. 2009. An update of the Angiosperm Phylogeny Group classification for the orders and families of flowering plants. *Botanical Journal of the Linnean Society* 161: 105–121.
Barros, F., Melo, M.M.R.F., Chiea, S.A.C., Kirizawa, M., Wanderley, M.G.L. and Jung-Mendaçolli, S.L. 1991. Caracterização geral da vegetação e listagem das espécies ocorrentes; pp. 1–184, in: M.M.R.F. Melo, F. Barros, M.G.L. Wanderley, M. Kirizawa, S.L. Jung-Mendaçolli and S.A.C. Chiea (ed.). *Flora Fanerogâmica da Ilha do Cardoso*. Vol.1. São Paulo: Instituto de Botânica.
Bastos, M. and C.H. Callado. 2009. *O ambiente da Ilha Grande*. Rio de Janeiro: UERJ/CEADS. 562 pp.
Batistella, M. 1996. Espécies vegetais dominantes do Arquipélago de Fernando de Noronha: grupos ecológicos e repartição espacial. *Acta Botânica Brasilica* 10(2): 223–235.
Bovini, M.G., M. Faria, R.R. Oliveira and B.C. Kurtz. 2013. Flora terrestre vascular: riqueza, biogeografia e vulnerabilidades; pp. 138–161, in: F. Moraes, A. Bertoncini and A. Aguiar. (ed.). *História, pesquisa e biodiversidade do Monumento Natural das ilhas Cagarras.* Série Livros, 48. Rio de Janeiro: Museu Nacional.
CNCFlora. 2013. *Centro Nacional de Conservação da Flora*. Accessible at www.cncflora.jbrj.gov.br. Captured on 03 March 2013.
Cunha, L., V. Alves, H. Rajão and A. Lanna. 2013. Aves do Monumento Natural das Ilhas Cagarras; pp. 177–205 in: F. Moraes, A. Bertoncini and A. Aguiar. (ed.). *História, pesquisa e biodiversidade do Monumento Natural das ilhas Cagarras.* Série Livros, 48. Rio de Janeiro: Museu Nacional.
Di Maio, F.R. and M.B. Silva. 2000*. Espécies ameaçadas de extinção no município do Rio de Janeiro: flora e fauna.* Rio de Janeiro: Secretaria Municipal de Meio Ambiente. 68 pp.
Filgueiras, T.S., A.L. Brochado, P.E. Nogueira and G.F. Gualla. 1994. Caminhamento - Um método expedito para levantamentos florísticos e qualitativos. *Caderno Geociência IBGE* 12: 39–43.
Gasparini, J.L. 2004. *Ilha da Trindade e Arquipélago Martin Vaz: pedaços de Vitória no azul atlântico.* Vitória: GSA, 100 pp.
Lorenzi, H., H.M. Souza, J.T.M. Costa, L.S.C. Cerqueira and E. Ferreira. 2004. *Palmeiras brasileiras e exóticas cultivadas*. Nova Odessa: Instituto Plantarum, 432 pp.
Kemenes, A. 2003. Distribuição espacial da flora terrestre fanerogâmica do Parque Nacional Marinho de Abrolhos, BA. *Revista Brasileira de Botânica 26*(2): 141–150.
Kreft, H., W. Jetz, J. Mutke, G. Kier and W. Barthlott. 2008. Global diversity of island floras from a macroecological perspective. *Ecology Letters* 11: 116–127.
Menezes-Silva, S. 1998. As formações vegetais da planície litorânea da Ilha do Mel, Paraná, Brasil: composição florística e principais características estruturais. Tese de Doutorado, Campinas, Universidade Estadual de Campinas.
MMA – Ministério do Meio Ambiente. 2008. *Instrução normativa nº6, 23 de setembro de 2008*. Accessible at http://www.mma.gov.br/estruturas/179/_arquivos/179_05122008033615.pdf. Captured on 04 May 2013
Moraes, F. and J.C. Seoane. 2013. Caracterização das ilhas e do entorno do Monumento Natural das Ilhas Cagarras; pp. 11–37 in: F. Moraes, A. Bertoncini and A. Aguiar. (ed.). *História, pesquisa e biodiversidade do Monumento Natural das ilhas Cagarras.* Série Livros, 48. Rio de Janeiro: Museu Nacional..
Moraes, F., M. Rebouças, S. Jordão, L.A.Pereira, E. Santos, R. Amorim, V. Lobo, L.S.Junior, D. Cabral and A. Bertoncini. 2013a. A pesca no entorno do Monumento Natural das Ilhas Cagarras; pp. 245–267, in: F. Moraes, A. Bertoncini and A. Aguiar. (ed.). *História, pesquisa e biodiversidade do Monumento Natural das ilhas Cagarras.* Série Livros, 48. Rio de Janeiro: Museu Nacional.
Oliveira, R.R. 2002. Ação antrópica e resultantes sobre a estrutura e composição da Mata Atlântica na Ilha Grande, RJ. *Rodriguesia* 53 (82): 33–58.
Rodrigues, A.S., R.R. Oliveira and B.C. Kurtz. 2007. Estudo da vegetação do arquipélago das Ilhas Cagarras, Rio de Janeiro, RJ. *Revista Brasileira de Biociências* 5(supl. 2): 945–947.
Serafini, T.Z., G.B. França and J.M. Andriguetto-Filho. 2010. Ilhas oceânicas brasileiras: biodiversidade conhecida e sua relação com o histórico de uso e ocupação humana. *Revista de Gestão Costeira Integrada* 10(3): 281–301.
Tessler, M.G. and S.C. Goya. 2005. Processos costeiros condicionantes do litoral brasileiro. *Revista do Departamento de Geografia* 17: 11–23.

Received: July 2013
Accepted: February 2014
Published online: May 2014
Editorial responsibility: James Byng