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 Gynanthes 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 (Aguiau 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, Cagarras, and Redonda) and two smaller ones (Filhote da Redonda and Filhote da Cagarras) (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 Cagarras 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” formations varying from herbaceous to low forests.

**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).

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, Coleoecephalocereus fluminensis (Mich.) 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 CIMN are shared with the coastal mainland restinga ecosystems (to which they were directly connected in the recent past). However, the occurrence of Syagrus romanziophiana, 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
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.
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.

| FAMILY (SYNONYMS) | Ca | Co | Pa | Re | VOUCHER |
|-------------------|----|----|----|----|---------|
| ANGIOSPERMAS      |    |    |    |    |         |
| Acanthaceae       |    |    |    |    |         |
| Justicia brasiliana Roth | X |    |    | RB 555751 |
| Schaueria lophura Nees & Mart. | X | X |    | RB 554287 |
| Aizoaceae         |    |    |    |    |         |
| Sesuvium portalacustrum (L.) L. | X |    |    | RB 572067 |
| Amaranthaceae      |    |    |    |    |         |
| Amaranthus spinosus L. | X |    |    | RB 564350 |
| Amaranthus viridis L. | X |    |    | RB 575661 |
| Amaryllidaceae     |    |    |    |    |         |
| Hippeastrum reticulatum Herb. | X |    |    | RB 564989 |
| Hippeastrum striatum (Lam.) Moore | X | X | X | RB 555195 |
| Anacardiaceae      |    |    |    |    |         |
| Schinus terebinthifolius | X |    |    | X | RB 550612 |
| Apiaceae           |    |    |    |    |         |
| Apium prostratum Labill. | X |    |    | RB 577843 |
| Apocynaceae        |    |    |    |    |         |
| Oxypetalum banksii R.Br. ex Schult. | X | X |    | RB 550887 |
| Tennadenia odorifera (Vell.) J.F.Morales | X |    |    | RB 550394 |
| Araceae            |    |    |    |    |         |
| Anthurium coriaceum G. Don | X | X | X | RB 555882 |
| Anthurium intermedium Kunth | X | X |    | RB 551911 |
| Anthurium pentaphyllum (Aubl.) G.Don | X | * |    |         |
| Arecaeeae          |    |    |    |    |         |
| Allagoptera arenaria (Gomes) Kuntze | X | * |    |         |
| Desmoncus orthacanthos Mart. | X | X | X | RB 560922 |
| Syngorus 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 pseudorygialis R.M.King & H.Rob. | X | X | X | RB 567424 |
| Mikania micrantha Kunth | X | X | X | RB 550893 |
| Tiletia baccata (L.f.) Pruski | X | X | X | RB 550389 |
| Trisix antimorrhoea (Schrank) Kunze | 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 |
| Bignoniacae        |    |    |    |    |         |
| Adenocalymma bracteatum (Cham.) DC. | X |    |    | RB 564338 |
| Adenocalymma marginatum (Cham.) DC. | X |    |    | RB 571494 |
| Boraginaceae       |    |    |    |    |         |
| Tournefortia membranacea (Gardner) DC. | X | X | X | RB 555752 |
| Varronia polycephala L.am. | X | X | X | RB 550626 |
| Bromeliaceae       |    |    |    |    |         |
| Acantharea glaziouana (Leme) J.R.Grant | X |    |    | RB 555745 |
| Bromelia antacantha Bertol. | X | * |    |         |
| Neoregelia cruenta (R.Graham) L.B.Sm. | X | X | X | RB 553210 |
| Pitcairnia flammea Lindl. | X |    |    | RB 553619 |
| Tillandsia araujei Mez | X | X | X | RB 579028 |
| Tillandsia stricta Sol. | X | X | X | RB 565041 |
| FAMILIES / SPECIES | Ca | Co | Pa | Re | VOUCHER |
|-------------------|----|----|----|----|---------|
| Tillandsia tricholepis Baker | X | | | RB 571956 |
| **CACTACEAE** | | | | | |
| Brasiliopuntia brasiliensis (Willd.) A.Berger | X | X | | RB 555879 |
| Cereus ferrambucensis 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.) Presl | X | X | X | RB 548091 |
| Hemiscola aculeata (L.) Raf. | X | X | X | RB 548088 |
| Monilicarpa brasiliana (Banks ex DC.) Cornejo & Iltis | X | X | | RB 554234 |
| **CELASTRACEAE** | | | | | |
| Maytenus aquifolium Mart. | X | | | RB 554301 |
| Maytenus obtusifolium Mart. | X | | | RB 55849 |
| **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 thrysiflora 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 gaucheensis 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 | | | |
| Dioscorea mollissima 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 | X | | RB 564986 |
| Romanoa tannoides (A.Juss.) Raddl.-Sm. | X | X | | RB 547946 |
| Sebastiania brevifolia (Müll.Arg.) Müll.Arg. | X | | | RB 550623 |
| **FABACEAE** | | | | | |
| Canavalia rosea (Sw.) DC. | X | | | RB 560871 |
| Centropluera brasiliensis (L.) Benth | X | | | RB 560886 |
| Cratylia hypargyreus Mart. ex Benth. | X | | | |
| Dalbergia frutescens (Vell.) Britton | X | | | |
| Inga maritima Benth. | X | | | |
| Lonchorcarpus virgilioides (Vogel) Benth. | X | | | RB 555754 |
| Phanera microstachya (Raddi) L.P. Queiroz | X | | | |
| Senegalia tenaxfolia (L.) Britton & Rose | X | | | |

370
| 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 |
| **Vignadenantha** (G. Mey.) Maréchal et al. | | | X | RB 571957 |
| **GESNERIACEAE** | | | | |
| **Sinningia bulbosa** (Ker Gawl.) Wiehler | | | | |
| **Sinningia speciosa** (Lodd.) Hiern | | | | |
| **LOASACEAE** | | | | |
| **Aosa parviflora** (Schrad. ex DC.) Weigend | X | X | | RB 564352 |
| **MALPIGHIACEAE** | | | | |
| **Heteropterys chrysophylla** (Lam.) DC. | X | X | | |
| **Niedenzuela acutifolia** (Cav.) W.R. Anderson | X | | | |
| **MALVACEAE** | | | | |
| **Abutilon esculentum** A.St.-Hil. | X | X | X | |
| **Eriotheca macrophylla** (K.Schum.) A.Robyns | X | | * | |
| **Sidra 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 sellowii** 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 |
| **PHYLLOLACCAEAE** | | | | |
| **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 |
|--------------------|----|----|----|----|---------|
| **PORTULACACEAE**  |    |    |    |    |         |
| Portulaca halimoides L. | X  |    |    |    | RB 550841 |
| Portulaca oleracea L.   | X  |    |    |    | RB 557934 |
| **PRIMULACEAE**       |    |    |    |    |         |
| Myrsine guianensis (Aubl.) Kuntze | X  |    |    |    | RB 567426 |
| **RUBIACEAE**         |    |    |    |    |         |
| Borneria 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  |    |    | RB 555856 |
| Cupania oblongifolia Mart. | X  |    |    |    |         |
| Cupania platycarpa Radlk. | X  | X  |    |    | RB 554318 |
| Paulinia 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 quinquemervia Vell. | X  |    |    |    |         |
| Smilax rufescens Griseb. | X  |    |    |    | RB 555755 |
| Smilax stenophylla A.D.C. | 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  |    | RB 548045 |
| **VERBENACEAE**       |    |    |    |    |         |
| Lantana camara L. | X  | X  | X  |    | RB 555853 |
| **VITACEAE**          |    |    |    |    |         |
| Cissus serrioniana (Glaz.) Lombardi | X  | X  |    |    |         |
| Cissus verticillata (L.) Nicolson & C.EJarvis | 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**  |    |    |    |    |         |
| Nephrolepis pendula (Raddi) J.Sm. | X  |    |    |    | RB 590888 |
| **POLYPODIACEAE**     |    |    |    |    |         |
| Microgramma crispa (Fée) R.M.Tryon & A.F.Tryon | X  |    |    |    | RB 565042 |
| Microgramma vaccinifolia (Langsd. & Fisch.) Copel. | X  |    |    |    | RB 560918 |
| Serpocaulon triseriale (Sw.) A.R.Sm. | X  | X  |    |    | RB 554236 |
| **PTERIDACEAE**       |    |    |    |    |         |
| Hemionitis tomentosa (Jam.) Raddi | X  |    |    |    | RB 565379 |
| Pteris splendens Kaull. | X  |    |    |    | RB 578584 |

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