Rodriguésia 68(1): 001-011. 2017
http://rodriguesia.jbrj.gov.br
DOI: 10.1590/2175-7860201768101

Flora of Rio de Janeiro state: an overview of Atlantic Forest diversity

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Abstract

Fully contained within the Atlantic Forest Biome, the state of Rio de Janeiro represents one of the greatest areas of diversity of vegetation physiognomy, habitats and plant species, including endemics. The flora of Rio de Janeiro state is recognized as one of the richest in the country and the state as an important center of endemism. These features have encouraged diferent botanical studies, highligthing Vellozo, Cysneiros, Glaziou, Gardner, among others, as precursor naturalists in exploration native forests. It is presented physiographic features of the state and brief retrospective of the Flora of Rio de Janeiro state project, which began in 2001, and consolidated in 2007 with a checklist prepared and made available online, and in 2011, with the implantation of the *Catálogo de espécies de plantas vasculares e briófitas da flora do estado do Rio de Janeiro*, with the participation of over 150 participants working online. Currently 334 families, 1,821 genera and, 8,203 species, subspecies and varieties have been recorded to the state, 1,740 of which are endemic. We highlight the vegetation formations, municipalities, conservation unities, and families of angiosperms, bryophytes, ferns and lycophytes families most diverse, as well as comments about monographic treatments already published. This special volume of Rodriguésia dedicated to the flora of Rio de Janeiro state presentes 19 families with 76 species of Angiosperms - Aizoaceae, Alismataceae, Asparagaceae, Ceratophyllaceae, Cabombaceae, Haloragaceae, Hydrocharitaceae, Hydroleaceae, Juncaginaceae, Lentibulariaceae, Mayacaceae, Menyanthaceae, Molluginaceae, Myristicaceae, Nymphaeaceae, Pontederiaceae, Potamogetonaceae, Rhizophoraceae e Typhaceae.

Key words: Angiosperms, Bryophytes, endemic, Gymnosperms, Lycophytes, Ferns.

Resumo

O estado do Rio de Janeiro, inserido no Bioma Mata Atlântica, representa uma área com alta diversidade de paisagens vegetacionais, habitats e espécies de plantas, incluindo várias endêmicas. A flora do estado do Rio de Janeiro é reconhecidamente uma das mais ricas do país e o estado apontado como um importante centro de endemismo. Tais características têm incentivado os mais diferentes estudos botânicos, destacando Vellozo, Cysneiros, Glaziou, Gardner, entre outros, como naturalistas precursores na exploração das florestas nativas. Apresentam-se, de modo geral, aspectos fisiográficos do estado e uma breve retrospectiva do projeto Flora do estado do Rio de Janeiro, iniciado em 2001, que culminou, em 2007, com a elaboração online do *checklist* da flora do estado, e em 2011, com a implantação do Catálogo de espécies de plantas vasculares e briófitas da flora do estado do Rio de Janeiro, no qual mais de 150 colaboradores trabalharam online. Essas iniciativas revelam números bem expressivos da diversidade da flora fluminense e a necessidade de se prosseguir nos estudos taxonômicos dos grupos botânicos que compõem a flora. Atualmente, são registradas para o estado do Rio de Janeiro 334 famílias, 1.821 gêneros e 8.203 espécies, subespécies e variedades de plantas vasculares e briófitas, sendo 1.740 endêmicas. Destacam-se as formações vegetacionais, os municípios, as Unidades de Conservação e as famílias de Angiospermas, Samambaias e Licófitas e Briófitas com maior riqueza de espécies, bem como se comenta sobre tratamentos monográficos já realizados. Este volume especial da Rodriguésia dedicado à flora do estado do Rio de Janeiro apresenta 76 espécies de angiospermas distribuídas nas famílias Aizoaceae, Alismataceae, Asparagaceae, Ceratophyllaceae, Cabombaceae, Haloragaceae, Hydrocharitaceae, Hydroleaceae, Juncaginaceae, Lentibulariaceae, Mayacaceae, Menyanthaceae, Molluginaceae, Myristicaceae, Nymphaeaceae, Pontederiaceae, Potamogetonaceae, Rhizophoraceae e Typhaceae.

Palavras-chave: Angiospermas, Briófitas, endemismo, Gimnospermas, Licófitas, Samambaias.

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Fully contained within the Atlantic Forest Biome, the state of Rio de Janeiro represents one of the greatest areas of diversity within this biome in Brazil, where vegetation physiognomy conforms to a wide range of relief of mountain ranges and coastal plains, as well as to the weather, especially temperature and precipitation. Various geomorphological units are contained within this state, which along with peculiarities of watersheds, topography, climate, soil and hydrology provide a diversity of vegetation and landscapes and consequently, an extraordinary variety of habitats and species, including several that are endemic. Of these units, Escarpas e Reversos da Serra do Mar and Vale do Paraíba do Sul stand out as the largest (Veloso & Goes Filho 1982; Costa *et al.* 2009).

This landscape considering vegetation physiognomy, ecological characteristics, flora and altitude allows us to recognize a variety of vegetation types in Rio de Janeiro (Fig. 1), especially the Atlantic Rainforest [lowland (< 50 m), submontane (50–500 m), montane (500–1,500 m) and high montane or cloud forest (> 1,500 m)]; Semideciduous Seasonal Forest (also divided into lowland, submontane and montane); Ecological Refuges, including the high-altitude grasslands, savanna-steppe and restricted areas in the coastal region; pioneer formations, classified as *restinga* vegetation, with marine influence, and mangroves, under estuary influence (Veloso *et al.* 1991; IBGE 2012). The high-altitude grasslands have been recognized as a distinct vegetation type within the context of the Atlantic Forest, lying along the mountain chains of Serra do Mar and Serra da Mantiqueira. They exhibit certain traits of floristic composition and ecology that are common above 1,800 m altitude and substrate composed of igneous or metamorphic rocks (Martinelli *et al.* 1989; Safford 1999, 2007; Keidel *et al.* 2009; Valencia 2011).

Igneous and metamorphic rocks predominate in the state and underlie mainly PreCambrian formations, although they are also found to a lesser extent in areas with Cretaceous, Tertiary and Quaternary sediments. This rugged relief alternates with plains, lowlands, valleys, and slopes of other large mountain ranges, such as Serra da Bocaina, in southern Rio de Janeiro, and Serra dos Órgãos and Serra do Desengano, farther inland, that are part of the extensive Serra do Mar range. It is precisely in Serra dos Órgãos that we find some of the highest peaks in the state: Pedra do Açu (2,245 m), Pico da Caledônia (2,219 m), Pedra do Sino (2,263 m) and Pico Maior de Friburgo (2,216 m). Another important mountain range of Southeast Brazil, the Serra da Mantiqueira, occupies only a small part of the Itatiaia massif, in the far southwest of the state, where the highest peak is Pico das Agulhas Negras at 2,791 m tall (INEA 2009; IBGE 2012; ICMBio 2016). The *restingas* stand out on the coast of Rio de Janeiro, which is broadly interpreted as being located on sandy plains of Quaternary age and marine origin (Araujo *et al.* 1994; IBGE 2102).

It is well known that the original vegetation cover of Rio de Janeiro has been greatly altered over the centuries, begining during colonization with disorganized human occupation and expansion of urban centers, introduction of cultivated species, and farming activities (Joly *et al.* 1999; Silva *et al.* 2001; Scarano 2014). Today, remnants of the Atlantic Forest Biome consist of approximately 1,300,000 ha, that is, around 30% of the original area (Fundação SOS Mata Atlântica/INPE 2015), including patches of forest (18.6%); *restinga* (1.2%), mangrove (0.3%), native vegetation (10%) and natural non-forest areas (0.6%) (Fundação SOS Mata Atlântica/INPE 2015), mainly of rain forests and semideciduous forests. These remnants are widely scattered and fragmented (Knight *et al.* 2009), concentrated in three areas farther inland on the Escarpas e Reversos da Serra do Mar, along the Vale do Paraíba and northern Rio de Janeiro state.

As regards legally protected areas, the state has some 462,000 ha, representing 19 federal and 36 state conservation units (INEA 2016). The main areas are larger where declivity is more pronounced, with thousands of small forest fragments scattered over private properties, rural areas and urban areas. On the other hand, there are significant stretches of preserved forests in Serra da Bocaina and on the mountains within the Tinguá Biological Reserve, Serra dos Órgãos National Park and in the área from Três Picos State Park to Desengano State Park. In the Paraíba River valley and northwestern and northern Rio de Janeiro, we find the greatly altered areas (Campalini & Prochnow 2006) due to intense ongoing farming activities. This region currently has multiple small forest fragments.

Despite constant degradation and fragmentation of vegetation, there is a larger proportion of Atlantic forest remnants in Rio de Janeiro at higher altitudes and usually lying within protected conservation units. In contrast, over 70% of semideciduous seasonal forest fragments no longer count on original cover, and there are very few forest remnants in legally protected areas (Costa *et al.* 2009).

Environmental particularities of Rio de Janeiro state feature a wide range of physiognomies and habitats associated with a lush, diverse flora (Fig. 2). These attributes have encouraged a number of botanical and other studies that are associated with or depend on knowledge of diversity or floristic composition, both in a more restrictive context, focusing on a taxonomic group, or in the context of local floras.

It was this landscape and species richness that, without a doubt, encouraged Frei José Mariano da Conceição Vellozo, in the 18th century, to undertake the first study that was to focus objectively on taxonomic knowledge of the flora of Rio de Janeiro

Figure 1 – Vegetation types in the Rio de Janeiro state, examples – a. Dense Montane Ombrophylous Forest, Parque Nacional do Itatiaia; b. Dense Montane High Ombrophylous Forest; c. Montane Semideciduous Seasonal Forest, in the municipality of Cambuci; d. High Altitude Field, Parque Nacional da Serra dos Órgãos, and the Parque Estadual dos Três Picos in the background; e. Mangrove, Rio de Janeiro; f. *Restinga*, Marambaia Island (Photos: a. J.F.A. Baumgratz; M.A.N. Coelho; d. L.A.F. Santos Filho; M. Trovó; f. K.C. Silva Gonçalves).

state - the world-renowned Flora Fluminensis (Vellozo 1827, 1831). Here, the author not only followed the Linnaean classification system, but also adopted the practice of short descriptions of taxa, as did Linnaeus and De Candolle (Sampaio 1946). It should be mentioned that this author points to the work of Fr. Vellozo as showing the world the ability of the naturalist, since the Flora Fluminensis was an example of work that appeared to determine, in Brazil, the advent of "regional floras", with a wealth of iconographies to aid in botanical identification in any part of the country.

Flora Fluminensis consists of three volumes of texts and 11 volumes of iconographies addressing 395 genera, 14 cryptogams and 381 phanerogams, for a total of 1,640 species described and illustrated (Vellozo 1829, 1831, 1881; Cruz 1946; Carauta 1973; Bediaga & Lima 2015). The concise morphological descriptions of genera and species were associated with comments on environmental peculiarities and, when available, the common name and use of plants by the natives. At that time, the collections of prominent naturalists were the basis for preparation of studies on the flora of Rio de Janeiro, such as those of A.F.C.P. Saint-Hilaire, C. Gaudichaud, F. Sellow, G.H. von Langsdorff, G. Raddi, H.W. Schott, J. Pohl, J.C. Mikan and K.F.P. von Martius, and also the plants that had been collected and identified by Vellozo (Neto 1881).

Another important work for the flora of Rio de Janeiro was that of Francisco Freire Allemão de Cysneiros, whose manuscripts ("papers") of observations, notes, and drawings took 40 years to prepare in the 19th century. It is an original work, featuring botanical illustrations and descriptions documented in 17 volumes - "Estudos Botânicos" (Damasceno & Cunha 1964).

In addition to these naturalists, several others were also essential for the knowledge and documentation of herbaria collections of species of the Rio de Janeiro flora up to the early 20th century, such as A.F.M. Glaziou, C.W.H. Mosén, E.H.G. Ule, G. Gardner, J.B.E. Pohl, L. Riedel and P. Claussen, among others. Several copies of these collections are types, most of which are documented mainly in European herbaria and are very important for current taxonomic and floristic studies, as well as representing historical records of floristic diversity in the state in times past.

The flora of Rio de Janeiro state is seen as one of the richest in the country, estimated at 8,037 species, belonging to 200 families of Angiosperms, 2 Gymnosperms, 34 ferns and lycophytes, and 98 bryophytes (<http://florariojaneiro.jbrj.gov.br>). Due to this incredible richness that includes species of algae and fungi, Rio de Janeiro is seen as the third most species-rich state in the country (Forzza *et al.* 2010). Of this total, 6,512 are Angiosperms (1,643 endemic), 3 are Gymnosperms, 892 are bryophytes (58 endemics), and 630 ferns and lycophytes (39 endemics). In terms of Angiosperms, Rio de Janeiro stands out as the fifth federal unit in the country with the greatest number of species, that is, 7,354. Of these, 1,076 are endemic (BFG 2015). As regards ferns and lycophytes, the state is second in greatest wealth, with 620 species, 20 endemics (Prado *et al.* 2015) and, for bryophytes, Rio de Janeiro and São Paulo emerge as the most diverse states, with 900 species each and, respectively, 17 and 12 endemics (Costa & Peralta 2015).

Mori *et al.* (1981) regarded Rio de Janeiro state to be a major center of endemism in Brazil, while Davis *et al.* (1997), addressing diversity centres, cited the areas of Cabo Frio and the mountains of Rio de Janeiro as centers of diversity. Werneck *et al.* (2011) in a study of angiosperm distribution and endemism in the Atlantic Forest show that the central and western regions of Rio de Janeiro have high species richness and also that the greatest number of endemisms (978 spp.) in a single sample unit (grid cell = 1 × 1) is found near the city of Rio de Janeiro. Furthermore, they report that the Serra dos Órgãos, with 746 species, is another major area of great Angiosperm richness.

Articles other than taxonomic treatments have greatly contributed to our knowledge of the floristic diversity of Rio de Janeiro state, reporting species richness of a given region or diversity that is available in herbaria collections, for example: *Flora Organensis*, an important publication dealing with the flora of Serra dos Órgãos National Park (Rizzini 1954); *Espécies coletadas no Estado do Rio de Janeiro e depositadas no Herbário RB* listing all taxa and the respective municipalities where the species occur (Marques & Novaes 1996); collection stations in Rio de Janeiro state mapping 165 areas to be visited due to the lack of information on diversity of the local flora (Guimarães & Mautone 1984).

Furthermore, several studies of local floras, mainly in the *restingas* (see references cited in Araujo *et al.* 1994; Costa & Dias 2001) and the Atlantic Forest (Rizzini 1954; Dusén 1955; Brade 1956; Lima & Guedes-Bruni 1994, 1996; Lima & Guedes-Bruni 1997; Marques *et al.* 1997) have been published, as well as other articles found in

Figure 2 – Plant species in the flora of the Rio de Janeiro state, examples – a. *Anthurium minarum*; b. *Araucaria angustifolia*; c. *Asplenium cariocanum*; d. *Brasiliorchis ubatubana*; e. *Ipomoea bonariensis*; f. *Luehea grandiflora*; g. *Jungermannia hyalina*; h. *Lupinus gilbertianus*; i. *Microlicia isophylla*; j. *Paepalanthus ovatus*; k. *Passiflora amethystina*; l. *Paullinia rubiginosa*; m. *Pavonia malacophylla*; n. *Solanum cernuum*; o. *Zygopetalum mackayi*. (Photos: a,d,e,l,m. M.A.N. Coelho; b,f,h,i,k,n,o. J.F.A. Baumgratz; c. C. Mynssen; g. M.A. Rezende; j. M. Trovó).

a special volume of Rodriguesia (vol. 57, no. 3), published in 2006 concerning the Poço das Antas Biological Reserve. We also highlight the iniciative of G.M. Barroso and collaborators (Barroso *et al.* 1974) who studied the Dioscoreaceae of Guanabara state (today Rio de Janeiro municipality), which gave rise to a multidisciplinar team that surveyed the state´s flora, the main sources of information being species in their natural habitat plus herbarium collections.

We present a brief summary in retrospect of monographic treatments on the flora of Rio de Janeiro state. The numbers are impressive, but still far from revealing the true diversity of the flora. A survey of the volumes of Rodriguésia, Arquivos do Jardim Botânico do Rio de Janeiro (<http://www.jbrj.gov.br>) and Albertoa (Marques & Martins 1997) reveals a total of 85 publications dealing with families as well as genera and infrageneric taxa. Equally important are publications of new genera and species of the flora that have been discovered.

The Flora of Rio de Janeiro State project began in 2001, informally coordinated, with representatives from research and teaching institutions, both public and private, in the state. The proposal was to publish monographs of the botanical groups that constitute the flora of Rio de Janeiro. An instruction manual for authors was produced to standardize monographic treatments as well as a grid map to record distribution in the state. Currently, manuscripts follow Rodriguésia publication guidelines, so the grid map can be used (Fig. 3).

In 2007, the online edition of the *Checklist da Flora do Rio de Janeiro* was begun (<http://www.jbrj.gov.br/pesquisa/div_tax>). For this purpose a specific module was constructed within the scientific collections management system - JABOT (<http://jabot.jbrj.gov.br>). This module has enabled researchers to associate taxa with the Catalogue and add information such as: conservation unit, vegetation type, municipality, etc. The model follows the concept of *Sistemas Colaborativos* proposed by Pimentel & Fuks (2011). A total of 3,243 species and varieties had been recorded in 153 families by the year 2010. As of 2011, a new consolidated version of this checklist was prepared and made available online:

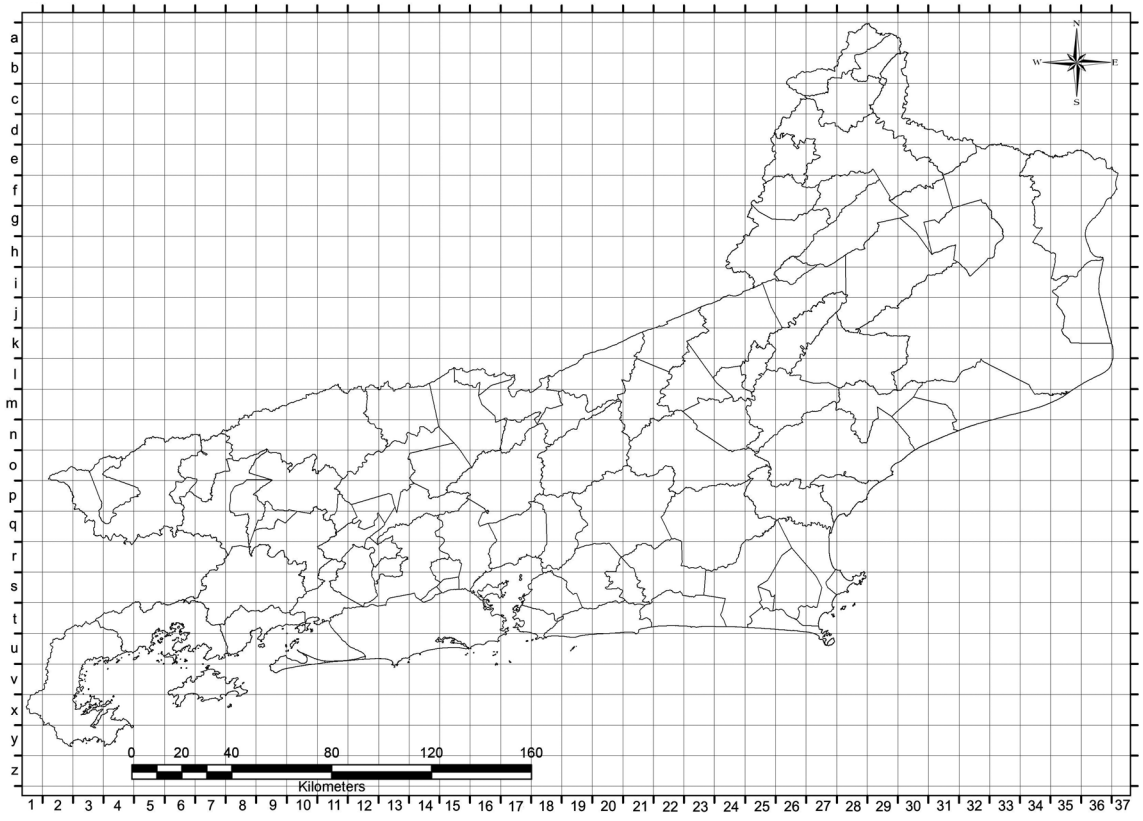

Figure 3 – Grid map used in the Flora of Rio de Janeiro state.

Catálogo de espécies de plantas vasculares e briófitas da flora do estado do Rio de Janeiro (<http://floriariojaneiro.jbrj.gov.br>) (Fig. 4), within the same JABOT base and supported by Fundação Carlos Chagas Filho de Amparo à Pesquisa do estado do Rio de Janeiro (FAPERJ).

In this new research scenario aimed to computerize all data on biodiversity and with the participation of over 150 participants, information was consolidated in the catalog on species richness of the vascular-plant and bryophyte flora in Rio de Janeiro state. Diversity was illustrated graphically as regards municipalities, vegetation types, conservation units and degrees of threat, in addition to herbarium specimen images. Currently 334 families, 1,821 genera and, 8,203 species, subspecies and varieties have been recorded, 1,740 of which are endemic.

Vegetation formations with higher angiosperm, gymnosperm, bryophyte, fern and lycophyte richness are Dense Ombrophilous Forest, Semideciduous Forest, High-altitude Grasslands and mixed Ombrophilous Forest.

As regards municipalities, the five most representative in number of species are Rio de Janeiro (4,362 spp.), Itatiaia (2,746 spp.), Petrópolis (2,532 spp.), Teresópolis (2,464 spp.) and Nova Friburgo (2,243 spp.) (<http://floriariojaneiro.jbrj.gov.br>). These municipalities are the most representative for all groups listed, except Petrópolis, one of the five richest in angiosperm species (2,259 spp.). For ferns and lycophytes, the fifth richest municipality is Santa Maria Madalena, with 165 spp. (*vs*. 145 in Petrópolis), while for bryophytes it is Niterói, with 205 spp. (*vs*. 126 in Petrópolis) (Tab. 1).

The five families of Angiosperms with greatest species richness are Orchidaceae (714 spp.), Leguminosae (399 spp.), Asteraceae (353 spp.), Bromeliaceae (311 spp.) and Melastomataceae (304 spp.). These families are also among the ten most diverse in the flora of Brazil and the Atlantic Rainforest Biome (BFG 2015).

In relation to ferns and lycophytes, the five most species-diverse families in Rio de Janeiro are Dryopteridaceae (86), Polypodiaceae (80), Pteridaceae (74), Aspleniaceae (43) and Hymenophyllaceae (36), all included in the group of 10 most diverse families in Brazil, according to Prado *et al.* (2015). Within the bryophyte families Lejeuneaceae (143), Dicranaceae (45 spp.), Sphagnaceae (43 spp.), Pilotrichaceae (37 spp.) and Sematophyllaceae (33 spp.) are part of the 10 most diverse.

As regards conservation units at the state level, the most representative in number of species

Figure 4 – Screen of the Catalog system of the flora do estado do Rio de Janeiro (<http://floriariojaneiro.jbrj.gov.br>).

Table 1 – Municipalities with highest species richness per group surveyed.

Municipality	Angiosperms	Ferns and Lycophytes	Bryophytes
Rio de Janeiro	3.844	246	269
Itatiaia	2.006	337	402
Petrópolis	2.259	145	126
Teresópolis	1.905	341	218
Nova Friburgo	1.834	173	233

for all inventoried groups are Serra dos Órgãos National Park (1,512 spp.), Itatiaia National Park (1,492 spp.), Tijuca National Park (1,141 spp.), Cairuçú Environmental Protection Area (503 spp.) and Poço das Antas Biological Reserve (451 spp.).

There is still an immense challenge to increase our knowledge, both in quality and quantity, of the Rio de Janeiro flora. There is an unfair struggle between acquired knowledge and vegetation vulnerability due to fragmentation and degradation, together with the effects of climate change and loss of diversity and possibly the loss of unpublished data regarding biodiversity. In addition, we most explore little-known areas or those not yet visited, do taxonomic studies on various botanical groups and study the floristic richness of various remaining fragments of the Atlantic Forest hotspot. Given this panorama, ongoing taxonomic studies will be essential to address gaps and gather knowledge (the most up-to-date possible) on the diversity of botanical groups that make up the plant formations, highlighting endemic species and those that have been shown to be threatened to a certain degree within the Rio de Janeiro flora. The importance of creating and maintaining protected areas must be stressed.

Apart from the advances already made in our knowledge of the large groups of Rio de Janeiro flora, based on botanical collections and floristic and taxonomic studies, it is clear that for many municipalities such as Aperibé, Belford Roxo, Comendador Levy Gasparian, Italva, Japeri, Laje de Muriaé, Macuco, Mesquita, Miracema, Natividade, Nilópolis, Pinheiral, Porto Real, São João de Meriti and São José de Ubá e Tanguá, the availability of information on flowering-plant diversity is still incipient, i.e. 10 species or less (<http://florariojaneiro.jbrj.gov.br>). This fact is mainly due to very few studies on vegetation patches, lack of collections, extreme degradation of natural environments, agropastoral activities and the absence of conservation units. Also, for many of these protected areas, at federal, state, and municipal levels, information on diversity is also very rudimentary, and may be fewer than 10 Angiosperm or fern and lycophyte records.

Rio de Janeiro state, together with Minas Gerais and Espírito Santo, leads the list of endangered species in Brazil. Based on a spatial perspective, it is part of the group of states with the highest proportion of species that are of interest for conservation and research. In addition, like Bahia, Espírito Santo, Minas Gerais and São Paulo, Rio de Janeiro state accounts for over 100 species that are not endangered but are of interest for conservation or research (Martinelli *et al.* 2013). Surprisingly, according to the *Catálogo de espécies de plantas vasculares e briófitas da flora do estado do Rio de Janeiro* (<http://florariojaneiro.jbrj.gov.br>), 786 species are listed as being endangered to a certain extent and 17 species are listed as extinct in Rio de Janeiro. Although these data do not constitute an official list, it is of significant concern and deserves to be carefully investigated in order to ensure preservation of Rio de Janeiro's floristic heritage.

This special volume of Rodriguésia dedicated to the flora of Rio de Janeiro state consolidates several initiatives of *Projeto Flora do Estado do Rio de Janeiro*, such as the *Catálogo de espécies de plantas vasculares e briófitas da flora do estado do Rio de Janeiro* (<http://florariojaneiro.jbrj.gov.br>). In this volume, there are 19 families with 76 species of Angiosperms - Aizoaceae, Alismataceae, Asparagaceae, Ceratophyllaceae, Cabombaceae, Haloragaceae, Hydrocharitaceae, Hydroleaceae, Juncaginaceae, Lentibulariaceae, Mayacaceae, Menyanthaceae, Molluginaceae, Myristicaceae, Nymphaeaceae, Pontederiaceae, Potamogetonaceae, Rhizophoraceae and Typhaceae. These new articles, as well as others published in

previous volumes of Rodriguésia and also in the Arquivos do Jardim Botânico do Rio de Janeiro (1915–1996), Arquivos do Instituto de Biologia Vegetal (1934–1938), Arquivos do Instituto do Serviço Florestal (1939–1957) are accessible online both on the JBRJ web page (<http://jbrj.gov.br/publicacoes/editoriais>) and the Catálogo (<http://florariojaneiro.jbrj.gov.br>). It should be mentioned here that monographs of the families Elaeocarpaceae, Combretaceae, Lentibulariaceae, Marcgraviaceae and Polygalaceae have already been published (Marques & Malik 1997). We aim to strongly encourage the publication of monographs of other botanical groups, thus providing an ever-increasing knowledge of the Rio de Janeiro flora and the true floristic diversity of the state. Families with large numbers of genera and species, such as Leguminosae, subfamilies, tribes and genera must be dealt with independently.

Our collective effort should keep on gathering knowledge of the Rio de Janeiro flora acquired over decades by researchers, as well as collecting information as yet unknown and retained in herbaria. We hope that this initiative will encourage new monographs and coordinated activities to extend our knowledge on the diversity of the Rio de Janeiro state flora, especially in areas hitherto very poorly studied and with low representation in botanical collections. In this context, floristic and taxonomic studies will increasingly encourage formation of new taxonomists and investigation of forest remnants that are little known floristically. Based on a better understanding and appreciation of the flora of Rio de Janeiro will certainly lead to more conscientious decision-making and actions for conservation and sustainable use of remnant vegetation patches.

Acknowledgements

We are grateful to the Fundação Carlos Chagas Filho de Amparo à Pesquisa do estado do Rio de Janeiro (Faperj), for financial support and encouragement in the development of the Project *Catálogo de espécies de plantas vasculares e briófitas da flora do estado do Rio de Janeiro*, including a Scientific Initiation Grant. To the collaborators, for the valuable participation in the Catalog, including data referring to the respective botanical groups. The technical team of the Núcleo de Computação Científica e Geoprocessamento (NCCG) and Coordenação de Tecnologia da Informação e da Comunicação (CTIC), both of the Instituto de Pesquisas Jardim Botânico do Rio de Janeiro, for the constant support in managing the database. To the Instituto Estadual do Ambiente (Inea) of Rio de Janeiro state, and Instituto Chico Mendes de Conservação da Biodiversidade (ICMBio) of the Ministério do Meio Ambiente (MMA), as well as directors and heads of the Conservation Units of Rio de Janeiro state, for the collection licenses granted and support for activities developed in the field. Dra. Dorothy Sue Dunn de Araujo, Associate Researcher of the Instituto de Pesquisas Jardim Botânico do Rio de Janeiro, for the English version of this text. The Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq), for financial support (Produtividade em Pesquisa) to the second author. And to all who have directly and indirectly contributed to the improvement and updating of the *Catálogo de espécies de plantas vasculares e briófitas da flora do estado do Rio de Janeiro*.

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Artigo recebido em 19/12/2016. Aceito para publicação em 07/03/2017.