

Article

Not peer-reviewed version

Bryophytes of the Serra dos Órgãos National Park: endemism and conservation in the Atlantic Forest.

[Jéssica Soares de Lima](#)*, [Allan Laid Alkimim Faria](#), [Mateus Tomás Anselmo Gonçalves](#),
[Denilson Fernandes Peralta](#)

Posted Date: 19 June 2025

doi: 10.20944/preprints202506.1554.v1

Keywords: endangered species; highlands; liverworts; mosses



Preprints.org is a free multidisciplinary platform providing preprint service that is dedicated to making early versions of research outputs permanently available and citable. Preprints posted at Preprints.org appear in Web of Science, Crossref, Google Scholar, Scilit, Europe PMC.

Copyright: This open access article is published under a Creative Commons CC BY 4.0 license, which permit the free download, distribution, and reuse, provided that the author and preprint are cited in any reuse.

Article

Bryophytes of the Serra dos Órgãos National Park: Endemism and Conservation in the Atlantic Forest

Jéssica de Lima ^{1,*}, Allan Faria ², Mateus Gonçalves ¹ and Denilson Peralta ¹

¹ Instituto de Pesquisas Ambientais, Av. Miguel Stéfano, 3687-CEP, São Paulo 04301-102, SP, Brasil

² Instituto de Biologia, Campus Darcy Ribeiro, Universidade de Brasília, Asa Norte-CEP, Brasília 70910-900, DF, Brasil

* Correspondence: jessicadelimaa@gmail.com

Abstract: This study presents a comprehensive inventory of bryophytes in Serra dos Órgãos National Park (PARNASO), aiming to evaluate species richness, floristic composition and threatened taxa. Despite the state of Rio de Janeiro being one of the most extensively sampled regions for bryophytes in Brazil, detailed surveys of its conservation units remain scarce. Data were obtained through bibliographic review, herbarium specimen analysis, and new field collections. A total of 507 species were recorded, belonging to 206 genera and 77 families, including 17 new records for the state. The Park harbors three locally endemic species, eight endemic to Rio de Janeiro, and 69 species endemic to Brazil. Additionally, eleven species were identified as threatened, comprising seven Endangered (EN), two Critically Endangered (CR), and two Vulnerable (VU). Montane Forest showed the highest species richness, followed by High-altitude Fields, Upper-montane Forest, and Sub-montane Forest. The findings highlight PARNASO's importance in preserving bryophyte diversity in a highly biodiverse yet understudied region. This work contributes valuable baseline data to support conservation strategies and future ecological studies in Atlantic Forest remnants.

Keywords: endangered species; highlands; liverworts; mosses

1. Introduction

Serra dos Órgãos National Park (PARNASO), established on November 30th, 1939, holds the distinction of being the third national park created in Brazil. This protected area is situated within the Atlantic Forest domain, specifically in the Serra do Mar massifs and called Órgãos because its peaks resemble and are named as “organs”. The Serra do Mar is an extensive mountain ranging approximately 1,500 kilometers along the Brazilian coast, from the northern Santa Catarina State to Rio de Janeiro State [1,2].

PARNASO currently represents one of the most important remaining biodiversity hotspots in Rio de Janeiro State, since its environment formations are one of the largest centers of flower plant endemism in the Atlantic Forest. It also plays a vital role in preserving essential water sources that feed two main watersheds — Paraíba do Sul and several streams of the Baía de Guanabara [3,4,5,6,7,8].

The Atlantic Forest domain is one of the most species-rich forests in the tropics [9,4,10], with. It is also recognized for having high levels of biodiversity and endemism, expressed via its complex structural environments [11,12].

Tropical forests hold the highest diversity of bryophyte species in the world due to their structural complexity and microhabitat diversity [13,14]. This diversity varies in altitudinal, both in structure and floristic composition [15,16,17, 14,18,19,20,21,22].

The Atlantic Forest within PARNASO comprises well-preserved forests characterized by four distinct vegetation formations based on altitude, climate, and soil conditions, among other factors [23,24,25,6,26]. In the lower parts around Sede Guapimirim, Sub-montane Forest prevails, while near

Sede at Teresópolis, the forest transitions from Montane Forest to Upper-montane Forest, culminating above 2,000 m.a.s.l. and High-altitude Fields along the trail from Teresópolis to Petrópolis [27].

Latitude, climatic variation and substrate disponibility due strong influence on species diversity with the altitude of these belts in different regions [15,18], while low species occurrence follows lower altitudinal ranges [28].

The species list of the vascular plants in Flora Organensis [23] is strongly based on the work of 18th century botanists and on collections made especially by A.C. Brade (1881-1971) and C.T. Rizzini (1921-1992), between the 1930s and 1950s of the 20th century. These collectors also recorded bryophytes and the specimens are studied by Bartram (1954), who found 146 species. Most bryophyte specimens from Serra dos Órgãos are deposited in the Herbarium of Jardim Botânico do Rio de Janeiro (RB).

Bryophytes from PARNASO were low explored, even though several researchers collected and published new taxa, the information was dispersed as examined material in taxonomical revisionary work. Faria et al. (2021) do collections trying to re-collect species founded by Glaziou in Serra dos Órgaos and the taxonomic reclassification of an Atlantic Forest endemic [30].

There is no other information of bryophytes in PARNASO, thus, no detailed data on the floristic structure and composition of bryophytes. A list of the species will fill an important area of the Rio de Janeiro state and help the threatened evaluation of bryophytes species. As well as provide revised herbarium specimens and new collections to stimulate new research on ecology and biogeography in this important National Park.

This work aimed to provide an inventory of the bryophyte species in PARNASO and discuss the following topics: (i) Species richness and floristic composition; (ii) Substrate colonization; and (iii) Endemism and conservation status.

2. Results

2.1. Species Richness and Floristic Composition

The present study documented 507 species, in 206 genera and 77 families (Table 1). The Serra dos Orgaos National Park preserves 57% of the known bryophyte flora of Rio de Janeiro State and 31% of Brazil. Seventeen new species occurrences for Rio de Janeiro State are founded, indicated by # in Table 1. We analyse ca 3,000 specimens for 428 species, while 79 species (indicated by * in Table 1) remains known only in the literature.

Three species are locally endemic, being known only from the type specimens collected over 100 years ago: *Southbya organensis* (Lützelburg 6003 p.p. [holotype JE]), *Plagiochila pseudoradicans* (Lützelburg 6029b [holotype JE]) and *Dicranodontium pulchroalare* ssp. *brasiliense* (Lützelburg 1519 [holotype JE]). Efforts are needed to obtain new records for these species.

Table 1. Richness and diversity of bryophyte species. Symbols on the species voucher: species only known from the literature (*); new occurrences of species for the Rio de Janeiro State (#).

Group	Family	Táxon		Author	Vouche r
Liverworts	Acrobolbaceae	<i>Tylimanthus</i>	<i>laxus</i>	(Lehm. & Lindenb.) Spruce	Peralta 27761 (SP)
	Adelanthaceae	<i>Syzygiella</i>	<i>colorata</i>	(Lehm.) K. Feldberg <i>et al.</i>	Gonçalv es 363 (SP)
	Adelanthaceae	<i>Syzygiella</i>	<i>concreta</i>	(Gottsche) Spruce	Peralta 20397 (SP)
	Aneuraceae	<i>Aneura</i>	<i>pinguis</i>	(L.) Dumort.	Peralta 27768 (SP)
	Aneuraceae	<i>Riccardia</i>	<i>digitiloba</i>	(Spruce ex Steph.) Pagán	Peralta 27496 (SP)

Aneuraceae	<i>Riccardia</i>	<i>emarginata</i>	(Steph.) Hell	Peralta 27618 (SP)
Aneuraceae	<i>Riccardia</i>	<i>fucoidea</i>	(Sw.) Schiffn.	Peralta 20395 (SP)
Aneuraceae	<i>Riccardia</i>	<i>glaziou</i>	(Spruce) Meenks	Gaspar 121 (R)
Aneuraceae	<i>Riccardia</i>	<i>regnellii</i>	(Aongström.) Hell	Peralta 27487 (SP)
Arnellaceae	<i>Gongylanthus</i>	<i>liebmannianus</i>	(Lindenb. & Gott.) Steph	Gonçalv es 358 (SP) *Ph. v. Lützelb urg 6003
Arnellaceae	<i>Southbya</i>	<i>organensis</i>	Herzog	p.p. (Tipo JE)
Balantiopsidacea e	<i>Isotachis</i>	<i>aubertii</i>	(Schwägr.) Mitt.	Gaspar 148 (R)
Balantiopsidacea e	<i>Isotachis</i>	<i>erythrorhiza</i>	(Lehm. & Lindenb.) Steph.	Peralta 27572 (SP)
Balantiopsidacea e	<i>Isotachis</i>	<i>multiceps</i>	(Lindenb. & Gottsche) Gottsche	Lima 783 (SP)
Balantiopsidacea e	<i>Isotachis</i>	<i>serrulata</i>	(Sw.) Gottsche	Gonçalv es 396 (SP)
Balantiopsidacea e	<i>Neesioscyphus</i>	<i>carneus</i>	(Nees) Grolle	Peralta 20398 (SP)
Balantiopsidacea e	<i>Neesioscyphus</i>	<i>homophyllus</i>	(Nees) Grolle	Peralta 27722 (SP)
Calypogeiaceae	<i>Calypogeia</i>	<i>peruviana</i>	Nees & Mont.	Peralta 27491 (SP)
Cephaloziaceae	<i>Cephaloziella</i>	<i>divaricada</i>	(Sm.) Schiffn.	Gaspar 112 (R)
Cephaloziaceae	<i>Cephaloziella</i>	<i>granatensis</i>	(J.B.Jack) Fulford	Peralta 27638 (SP)
Cephaloziaceae	<i>Cylindrocolea</i>	<i>planifolia</i>	(Steph.) R.M.Schust.	Peralta 27621 (SP)
Cephaloziaceae	<i>Kymatocalyx</i>	<i>dominicensis</i>	(Spruce) Vána	Peralta 27755 (SP)
Cephaloziaceae	<i>Odontoschisma</i>	<i>denudatum</i>	(Nees) Dumort.	Peralta 20506 (SP)
Cephaloziaceae	<i>Odontoschisma</i>	<i>longiflorum</i>	(Taylor) Trevis.	*Fulford (1976)
Cephaloziellacea e	<i>Cephaloziopsis</i>	<i>intertexta</i>	(Gottsche) R.M. Schust.	Peralta 27488 (SP)

Cephaloziellaceae	<i>Fuscocephaloziopsis</i>	<i>crassifolia</i>	(Lindenb. & Gottsche) Váňa & L. Söderstr.	Dias 1414 (SP)
Dumortieraceae	<i>Dumortiera</i>	<i>hirsuta</i>	Nees & Mont.	Peralta 27710 (SP)
Frullaniaceae	<i>Frullania</i>	<i>atrata</i>	Nees	Faria 1560 (SP)
Frullaniaceae	<i>Frullania</i>	<i>beyrichiana</i>	(Lehm. & Lindenb.) Lehm. & Lindenb.	*Beyrich s.n. (holótip o W)
Frullaniaceae	<i>Frullania</i>	<i>brasiliensis</i>	Raddi	Peralta 27631 (SP)
Frullaniaceae	<i>Frullania</i>	<i>cuencensis</i>	Taylor	Peralta 27551 (SP)
Frullaniaceae	<i>Frullania</i>	<i>ericoides</i>	(Nees) Mont.	*Nees (1833, as <i>Jungermannia</i>)
Frullaniaceae	<i>Frullania</i>	<i>kunzei</i>	(Lehm. & Lindb.) Lehm. & Lindb.	Peralta 20492 (SP)
Frullaniaceae	<i>Frullania</i>	<i>obcordata</i>	(Lehm. & Lindenb.) Lehm. & Lindenb.	*Winter & Schaefer Verwimp (2020)
Frullaniaceae	<i>Frullania</i>	<i>obscura</i>	(Sw.) Dumort.	Peralta 20453 (SP)
Frullaniaceae	<i>Frullania</i>	<i>riojaneirensis</i>	(Raddi) Spruce	*Gottsch e <i>et al.</i> (1844)
Frullaniaceae	<i>Frullania</i>	<i>schaefer-verwimpii</i>	Yuzawa & Hatt.	Schafer-Verwimp 7375 (SP)
Frullaniaceae	<i>Frullania</i>	<i>setigera</i>	Steph.	Peralta 27501 (SP)
Frullaniaceae	<i>Frullania</i>	<i>vitalii</i>	Yuzawa & Hatt.	Yano 13575 (SP)
Geocalycaceae	<i>Saccogynidium</i>	<i>caldense</i>	(Ångstr.) Grolle	Peralta 27620 (SP)
Herbertaceae	<i>Herbertus</i>	<i>acanthelius</i>	Spruce	Peralta 27534 (SP)
Herbertaceae	<i>Herbertus</i>	<i>juniperoideus</i>	(Sw.) Grolle	Gissi 339 (SP)
Herbertaceae	<i>Herbertus</i>	<i>pensilis</i>	(T. Taylor) Spruce	Peralta 27612 (SP)

Herbertaceae	<i>Herbertus</i>	<i>sendtneri</i>	(Nees) A. Evans	*Fulford (1963 with Herbertus grossispinus)
Herbertaceae	<i>Triandrophyllum</i>	<i>subtrifidum</i>	(Hook.f. & Taylor) Fulford & Hatch.	*Grolle (1964) Lima 789pp (SP)
Jamesoniellaceae	<i>Syzygiella</i>	<i>anomala</i>	(Lindenb. & Gottsche) Steph.	Peralta 27575 (SP)
Jamesoniellaceae	<i>Syzygiella</i>	<i>colorata</i>	(Lehm.) K. Feldberg <i>et al.</i>	Peralta 20509 (SP)
Jamesoniellaceae	<i>Syzygiella</i>	<i>contigua</i>	Steph.	Gonçalves 389 (SP)
Jamesoniellaceae	<i>Syzygiella</i>	<i>manca</i>	(Mont.) J. B. Jack & Steph.	Peralta 20401 (SP)
Jamesoniellaceae	<i>Syzygiella</i>	<i>perfoliata</i>	(Sw.) Spruce	Peralta 27502 (SP)
Jamesoniellaceae	<i>Syzygiella</i>	<i>sonderi</i>	(Gottsche) K. Feldberg, Váňa, Hentschel & Heinrichs	Peralta 27613 (SP)
Jamesoniellaceae	<i>Syzygiella</i>	<i>trigonifolia</i>	(Steph.) Herzog, Hedwigia	Peralta 20428 (SP)
Jamesoniellaceae	<i>Syzygiella</i>	<i>uleana</i>	Steph.	Peralta 20380 (SP)
Jungermanniaceae	<i>Anastrophyllum</i>	<i>piligerum</i>	(Nees) Steph.	Peralta 27565 (SP)
Jungermanniaceae	<i>Anastrophyllum</i>	<i>tubulosum</i>	(Nees) Grolle	Gaspar 131 (R)
Jungermanniaceae	<i>Jungermannia</i>	<i>amoena</i>	Lindenb. & Gottsche	Lima 792 (SP)
Jungermanniaceae	<i>Jungermannia</i>	<i>hyalina</i>	Lyell	Gaspar 122 (R)
Jungermanniaceae	<i>Jungermannia</i>	<i>sphaerocarpa</i>	Hook.	Peralta 27465 (SP)
Lejeuneaceae	<i>Acanthocoleus</i>	<i>aberrans</i>	(Lindenb. & Gottsche) Kruijt	Peralta 27645 (SP)
Lejeuneaceae	<i>Anoplolejeunea</i>	<i>conferta</i>	(C.F.W.Meissn. ex Spreng.) A.Evans	Peralta 27577 (SP)
Lejeuneaceae	<i>Blepharolejeunea</i>	<i>incongrua</i>	(Lindenb. & Gottsche) van Slageren & Kruijt	*Gottsch <i>et al.</i> (1844)
Lejeuneaceae	<i>Brachiolejeunea</i>	<i>phyllorhiza</i>	(Nees) Kruijt & Gradst.	*Stotler &
Lejeuneaceae	<i>Bryopteris</i>	<i>diffusa</i>	(Sw.) Nees	

				Crandal 1 (1974)
Lejeuneaceae	<i>Bryopteris</i>	<i>filicina</i>	(Sw.) Nees	Peralta 27530 (SP)
Lejeuneaceae	<i>Ceratolejeunea</i>	<i>rubiginosa</i>	Gottsche ex Steph.	Peralta 27681 (SP)
Lejeuneaceae	<i>Cheilolejeunea</i>	<i>acutangula</i>	(Nees) Grolle	Peralta 27523 (SP)
Lejeuneaceae	<i>Cheilolejeunea</i>	<i>beyrichii</i>	(Lindenb.) E. Reiner	Peralta 27492 (SP)
Lejeuneaceae	<i>Cheilolejeunea</i>	<i>filiformis</i>	(Sw.) W. Ye, R.L. Zhu & Gradst.	*Gottsch e et al. (1844, as Omphal anthus)
Lejeuneaceae	<i>Cheilolejeunea</i>	<i>grosseoleosa</i>	C.J. Bastos & Schäf.-Verw.	Peralta 27549pp (SP)
Lejeuneaceae	<i>Cheilolejeunea</i>	<i>holostipa</i>	(Spruce) Grolle & R.-L.Zhu	Alkimi m-Faria 1486
Lejeuneaceae	<i>Cheilolejeunea</i>	<i>unciloba</i>	(Lindenb.) Malombe	Lima 750 (SP)
Lejeuneaceae	<i>Cheilolejeunea</i>	<i>xanthocarpa</i>	(Lehm. & Lindenb.) Malombe	Peralta 27504 (SP)
Lejeuneaceae	<i>Cololejeunea</i>	<i>cardiocarpa</i>	(Mont.) A.Evans	Peralta 27687pp (SP)
Lejeuneaceae	<i>Cololejeunea</i>	<i>diaphana</i>	A. Evans	Peralta 27687pp (SP)
Lejeuneaceae	<i>Cololejeunea</i>	<i>jamesii</i>	M.E.Reiner & Pócs	Peralta 20511pp (SP)
Lejeuneaceae	<i>Cololejeunea</i>	<i>microscopica</i>	(Taylor) Schiffn.	Peralta 27694 (SP)
Lejeuneaceae	<i>Cololejeunea</i>	<i>papilliloba</i>	(Steph). Steph.	Peralta 27695 (SP)
Lejeuneaceae	<i>Colura</i>	<i>Itatyana</i>	Steph.	Gaspar 138 (R)
Lejeuneaceae	<i>Colura</i>	<i>tenuicornis</i>	(A.Evans) Steph.	*Jovet- Ast (1953)
Lejeuneaceae	<i>Cyclolejeunea</i>	<i>luteola</i>	(Spruce) Grolle & R.-L.Zhu	Schafer- Verwim p 7416 (SP)
Lejeuneaceae	<i>Dibrachiella</i>	<i>parviflora</i>	(Nees) X.Q. Shi, R.L. Zhu & Gradst.	Silva, AL 500
Lejeuneaceae	<i>Dicranolejeunea</i>	<i>axilaris</i>	(Nees & Mont.) Schiffn.	Peralta 27735 (SP)

Lejeuneaceae	<i>Diplasiolejeunea</i>	<i>alata</i>	Jovet-Ast	Peralta 27593pp (SP) *Gradst ein & Costa (2003)
Lejeuneaceae	<i>Diplasiolejeunea</i>	<i>unidentata</i>	(Lehm. & Lindenb.) Schiffn.	Peralta 27659 (SP)
Lejeuneaceae	<i>Drepanolejeunea</i>	<i>anoplanta</i>	(Spruce) Steph.	Gaspar 135 (R)
Lejeuneaceae	<i>Drepanolejeunea</i>	<i>araucariae</i>	Steph.	Gaspar 117 (R)
Lejeuneaceae	<i>Drepanolejeunea</i>	<i>bidens</i>	(Steph.) A.Evans	Peralta 27593pp (SP)
Lejeuneaceae	<i>Drepanolejeunea</i>	<i>fragilis</i>	Bischl.	*Bischle r (1964)
Lejeuneaceae	<i>Drepanolejeunea</i>	<i>lichenicola</i>	(Spruce) Steph.	Peralta 27639 (SP)
Lejeuneaceae	<i>Drepanolejeunea</i>	<i>mosenii</i>	(Steph.) Bischl.	Peralta 27646 (SP)
Lejeuneaceae	<i>Frullanoides</i>	<i>tristis</i>	van Slageren	Peralta 27495 (SP)
Lejeuneaceae	<i>Haplolejeunea</i>	<i>umbrosa</i>	Gradst. & Ilkiu-Borges	Gaspar 124 (R)
Lejeuneaceae	<i>Harpalejeunea</i>	<i>oxyphylla</i>	(Nees & Mont.) Steph.	Peralta 27462 (SP)
Lejeuneaceae	<i>Harpalejeunea</i>	<i>schiffneri</i>	S.W. Arnell	Peralta 27526 (SP)
Lejeuneaceae	<i>Harpalejeunea</i>	<i>stricta</i>	(Lindenb. & Gottsche) Steph.	Peralta 20450pp (SP)
Lejeuneaceae	<i>Harpalejeunea</i>	<i>subacuta</i>	A. Evans	Peralta 27463 (SP)
Lejeuneaceae	<i>Lejeunea</i>	<i>acanthogona</i>	Spruce	Lima 750 (SP)
Lejeuneaceae	<i>Lejeunea</i>	<i>aphanes</i>	Spruce	Peralta 27719 (SP)
Lejeuneaceae	<i>Lejeunea</i>	<i>bermudiana</i>	(A.Evans) R.M.Schust.	*Beyrich s.n. (Tipo NY)
Lejeuneaceae	<i>Lejeunea</i>	<i>beyrichiana</i>	(Steph) Gradst. & C.J. Bastos	Schaefer -
Lejeuneaceae	<i>Lejeunea</i>	<i>cerina</i>	(Lehm. & Lindenb.) Gottsche	Verwim p 7369 (SP)
Lejeuneaceae	<i>Lejeunea</i>	<i>flaccida</i>	Lindenb. & Gottsche	Peralta 27512 (SP)

Lejeuneaceae	<i>Lejeunea</i>	<i>flava</i>	(Sw.) Nees	Peralta 27505 (SP)
Lejeuneaceae	<i>Lejeunea</i>	<i>glaucescens</i>	Gottsche	Peralta 27476 (SP) *Schäfer -
Lejeuneaceae	<i>Lejeunea</i>	<i>grossitexta</i>	(Steph.) E.Reiner & Goda	Verwimp & Vital (1989)
Lejeuneaceae	<i>Lejeunea</i>	<i>laetevirens</i>	Nees & Mont.	Peralta 27464 (SP)
Lejeuneaceae	<i>Lejeunea</i>	<i>longidentata</i>	C.J. Bastos, Gradst., S. Vilas Bôas-Bastos & Schäf.-Verw.	Peralta 27543 (SP)
Lejeuneaceae	<i>Lejeunea</i>	<i>oligoclada</i>	Spruce	Peralta 27498pp (SP)
Lejeuneaceae	<i>Lejeunea</i>	<i>pterigonia</i>	(Lehm. & Lindenb.) Mont.	Peralta 27525 (SP)
Lejeuneaceae	<i>Lejeunea</i>	<i>raddiana</i>	Lindenb.	Peratla 20484 (SP)
Lejeuneaceae	<i>Lejeunea</i>	<i>serpillifolioides</i>	(Raddi) Gradst.	Peralta 27611 (SP)
Lejeuneaceae	<i>Lejeunea</i>	<i>subplana</i>	(Steph.) C.J. Bastos	Gonçalves 306 pp (SP)
Lejeuneaceae	<i>Marchesinia</i>	<i>brachiata</i>	(Sw.) Schiffn.	Peralta 27508 (SP)
Lejeuneaceae	<i>Metalejeunea</i>	<i>cuculata</i>	(Reinw. <i>et al.</i>) Grolle	Yano 13558 (SP)
Lejeuneaceae	<i>Microlejeunea</i>	<i>cystifera</i>	Herzog	Peralta 27482 (SP)
Lejeuneaceae	<i>Microlejeunea</i>	<i>epiphylla</i>	Bischl.	Gonçalves 306 pp (SP)
Lejeuneaceae	<i>Microlejeunea</i>	<i>squarrosa</i>	J. Heinrichs, A. Schäfer-Verwimp, Pócs & S.S. Dong	Peralta 27671pp (SP)
Lejeuneaceae	<i>Microlejeunea</i>	<i>stricta</i>	(Lindenb. & Gottsche) Steph.	Lima 782pp (SP)
Lejeuneaceae	<i>Neurolejeunea</i>	<i>breutelii</i>	(Gottsche) A.Evans	Lima 767pp (SP)
Lejeuneaceae	<i>Otigoniolejeunea</i>	<i>huctumalcensis</i>	(Lindenb. & Gottsche) Y.M. Wei, R.L. Zhu & Gradst.	Peralta 27474 (SP)

Lejeuneaceae	<i>Prionolejeunea</i>	<i>aemula</i>	(Gottsche) A.Evans	Peralta 27727 (SP)
Lejeuneaceae	<i>Schiffneriolejeunea</i>	<i>polycarpa</i>	(Nees) Gradst.	Peralta 20468 (SP) *Gottsch e et al. (1844, as Phragmi coma juliform is)
Lejeuneaceae	<i>Vitalianthus</i>	<i>bischelerianus</i>	(Porto & Grolle) R.M.Schust. & Giancotti	Peralta 20394 (SP)
Lepidoziaceae	<i>Bazzania</i>	<i>aurescens</i>	Spruce	Fulford (1963)
Lepidoziaceae	<i>Bazzania</i>	<i>hookeri</i>	(Lindenb.) Trevis.	Peralta 27480 (SP)
Lepidoziaceae	<i>Bazzania</i>	<i>longistipula</i>	(Lindenb.) Trevis.	Peralta 27529 (SP) *Nees (1833, as Jungerm annia)
Lepidoziaceae	<i>Bazzania</i>	<i>nitida</i>	(Weber) Grolle	Lima 780 (SP)
Lepidoziaceae	<i>Bazzania</i>	<i>stolonifera</i>	(Sw.) Trevis.	Peralta 27532 (SP)
Lepidoziaceae	<i>Kurzia</i>	<i>capillaris</i>	(Sw.) Grolle	Gonçalv es 311 (SP)
Lepidoziaceae	<i>Lepidozia</i>	<i>coilophylla</i>	Taylor	Peralta 20402 (SP)
Lepidoziaceae	<i>Lepidozia</i>	<i>cupressina</i>	(Sw.) Lindenb.	Lima 784 (SP)
Lepidoziaceae	<i>Lepidozia</i>	<i>inaequalis</i>	(Lehm. & Lindenb.) Lehm. & Lindenb.	Peralta 27539 (SP) *Gottsch e et al. (1844, as M. vulgare)
Lepidoziaceae	<i>Lepidozia</i>	<i>incurvata</i>	Lindenb.	*Nees (1833, as Jungerm annia)
Lepidoziaceae	<i>Lepidozia</i>	<i>macrocolea</i>	Spruce	Dias 1310 (SP)
Lepidoziaceae	<i>Micropterygium</i>	<i>leiophyllum</i>	Spruce	Schafer- Verwim
Lepidoziaceae	<i>Micropterygium</i>	<i>pterygophyllum</i>	(Nees) Trevis.	
Lepidoziaceae	<i>Paracromastigum</i>	<i>dusenii</i>	R.M.Schust.	
Lepidoziaceae	<i>Paracromastigum</i>	<i>pachyrhizum</i>	(Nees) Fulford	

				p 7421 (SP) Lima 754 (SP)
Lepidoziaceae	<i>Telaranea</i>	<i>nematodes</i>	(Gottsche ex Austin) M.A.Howe	Peralta 27508 (SP)
Lophocoleaceae	<i>Lophocolea</i>	<i>muricata</i>	(Lehm.) Nees in Gottsche <i>et al.</i>	Peralta 27566 (SP)
Lophocoleaceae	<i>Clasmatocolea</i>	<i>vermicularis</i>	(Lehm.) Grolle	Lima 768 (SP)
Lophocoleaceae	<i>Cryptolophocolea</i>	<i>martiana</i>	(Nees) L.Soderstr. <i>et al.</i> subsp. martiana	Peralta 27556 (SP)
Lophocoleaceae	<i>Heteroscyphus</i>	<i>combinatus</i>	(Nees) Schiffn.	Peralta 27583 (SP)
Lophocoleaceae	<i>Leptoscyphus</i>	<i>amphibolius</i>	(Nees) Grolle	Peralta 27628 (SP)
Lophocoleaceae	<i>Leptoscyphus</i>	<i>porphyrius</i>	(Nees) Grolle	Peralta 27658 (SP)
Lophocoleaceae	<i>Leptoscyphus</i>	<i>spectabilis</i>	(Steph.) Grolle	Peralta 20420 (SP)
Lophocoleaceae	<i>Lophocolea</i>	<i>bidentata</i>	(L.) Dumort.	*Nees (1833, as <i>Jungermannia</i>)
Lophocoleaceae	<i>Lophocolea</i>	<i>connata</i>	(Sw.) Nees	Peralta 20379 (SP)
Lophocoleaceae	<i>Lophocolea</i>	<i>mandonii</i>	Steph.	Vital 1197 (SP)
Marchantiaceae	<i>Marchantia</i>	<i>chenopoda</i>	L.	Schwacke, C.A.W. s.n. (R)
Marchantiaceae	<i>Marchantia</i>	<i>polymorpha</i>	L.	Peralta 20475 (SP)
Marchantiaceae	<i>Marchantia</i>	<i>paleacea</i>	Bert.	Peralta 27471 (SP)
Metzgeriaceae	<i>Metzgeria</i>	<i>acuminata</i>	Steph.	Peralta 27475 (SP)
Metzgeriaceae	<i>Metzgeria</i>	<i>albinea</i>	Spruce	Dias 1234 (SP)
Metzgeriaceae	<i>Metzgeria</i>	<i>brasiliensis</i>	Schiffn.	*Raddi (1823)
Metzgeriaceae	<i>Metzgeria</i>	<i>ciliata</i>	Raddi	Silva, AL 517 (UB)
Metzgeriaceae	<i>Metzgeria</i>	<i>conjugata</i>	Lindb.	

Metzgeriaceae	<i>Metzgeria</i>	<i>consanguinea</i>	Schiffn.	Peralta 27528 (SP)
Metzgeriaceae	<i>Metzgeria</i>	<i>convoluta</i>	Steph.	*Costa (2008)
Metzgeriaceae	<i>Metzgeria</i>	<i>cratoneura</i>	Schiffn.	*Costa (2008)
Metzgeriaceae	<i>Metzgeria</i>	<i>decipiens</i>	(C. Massal.) Schiffn.	Eiten 7105 (SP)
Metzgeriaceae	<i>Metzgeria</i>	<i>fruticola</i>	Spruce	Peralta 27715 (SP)
Metzgeriaceae	<i>Metzgeria</i>	<i>furcata</i>	(L.) Dumort.	*Bartram (1954) Gonçalves 326 (SP)
Metzgeriaceae	<i>Metzgeria</i>	<i>hegewaldii</i>	Kuwah.	Peralta 27466 (SP)
Metzgeriaceae	<i>Metzgeria</i>	<i>lechlerii</i>	Steph.	*Costa <i>et al.</i> (2005)
Metzgeriaceae	<i>Metzgeria</i>	<i>myriopoda</i>	Lindb.	Yano 13561 (SP)
Noterocladaeae	<i>Noteroclada</i>	<i>confluens</i>	(Hook. f. & Taylor) Spruce	Peralta 20471 (SP)
Pallaviciniaceae	<i>Jensenia</i>	<i>spinosa</i>	(Lindenb. & Gottsche) Grolle	Gonçalves 400 (SP)
Pallaviciniaceae	<i>Pallavicinia</i>	<i>lyelii</i>	(Hook.) S.F.Gray	Gonçalves 186 (SP)
Pallaviciniaceae	<i>Symphyogyna</i>	<i>brasiliensis</i>	(Nees) Nees & Mont.	Peralta 27750 (SP)
Pallaviciniaceae	<i>Symphyogyna</i>	<i>podophylla</i>	(Thunb.) Mont. & Nees	Silva, AL 502
Plagiochilaceae	<i>Plagiochila</i>	<i>amicta</i>	Steph.	*Heinrichs (2002)
Plagiochilaceae	<i>Plagiochila</i>	<i>bicuspidata</i>	Gottsche	Peralta 10518 (SP)
Plagiochilaceae	<i>Plagiochila</i>	<i>bifaria</i>	(Sw.) Lindenb.	Peralta 27516 (SP)
Plagiochilaceae	<i>Plagiochila</i>	<i>boryana</i>	Gottsche ex Steph.	Peralta 27749 (SP)
Plagiochilaceae	<i>Plagiochila</i>	<i>corrugata</i>	(Nees) Nees & Mont.	Peralta 20376 (SP)
Plagiochilaceae	<i>Plagiochila</i>	<i>crispabilis</i>	Lindenb.	Peralta 20511 (SP)

Plagiochilaceae	<i>Plagiochila</i>	<i>cristata</i>	(Sw.) Lindenb.	Schafer-Verwimp 7401 (SP)
Plagiochilaceae	<i>Plagiochila</i>	<i>deflexirama</i>	Taylor	Peralta 27721 (SP)
Plagiochilaceae	<i>Plagiochila</i>	<i>exigua</i>	(Taylor) Taylor	Peralta 20468 (SP)
Plagiochilaceae	<i>Plagiochila</i>	<i>flabelliflora</i>	Steph.	Gonçalves 334 (SP)
Plagiochilaceae	<i>Plagiochila</i>	<i>gymnocalycina</i>	(Lehm. & Lindenb.) Lindenb.	Dias 1397 (SP)
Plagiochilaceae	<i>Plagiochila</i>	<i>loriloba</i>	Herzog ex Carl	Perlata 27519 (SP)
Plagiochilaceae	<i>Plagiochila</i>	<i>macrotachya</i>	Lindenb.	Peralta 27700 (SP)
Plagiochilaceae	<i>Plagiochila</i>	<i>martiana</i>	(Nees) Lindenb.	Peralta 20385 (SP)
Plagiochilaceae	<i>Plagiochila</i>	<i>montagnei</i>	Nees & Mont.	*Heinrichs & Gradstein (2000)
Plagiochilaceae	<i>Plagiochila</i>	<i>pseudoradicans</i>	Herzog	*Ph. v. Lützelburg 6029b (type JE)
Plagiochilaceae	<i>Plagiochila</i>	<i>punctata</i>	(Taylor) Taylor	Lima 783pp (SP)
Plagiochilaceae	<i>Plagiochila</i>	<i>rutilans</i>	Lindenb.	*Heinrichs <i>et al.</i> (2001)
Plagiochilaceae	<i>Plagiochila</i>	<i>simplex</i>	(Sw.) Lindenb.	Peralta 27780 (SP)
Plagiochilaceae	<i>Plagiochila</i>	<i>subbidentata</i>	Taylor	Peralta 27586 (SP)
Plagiochilaceae	<i>Plagiochila</i>	<i>superba</i>	d’Orbigny	Peralta 20457 (SP)
Porellaceae	<i>Porella</i>	<i>brasiliensis</i>	(Raddi) Schiffn.	Peralta 27724 (SP)
Porellaceae	<i>Porella</i>	<i>reflexa</i>	(Lehm. & Lindenb.) Trevis.	Yano 13580 (SP)
Radulaceae	<i>Radula</i>	<i>angulata</i>	Steph.	Peralta 27697 (SP)

	Radulaceae	<i>Radula</i>	<i>javanica</i>	Gottsche	Peralta 27527 (SP)
	Radulaceae	<i>Radula</i>	<i>ligula</i>	Steph.	Peralta 20407 (SP)
	Radulaceae	<i>Radula</i>	<i>nudicaulis</i>	Steph.	Gonçalv es 408 (SP)
	Radulaceae	<i>Radula</i>	<i>pallens</i>	(Sw.) Nees ex Mont	Lima 759 (SP)
	Radulaceae	<i>Radula</i>	<i>recubans</i>	Taylor	Gaspar 142 (R)
	Radulaceae	<i>Radula</i>	<i>schaefer- verwimpii</i>	K.Yamada	Peralta 27489 (SP)
	Radulaceae	<i>Radula</i>	<i>stenocalyx</i>	Mont.	Peralta 27691 (SP)
	Radulaceae	<i>Radula</i>	<i>subinflata</i>	Lindenb. et Gottsche	Gonçalv es 322 (SP)
	Radulaceae	<i>Radula</i>	<i>tectiloba</i>	Steph.	Peralta 27507 (SP)
	Radulaceae	<i>Radula</i>	<i>voluta</i>	Taylor ex Gottsche, Lindenb. & Nees	Peralta 20429 (SP)
	Riccardiaceae	<i>Riccardia</i>	<i>chamedryfolia</i>	(With.) Grolle	Silva, AL 515
	Scapaniaceae	<i>Scapania</i>	<i>portoricensis</i>	Hampe & Gottsche	Peralta 27541 (SP)
	Trichocoleaceae	<i>Trichocolea</i>	<i>brevifissa</i>	Steph.	Peralta 27503 (SP)
Mosses	Adelotheciaceae	<i>Adelothecium</i>	<i>bogotense</i>	(Hampe) Mitt.	Peralta 27692 (SP)
	Andreaceae	<i>Andreaea</i>	<i>acutifolia</i>	Hook. f. & Wilson	*Muelle r (1845)
	Andreaceae	<i>Andreaea</i>	<i>rupestris</i>	Hedw.	Gonçalv es 401 (SP)
	Andreaceae	<i>Andreaea</i>	<i>subulata</i>	Harv.	Gaspar 137 (R)
	Bartramiaceae	<i>Bartramia</i>	<i>mathewsii</i>	Mitt.	*Lützelb urg, P. von 7041 (tipo JE of <i>Andreaea hamulata</i>) Peralta 27606 (SP)

Bartramiaceae	<i>Breutelia</i>	<i>grandis</i>	(Hampe) Paris	Peralta 27559 (SP)
Bartramiaceae	<i>Breutelia</i>	<i>tomentosa</i>	(Sw. ex Brid.) A. Jaeger	Lima 798 (SP)
Bartramiaceae	<i>Leiomela</i>	<i>bartramioides</i>	(Hook.) Paris	Peralta 27500 (SP)
Bartramiaceae	<i>Leiomela</i>	<i>piligera</i>	(Hampe) Broth.	*Brother us (1924)
Bartramiaceae	<i>Philonotis</i>	<i>cernua</i>	(Wilson) Griffin & W.R.Buck	Peralta 20426 (SP)
Bartramiaceae	<i>Philonotis</i>	<i>hastata</i>	(Duby) Wijk & Margad.	Alkimi m-Faria, 1513
Bartramiaceae	<i>Philonotis</i>	<i>uncinata</i>	(Schwägr.) Brid.	*Brother us (1894)
Brachytheciaceae	<i>Aerolindigia</i>	<i>capillacea</i>	(Hornsch.) M. Menzel	Peralta 20418 (SP)
Brachytheciaceae	<i>Meteoridium</i>	<i>remotifolium</i>	(Müll.Hal.) Manuel	Peralta 27763 (SP)
Brachytheciaceae	<i>Rhynchostegium</i>	<i>scariosum</i>	(Taylor) A.Jaeger	Peralta 20419 (SP)
Brachytheciaceae	<i>Rhynchostegium</i>	<i>serrulatum</i>	(Hedw.) A.Jaeger	Gonçalv es 333 pp (SP)
Brachytheciaceae	<i>Squamidium</i>	<i>brasiliense</i>	Broth.	*Allen & Crosby (1986)
Brachytheciaceae	<i>Squamidium</i>	<i>leucotrichum</i>	(Taylor) Broth.	Peralta 27486 (SP)
Brachytheciaceae	<i>Zelometeorium</i>	<i>ambiguum</i>	(Hornsch.) Manuel	*Manuel (1977)
Brachytheciaceae	<i>Zelometeorium</i>	<i>patulum</i>	(Hedw.) Manuel	Gonçalv es 332 (SP)
Bruchiaceae	<i>Trematodon</i>	<i>longicollis</i>	Michx.	*Brother us (1924b)
Bryaceae	<i>Anomobryum</i>	<i>julaceum</i>	(Schrad. ex P.Gaertn. <i>et al.</i>) Schimp.	Peralta 20377 (SP)
Bryaceae	<i>Brachymenium</i>	<i>acuminatum</i>	Harv.	Dias 1372 (SP)
Bryaceae	<i>Brachymenium</i>	<i>consimile</i>	(Mitt.) A.Jaeger	Peralta 27654 (SP)
Bryaceae	<i>Brachymenium</i>	<i>hornschuchianu m</i>	Mart.	*Brother us (1894)

Bryaceae	<i>Brachymenium</i>	<i>radiculosum</i>	(Schwägr.) Hampe	*Brother us (1924b) Peralta 27673 (SP) Vital 1191 (SP) Alkimi m-Faria 1246 (UB) Dias 1306a (SP) Peralta 20465 (SP) *Bartra m (1954, as <i>B.</i> <i>gracilesc</i> <i>ens</i>) Peralta 20415 (SP) *Ochi (1980) Gonçalv es 384 (SP) *Hampe (1879) Peralta 20462 (SP) Peralta 27762 (SP) Peralta 20514 (SP) Peralta 27582 (SP) *Bartra m (1952) *Bartra m (1954) Alkimi m-Faria 1256 *Bartra m (1954) Alkimi m-Faria, AL 1254
Bryaceae	<i>Brachymenium</i>	<i>systilium</i>	(Müll. Hal.) A. Jaeger	
Bryaceae	<i>Bryum</i>	<i>argenteum</i>	Hedw.	
Bryaceae	<i>Bryum</i>	<i>atenense</i>	Williams	
Bryaceae	<i>Bryum</i>	<i>billarderii</i>	Schwaegr.	
Bryaceae	<i>Bryum</i>	<i>capillare</i>	Hedw.	
Bryaceae	<i>Bryum</i>	<i>densifolium</i>	Brid.	
Bryaceae	<i>Bryum</i>	<i>huillense</i>	Welw. & Duby	
Bryaceae	<i>Bryum</i>	<i>limbatum</i>	Müll. Hal	
Bryaceae	<i>Bryum</i>	<i>pabstianum</i>	Müll. Hal.	
Bryaceae	<i>Bryum</i>	<i>subapiculatum</i>	Hampe	
Bryaceae	<i>Rhodobryum</i>	<i>aubertii</i>	(Schwägr.) Thér.	
Bryaceae	<i>Rhodobryum</i>	<i>beyrichianum</i>	(Hornsch.) Müll.	
Bryaceae	<i>Rhodobryum</i>	<i>roseum</i>	(Hedw.) Limpr.	
Bryaceae	<i>Rhodobryum</i>	<i>subverticillatum</i>	Broth.	
Bryaceae	<i>Schoenobryum</i>	<i>concauifolium</i>	(Griff.) Gangulee	
Calymperaceae	<i>Calymperes</i>	<i>nicaraguense</i>	Renauld & Cardot	
Calymperaceae	<i>Syrrhopodon</i>	<i>gaudichaudii</i>	Mont.	
Calymperaceae	<i>Syrrhopodon</i>	<i>helicophyllus</i>	Mitt.	

Calymperaceae	<i>Syrrhopodon</i>	<i>ligulatus</i>	Mont.	Peralta 27490 (SP)
Calymperaceae	<i>Syrrhopodon</i>	<i>prolifer</i>	Schwägr.	Peralta 27473 (SP)
Catagoniaceae	<i>Catagonium</i>	<i>brevicaudatum</i>	Müll. Hal. ex Broth.	Peralta 27630 (SP)
Daltoniaceae	<i>Calyptrochaeta</i>	<i>albescens</i>	(Hampe) W.R.Buck	Lima 775 (SP)
Daltoniaceae	<i>Calyptrochaeta</i>	<i>setigera</i>	(Mitt.) W.R.Buck	Peralta 27702 (SP)
Daltoniaceae	<i>Daltonia</i>	<i>splachnoides</i>	(Sm.) Hook. & Taylor	Peralta 27546 (SP)
Daltoniaceae	<i>Lepidopilum</i>	<i>affine</i>	Müll. Hal. ex Broth.	Alkimi m-Faria, 1360 (UB)
Daltoniaceae	<i>Lepidopilum</i>	<i>muelleri</i>	(Hampe) Mitt.	Gonçalv es 323 (SP)
Daltoniaceae	<i>Lepidopilum</i>	<i>subsubulatum</i>	Geh. & Hampe	Gonçalv es 309 (SP)
Daltoniaceae	<i>Leskeodon</i>	<i>aristatus</i>	(Geh. & Hampe) Broth.	Peralta 27517 (SP)
Dicranaceae	<i>Aongstroemia</i>	<i>julacea</i>	(Hook.) Mitt.	Peralta 27550 (SP)
Dicranaceae	<i>Atractylocarpus</i>	<i>brasiliensis</i>	(Müll.Hal.) R.S.Williams	Peralta 20490 (SP)
Dicranaceae	<i>Atractylocarpus</i>	<i>longisetus</i>	(Hook.) E.B.Bartram	*Bartra m (1954)
Dicranaceae	<i>Dicranella</i>	<i>harrisii</i>	Mül. Hal.) Broth.	Schafer- Verwim p 13101 (SP)
Dicranaceae	<i>Dicranella</i>	<i>hilariana</i>	(Mont.) Mitt.	*Luetzel burg (1923)
Dicranaceae	<i>Dicranella</i>	<i>subsulcata</i>	(Hampe) Hampe	Schafer- Verwim p 7422 (SP)
Dicranaceae	<i>Dicranodontium</i>	<i>pulchroalare</i>	Broth.	*Lützelb urg 1519 (holótip o JE)
Dicranaceae	<i>Dicranoloma</i>	<i>billardieri</i>	(Brid. ex Anon) Paris	Peralta 27597 (SP)
Dicranaceae	<i>Dicranum</i>	<i>frigidum</i>	Müll. Hal.	Dias 1361 (SP)

Dicranaceae	<i>Holomitrium</i>	<i>crispulum</i>	Mart.	Peralta 27599 (SP)
Dicranaceae	<i>Leucoloma</i>	<i>cruegerianum</i>	(Müll.Hal.) A.Jaeger	Peralta 27678 (SP)
Dicranaceae	<i>Leucoloma</i>	<i>serrulatum</i>	Brid.	Peralta 27701 (SP)
Dicranaceae	<i>Leucoloma</i>	<i>triforme</i>	(Mitt.) A.Jaeger	Gonçalv es 190 (SP)
Dicranaceae	<i>Microcampylopus</i>	<i>curvisetus</i>	(Hampe) Giese & J.-P.Frahm	Schafer- Verwim p 7422 pp (SP)
Dicranaceae	<i>Paraleucobryum</i>	<i>longifolium</i>	(Hedw.) Loeske	Dias 1325 (SP)
Dicranaceae	<i>Pilopogon</i>	<i>guadalupensis</i>	(Brid.) J.-P.Frahm	Peralta 1558 (SP)
Diphysciaceae	<i>Diphyscium</i>	<i>longifolium</i>	Griff.	Peralta 27723 (SP)
Ditrichaceae	<i>Ceratodon</i>	<i>purpureus</i>	(Hedw.) Brid.	Dias 1315 (SP)
Ditrichaceae	<i>Cladastomum</i>	<i>robustum</i>	Broth.	Lima 485 (SP)
Ditrichaceae	<i>Cladastomum</i>	<i>ulei</i>	Müll. Hal.	Peralta 27635 (SP)
Ditrichaceae	<i>Crumuscus</i>	<i>vitalis</i>	W.R. Buck & Snider	Lima 791 (SP)
Ditrichaceae	<i>Ditrichum</i>	<i>crinale</i>	(Taylor) Kuntze	Lima 801 (SP)
Ditrichaceae	<i>Ditrichum</i>	<i>paulense</i>	Geh. ex Hampe	Peralta 27656 (SP)
Entodontaceae	<i>Entodon</i>	<i>hampeanus</i>	Müll. Hal.	Peralta 27614 (SP)
Entodontaceae	<i>Entodon</i>	<i>jamesonii</i>	(Taylor) Mitt.	Peralta 27580 (SP)
Entodontaceae	<i>Erythrodontium</i>	<i>longisetum</i>	(Hook.) Paris	*Vattim o-Gil & Vattimo (1980)
Entodontaceae	<i>Erythrodontium</i>	<i>squarrosus</i>	(Hampe) Paris	*Brother us (1924)
Ephemeraceae	<i>Micromitrium</i>	<i>tenerum</i>	(Bruch & Schimp.) Crosby	Alkimi m-Faria, AL 1379 (UB)
Fabroniaceae	<i>Dimerodontium</i>	<i>pellucidum</i>	Schwägr.	Schafer- Verwim

				p 13113 (SP) Gonçalv es 182 (SP) Peralta 27665 (SP) Peralta 27709 (SP) Lima 787 (SP) Gonçalv es 180 (SP) Peralta 27479 (SP) *Beyrich s.n. (lectótip o BM) *Ule 1225 (lectoty pe H, tipo de F. hemibryo ides) *Bartra m (1954) Peralta 20464 (SP) Peralta 27571 (SP) Peralta 27538 (SP) Peralta 27740 (SP) Peralta 27737 (SP) Peralta 27756 (SP) Lima 754 (SP) Lima 756 (SP) Alkimi m-Faria 1228
Fabroniaceae	<i>Fabronia</i>	<i>ciliaris</i>	(Brid.) Brid.	
Fissidentaceae	<i>Fissidens</i>	<i>anguste- limbatus</i>	Mitt.	
Fissidentaceae	<i>Fissidens</i>	<i>asplenioides</i>	Hedw.	
Fissidentaceae	<i>Fissidens</i>	<i>bryoides</i>	Hedw.	
Fissidentaceae	<i>Fissidens</i>	<i>crispus</i>	Mont.	
Fissidentaceae	<i>Fissidens</i>	<i>elegans</i>	Brid.	
Fissidentaceae	<i>Fissidens</i>	<i>flabellatus</i>	Hornsch.	
Fissidentaceae	<i>Fissidens</i>	<i>intromarginatus</i>	(Hampe) Mitt.	
Fissidentaceae	<i>Fissidens</i>	<i>lagenarius</i>	Mitt.	
Fissidentaceae	<i>Fissidens</i>	<i>oblongifolius</i>	Hook. f. & Wilson	
Fissidentaceae	<i>Fissidens</i>	<i>oediloma</i>	Müll. Hal. ex Broth.	
Fissidentaceae	<i>Fissidens</i>	<i>pellucidus</i>	Hornsch.	
Fissidentaceae	<i>Fissidens</i>	<i>prionodes</i>	Mont.	
Fissidentaceae	<i>Fissidens</i>	<i>radicans</i>	Mont.	
Fissidentaceae	<i>Fissidens</i>	<i>rigidulus</i>	Hook. f. & Wilson	
Fissidentaceae	<i>Fissidens</i>	<i>saprofilus</i>	Broth.	
Fissidentaceae	<i>Fissidens</i>	<i>scariosus</i>	Mitt.	
Fissidentaceae	<i>Fissidens</i>	<i>semicompletus</i>	Hedw.	

Fissidentaceae	<i>Fissidens</i>	<i>taxifolius</i>	Hedw.	Alkimi m-Faria 1367
Fissidentaceae	<i>Fissidens</i>	<i>wallisii</i>	Müll. Hal. ex Broth.	Peralta 27675 (SP)
Fissidentaceae	<i>Fissidens</i>	<i>weirii</i>	Mitt.	Peralta 27484 (SP) Schaefer -
Funariaceae	<i>Entosthodon</i>	<i>bonplandii</i>	(Hook.) Mitt.	Verwim p 7405 (SP)
Funariaceae	<i>Funaria</i>	<i>hygrometrica</i>	Hedw.	*Muelle r (1845) Dias 1298 (SP)
Grimmiaceae	<i>Grimmia</i>	<i>laevigata</i>	(Brid.) Brid.	Gaspar 110 (R) Dias 1405 (SP)
Grimmiaceae	<i>Grimmia</i>	<i>longirostris</i>	Hook. f. & Wilson	Faria 1547 (SP)
Grimmiaceae	<i>Racomitrium</i>	<i>subsecundum</i>	(Hook. & Grev. ex Harv.) Mitt.	Peralta 27739 (SP)
Hedwigiaceae	<i>Hedwigidium</i>	<i>rhabdocarpum</i>	(Hampe)	Peralta 27581 (SP)
Hookeriaceae	<i>Hookeria</i>	<i>acutifolia</i>	Hook. & Grev.	Peralta 20478 (SP)
Hookeriaceae	<i>Philophyllum</i>	<i>tenuifolium</i>	(Mitt.) Broth.	Peralta 20461 (SP)
Hypnaceae	<i>Chrysohypnum</i>	<i>diminutivum</i>	(Mitt.) Broth.	Peralta 27624 (SP)
Hypnaceae	<i>Ectropothecium</i>	<i>leptochaeton</i>	(Schwägr.) W.R.Buck	Eiten 7133 (SP)
Hypnaceae	<i>Mittenothamnium</i>	<i>reduncum</i>	(Mitt.) Ochyra	Gonçalv es 194 (SP)
Hypnaceae	<i>Mittenothamnium</i>	<i>reptans</i>	(Hedw.) Cardot	Alkimi m-Faria, 1364
Hypnaceae	<i>Taxiphyllum</i>	<i>taxirameum</i>	(Mitt.) M. Fleisch.	Yano 13560 (SP)
Hypnaceae	<i>Vesicularia</i>	<i>vesicularis</i>	(Schwägr.) Broth.	Peralta 27712 (SP)
Hypopterygiaceae	<i>Hypopterygium</i>	<i>tamariscinum</i>	(Hedw.) Brid.	
Hypopterygiaceae	<i>Lopidium</i>	<i>concinnum</i>	(Hook.) Wilson	

Lembophyllaceae	<i>Orthostichella</i>	<i>versicolor</i>	(Müll.Hal.) B.H.Allen & W.R.Buck	Peralta 27520 (SP)
Leucobryaceae	<i>Campylopus</i>	<i>aemulans</i>	(Hampe) A.Jaeger	*Frahm (1975)
Leucobryaceae	<i>Campylopus</i>	<i>arctocarpus</i>	(Hornsch.) Mitt.	Peralta 27547 (SP)
Leucobryaceae	<i>Campylopus</i>	<i>cryptopodioides</i>	Broth.	*Frahm (1991)
Leucobryaceae	<i>Campylopus</i>	<i>cuspidatus</i>	(Hornsch.) Mitt.	*Frahm (1975)
Leucobryaceae	<i>Campylopus</i>	<i>densicoma</i>	(Müll.Hal.) Paris	Gonçalv es 409 (SP)
Leucobryaceae	<i>Campylopus</i>	<i>dichrostis</i>	(Müll. Hal.) Paris	Gonçalv es 330 (SP)
Leucobryaceae	<i>Campylopus</i>	<i>filifolius</i>	(Müll. Hal.) Paris	Lima 789 (SP)
Leucobryaceae	<i>Campylopus</i>	<i>fragilis</i>	(Brid.) Bruch & Schimp.	Peralta 27610 (SP)
Leucobryaceae	<i>Campylopus</i>	<i>gemmatus</i>	(Müll.Hal.) Paris	Vital 7634 (SP)
Leucobryaceae	<i>Campylopus</i>	<i>heterostachys</i>	(Hampe) A.Jaeger	Dias 1299 (SP)
Leucobryaceae	<i>Campylopus</i>	<i>introflexus</i>	(Hedw.) Brid.	Alkimi m-Faria 1510
Leucobryaceae	<i>Campylopus</i>	<i>julicaulis</i>	Broth.	Gaspar 104 (R)
Leucobryaceae	<i>Campylopus</i>	<i>lamellinervis</i>	(Müll.Hal.) Mitt.	Mueller 1845
Leucobryaceae	<i>Campylopus</i>	<i>occultus</i>	Mitt.	Frahm sn (SP1470 28)
Leucobryaceae	<i>Campylopus</i>	<i>pilifer</i>	Brid.	Peralta 27605 (SP)
Leucobryaceae	<i>Campylopus</i>	<i>pyriformis</i>	(Schultz) Brid.	Gaspar 114 (R)
Leucobryaceae	<i>Campylopus</i>	<i>richardii</i>	Brid.	Dias 1324 (SP)
Leucobryaceae	<i>Campylopus</i>	<i>savannarum</i>	(Müll.Hal.) Mitt.	Gaspar 139 (R)
Leucobryaceae	<i>Campylopus</i>	<i>subcuspidatus</i>	(Hampe) A.Jaeger	Peralta 27641 (SP)
Leucobryaceae	<i>Campylopus</i>	<i>thwaitesii</i>	(Mitt.) A.Jaeger	Gonçalv es 183 (SP)
Leucobryaceae	<i>Campylopus</i>	<i>trachyblepharon</i>	(Müll.Hal.) Mitt.	Paula sn (SP4638 31)

Leucobryaceae	<i>Campylopus</i>	<i>uleanus</i>	(Müll.Hal.) Broth.	Dias 1384 (SP) Vital
Leucobryaceae	<i>Campylopus</i>	<i>widgrenii</i>	(Müll.Hal.) Mitt.	1189 (SP)
Leucobryaceae	<i>Leucobryum</i>	<i>albicans</i>	(Schwägr.) Lindb.	Peralta 27522 (SP)
Leucobryaceae	<i>Leucobryum</i>	<i>clavatum</i>	Hampe	*Luetzel burg 1921 Dias
Leucobryaceae	<i>Leucobryum</i>	<i>crispum</i>	Müll. Hal.	1235 (SP)
Leucobryaceae	<i>Leucobryum</i>	<i>giganteum</i>	Müll. Hal.	*Herzog (1926)
Leucobryaceae	<i>Leucobryum</i>	<i>sordidum</i>	Ångström	*Luetzel burg (1923) Alkimi
Leucobryaceae	<i>Ochrobryum</i>	<i>gardneri</i>	(Müll.Hal.) Lindb.	m-Faria 1364 (UB)
Leucobryaceae	<i>Octoblepharum</i>	<i>albidum</i>	Hedw.	*Bartra m (1954)
Leucomiaceae	<i>Leucomium</i>	<i>strumosum</i>	(Hornsch.) Mitt.	Peralta 27769 (SP)
Meteoriaceae	<i>Meteorium</i>	<i>deppei</i>	(Hornsch.) Mitt.	Peralta 27573 (SP)
Meteoriaceae	<i>Meteorium</i>	<i>nigrescens</i>	(Hedw.) Dozy & Molk.	*Brother us (1924)
Meteoriaceae	<i>Meteorium</i>	<i>pseudoteres</i>	W.R. Buck	Peralta 27668 (SP)
Meteoriaceae	<i>Pilotrichella</i>	<i>flexilis</i>	(Hedw.) Ångström	Peralta 20491 (SP)
Meteoriaceae	<i>Toloxis</i>	<i>imponderosa</i>	(Taylor) W.R. Buck	Peralta 20517 (SP)
Mniaceae	<i>Epipterygium</i>	<i>immarginatum</i>	Mitt.	Peralta 20432 (SP)
Mniaceae	<i>Plagiomnium</i>	<i>rhynchophorum</i>	(Hook.) T.J.Kop.	Peralta 20411pp (SP)
Mniaceae	<i>Pohlia</i>	<i>camptotrachela</i>	(Renauld & Cardot) Broth.	Peralta 20433 (SP)
Mniaceae	<i>Pohlia</i>	<i>elongata</i>	Hedw.	Lima 790 (SP)
Mniaceae	<i>Pohlia</i>	<i>papilosa</i>	(Müll.Hal. ex A.Jaeger) Broth.	Faria 1554 (SP)

Mniaceae	<i>Pohlia</i>	<i>tenuifolia</i>	(A.Jaeger) Broth.	Peralta 27579 (SP)
Mniaceae	<i>Schizymenium</i>	<i>campylocarpum</i>	(Arn. & Hook.) Shaw	Lima 761 (SP)
Mniaceae	<i>Schizymenium</i>	<i>pusillum</i>	(Hook.f. & Wilson) A.J.Shaw	Dias 1382 (SP)
Neckeraceae	<i>Homalia</i>	<i>glabella</i>	(Hedw.) Schimp.	Gonçalv es 310 (SP)
Neckeraceae	<i>Homaliodendron</i>	<i>flabellatum</i>	(Sm.) M.Fleisch.	Peralta 27569 (SP)
Neckeraceae	<i>Neckera</i>	<i>ehrenbergii</i>	C.Müller	Peralta 27588 (SP)
Neckeraceae	<i>Porotrichum</i>	<i>korthalsianum</i>	(Dozy & Molk.) Mitt.	Dias 1420 (SP)
Neckeraceae	<i>Porotrichum</i>	<i>leucocaulon</i>	Müll. Hal.	Peralta 27674 (SP)
Neckeraceae	<i>Porotrichum</i>	<i>longirostre</i>	(Hook.) Mitt.	Peralta 20387 pp (SP)
Neckeraceae	<i>Porotrichum</i>	<i>superbum</i>	(Taylor) Hampe	Peralta 27585 (SP)
Neckeraceae	<i>Porotrichum</i>	<i>thieleanum</i>	(Müll.Hal.) Mitt.	Peralta 20383 (SP)
Neckeraceae	<i>Thamnobryum</i>	<i>fasciculatum</i>	(Hedw.) I.Sastre	Peralta 27703 (SP)
Orthotrichaceae	<i>Macrocoma</i>	<i>orthotrichoides</i>	(Raddi) Wijk & Margad.	Schafer- Verwim p 7449 (SP)
Orthotrichaceae	<i>Macromitrium</i>	<i>catharinense</i>	Paris	*Li <i>et al.</i> (2019)
Orthotrichaceae	<i>Macromitrium</i>	<i>cirrosum</i>	(Hedw.) Brid.	*Bartra m (1954)
Orthotrichaceae	<i>Macromitrium</i>	<i>microstomum</i>	(Hook. & Grev.) Schwägr.	Gonçalv es 395 (SP)
Orthotrichaceae	<i>Orthotrichum</i>	<i>papillosum</i>	(Hampe) Lesquereux & James	Alkimi m-Faria, 1236
Orthotrichaceae	<i>Schlotheimia</i>	<i>appressifolia</i>	Mitt.	Atwood 2007
Orthotrichaceae	<i>Schlotheimia</i>	<i>capillaris</i>	Hampe	Peralta 20376 pp (SP)
Orthotrichaceae	<i>Schlotheimia</i>	<i>rugifolia</i>	(Hook.) Schwägr.	Lima 753 (SP)
Orthotrichaceae	<i>Schlotheimia</i>	<i>tecta</i>	Hook. f. & Wilson	Gonzatti 4003 (SP)

Orthotrichaceae	<i>Zygodon</i>	<i>reiwardtii</i>	(Hornsch.) A.Braun	Peralta 27629 (SP)
Phyllogoniaceae	<i>Phyllogonium</i>	<i>viride</i>	Brid.	Gonçalv es 320 (SP)
Pilotrichaceae	<i>Callicostella</i>	<i>martiana</i>	(Hornsch.) A.Jaeger	Gonçalv es 197 (SP)
Pilotrichaceae	<i>Callicostella</i>	<i>pallida</i>	(Hornsch.) Ångström	Peralta 27689 (SP)
Pilotrichaceae	<i>Cyclodictyon</i>	<i>albicans</i>	(Hedw.) Kuntze	Peralta 27587 (SP)
Pilotrichaceae	<i>Cyclodictyon</i>	<i>marginatum</i>	(Hook. & Wilson) Kuntze	Schafer- Verwim p 13124 (SP)
Pilotrichaceae	<i>Cyclodictyon</i>	<i>varians</i>	(Sull.) Kuntze	Peralta 27619 (SP)
Pilotrichaceae	<i>Lepidopilidium</i>	<i>brevisetum</i>	(Hampe) Broth.	Silva, AL 481A (UB)
Pilotrichaceae	<i>Lepidopilidium</i>	<i>nitens</i>	(Hornsch.) Broth.	Peralta 27764 (SP)
Pilotrichaceae	<i>Lepidopilum</i>	<i>muelleri</i>	(Hampe) Mitt.	Peralta 20409 (SP)
Pilotrichaceae	<i>Lepidopilum</i>	<i>scabrisetum</i>	(Schwägr.) Steere	Peralta 27666 (SP)
Pilotrichaceae	<i>Lepidopilum</i>	<i>subsubulatum</i>	Geh. & Hampe	Peralta 27521 (SP)
Pilotrichaceae	<i>Thamniopsis</i>	<i>incurva</i>	(Hornsch.) W.R. Buck	Yano 13564 (SP)
Pilotrichaceae	<i>Thamniopsis</i>	<i>langsдорffii</i>	(Hook.) W.R. Buck	Gonçalv es 307 (SP)
Pilotrichaceae	<i>Trachyxiphium</i>	<i>guadalupense</i>	(Brid.) W.R.Buck	Peralta 27497pp (SP)
Plagiotheciaceae	<i>Plagiothecium</i>	<i>novogranatense</i>	(Hampe) Mitt.	Peralta 27570 (SP)
Polytrichaceae	<i>Atrichum</i>	<i>androgynum</i>	(Müll. Hal.) A. Jaeger	Gonçalv es 195 (SP)
Polytrichaceae	<i>Itatiella</i>	<i>ulei</i>	(Broth. ex Müll. Hal.) G.L.Sm.	Peralta 27634 (SP)
Polytrichaceae	<i>Oligotrichum</i>	<i>riedelianum</i>	Mitt.	Peralta 27594 (SP)

Polytrichaceae	<i>Pogonatum</i>	<i>campylocarpum</i>	(Müll.Hal.) Mitt.	Peralta 20439 (SP) Paula, J.C. sn (SP4638 29) Alkimi m-Faria 1236 (UB) Eiten 7156 (SP)
Polytrichaceae	<i>Pogonatum</i>	<i>pensilvanicum</i>	(E.B.Bartram ex Hedw.) P.Beauv.	Peralta 20378 (SP) Goeldi sn (SP2197 63) Faria 1562 (SP)
Polytrichaceae	<i>Pogonatum</i>	<i>perichaetiale</i>	(Mont.) A.Jaeger	Peralta 27774 (SP)
Polytrichaceae	<i>Polytrichadelphus</i>	<i>pseudopolytrichum</i>	(Raddi) G.L.Sm.	Peralta 27677 (SP)
Polytrichaceae	<i>Polytrichum</i>	<i>angustifolium</i>	Mitt.	Peralta 27589 (SP)
Polytrichaceae	<i>Polytrichum</i>	<i>commune</i>	L. ex Hedw.	Silva, AL 499 (UB)
Polytrichaceae	<i>Polytrichum</i>	<i>juniperinum</i>	Willd. ex Hedw.	*Bartra m (1954) Gonçalv es 413 (SP)
Pottiaceae	<i>Barbula</i>	<i>indica</i>	(Hook.) Spreng.	Peralta 27669 (SP) Dias 1276 (SP)
Pottiaceae	<i>Chionoloma</i>	<i>angustatum</i>	(Mitt.) M. Menzel	Dias 1377 (SP)
Pottiaceae	<i>Chionoloma</i>	<i>fractum</i>	M.J. Cano, J.A. Jiménez & M. Alonso	Peralta 27595 (SP)
Pottiaceae	<i>Hyophila</i>	<i>involuta</i>	(Hook.) A.Jaeger	Peralta 27607 (SP)
Pottiaceae	<i>Hyophiladelphus</i>	<i>agrarius</i>	(Hedw.) R.H.Zander	Gonçalv es 364 (SP)
Pottiaceae	<i>Leptodontium</i>	<i>araucarieti</i>	(Müll.Hal.) Paris	
Pottiaceae	<i>Leptodontium</i>	<i>filicicola</i>	Herzog	
Pottiaceae	<i>Leptodontium</i>	<i>flexifolium</i>	(Dicks.) Hampe	
Pottiaceae	<i>Leptodontium</i>	<i>pungens</i>	(Mitt.) Kindb.	
Pottiaceae	<i>Leptodontium</i>	<i>stellatifolium</i>	(Hampe) Broth.	
Pottiaceae	<i>Leptodontium</i>	<i>viticulosoides</i>	(P. Beauv.) Wijk & Margad.	
Pottiaceae	<i>Leptodontium</i>	<i>wallisii</i>	(Müll.Hal.) Kindb.	

Pottiaceae	<i>Streptopogon</i>	<i>calymperes</i>	Müll. Hal.	Peralta 27450 (SP)
Pottiaceae	<i>Tortella</i>	<i>humilis</i>	(Hedw.) Jenn.	Peralta 20417 (SP)
Pottiaceae	<i>Tortella</i>	<i>tortuosa</i>	(Hedw.) Limpr.	Lima 806 (SP)
Priodontaceae	<i>Prionodon</i>	<i>densus</i>	(Hedw.) Müll.Hal.	Yano 13579 (SP)
Pterobryaceae	<i>Orthostichopsis</i>	<i>tortipilis</i>	(Müll.Hal.) Broth.	Peralta 27515 (SP)
Ptychomitriaceae	<i>Ptychomitrium</i>	<i>sellowianum</i>	(Müll.Hal.) A.Jaeger	Yano 12555 (SP)
Pylaisiadelphaceae	<i>Isopterygium</i>	<i>tenerifolium</i>	Mitt.	Peralta 20516 (SP)
Pylaisiadelphaceae	<i>Isopterygium</i>	<i>tenerum</i>	(Sw.) Mitt.	Eiten 7100
Racopilaceae	<i>Racopilum</i>	<i>tomentosum</i>	(Hedw.) Brid.	Alkimi m-Faria 1402 (UB)
Rhacocarpaceae	<i>Rhacocarpus</i>	<i>inermis</i>	(Müll.Hal.) Lindb.	Vital 1192 (SP)
Rhacocarpaceae	<i>Rhacocarpus</i>	<i>purpurascens</i>	(Brid.) Müll. Hal.	Peralta 27643 (SP)
Rhizogoniaceae	<i>Pyrrhobryum</i>	<i>spiniforme</i>	(Hedw.) Mitt.	Gonçalv es 314 (SP)
Rhizogoniaceae	<i>Rhizogonium</i>	<i>novae-hollandiae</i>	(Brid.) Brid.	Schaefer - Verwimp 13122 (SP)
Rigodiaceae	<i>Rigodium</i>	<i>toxarion</i>	(Schwägr.) A. Jaeger.	Peralta 27537 (SP)
Seligeriaceae	<i>Brachydontium</i>	<i>notorogenes</i>	W.R.Buck & Schaf.-Verw.	Peralta 20441 (SP)
Sematophyllaceae	<i>Aptychella</i>	<i>proligera</i>	(Broth.) Herzog	Peralta 27650 (SP)
Sematophyllaceae	<i>Aptychopsis</i>	<i>pungifolia</i>	(Hampe) Broth.	Gonçalv es 200 (SP)
Sematophyllaceae	<i>Aptychopsis</i>	<i>pyrrhophylla</i>	(Müll.Hal.) Wijk & Margad.	Peralta 27485 (SP)
Sematophyllaceae	<i>Brittonodoxa</i>	<i>subpinnata</i>	(Brid.) W.R. Buck, P.E.A.S.Câmara & Carv.-Silva	*Muelle r (1845)
Sematophyllaceae	<i>Donnellia</i>	<i>commutata</i>	(Müll.Hal.) W.R.Buck	Alkimi m-Faria

				1342 (UB)
Sematophyllaceae	<i>Donnellia</i>	<i>lagenifera</i>	(Müll.Hal.) W.R.Buck	Gonzatti 4005 (SP)
Sematophyllaceae	<i>Microcalpe</i>	<i>subsimplax</i>	(Hedw.) W.R. Buck	*Mueller (1845) *Ochyra & Bednarek Ochyra (2010)
Sematophyllaceae	<i>Kuerschneria</i>	<i>laevigata</i>	(Herzog) Ochyra & Bedn.-Ochyra	Gonçalves 331 (SP)
Sematophyllaceae	<i>Sematophyllum</i>	<i>beyrichii</i>	(Hornsch.) Broth.	Peralta 20495 (SP)
Sematophyllaceae	<i>Sematophyllum</i>	<i>cuspidiferum</i>	Mitt.	Peralta 27494 (SP)
Sematophyllaceae	<i>Sematophyllum</i>	<i>decumbens</i>	Mitt.	Peralta 27748 (SP)
Sematophyllaceae	<i>Sematophyllum</i>	<i>lithophilum</i>	(Hornsch.) Ångström	*Buck (1998) *Brotherus (1924)
Sematophyllaceae	<i>Sematophyllum</i>	<i>subdepressum</i>	(A.Jaeger) Broth.	Peralta 27743 (SP)
Sematophyllaceae	<i>Sematophyllum</i>	<i>subpinnatum</i>	(Brid.) E.Britton	Peralta 27514 (SP)
Sematophyllaceae	<i>Trichosteleum</i>	<i>glaziovii</i>	(Hampe) W.R.Buck	Peralta 27497pp (SP)
Sematophyllaceae	<i>Trichosteleum</i>	<i>sentosum</i>	(Sull.) A.Jaeger	Sampaio, A.J. 2380 Lima 768pp (SP)
Sematophyllaceae	<i>Vitalia</i>	<i>cuspidifera</i>	(Mitt.) P.E.A.S.Câmara, Carv.-Silva & W.R. Buck	Peralta 27592 (SP)
Sematophyllaceae	<i>Vitalia</i>	<i>galipensis</i>	(Müll. Hal.) P.E.A.S.Câmara, Carv.-Silva & W.R. Buck	Santos & Costa 759, 760 (RB)
Sphagnaceae	<i>Sphagnum</i>	<i>aciphyllum</i>	Müll. Hal	Gonçalves 167 (SP)
Sphagnaceae	<i>Sphagnum</i>	<i>brasiliense</i>	Warnst.	Gonçalves 170 (SP)
Sphagnaceae	<i>Sphagnum</i>	<i>brevirameum</i>	Hampe	
Sphagnaceae	<i>Sphagnum</i>	<i>capillifolium</i>	(Ehrh.) Hedw.	

Sphagnaceae	<i>Sphagnum</i>	<i>costae</i>	H.A. Crum & D.P. Costa	Peralta 20494 (SP) *Luetzel burg (1923, as S. <i>serratum</i>) Gonçalv es 369 (SP) Gonçalv es 419 (SP) Lima 822 (SP) Gonçalv es 421 (SP) Peralta 27651 (SP) Costa 4173 (RB) Gonçalv es 335 (SP) Peralta 27553 (SP) Lima 824 (SP) *Andre ws (1941) Costa <i>et</i> <i>al.</i> 5017 (RB) Peralta 27652 (SP) Gonçalv es 415 (SP) Lima 817 (SP) Lima 815 (SP) Peralta 27560 (SP) Gonçalv es 168 (SP) Luetzel burg 6162 (F,
Sphagnaceae	<i>Sphagnum</i>	<i>cuspidatum</i>	Ehrh. ex Hoffm.	
Sphagnaceae	<i>Sphagnum</i>	<i>divisum</i>	H.A. Crum	
Sphagnaceae	<i>Sphagnum</i>	<i>exquisitum</i>	H.A. Crum	
Sphagnaceae	<i>Sphagnum</i>	<i>geraisense</i>	H.A. Crum	
Sphagnaceae	<i>Sphagnum</i>	<i>gracilescens</i>	Hampe ex. Müll. Hal.	
Sphagnaceae	<i>Sphagnum</i>	<i>luetzelburgii</i>	H.K.G.Paul ex H.A.Crum	
Sphagnaceae	<i>Sphagnum</i>	<i>longicomosum</i>	Müll. Hal. ex Warnst.	
Sphagnaceae	<i>Sphagnum</i>	<i>longistolo</i>	Müll. Hal.	
Sphagnaceae	<i>Sphagnum</i>	<i>magellanicum</i>	Brid.	
Sphagnaceae	<i>Sphagnum</i>	<i>palustre</i>	L.	
Sphagnaceae	<i>Sphagnum</i>	<i>perforatum</i>	Warnst.	
Sphagnaceae	<i>Sphagnum</i>	<i>perichaetiale</i>	Hampe	
Sphagnaceae	<i>Sphagnum</i>	<i>platyphylloides</i>	Warnst.	
Sphagnaceae	<i>Sphagnum</i>	<i>pseudoramulinu m</i>	H.A. Crum	
Sphagnaceae	<i>Sphagnum</i>	<i>ramulinum</i>	Warnst.	
Sphagnaceae	<i>Sphagnum</i>	<i>recurvum</i>	P. Beauv.	
Sphagnaceae	<i>Sphagnum</i>	<i>sanguinale</i>	Warnst.	
Sphagnaceae	<i>Sphagnum</i>	<i>sehnemii</i>	H.A. Crum	

					HBR as <i>Sphagnu m densum</i>) Gonçalv es 353 (SP) Peralta 27598 (SP) Alkimi m-Faria 1456 (UB) Alkimi m-Faria 1263 (UB) *Costa <i>et al.</i> (2005) Peralta 27616 (SP) Lima 797 (SP) Gonçalv es 359 (SP) Peralta 20510 (SP) Lima 751 (SP) Lima 746 (SP) Alkimi m-Faria 1376 (UB) Alkimi m-Faria 1388 (UB)
	Sphagnaceae	<i>Sphagnum</i>	<i>subsecundum</i>	Nees	
	Sphagnaceae	<i>Sphagnum</i>	<i>sucrei</i>	H.A. Crum	
	Stereophyllaceae	<i>Entodontopsis</i>	<i>leucostega</i>	(Brid.) W.R.Buck & Ireland	
	Stereophyllaceae	<i>Entodontopsis</i>	<i>nitens</i>	(Mitt.) W.R.Buck & Ireland	
	Stereophyllaceae	<i>Eulacophyllum</i>	<i>cultelliforme</i>	(Sull.) W.R.Buck & Ireland	
	Thuidiaceae	<i>Thuidium</i>	<i>pseudoprotensu m</i>	(Müll.Hal.) Mitt.	
	Thuidiaceae	<i>Thuidium</i>	<i>recognitum</i>	(Hedwig) Lindberg	
	Thuidiaceae	<i>Thuidium</i>	<i>tamariscinum</i>	(Hedw.) Schimp.	
	Thuidiaceae	<i>Thuidium</i>	<i>tomentosum</i>	Schimp.	
	Thuidiaceae	<i>Pelekium</i>	<i>involvens</i>	(Hedw.) A. Touw	
	Thuidiaceae	<i>Pelekium</i>	<i>minutulum</i>	(Hedw.) A.Touw	
	Thuidiaceae	<i>Pelekium</i>	<i>muricatum</i>	(Hampe) A.Touw	
	Thuidiaceae	<i>Pelekium</i>	<i>scabrosulum</i>	(Mitt.) A.Touw	
Hornworts	Anthocerotaceae	<i>Anthoceros</i>	<i>hispidus</i>	Steph.	Yano 13588 (SP) *Hooker & Wilson (1844) Peralta 27459 (SP) *Gottsch e <i>et al.</i> (1844)
	Anthocerotaceae	<i>Anthoceros</i>	<i>punctatus</i>	L.	
	Dendrocerotacea e	<i>Dendroceros</i>	<i>crispatus</i>	(Hook.) Nees	
	Dendrocerotacea e	<i>Dendroceros</i>	<i>crispus</i>	(Sw.) Nees	

Dendrocerotaceae	<i>Nothoceros</i>	<i>minarum</i>	(Nees) J.C.Villarreal	Gonçalves 178 (SP)
Dendrocerotaceae	<i>Nothoceros</i>	<i>vincentianus</i>	(Lehm. & Lindenb.) J.C. Villareal	Peralta 27705 (SP)
Nothotyladaceae	<i>Phaeoceros</i>	<i>bulbiculosus</i>	(Broth.) Prosk.	Peralta 20452 (SP)
Nothotyladaceae	<i>Phaeoceros</i>	<i>laevis</i>	(L.) Prosk.	Peralta 27542 (SP)

The most species-rich families of liverworts are Lejeuneaceae (65 *spp.*) and Lepidoziaceae (16 *spp.*), while for moss they are Leucobryaceae (30 *spp.*) and Sphagnaceae (25 *spp.*). Eight species of hornworts were found, distributed among the families Dendrocerotaceae (4 *spp.*), Anthocerotaceae (2 *spp.*) and Nothotyladaceae (2 *spp.*). The most species-rich genera were: *Campylopus* (Leucobryaceae, 23 *spp.*); *Plagiochila* (Plagiochilaceae, 21 *spp.*); *Fissidens* (Fissidentaceae, 20 *spp.*); *Lejeunea* (Lejeuneaceae, 16 *spp.*) and *Metzgeria* (Metzgeriaceae, 14 *spp.*). Considering the samples analyzed, the species comonest species and more recorded were: *Campylopus arctocarpus* (7 specimens); *Lejeunea acanthogona* (7); *Lejeunea flava* (7); *Radula nudicaulis* (7); *Bryum capillare* (6); *Fissidens wallisii* (6); *Lejeunea serpillifolioides* (6); *Rigodium toxarion* (6); *Trichocolea brevifissa* (6) and *Zelometeorium ambiguum* (6).

2.2. Substrate Colonization

The bryophyte species predominantly colonized rocks (210 *spp.*), followed by tree trunks (209 *spp.*), soil (205 *spp.*), logs (50 *spp.*), and leaves (29 *spp.*).

Phorophyte availability within the forests of PARNASO clearly influences the bryophyte species occurrence. Mosses predominantly colonize tree trunks, with only four species being found on leaves: *Paraleucobryum longifolium* (Dicranaceae); *Philophyllum tenuifolium* (Hookeriaceae); *Toloxis imponderosa* (Meteoriaceae) and *Schlotheimia tecta* (Orthotrichaceae).

The colonization of rocks by bryophytes is mainly related to the rare species such as *Campylopus uleanus*. The high-altitude rocky outcrops of igneous and metamorphic origin (Figure 1) are characteristic of altitudes above 1800 m.a.s.l.

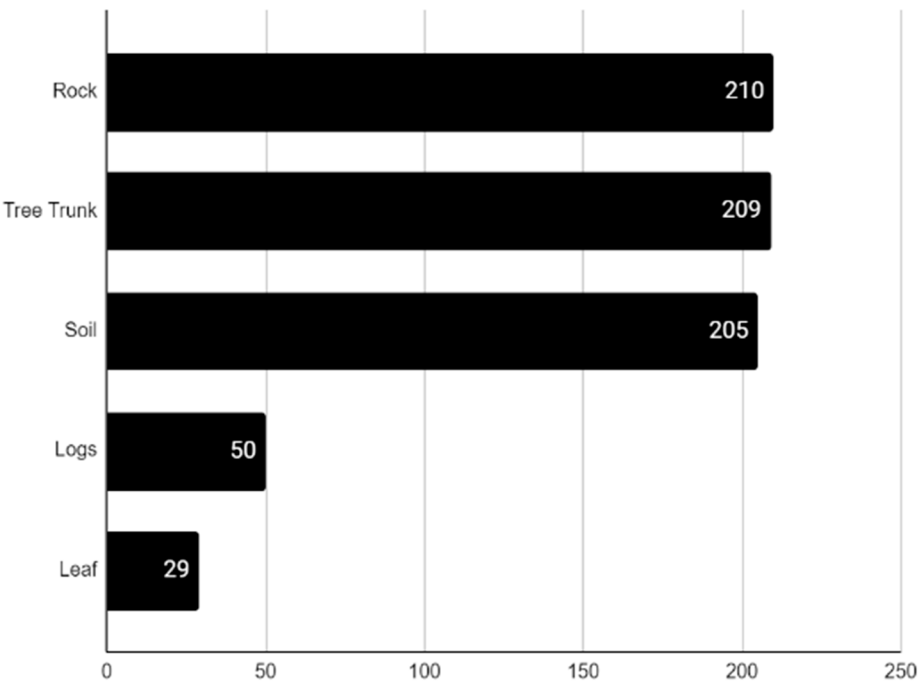


Figure 1. Substrates colonized by bryophytes in Serra dos Órgãos National Park.

The lowest bryophyte colonization was for leaves (epiphyllous). Most of the species that colonized this substrate in High-altitude Fields were mosses (60%), followed by liverworts (40%).

The leaf-colonizing species most frequent were the leafy liverworts of the family Lejeuneaceae (21 spp.), followed by Radulaceae (2 spp.) and the thallose liverwort family Metzgeriaceae (2 spp.). According to Gradstein *et al.* (2001) and Ilkiu-Borges & Lisboa (2004) species of Lejeuneaceae can colonize different types of substrates, but their occurrence on leaves is indicative of preserved native areas.

2.3. Endemism and Conservation Status

The Serra dos Orgaos Park protects three species locally endemic, 8 from Rio de Janeiro state and 69 Brazilian (Table 2). The species endemic to Rio de Janeiro state recorded in the park was in High-altitude Fields (Table 2) Endemism and species richness are high with increase of altitudes, as was also found in Itatiaia National Park located in Serra da Mantiqueira [22].

Of the 28 species of Brazilian endemic bryophytes exclusive to High-altitude Fields, 12 belong to the family Sphagnaceae (42%), representing almost half of the Brazilian endemic species found in this vegetation formation. The species *Sphagnum luetzelburgii* and *S. sehnemii* are endemic to Brazil, occurring in the states of Paraná, Santa Catarina, Rio Grande do Sul and Rio de Janeiro. However, in Rio de Janeiro State, these species are restricted to mountains of the Atlantic Forest and have only been reported for PARNASO by Costa (2021), and not by the present work.

The lower number of endemic species recorded in Sub-montane Forest, probably reflecting the effects of ecological and biogeographic processes, as well as human interference [22]. Among the 19 endemic species exclusively found in Montane Forest, 13 are liverworts and six are mosses. The predominant liverwort family is Lejeuneaceae, with nine species, followed by Metzgeriaceae with three and Jamesoniellaceae with two.

We have re-collected some species considered rare like: *Bryum limbatum*, Ochi (1980) cite a collection from (43 years ago; *Metzgeria furcata*, Bartram (1954) cite a collection from 69 years ago; *Sphagnum cuspidatum*, collected by Luetzelburg in 1923 (100 years ago) and *Andreaea acutifolia*, collected by Mueller in 1845 (178 years ago). *Andreaea acutifolia* is always mistakenly identified as *A. rupestris*, the two differing mainly by perichaetial leaves [30]. The species *S. cuspidatum* is widespread in Brazil [33], but has been collected only once in PARNASO.

The Serra dos Orgaos Park also protects eleven of the species indicated as threatened by CNCFlora and Flora e Funga do Brasil (Figure 2 and Table 2) to the Rio de Janeiro state: seven as Endangered (EN), two as Critically Endangered (CR) and two as Vulnerable (VU). Among these threatened species, three are known only from the type material, and were not found in the field trips. *Southbya organensis* was described by Herzog (1948-1949) and is classified as Critically Endangered (CR) by CNCFlora (2012) due to its distribution being restricted to Serra dos Órgãos, specifically Morro do Açu peak that has an excessive tourism and recurrent criminal fires. *Plagiochila pseudoradicans*, and *Dicranodontium pulchroalare* ssp. *brasiliense* was described by Herzog (1925) and both were not assessed by CNCFlora (2012) because they were considered as Data Deficient (DD) at that time.

Table 2. Endemism of bryophyte species (EB = endemic to Brazil; ERJ = endemic to Rio de Janeiro State and CS = conservation status category).

Group	Species	End. Brazil	End. RJ	C.S.
LIVERWORTS	<i>Cheilolejeunea grosseoleosa</i> C.J. Bastos & Schäf.-Verw.	X		
	<i>Cololejeunea diaphana</i> A. Evans	X		
	<i>Cololejeunea papilliloba</i> (Steph). Steph.	X		
	<i>Colura itatyana</i> Steph.	X	X	
	<i>Frullania schaefer-verwimpii</i> Yuzawa & Hatt.	X		
	<i>Frullania vitalii</i> Yuzawa & Hatt.	X		
	<i>Fuscocephaloziopsis crassifolia</i> (Lindenb. & Gottsche) Váša & L. Söderstr.	X		
	<i>Gongylanthus liebmannianus</i> (Lindenb. & Gottsche) Steph. (Figure 6A)			EN

	<i>Haplolejeunea umbrosa</i> Gradst. & Ilkiu-Borges	X		
	<i>Harpalejeunea schiffneri</i> S.W. Arnell	X		
	<i>Harpalejeunea subacuta</i> A. Evans	X		
	<i>Lejeunea beyrichiana</i> (Steph) Gradst. & C.J. Bastos	X	X	
	<i>Lejeunea longidentata</i> C.J. Bastos, Gradst., S. Vilas Bôas-Bastos & Schäf.-Verw.	X		
	<i>Lejeunea oligoclada</i> Spruce	X		
	<i>Leptoscyphus spectabilis</i> (Steph.) Grolle	X		
	<i>Metzgeria brasiliensis</i> Schiffn.	X		
	<i>Metzgeria convoluta</i> Steph.	X		
	<i>Metzgeria cratoneura</i> Schiffn.	X		
	<i>Metzgeria hegewaldii</i> Kuwah. (Figure 6B)		X	EN
	<i>Microlejeunea squarrosa</i> J. Heinrichs, A. Schäfer-Verwimp, Pócs & S.S. Dong	X		
	<i>Micropterygium pterygophyllum</i> (Nees)	X		
	<i>Neesioscyphus carneus</i> (Nees) Grolle	X		
	<i>Paracromastigum dusenii</i> (Steph.) R.M.Schust.		X	EN
	<i>Plagiochila amicta</i> Steph.	X		
	<i>Plagiochila boryana</i> Gottsche ex Steph. (Figure 6C)			EN
	<i>Saccogynidium caldense</i> (Ångstr.) Grolle	X		
	<i>Southbya organensis</i> Herzog		X	CR
	<i>Syzygiella uleana</i> Steph.	X		
	<i>Vitalianthus bischlerianus</i> (Porto & Grolle) R.M.Schust. & Giancotti	X		
MOSESSES	<i>Atractyllocarpus brasiliensis</i> (Müll.Hal.) R.S.Williams	X		EN
	<i>Atractyllocarpus longisetus</i> (Hook.) E.B.Bartram (Figure 6D)			EN
	<i>Brachydontium notorogenes</i> W.R.Buck & Schaf.-Verw.	X	X	CR
	<i>Brachymenium hornschruchianum</i> Mart.	X		
	<i>Breutelia grandis</i> (Hampe) Paris	X		
	<i>Callicostella martiana</i> (Hornsch.) A.Jaeger	X		
	<i>Calypstrochaeta albescens</i> (Hampe) W.R.Buck	X		
	<i>Campylopus densicoma</i> (Müll.Hal.) Paris			EN
	<i>Campylopus dichrostis</i> (Müll.Hal.) Paris	X		
	<i>Campylopus gemmatus</i> (Müll.Hal.) Paris	X		
	<i>Campylopus julicaulis</i> Broth.	X		
	<i>Campylopus thwaitesii</i> (Mitt.) A.Jaeger	X		
	<i>Campylopus uleanus</i> (Müll.Hal.) Broth.	X		
	<i>Campylopus widgrenii</i> (Müll.Hal.) Mitt.	X		
	<i>Cladastomum robustum</i> Broth.	X		
	<i>Cladastomum ulei</i> Müll.	X		
	<i>Crumescus vitalis</i> W.R.Buck	X		
	<i>Cyclodictyon marginatum</i> (Hook. & Wilson) Kuntze	X		
	<i>Daltonia splachnoides</i> (Sm.) Hook. & Taylor	X		
	<i>Dicranodontium pulchroalare</i> Broth.	X	X	
	<i>Dimerodontium pellucidum</i> Schwägr.	X		
	<i>Ditrichum paulense</i> Geh. ex Hampe	X		
	<i>Itatiella ulei</i> (Broth. ex Müll. Hal.) G.L.Sm.	X		
	<i>Leiomela piligera</i> (Hampe) Broth.	X		
	<i>Lepidopilidium brevisetum</i> (Hampe) Broth.	X		
	<i>Lepidopilum scabrisetum</i> (Schwägr.) Steere	X		
	<i>Leptodontium stellatifolium</i> (Hampe) Broth.	X		
	<i>Leptodontium wallisii</i> (Müll.Hal.) Kindb. (Figure 6E)			VU
	<i>Leskeodon aristatus</i> (Geh. & Hampe) Broth.	X		
	<i>Leucobryum clavatum</i> Hampe	X		
	<i>Leucoloma trifforme</i> (Mitt.) A.Jaeger	X		
	<i>Microcalpe subsimplex</i> (Hedw.) W.R. Buck	X		
	<i>Polytrichum angustifolium</i> Mitt.	X		
	<i>Rhacocarpus inermis</i> (Müll.Hal.) Lindb.	X		

<i>Sphagnum brasiliense</i> Warnst.	X		
<i>Sphagnum costae</i> H.A.Crum & D.P.Costa	X		
<i>Sphagnum divisum</i> H.A.Crum	X		
<i>Sphagnum exquisitum</i> H.A.Crum	X		
<i>Sphagnum geraisense</i> H.A.Crum	X		
<i>Sphagnum gracilescens</i> Hampe	X		
<i>Sphagnum longicomosum</i> Müll. Hal. ex Warnst.	X		
<i>Sphagnum luetzelburgii</i> H.K.G.Paul ex H.A.Crum	X	X	
<i>Sphagnum perforatum</i> Warnst. (Figure 6F)	X		VU
<i>Sphagnum pseudoramulinum</i> H.A.Crum	X		
<i>Sphagnum ramulinum</i> Warnst.	X		
<i>Sphagnum sehnemii</i> H.A.Crum	X		
<i>Sphagnum sucrei</i> H.A.Crum	X		
<i>Trichosteleum glaziovii</i> (Hampe) W.R.Buck	X		



Figure 2. Pictures of some species indicated as threatened to Serra dos Orgaos National Park. A. *Gongylanthus liebmannianus* (Lindenb. & Gottsche) Steph., B. *Metzgeria hegewaldii* Kuwah., C. *Plagiochila boryana* Gottsche ex

Steph., D. *Atractylolopus longisetus* (Hook.) E.B.Bartram, E. *Leptodontium wallisii* (Müll.Hal.) Kindb., F. *Sphagnum perforatum* Warnst. (Photos D.F. Peralta).

3. Discussion

The Serra dos Órgãos National Park (PARNASO) exhibits remarkable bryophyte diversity. This richness highlights the park as a key conservation area for bryophytes in the Atlantic Forest. The discovery of 17 species newly recorded for the state of Rio de Janeiro emphasizes the urgent need for continued floristic inventories, particularly in underexplored regions. These findings suggest that even in areas already considered well-studied, significant knowledge gaps remain, highlighting the dynamic nature of bryophyte diversity and distribution.

One important factor contributing to this diversity is the presence of forested areas with abundant tree trunks, which serve as critical substrates for epiphytic bryophytes. The architectural, morphological, phenological, and chemical traits of different tree species create varied microhabitats that support a wide range of bryophyte taxa [36,37]. Shade-loving epiphytes, in particular, are commonly found in these forest environments, but are highly sensitive to environmental disturbances. As such, they are often among the first species to disappear following canopy opening or habitat degradation [38] making them reliable indicators of forest health.

In contrast, mosses exhibit a broader ecological amplitude due to their desiccation tolerance and structurally complex adaptations, such as costa development, hyaline leaf apices, papillae, and specialized conducting tissues like hydroids and leptoids [39, 40, 41]. These features enable many mosses to colonize exposed and drier substrates, including rocky outcrops. Similar patterns of moss dominance on rock surfaces have been observed in other highland regions of Brazil, such as Chapada Diamantina [42,43], Serra do Caraça [44], and Serra da Canastra [45].

The high-altitude ecosystems of PARNASO further enhance bryophyte diversity by creating isolated and unique habitats. Mountain summits, often compared to ecological islands due to their environmental isolation, support specialized flora adapted to harsh conditions such as strong winds, low temperatures, and nutrient-poor soils [46,47,48]. These rupestrian fields form natural refugia, acting as barriers to typical forest species and favoring the emergence of narrow endemics and rare taxa [49,50,51].

Overall, the findings of this study underscore the ecological importance and conservation value of Serra dos Órgãos National Park. Alongside Itatiaia National Park, PARNASO remains one of the most critical remnants of Atlantic Forest in Rio de Janeiro and Brazil, particularly in terms of bryophyte conservation. The park's diverse topography, wide range of microhabitats, and climatic heterogeneity—marked by high altitudes, low temperatures, and high light availability—create optimal conditions for bryophyte diversity. Furthermore, the presence of endemic and threatened species reinforces the park's role as a conservation priority. Such studies are valuable as they reveal the significance of endemism and species richness, crucial factors in determining conservation priorities [52], and emphasize the importance of preserving Serra dos Órgãos National Park.

4. Materials and Methods

Serra dos Órgãos National Park (PARNASO) is located in the highlands region of Rio de Janeiro State, Brazil, raging the municipalities of Teresópolis, Petrópolis, Guapimirim and Magé (22°23'36,96"—22°34'57,72" S, 43°10'57,72"— 42°58'43,68" W). It is a protected area with 20,024 hectares of Atlantic Forest in a central position in the Serra do Mar Ecological Corridor. Ranging in altitude from 80 to 2,275 m.a.s.l. (Figure 3), it is the highest portion of the entire Serra do Mar [2]. The climate is tropical super humid (80 – 90% relative humidity), with the annual average temperature ranging 13° – 23°C, although minimums can reach -5°C during winter above 800 m.a.s.l. [53,54,6,8]. The average annual rainfall ranges from 1,500 mm to 3,000 mm, with higher concentrations of rain during summer (December to March) and a dry season during winter (June to August), while heat is well distributed throughout the year [53,54,6,8].

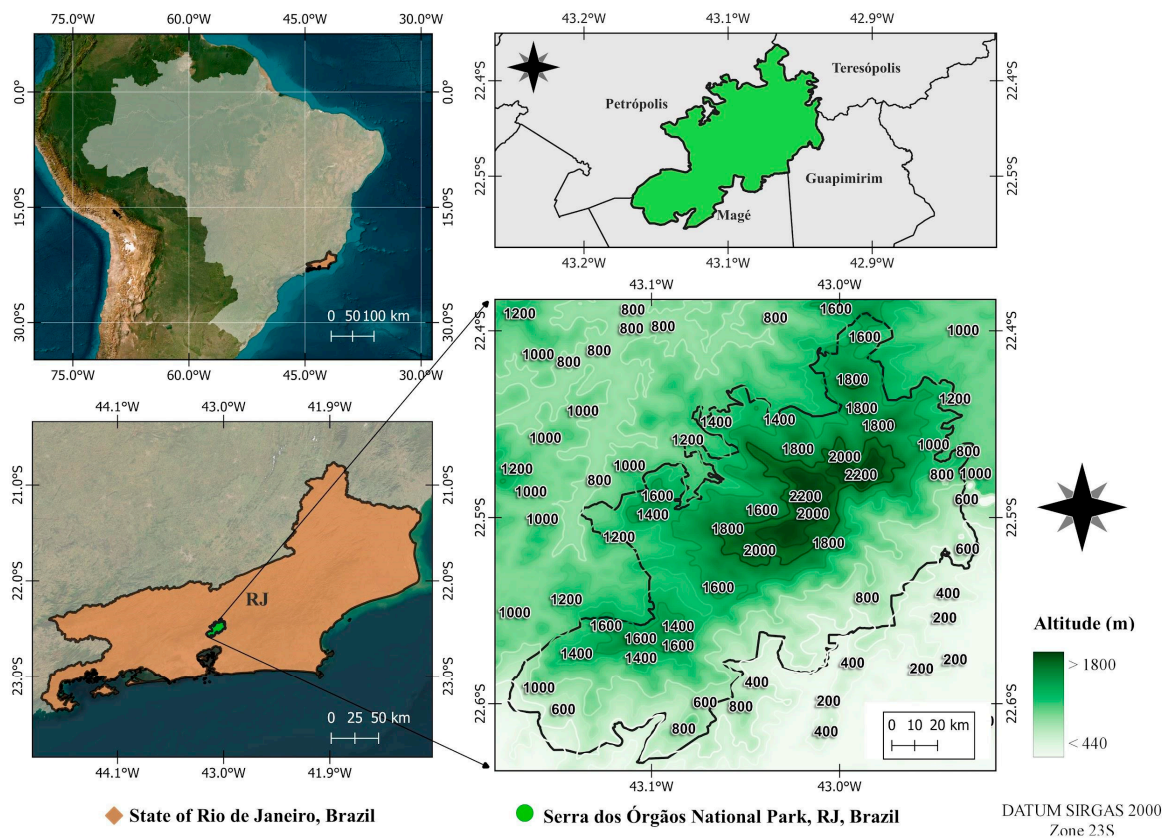


Figure 3. Location of the Serra dos Órgãos National Park, Rio de Janeiro State, Brazil.

The species list developed here is based on a bibliographic survey, herbarium specimens, and new collections (Figure 4). Herbarium specimens were located by on line sources like (GBIF, jabot, JstorTypes and SpeciesLink). All specimens are re-determined and carefully examined for small species associations. The collection, preservation and herborization methodologies follow Frahm (2003), and employed free walks [56] for covering all available substrates like: tree trunks, logs, soil, rocks and leaves.

Field trips in the Park intended to check if species collected in the past are yet present, taxa not recorded and fill the elevation information. Collected samples were deposited in the herbarium of the University of Brasília (UB), with duplicates sent to the herbarium of Instituto de Pesquisas Ambientais (SP). The classification system used here follows Crandall-Stotler et al. (2009) for Marchantiophyta, Buck & Goffinet (2009) for Bryophyta and Renzaglia et al. (2009) for Anthocerotophyta. Data referring to endemic species of Brazil and of Rio de Janeiro State came from Flora e Funga do Brasil (floradobrasil.jbrj.gov.br), while conservation status followed CNCFlora (cncflora.jbrj.gov.br).

The vegetation classification adopted follows Veloso *et al.* (1991) and Safford (1999): Sub-montane Forest below 600 m.a.s.l., Montane Forest (600 – 1.500), Upper-montane Forest (above 1.500), and High-altitude Fields (above 1800 – 2000) (Figure 4).

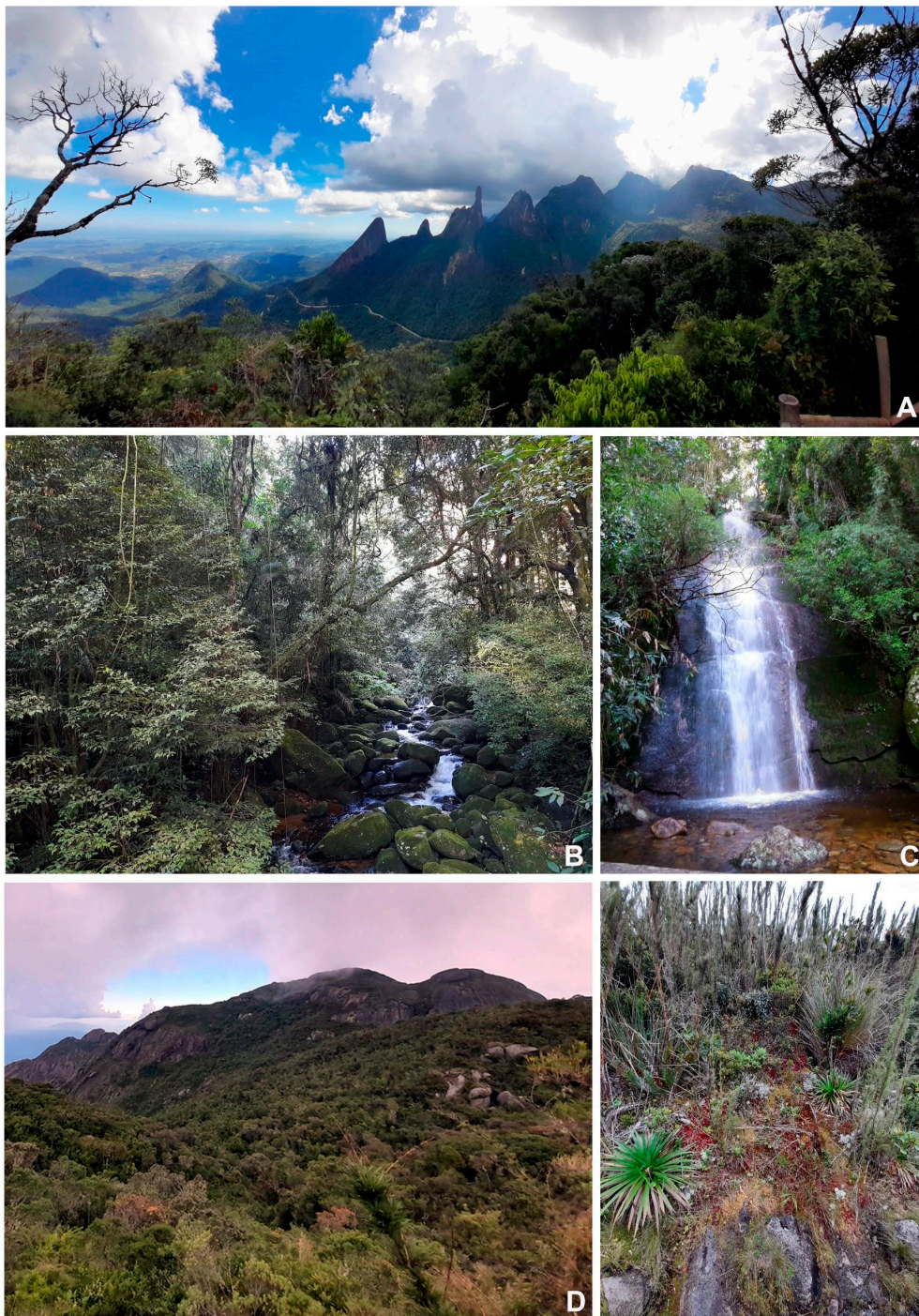


Figure 4. Collection sites in Serra dos Órgãos National Park. A. Trail of the "Mirante", B. Aspect of the Montane Forest with streams, C. "Véu da Noiva" waterfall, D. Aspect of the Upper-montane Forest, E. Aspect of High-altitude Fields, with *Sphagnum* among *Chusquea* sp.

5. Conclusions

The Serra dos Órgãos National Park stands out as a key refuge for bryophyte diversity in the Atlantic Forest, hosting numerous endemic and threatened species. The discovery of several new records for Rio de Janeiro highlights the importance of continued floristic surveys. The park's altitudinal variation, diverse microhabitats, and unique environmental conditions favor high species richness and endemism. These findings reinforce the ecological value of PARNASO and underscore the urgency of conserving this unique mountainous ecosystem.

Funding: This research was funded by the Fundação de Amparo à Pesquisa do Distrito Federal (FAP-DF)

Data Availability Statement: The original contributions presented in this study are included in the Supplementary Materials; further inquiries can be directed to the corresponding author.

Acknowledgements: We thank the Fundação de Amparo à Pesquisa do Distrito Federal (FAP-DF) for financial support to this project and the park coordinator PARNASO (Jorge Nascimento). We fully thank the support in field collections of the colleagues Amanda Leal, Anderson Eustáquio, Clapton Moura, Cosme Ponte and Flávio Rick.

Conflicts of Interest: The authors declare no conflicts of interest.

Abbreviations

PARNASO Serra dos Órgãos National Park

References

1. Mello, D.; Mello, G.; Mallet-Rodrigues, F. Aves da Serra dos Órgãos e Adjacências: Guia de Campo (Birds of the Serra dos Órgãos and surrounding areas: field guide). *Neotropical Birding* 2015, 19, 87.
2. Cronemberger, C.; Delciellos, A.C.; Barros, C.S. et al. Mamíferos do Parque Nacional da Serra dos Órgãos: Atualização da lista de espécies e implicações para a conservação. *Oecologia Australis* 2019, 23, 191–214.
3. Mori, S.A.; Boom, B.M.; Prance, G.T. Distribution patterns and conservation of Eastern Brazilian coastal forest tree species. *Brittonia* 1981, 33, 233–245.
4. Lima, H.C.; Guedes-Bruni, R.R. Plantas arbóreas da Reserva Ecológica de Macaé de Cima. In: Serra de Macaé de Cima: diversidade florística e conservação em Mata Atlântica; Lima, H.C., Guedes-Bruni, R.R., Eds.; Jardim Botânico do Rio de Janeiro: Rio de Janeiro, Brasil, 1997; pp. 53–63.
5. Guedes, M.L.; Batista, M.A.; Ramalho, M.; Freitas, H.M.B.; Silva, E.M. Breve incursão sobre a biodiversidade da Mata Atlântica. In: Mata Atlântica e biodiversidade; Franke, C.R., Rocha, P.L.B., Klein, W., Gomes, S.L., Orgs.; Edufba: Salvador, Brasil, 2005; pp. 39–92.
6. Cronemberger, C.; Castro, E.V. Envolvendo a Comunidade Científica na Gestão do Parque Nacional da Serra dos Órgãos. *Biodiversidade Brasileira* 2015, 5, 4–20.
7. Coelho, M.A.N.; Baumgratz, J.F.A.; Lobão, A.Q.; Sylvestre, L.S.; Trovó, M.; Silva, L.A.E. Flora of Rio de Janeiro state: an overview of Atlantic Forest diversity. *Rodriguésia* 2017, 68, 1–011.
8. Carvalho-e-Silva, S.; Carvalho-e-Silva, A.M.P.T.; Folly, M. et al. Parque Nacional da Serra dos Órgãos: the highest Amphibian diversity within an Atlantic Forest protected area. *Biota Neotropica* 2020, 20. doi.org/10.1590/1676-0611-BN-2020-1033.
9. Primack, R.B. *Essentials of Conservation Biology*. Sinauer: Sunderland, UK, 1993; 608 pp.
10. Myers, N.; Mittermeier, R.A.; Mittermeier, C.G.; Fonseca, G.A.B.; Kent, J. Biodiversity hotspots for conservation priorities. *Nature* 2000, 403, 853–858.
11. Leigh, E.G.; Davidar, P.; Dick, C.W. et al. Why do some tropical forests have so many species of trees? *Biotropica* 2004, 36, 447–473.
12. Corlett, R.T.; Primack, R.B. *Tropical rain forests: an ecological and biogeographical comparison*. Wiley Blackwell: Oxford, UK, 2011.
13. Pócs, T. Tropical Forest Bryophytes. In: *Bryophyte Ecology*; Smith, A.J.E., Ed.; Chapman and Hall: New York, USA, 1982; pp. 59–103.
14. Gradstein, S.R. Bryophyte diversity of the tropical rainforest. *Archives des sciences [Société de physique et d'histoire naturelle de Genève]* 1995, 48, 91–96.
15. Frahm, J.P.; Gradstein, S.R. An altitudinal zonation of tropical rain forests using bryophytes. *Journal of Biogeography* 1991, 18, 669–678.
16. Wolf, J.H.D. Epiphyte communities of tropical montane rain forest in the northern Andes. II. Upper montane communities. *Phytocoenologica* 1993, 22, 53–103.
17. Pócs, T. The altitudinal distribution of Kilimanjaro bryophytes. In: XIIIth Plenary meeting. AETFAT; Seyani, J.H., Chikuni, A.C., Eds.; Zomba, Malawi, 1994; pp. 797–812.

18. Gradstein, S.R.; Churchill, S.P.; Salazar, A.N. Guide to the Bryophytes of Tropical America. Memoirs of The New York Botanical Garden: New York, USA, 2001; Volume 86, pp. 1–577.
19. Gyrtnes, J.A.; Heegaard, E.; Ihlen, P.G. Species richness of vascular plants, bryophytes and lichens along an altitudinal gradient in western Norway. *Acta Oecologica* 2006, 29, 241–246.
20. Grau, O.; Grytnes, J.A.; Birks, H.J.B. A comparison of altitudinal species richness patterns of bryophytes with other plant groups in Nepal, Central Himalaya. *Journal of Biogeography* 2007, 34, 1907–1915.
21. Ah-Peng, C.; Wilding, N.; Kluge, J. et al. Bryophyte diversity and range size distribution along two altitudinal gradients: Continent vs. Island. *Acta Oecologica* 2012, 42, 58–65.
22. Costa, D.P.; Santos, N.D.; Rezende, M.A.; Buck, W.R.; Schäfer-Verwimp, A. Bryoflora of the Itatiaia National Park along an elevation gradient: diversity and conservation. *Biodiversity and Conservation* 2015, 24, 2199–2212.
23. Rizzini, C.T. Flora organensis: lista preliminar dos Cormophyta da Serra dos Órgãos. *Arquivos do Jardim Botânico do Rio de Janeiro* 1954, 13, 115–243.
24. Veloso, H.P.; Rangel-Filho, A.L.R.; Lima, J.C.A. Classificação da vegetação brasileira, adaptada a um sistema universal. IBGE: Rio de Janeiro, Brasil, 1991; 124 p.
25. Amador, E.S. Baía de Guanabara e ecossistemas periféricos: homem e natureza. Rio de Janeiro, Brasil, 1997; 539 p.
26. Aguiar, A.P.; Chiarello, A.G.; Mendes, S.L.; Matos, E.N. Os corredores Central e da Serra do Mar na Mata Atlântica Brasileira. In: *Mata Atlântica: biodiversidade, ameaças e perspectivas*; Galindo-Leal, C., Câmara, I.G., Eds.; S.O.S. Mata Atlântica e Conservação Internacional e Centro de Ciências Aplicadas à Biodiversidade: Belo Horizonte, Brasil, 2005; pp. 119–132.
27. Parrini, R.; Pardo, C.S.; Pacheco, J.F. Conhecendo as plantas cujos frutos e recursos florais são consumidos pelas aves na Mata Atlântica do Parque Nacional da Serra dos Órgãos. *Atualidades Ornitológicas* 2017, 199, 38–136.
28. Gradstein, S.R.; Costa, D.P. The hepaticae and anthocerotae of Brazil. Memoirs of the New York Botanical Garden: New York, USA, 2003; Volume 87, pp. 1–336.
29. Faria, A.L.A.; Peralta, D.F.; Amorim, E.T.; Carvalho-Silva, M.; Câmara, P.E.A.S. Bryophytes from Glaziou's historical collections: revisiting the flora of Rio de Janeiro and implications for conservation. *Cryptogamie Bryologie* 2021, 42, 197–204.
30. Peralta, D.F. The genus *Andreaea* Hedw. (Andreaeaceae, Bryophyta) in Brazil. *Phytotaxa* 2020, 451, 169–174.
31. Costa, D.P. A synopsis of the family Sphagnaceae in Brazil. *Systematics Botany Monograph* 2021, 111, 1–142.
32. Ochi, H. A revision of the neotropical Bryoideae, Musci (First part). The Journal of the Faculty of Education Tottori University. *Natural Science* 1980, 29, 49–154.
33. Flora e Funga do Brasil. Jardim Botânico do Rio de Janeiro. Available online: <http://floradobrasil.jbrj.gov.br/> (accessed on July 30, 2023).
34. Herzog, T.H. *Miscellanea Bryologica. I. Neotropica. Memoranda Societatis pro Fauna et Flora Fennica* 1948–1949, 25, 53–54.
35. CNCFlora. *Southbya organensis*. In: *Lista Vermelha da flora brasileira versão 2012.2*. Centro Nacional de Conservação da Flora. 2012. Available online: [http://cncflora.jbrj.gov.br/portal/pt-br/profile/Southbya organensis](http://cncflora.jbrj.gov.br/portal/pt-br/profile/Southbya%20organensis) (accessed on July 27, 2023).
36. Zotz, G.; Vollrath, B. The epiphyte vegetation of the palm *Socratea exorrhiza* - correlations with tree size, tree age and bryophyte cover. *Journal of Tropical Ecology* 2003, 19, 81–90.
37. Ilkiu-Borges, A.L.; Lisboa, R.C.L. Cololejeuneae (Lejeuneaceae, Hepaticae) na Estação Científica Ferreira Penna, Melgaço, PA, Brasil. *Acta Botanica Brasilica* 2004, 18, 887–902.
38. Gradstein, S.R. The taxonomic diversity of epiphyllous bryophytes. *Abstracta Botanica* 1997, 21, 15–19.
39. Goffinet, B.; Buck, W.R.; Shaw, A.J. Morphology, anatomy and classification of the Bryophyta. In: *Bryophyte Biology*, 2nd ed.; Goffinet, B., Shaw, A.J., Eds.; Cambridge University Press: New York, USA, 2009; pp. 56–138.
40. Gao, B.; Li, X.; Zhang, D. et al. Desiccation tolerance in bryophytes: The dehydration and rehydration transcriptomes in the desiccation-tolerant bryophyte *Bryum argenteum*. *Scientific Reports* 2017, 7, 7571.

41. Stotler, R.E.; Crandall-Stotler, B.J. A monograph of the genus *Bryopteris* (Swartz) Nees von Esenbeck. Bryophytorum Bibliotheca: Berlin, Germany, 1974; Volume 3, 159 pp.
42. Bastos, C.J.P.; Yano, O.; Vilas Bôas-Bastos, S.B. Briófitas de campos rupestres da Chapada Diamantina, estado da Bahia, Brasil. *Revista Brasileira de Botânica* 2000, 23, 357–368.
43. Valente, E.B.; Pôrto, P.K.C.; Bastos, C.J.P. Habitat heterogeneity and diversity of bryophytes in campos rupestres. *Acta Botanica Brasilica* 2017, 31, 241–249.
44. Carmo, D.M.; Lima, J.S.; Silva, M.I.; Amélio, L.A.; Peralta, D.F. Briófitas da Reserva Particular do Patrimônio Natural da Serra do Caraça, Estado de Minas Gerais, Brasil. *Hoehnea* 2018, 45. doi.org/10.1590/2236-8906-35/2018.
45. Carmo, D.M.; Peralta, D.F. Survey of bryophytes in Serra da Canastra National Park, Minas Gerais, Brazil. *Acta Botanica Brasilica* 2016, 30, 254–265.
46. Schuster, R.M. Phytogeography of bryophytes. In: *New manual of bryophytes*; Schuster, R.M., Ed.; Hattori Botanical Laboratory: Nichinan, Japan, 1983; pp. 463–626.
47. Gotelli, N.J. Island Biogeography. In: *A Primer of Ecology*, 4th ed.; Gotelli, N.J., Ed.; Sinauer Associates: Massachusetts, USA, 2009.
48. Lomolino, M.V.; Riddle, B.R.; Whittaker, R.J. *Biogeography: biological diversity across space and time*, 5th ed.; Sinauer Associates is an imprint of Oxford University Press: Oxford, UK, 2016.
49. Ribeiro, K.T.; Medina, B.M.O.; Scarano, F.R. Species Composition and Biogeographic Relations of the Rock Outcrop Flora on the High Plateau of Itatiaia, SE - Brazil. *Revista Brasileira de Botânica* 2007, 30, 623–639.
50. Costa, D.P.; Couto, G.P.; Siqueira, M.F.; Churchill, S.P. Bryofloritic affinities between Itatiaia National Park and tropical Andean countries. *Phytotaxa* 2018, 346, 203–220.
51. Santos, N.D.; Oliveira, J.R.P.M.; Silva, L.T.P.; Gonçalves, M.T.A.; Peralta, D.F. Campos de altitude: ecossistemas prioritários para a conservação de briófitas. In: *Botânica: para que e para quem? Desafios, Avanços e Perspectivas na Sociedade Contemporânea*; Moura, C.W.N., Shimizu, G.H., Eds.; Sociedade Botânica do Brasil: Brasília - DF, Brasil, 2022; pp. 92–99.
52. Kier, G.; Kreft, H.; Lee, T.M.; Jetz, W.; Ibis, P.L.; Nowicki, C.; Mutke, J.; Barthlott, W. A global assessment of endemism and species richness across island and mainland regions. *Proceedings of the National Academy of Sciences of the United States of America* 2009, 106, 9322–9327.
53. Fiderj. Indicadores Climatológicos do Estado do Rio de Janeiro. Fundação de Desenvolvimento Econômico e Social do Rio de Janeiro: Rio de Janeiro, Brasil, 1978; 156 p.
54. Davis, E.G.; Naghettini, M.C. Estudos de chuvas intensas no estado do Rio de Janeiro. 2 ed. CPRM: Brasília, Brasil, 2000; 142 p.
55. Frahm, J.P. Manual of tropical bryology. *Tropical Bryology* 2003, 23, 1–195.
56. Filgueiras, T.S.; Nogueira, P.E.; Brochado, A.L.; Guala II, G.F. Caminhamento: um método expedito para levantamentos florísticos qualitativos. *Caderno de Geociências* 1994, 12, 39–43.
57. Safford, H.D. Brazilian páramos I. An introduction to the physical environment and vegetation of the campos de altitude. *Journal of Biogeography* 1999, 26, 693–712.

Disclaimer/Publisher's Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.