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# RESEARCH ARTICLE TAXONOMIC CATALOG OF THE BRAZILIAN FAUNA

The taxonomic catalog of the Brazilian fauna: Dermaptera and Phasmatodea (Insecta), with commentaries on species list, types, authorship and distribution

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ABSTRACT. A checklist of Dermaptera and Phasmatodea from Brazil is presented, from the Catalog of the Brazilian Fauna project, an online platform available at http://fauna.jbrj.gov.br, which gathers taxonomic information (valid species, distribution, synonymies, depository location, etc.) from species recorded in the country. The patterns of known type locations, biome distribution, and rate of new species descriptions in Brazil are discussed. There is a great number of lost types and few numbers of secondary types, indicating that collecting activities focused on Dermaptera and Phasmatodea followed by taxonomic treatments have not been many. The best-known biome in terms of species of Dermaptera and Phasmatodea is the Atlantic Forest, followed by the Amazon Forest. There are significantly less species recorded for the other biomes. This bias may be explained by the colonization of Brazil, which started in areas of Atlantic Forest, and the several expeditions that occurred in the Amazon region in the last century. As for the rate of new species descriptions, a steady and slow pattern of new species described through time is characteristic of Dermaptera, while large gaps of time without any new taxon followed by clusters of many described species is characteristic of Phasmatodea.

KEY WORDS. Biodiversity, checklist, earwigs, Hexapoda, Insecta, stick insects.

#### **INTRODUCTION**

# Dermaptera general information

Dermaptera, also known as earwigs (in Brazil, they are popularly known as *tesourinhas*), can be easily recognized by the pincer-shaped, modified cerci. They are relatively small, ranging from 3 to 85 mm (generally ranging from 10 to 15 mm) and have a uniform morphology across the entire order, which includes a cordiform head, elongated body, and body varying from dark brown to black (Haas 2012). Earwigs inhabit a diversity of environments, from the litter at ground level, under loose bark of fallen trees, to the highest canopies (Haas 2012). They have adopted different feeding strategies: some species are mostly predators of other small arthropods, while there are more generalist species that feed on decomposing organic matter (Haas 2012). Currently, this

insect order includes over 2,200 species described worldwide, distributed in 12 families: Anisolabididae, Apachyidae, Arixeniidae, Chelisochidae, Diplatyidae, Forficulidae, Haplodiplatyidae, Hemimeridae, Karschiellidae, Labiduridae, Pygidicranidae, and Spongiphoridae (Hopkins et al. 2022). Out of the total species, 303 have been recorded from South America (Hopkins et al. 2022). Currently, there is strong support for the hypothesis that Dermaptera and Zoraptera are sister groups, mostly based on molecular evidence (Misof et al. 2014, Wipfler et al. 2019).

The New World checklist of Dermaptera species was presented in a series of publications by Reichardt: 1968a – Pygidicranoidea; 1968b – Anisolabididae I; 1970 – Anisolabididae II and Spongiphoridae; 1971a – Chelisochidae, Forficulidae and Labiduridae; and 1971b – Amendments, additions and bibliography. These were followed by the



World Catalog of Steinmann (1989a) and his taxonomic works (1986 and 1989b – Catadermaptera; 1990 and 1993 – Eudermaptera) and Srivastava (1995 – Spongiphoridae; 1999 – Anisolabididae). The works of Reichardt, Srivastava, and Steinmann complement one another: Srivastava and Steinmann updated the checklist with species that were described after Reichardt's checklist; further, there are species cited by Reichardt and Srivastava that are not mentioned by Steinmann. An important reference is Domenico (2005), a Brazilian author who published the type catalogue of Dermaptera housed at the Museu de Zoologia da Universidade de São Paulo (São Paulo, Brazil).

# Phasmatodea general information

The Phasmatodea are known as leaf or stick insects (in Brazil, they are popularly known as bicho-pau). They can be recognized by their leafy body or by the slender body in the case of those species that resemble sticks. However, there are several cases (e.g., Pseudophasmatidae) that do not follow these two patterns. In these cases, phasmatodeans can be recognized by the prognathous mouth parts coupled with the elongated body, with or without tegmina and posterior wings, all leg pairs without adaptations, and cerci simple (Zompro 2012). Phasmatodea are terrestrial and herbivorous, mostly active during night (Zompro 2012). There are about 3,300 valid species worldwide, out of which over a thousand are recorded from the New World (Brock et al. 2022). In the Americas, Agathemeridae, Diapheromeridae, Heteronemiidae, Phasmatidae, Prisopodidae, Pseudophasmatidae, and Timematidae are present (Brock et al. 2022). Phylogenetically, Embioptera is the sister group of Phasmatodea (Misof et al. 2014, Beutel et al. 2017). The most updated catalogue of the World Phasmatodea is the ongoing Phasmida Species File project (Brock et al. 2022), an international collaboration among authors from all major regions of the globe. Special references should be made to Zompro and Domenico (2005), who published a catalogue of the type material of Phasmatodea deposited in Brazilian museums, and Araújo and Garraffoni (2012), who published a list of species originally described from Brazil.

# Taxonomic Catalog of the Brazilian Fauna

The Taxonomic Catalog of the Brazilian Fauna (Catálogo Taxonômico da Fauna do Brasil – CTFB) is an online platform for the scientific names applied to the animals recorded from Brazil, including valid names, synonyms, homonyms, unavailable names, geographical records, etc. It is constantly updated to include new published or new

recorded data. This paper continues the series of updtates of the information on Brazilian species, which started with Trichoptera by Santos et al. (2020). Herein, lists of valid species of Dermaptera and Phasmatodea recorded from Brazil are presented, together with the type locality and depository of the types of these species. Discussions on distribution, authorship, and estimations are also provided.

#### MATERIAL AND METHODS

The CTFB is available at http://fauna.jbrj.gov.br. The data on Dermaptera species were obtained from original descriptions, from the Dermaptera World Catalogue of Reichardt (1968a, 1968b, 1970, 1971a, 1971b), and from Steinmann (1990). For the Phasmatodea, the data were acquired also in original descriptions and from the Phasmida Species File Online (Brock et al. 2022, available at http://phasmida. speciesfile.org/HomePage/Phasmida/HomePage.aspx). The present list was updated until 26 April 2022. The species lists provided are taxonomically ranked and the tables are alphabetically ranked, and both are available as Supplementary Material S1 and S2. Species considered endemic are those so far recorded only from Brazil. In the tables, species with the "Biome" field filled with a dash (-) are those known only from "Brazil", without further information on the specific location. Graphs and charts were made using the R software. Synonym lists of Dermaptera and Phasmatodea are also provided. These lists are alphabetically organized and the names are separated by family, with the valid taxon name being placed at the left margin, followed by their synonyms in subsequent lines; the synonyms are marked by indentation.

List of institutional acronyms: ANSP - Academy of Natural Sciences of Drexel University, Philadelphia, USA; CEIOC - Coleção Entomológica do Instituto Oswaldo Cruz, Rio de Janeiro, Brazil; CUMZ - Cambridge University Museum of Zoology, Cambridge, England; CZIICT - Centro de Zoologia do Instituto de Investigação Científica Tropical, Lisboa, Portugal; CZMA – Coleção Zoológica do Maranhão, Caxias, Maranhão; DZUP - Coleção Entomológica Pe Jesus Santiago Moure, Departamento de Zoologia, Universidade Federal do Paraná, Curitiba, Brazil; ETHZ - Zurich Entomological Collection, Zurich, Switzerland; FMNH - Finnish Museum of Natural History, Helsinki, Finland; HMNH - Hungarian Museum of Natural History, Budapest, Hungary; INPA - Instituto Nacional de Pesquisas da Amazônia, Manaus, Brazil; MDG - Musei di Genova, Genova, Italy; MELQ - Museu de Entomologia "Luiz de Queiroz", Escola Superior de Agricultura "Luiz de Queiroz", Universidade de



São Paulo, Piracicaba, Brazil; MHNG – Museum d'histoire naturelle Genève, Geneva, Switzerland; MLUH - Martin Luther Universität, Halle, Germany; MNHN - Muséum national d'Histoire naturelle, Paris, France; MNMS - Museo Nacional de Ciencias Naturales, Madrid, Spain; MNRJ - Museu Nacional, Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brazil; MNRS – Museo Regionale di Scienze Naturali di Torino, Turin, Italy; MPEG - Museu Paraense Emílio Goeldi, Belém, Brazil; MSNG - Museo Civico di Storia Naturale "Giacomo Doria", Genova, Italy; MVMA - Museum Victoria, Melbourne Museum, Melbourne, Australia; MZSP – Museu de Zoologia da Universidade de São Paulo, São Paulo, Brazil; NHM - Natural History Museum, London, England. NHRS - Naturhistoriska Riksmuseet, Stockholm, Sweden; NMNH - Smithsonian National Museum of Natural History, Washington, D.C., USA; NMW - Naturhistorisches Museum Wien, Vienna, Austria; PAS – Museum and Institute of Zoology of the Polish Academy of Sciences, Warsaw, Poland; RBINS - Royal Belgian Institute of Natural Sciences, Brussels, Belgium; RMNH - Naturalis Biodiversity Center, Leiden, Netherlands; SMF - Forschungsinstitut und Naturmuseum Senckenberg, Frankfurt, Germany; SMNS - Staatliches Museum für Naturkunde Stuttgart, Stuttgart, Germany; SNH - Senckenberg Natural History Collections, Museum of Zoology, Dresden, Germany; UFLA - Universidade Federal de Lavras, Lavras, Brazil; UFRPE – Universidade Federal Rural de Pernambuco, Camaragibe, Brazil; UFV - Universidade Federal de Viçosa, Viçosa, Brazil; UMO – Oxford University Museum of Natural History, Oxford, England; UNESP - Universidade Estadual Paulista "Júlio de Mesquita Filho", Rio Claro, Brazil; ZIN – Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia; ZMHB – Museum für Naturkunde Berlin, Berlin, Germany; ZMUH – Zoologisches Museum, Hamburg, Germany.

#### RESULTS AND DISCUSSION

#### Species number and types

Dermaptera: we recorded 117 valid species distributed in 43 genera and six families. There are 44 synonyms for species and 29 for genera (see Supplementary Material S1). The number of endemic species is 71 and the number of species that are not endemic is 46. Dermapteran species are distributed in Brazil as follows: there are 136 biome records for 108 species, while eight species lack biome records (Fig. 1A). The Atlantic Forest leads the rank with 81 records, followed by the Amazon Forest with 23, Caatinga with 15, Cerrado and Pantanal with nine each and Pampas with seven (Fig. 1A). The depository location of 78 types is known, whereas 39 types cannot be located (Appendix 1, Supplementary Material S1). In the case of species that had their types located, 62 are holotypes and 16 are syntypes. Among the species represented by holotypes, 17 also had designated paratypes, which is also the number of recorded paratypes (Appendix 1, Supplementary Material S1). However, out of these 17 recorded paratypes, six are considered lost, meaning that only 11 Dermaptera paratypes are known (Appendix 1, Supplementary Material S1). The type specimens of Dermaptera are largely deposited and distributed among 15 European collections (totaling 62 species), followed by three Brazilian

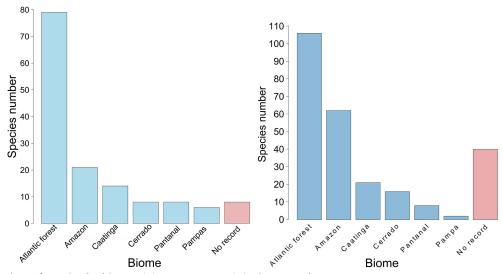


Figure 1. Number of species by biome: (A) Dermaptera; (B) Phasmatodea.



institutions (totaling 15 species), and two North American institutions (two species) (Appendix 1, Supplementary Material S1). The Brazilian MZSP houses the greatest number of Brazilian Dermaptera types in the world, with 12 species (Appendix 1, Supplementary Material S1).

Phasmatodea: we recorded 231 valid species distributed in 68 genera and five families (see Supplementary Material S2). There are 178 synonyms for species and 30 for genera. The number of endemic species is 190, while 41 species are not endemic. Phasmatodean species are distributed in Brazil as follows: there are 190 biome records for the 231 species, (Fig. 1B). Among the biome records, 106 are from the Atlantic Forest, 62 from the Amazon Forest, 21 from the Caatinga, 16 from the Cerrado, eight from the Pantanal, and two from the Pampa (Fig. 1B). The depository of types is known for 200 Brazilian Phasmatodea species, while 31 types cannot be located. Out of the species with located types, 143 are represented by holotypes, 42 by syntypes, and three by neotypes (Appendix 2, Supplementary Material S2). Furthermore, 47 of these species also have secondary types: 17 are paralectotypes and 30 are paratypes (Appendix 2, Supplementary Material S2). Phasmatodea type-specimens are also largely deposited in European museums, with a total of 20 institutions housing types from 148 species, especially the NMW, which houses types from 48 species, and the NHM, with types from 23 species (Appendix 2, Supplementary Material S2). There are ten Brazilian institutions with Phasmatodea type specimens (totaling types from 58 species), with MELQ and MZSP leading with types from 24 and 31 species, respectively. In North America, the ANSP houses types of four species and the NMNH, one (Appendix 2, Supplementary Material S2).

It is important to note that the information assembled about dermapteran types has not been thoroughly verified since Reichard's works. By "thoroughly verified" we mean that due to the inadequate number of specialists working with Dermaptera, especially from the 1990's on, there is no recent confirmation of whether the types are in the same place as the alleged type location provided in original descriptions and catalogues. More recent contributions, such as those of Steinmann and Srivastava, for instance, reproduce data from the literature, as we do in the present work. It is likely that some data is outdated and authors should consider this when engaging in Dermaptera research. The list of Phasmatodea, on the other hand, is much more precise, due to the Phasmida Species File (Brock et al. 2022), a large collaboration of Phasmatodea taxonomists from around the world, presenting updated and verified information from

specialists who have visited museums recently. However, our list shows some discrepancies with respect to the species listed in the Phasmida Species File.

In our Phasmatodea section, we list *Creoxylus spinosus* (Fabricius, 1775), Dinelytron grylloides Gray, 1835, and Parastratocles multilineatus (Rehn, 1904), which were recorded from Brazil by Heleodoro and Rafael (2019, 2020) and Heleodoro et al. (2017), respectively. Brock et al. (2022) stated that the distribution of D. grylloides is unknown. They provided distribution data for C. spinosus in Trinidad & Tobago, Guyana, and French Guiana and for P. multilineatus in Costa Rica and Panama. Furthermore, the Phasmida Species File (Brock et al. 2022) does not include the recently described Isagoras sobrali Heleodoro, 2022, which is listed herein. We deliberately excluded from our list species listed by Brock et al. (2022), namely Eurycnema versiruba (Audinet-Serville, 1838), Hermagoras hosei Kirby, 1896, Paradiacantha acanthocephala (de Haan, 1842), and Phobaeticus serratipes (Gray, 1835). These are all Asian species that were erroneously recorded from Brazil. Also, the Phasmida Species File lists Isagoras phlegyas as recorded from Brazil; however, the information on the species collection is "Brazil: Mte. Video" (Westwood 1859), which is much more likely to be an error. It is possible that the correct location is Montevideo, Uruguay. Hence, after considering these discrepancies, our list includes 231 species, whereas Brock et al. (2022) include 229.

#### **Biomes**

Both insect orders have a similar pattern of geographical records from Brazil: the Atlantic Forest represents 59.5% of the total geographical records for Dermaptera and 49.3% for Phasmatodea, followed by the Amazon Forest (16.9% Dermaptera, 28.8% Phasmatodea), Caatinga (11.0%, 9.7%), Cerrado (6.6%, 7.4%), Pantanal (6.6%, 3.7%), and Pampas (5.1%, 0.9%). This clear predominance of Atlantic Forest records may be explained by the distribution of research resources and institutions across Brazil. Brazil was discovered and colonized by Europeans starting from Atlantic Forest areas at the Northeast. Gradually, colonization expanded towards the Southeast. This trend prevailed and can be traced until present days. Marques and Lamas (2006) reported that 47.7% of the taxonomists from Brazil were settled in southeastern institutions, followed by 20.7% in the South, 14.2% in the Northeast, 13.3% in the North, and 4.1% in the Midwest. Consequently, collecting activities have been more intense in the Atlantic Forest since the colonial days, leading to a greater amount of collected specimens from this biome and thus to more described species.



The Amazon Forest coming second in number of records may be explained by the several expeditions that happened in this biome, led by European naturalists. A notorious example is the great adventure of Henry Walter Bates and Alfred Russel Wallace, who spent nearly eleven years collecting in the Amazon region in the mid-19<sup>th</sup> century. These expeditions brought several species to our knowledge, although their numbers were not comparable with the numbers of species from the previous decades of collecting in the Atlantic Forest. Surprisingly, even though 20.7% of the taxonomists who were working in Brazil back in 2006 were from sounthern institutions (Marques and Lamas 2006), the Pampas, a southern biome, is the least known for Dermaptera and Phasmatodea. Cerrado and Pantanal are in a similar situation.

There are several species recorded for "Atlantic Forest/ Caatinga", meaning that these records are dubious. In these cases, we only know the name of a general collection site that has both Atlantic Forest and Caatinga within their range. For instance, there are some species recorded from "Bahia", one of the largest states of Brazil that encompasses different biomes. Thus, if some species can be more precisely located, it is possible that the number of records from the Atlantic Forest and Caatinga will change.

#### Species authorship

In the case of Dermaptera, the types of nearly onethird (39) of the species recorded from Brazil are missing. This can potentially hinder taxonomic research (descriptions of new taxa) and identification of Dermaptera species. The fact that not enough lectotypes have been designated for Dermaptera is a consequence of the shortage of specialists on the Brazilian fauna, which can be confirmed by the demography of taxonomists in Brazil. Dermaptera species were described by 34 authors, out of which only four were Brazilians. Brazilians were responsible for the description of 21 species (17.9%), whereas authors from other nationalities described 96 species (82.01%) (Fig. 2A). Surprisingly, the author who described the greatest number of Brazilian Dermaptera species was a Brazilian, Carlos Moreira, with 13 species described, followed by Malcom Burr and Carl August Dohrn tied in second place (ten species), Alan Brindle in third (eight species), Jean Guillaume Audinet-Serville, Alfredo Borelli, Samuel Scudder, Carl Stål, and Henrik Steinmann tied in fourth (six species), and Auguste de Bormans, William Kirby, and Joaquim Machado Filho tied in fifth (five species) (Fig. 2B).

Considering the Phasmatodea recorded from Brazil, the types of 31 species out of 231 described species are considered lost. This is a less complicated scenario when compared with Dermaptera. Lecto- and paralectotypes have been designated for 13 species, indicating a relatively high interest in the taxonomy of Phasmatodea species. This interest is evidenced by the significant number of authors working on the group, 62, out of which 12 are Brazilians and 50 are not. The Brazilian authors were responsible for the descriptions of 66 species (28.5% of the total) versus 164 proposed by non-Brazilians (Fig. 3A). Two Brazilians are also among the top five authors who described the greatest numbers of phasmatodean species (Fig. 3B); this ranking is

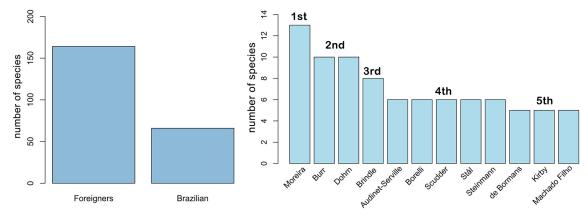


Figure 2. Data on species authorship of Dermaptera: (A) demography in relation to nationality; (B) ranking of authors who described the highest numbers of earwig species, from first to last: Carlos Moreira in first place; Malcom Burr and Carl August Dohrn tied in second; Alan Brindle in third; Jean Guillaume Audinet-Serville, Alfredo Borelli, Samuel Scudder, Carl Stål, and Henrik Steinmann tied in fourth; Auguste de Bormans, William Kirby, and Joaquim Machado Filho tied in fifth.



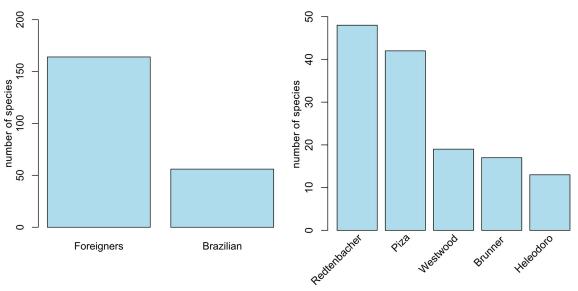


Figure 3. Data on species authorship of Phasmatodea: (A) demography in relation to nationality; (B) ranking of authors who described the highest numbers of walking-sticks species, from first to last: Ludwig Redtenbacher, Salvador de Toledo Piza Jr., John O. Westwood, Karl Brunner-von Wattenwyl, and Raphael A. Heleodoro.

as follows: Ludwig Redtenbacher (48 species), Salvador de Toledo Piza Jr. (42), John O. Westwood (19), Karl Brunner-von Wattenwyl (17), and Raphael A. Heleodoro (13).

The numbers above are politically important for Brazilian scientists, because they may be taken as evidence to demonstrate that researchers from other countries have produced more knowledge about our fauna than we have. Brazilians have been responsible for less than 30% of the described species of Brazilian Phasmatodea and Dermaptera and are not amongst the most productive taxonomisits in these groups. Brazil needs to invest more on local research on these groups, and we suggest that our data is taken into account when evaluating grants that aim to study our Phasmatodea and Dermaptera fauna in more depth.

The rate of species descriptions of Dermaptera from Brazil followed a somewhat steady rhythm (Fig. 4). The first two species described were *Forficula auricularia* Linnaeus, 1758 and *Labia minor* (Linnaeus, 1758), followed by *Labidura riparia* (Pallas, 1773). There were few long-time gaps of no species described, with the longest gap (49 years) from the third species to the fourth – *Doru lineare* (Eschscholtz, 1822). Afterwards, the steady rhythm of new species descriptions was settled, with the longest gap with no new species from 2002 to 2017 (15 years), followed by the period 1918–1930 (12 years), 1937–1947 and 1992–2002 (both 10 years) (Fig. 4). The gaps of the 90's and early 2000's together represent a total of 25 years with no new species described, a worrying

scenario since this is the period when the internet became gradually available to the general public (Fig. 4). The fact that data on Dermaptera species has become more easily accessible has not been enough to raise the interest of Brazilian taxonomists. The most significant period of new species descriptions for Dermaptera happened from 1838 to 1937, with an increase from 14 to 91 species, totaling 77 species described throughout nearly 100 years and representing almost two-thirds of all described species from Brazil. The pattern of species descriptions in Brazil may be explained by the few numbers of Dermaptera specimens collected over time. There are no specific methods for collecting earwigs efficiently (except for few specific cases, such as high amounts of Anisolabididae on pitfalls). Therefore, collecting efficacy depends on the active effort and experience of the collector. Due to their thigmotaxic tendency, these insects are very reclusive and often hide under tree bark, fallen trees, and rocks, or inside flowers or small holes along the height of a tree. Furthermore, having mastered the art of fleeing, when earwigs are uncovered from their shelters, they tend to quickly run and hide. Hence, collecting efforts on these insects generally lead to few numbers of collected specimens.

The descriptions of new Phasmatodea species from Brazil were marked by large gaps of time with no publications at all, as well as large amounts of species being described in "short" periods of time (Fig. 5). The oldest Phasmatodea descriptions from Brazil are from *Creoxylus spinosus* 



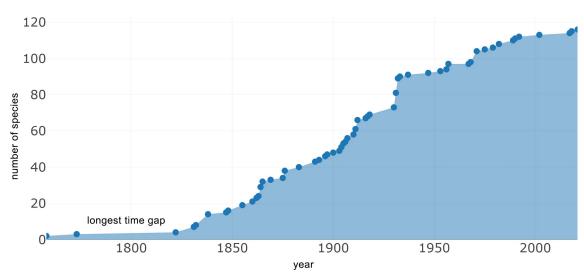


Figure 4. Distribution of the publications of Dermaptera species across time. Time gap\* = period of time that had no descriptions of species.

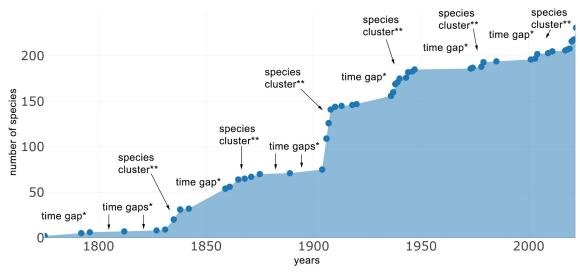


Figure 5. Distribution of the publications of Phasmatodea species across time. Time gap\* = period of time that had no descriptions of species; species cluster\*\* = high amounts of species described clustered in a short period of time, between time gaps.

Fabricius, 1775 and *Paraphasma laterale* (Fabricius, 1775). The longest time gap without new species being described happened from 1947 to 1973 (26 years), followed by other eight large gaps (chronologically): 1775–1792 (17 years), 1796–1812 (16), 1812–1827 (15), 1842–1859 (17), 1875–1889 (14), 1889–1904 (15), 1920–1936 (16), and 1985–2001 (16) (Fig. 3C). Between these gaps there were six periods of high amounts of new species described, chronologically:

1831–1838 (22 species), 1842–1875 (38), 1904–1920 (72), 1936–1947 (38), 1973–1985 (eight), and 2001–2022 (34). The pattern of Phasmatodea species descriptions in Brazil may be linked to several expeditions that brought specimens to European museums. This material was studied mainly by Redtenbacher (1906, 1908) and Brunner von Wattenwyl (1907), who together were responsible for the description of 65 species in two years.



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#### **Competing Interests**

The authors have declared that no competing interests exist.

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# Supplementary material 1

Supplementary S1. List of species and synomyms of the Dermaptera occurring in Brazil.

Authors: RA Heleodoro and JA Rafael

Data type: Species data.

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Link: https://doi.org/10.1590/S1984-4689.v40.e22060

# Supplementary material 2

Supplementary S1. List of species and synonyms of the Phasmatodea occurring in Brazil.

Authors: RA Heleodoro and JA Rafael

Data type: Species data.

Copyright notice: This dataset is made available under the Open Database License (http://opendatacommons.org/licenses/odbl/1.0/). The Open Database License (ODbL) is a license agreement intended to allow users to freely share, modify, and use this Dataset while maintaining this same freedom for others, provided that the original source and author(s) are credited.

Link: https://doi.org/10.1590/S1984-4689.v40.e22060



Appendix 1. Recorded species of Dermaptera in Brazil, alphabetically ordered. Records considered updates available until March 31, 2022.

Species	Type locality	Endemic	Biome	Primary types	Secondary type specimens
Ancistrogaster arthritica	Brazil	endemic	-	Type lost	-
Ancistrogaster maculifera	Venezuela	not endemic	Atlantic Forest	Syntype male NMW; syntype female SNH	-
Ancistrogaster mendesi	Brazil, Rio de Janeiro, Itatiaia	endemic	Atlantic Forest	Syntypes 2 male and female probably CEIOC	-
Ancistrogaster signficans	Brazil, São Paulo, Alto da Serra	endemic	Atlantic Forest	Holotype HMNH	-
Anisolabella antoni	Venezuela	not endemic	-	Holotype male PAS	-
Anisolabis marítima	Unknown	not endemic	Amazon/Atlantic Forest Caatinga/Pantanal	Type lost	-
Brachylabis coriacea	Brazil, Espírito Santo	endemic	Atlantic Forest	Syntype female NHM; syntype male NMW	-
Brachylabis lenkoi	Brazil, São Paulo, Barueri	endemic	Atlantic Forest	Holotype male MZSP	Paratypes male and female MZSP
Brachylabis punctulate	Brazil, Rio de Janeiro, Guanabara	endemic	Atlantic Forest	Syntypes 2 males and 2 females lost	-
Carcinophora brasiliensis	Brazil, Rio de Janeiro, Guanabara	endemic	Atlantic Forest	Holotype male lost	-
Carcinophora croceipes	Brazil, Rio de Janeiro, Campo Belo	endemic	Atlantic Forest	Holotype female lost	-
Carcinophora deplanata	Brazil, Amazonas, Huitanaã (Lábrea)	endemic	Amazon	Holotype male NRM	-
Carcinophora festiva	Brazil, Bahia	endemic	Atlantic Forest/Caatinga	Syntypes 3 females NHRS	-
Carcinophora mínima	Brazil, Rio de Janeiro	endemic	Atlantic Forest	Holotype male lost	-
Carcinophora percheroni	Guiana Francesa	endemic	Amazon	Type lost	-
Carcinophora saramaccensis	Suriname	not endemic	Amazon	Syntypes male and female, ZMHB	-
Carcinophora scudderi	Paraguay, Puerto 14 de Mayo	not endemic	Amazon	Syntypes 2 females MDG	-
Carcinophora spitzi	Brasil, São Paulo, Paranapiacaba e São Bernardo do Campo	endemic	Atlantic Forest	Syntypes 2 males and 2 MZSP	-
Circolabia arcuate	Brazil, Rio de Janeiro, Vassouras	not endemic	Atlantic Forest	Holotype male lost	-
Cosmiella brasiliensis	Brazil, Rio de Janeiro, Itatiaia	endemic	Atlantic Forest	Holotype male lost	-
Cosmogerax formica	Brazil, Bahia	not endemic	Atlantic Forest	Holotype HMNH	-
Ctenisolabis nigra	Brazil, Pará	endemic	Amazon	Syntypes male and female, lost	-
Cylindrogaster bicylurus	Brazil, Pernambuco, Serra do Açai	endemic	Atlantic Forest/Caatinga	Lost holotype male MNRJ	Lost paratypes 2 males 4 females MNRJ
Cylindrogaster cavernicola	Brazil, Rio Grande do Norte, Jandaira	endemic	Caatinga	Holotype male UFLA	=
Cylindrogaster gracilis	Brazil, Rio de Janeiro, Guanabara	not endemic	Atlantic Forest	Holotype male NHRS	-
Cylindrogaster sahlbergi	Brazil, Rio de Janeiro, Guanabara	endemic	Atlantic Forest	Syntypes 2 males FMNH	=
Cylindrogaster thoracicus	Brazil, Rio de Janeiro, Guanabara	endemic	Atlantic Forest	Holotype male FMNH	Paratype female NHM
Dacnodes herberti	Brazil, Rio de Janeiro, Mangaratiba	endemic	Atlantic Forest	Lost holotype male MNRJ	Lost paratype female MNRJ
Dacnodes welmanni	Angola	not endemic	Atlantic Forest	Syntype male NHM; syntype female MRSN	-
Doru cincinnatoi	Brazil, Pernambuco, Recife	endemic	Atlantic Forest	Lost holotype male MNRJ	Lost paratype female MNRJ
Doru gracilis	Brazil	not endemic	Atlantic Forest	Lost holotype	-
Doru lineare	Brazil, Santa Catarina	not endemic	Atlantic Forest/Cerrado	Lost holotype	-
Doru luteipes	Brazil	not endemic	Atlantic Forest/Amazon/ Caatinga/Cerrado/Pampas/ Pantanal	Lost syntypes	-
Doru unicolor	Brazil, São Paulo, Itu	not endemic	Atlantic Forest	Holotype male MZSP	_
Echinopsalis guttata	Nicaragua, Chontales	not endemic	Amazon	Holotype male NHM	_
Esphalmenus vulcani	Brazil, São Paulo, Pindamonhagaba	endemic	Atlantic Forest	Holotype male MZSP	_
Euborellia annulipes	França, Paris	not endemic	Atlantic Forest/Amazon/ Caatinga/Cerrado/Pampas/ Pantanal	Holotype male MNHN	-
Euborellia armata	Costa Rica	not endemic	Atlantic Forest	Holotype male MRSN	_
Euborellia brasiliensis	Brazil, Minas Gerais	endemic	Cerrado	Syntypes male and female MNHN	-
Euborellia flavipes	Brazil, Rio de Janeiro, Guanabara	endemic	Atlantic Forest	Holotype male lost	_
Euborellia inermis	Brazil, Rio de Janeiro, Guanabara	endemic	Atlantic Forest	Holotype female lost	_
Euborellia janeirensis	Brazil, Rio de Janeiro, Guanabara	endemic	Atlantic Forest	Holotype female NMW	_
Euborellia nitida	Brazil, Santa Catarina, Blumenau	endemic	Atlantic Forest	Holotype female MZSP	_
Euborellia peregrina	Brazil, Mato Grosso, Santa Ana	endemic	Pantanal	Holotype female NHRS	_
Euborellia tropica	Brazil, Paraná	endemic	Atlantic Forest	Holotype male MZSP	_
Filolabia exígua	Brazil, Pará, Santarém	endemic	Amazon	Holotype male CUMZ	_
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Species	Type locality	Endemic	Biome	Primary types	Secondary type specimens
Forcepsia pulla	Brazil, Rio de Janeiro, Itatiaia	endemic	Atlantic Forest	Syntypes male and female lost	
Forficula Auricularia	Europe	not endemic	Atlantic Forest/Amazon/ Caatinga/Cerrado/Pampas/ Pantanal	Type lost	-
Gerax serranoi	Brazil, Minas Gerais, Viçosa	endemic	Cerrado	Holotype male CZIICT	_
dolopsalis borgmeieri	Brazil, Rio de Janeiro, Petrópolis	endemic	Atlantic Forest	Syntypes 1 male, several females lost	-
Idolopsalis nigrita	Brazil, São Paulo, Salesópolis, Serra da Boracéia	endemic	Atlantic Forest	Holotype male MZSP	Paratypes 2 males 3 females MZSP
Idolopsalis parva	Brazil, São Paulo, Campos do Jordão	endemic	Atlantic Forest	Holotype male MZSP	-
Kleter aterrimus	Ecuador	not endemic	Amazon	Holotype male NMW	-
Kleter devians	Brazil	endemic	Atlantic Forest	holotype male NMW	-
Kleter perplexus	Brazil	endemic	-	Holotype male NHM	-
Labia minor	Europe	not endemic	Amazon/Atlantic Forest/ Caatinga/Cerrado/Pampas/ Pantanal	Lost holotype male	-
Labidura riparia	Siberia	not endemic	Atlantic Forest/Amazon/ Caatinga/Cerrado/Pampas/ Pantanal	Type lost	-
Labidura xanthopus	Brazil, Rio de Janeiro, Guanabara	not endemic	Atlantic Forest/Amazon/ Caatinga	Holotype male NHRS	-
Litocosmia roraimae	Brazil, Roraima	endemic	Amazon	Holotype male NMNH	-
Marava brasiliana	Brazil, Rio de Janeiro, Petrópolis	endemic	Atlantic Forest	Holotype male NHM	-
Marava moreirai	Brazil, São Paulo, Alto da Serra	endemic	Atlantic Forest	Lost holotype male	-
Marava silvestrii	Paraguay	not endemic	Atlantic Forest	Holotype male MRSN	-
Marava tricolor	Brazil, Pará, Santarém	endemic	Amazon	Holotype NHM	-
Mecomera brunnea	French Guyane	not endemic	Amazon	Syntypes 2 males 1 female MNHN	-
Mecomera reichardti	Brazil, São Paulo, Santo Amaro	endemic	Atlantic Forest	Holotype male MZSP	Paratypes 2 males 6 females MZSP
Mecomera ze	Brazil, São Paulo, Piracicaba	endemic	Atlantic Forest	Holotype male ESALQ	Paratypes 3 males 1 female ESALQ
Mesodiplatys falcifer	Brazil, Bahia, Carinhanha	endemic	Atlantic Forest/Caatinga	Holotype male UFLA	-
Neolabis brasiliensis	Brazil, Bahia, Itabuna	endemic	Atlantic Forest	Holotype male MZSP	-
Neolobophora bogotensis	Colômbia, Bogotá	not endemic	Atlantic Forest	Lost holotype female	=
Neolobophora handlirschi	Brazil	endemic	-	Holotype male NMW	-
Opisthocosmia silvestres	Brazil, Rio de Janeiro, Itatiaia	endemic	Atlantic Forest	Lost holotype male	-
Paralabella curvicauda	Sri Lanka	not endemic	-	Lost holotype male	-
Paralabella dorsalis	Colombia	not endemic	Amazon	Lost holotype male	-
Paralabella maeklini	Brazil, Rio de Janeiro, Petrópolis	not endemic	Atlantic Forest	Holotype male FMNH	-
Paralabella profana	Brazil, Santa Catarina	endemic	Atlantic Forest	Holotype male HMNHN	-
Praos paulensis	Brazil, São Paulo, Ipiranga	endemic	Atlantic Forest	Holotype male MZSP	Paratype male and female MZSP
Purex brunneri	Brazil, Amazonas	not endemic	Amazon	Lost holotype male	=
Purex parvicollis	Brazil, Rio de Janeiro, Guanabara	not endemic	Atlantic Forest	Holotype male NHRS	=
Purex propinquus	Brazil, Amazonas, Fonte Boa	endemic	Amazon	Lost type	-
Pygidicrana bivittata	Guyana	not endemic	-	Holotype male ZMHB	=
Pygidicrana forcipata	Brazil, Pará	endemic	Amazon	Holotype male NHM	-
Pygidicrana notigera	Brazil, Rio de Janeiro, Guanabara	not endemic	Atlantic Forest	Holotype female NHRS	-
Pygidicrana vnigra	Brazil	not endemic	Amazon/Atlantic Forest/Caa tinga/Cerrado/Pantanal	- Holotype female MNHN	-
Pyragra eryrunepensis	Brazil, Amazonas, Eirunepé	endemic	Amazon	Lost male holotype MNRJ	=
Pyragra fuscata	French Guyana	not endemic	Amazon	Holotype male MNHN	=
Pyragra paraguayensis	Brazil, Mato Grosso, Corumbá; Bolivia, Caiza, missione di Aguairenda; Para- guay, Asuncion, Luque, Vila Rica;	not endemic	Amazon/Pantanal	Unspecified number of syntypes, male and females MRSN	=
Pyragropsis emarginata	Brazil, Amazonas, Manaus	not endemic	Amazon	Holotype male ANSP	
Sarcinatrix quadrimaculata	Brazil, São Paulo, Diadema	endemic	Atlantic Forest	Holotype male MZSP	-
Skalistes lozadai	Brazil, São Paulo, Leme	endemic	Atlantic Forest	Holotype male lost	Paratypes 2 males 1 female los
Sparatta bocainensis	Brazil, Rio de Janeiro, Bocaina	endemic	Atlantic Forest	Lost holotype male MNRJ	Lost paratype female MNRJ
Sparatta colombiana	Colombia	not endemic	Amazon	Lost holotype	-
Sparatta dudichi	Brazil	endemic	-	Holotype male HMNH	-



Species	Type locality	Endemic	Biome	Primary types	Secondary type specimens
Sparatta incerta	Paraguay	not endemic	Atlantic Forest	Holotype male MRSN	-
Sparatta luederwaldti	Brazil, Espírito Santo	endemic	Atlantic Forest	Lost holotype	-
Sparatta nigrina	Brazil, Rio de Janeiro, Guanabara	not endemic	Atlantic Forest	Holotype male NHRS	-
Sparatta pelvimetra	Brazil	endemic	-	Holotype male MNHN	=
Sparatta quinquepunctata	Brazil, Rio de Janeiro, Petrópolis	endemic	Atlantic Forest	Holotype male ZMUH	Paratype female ZMUH
Sparatta rufina	Brazil, Rio de Janeiro, Guanabara	endemic	Atlantic Forest/Pampa	Holotype female NHRS	-
Sparatta schotti	Brazil	endemic	Atlantic Forest	Holotype female NMW	-
Sparatta semirufa	Brazil, Pernambuco, Iguaraçu	not endemic	Atlantic Forest/Caatinga	Syntypes male and female NHM	_
Sparatta sinuata	Brazil, Bahia, Itabuna	endemic	Atlantic Forest	Holotype male MZSP	-
Spongiphora bormansi	Brazil, Santa Catarina	endemic	Atlantic Forest	Holotype male NHM	Paratype female NHM
Spongiphora buprestoides	Brazil, Amazonas, Tefé	endemic	Amazon	Syntypes male and female NHM	-
Spongiphora croceipennis	Brazil	endemic	Atlantic Forest/Pampas	Holotype male MNHN	-
Spongiphora moreirai	Brazil, Rio Grande do Sul	endemic	Atlantic Forest	Lost holotype male MNRJ	
Spongovostox alter	Bolivia	not endemic	Atlantic Forest	Holotype male NMW	Paratype female NMW
Spongovostox bilineata	Ecuador	not endemic	Atlantic Forest	Lost male holotype	-
Spongovostox ghilianii	Brazil, Pará; French Guyane; Venezuela	not endemic	Amazon	Syntypes male and 2 females NMW	-
Spongovostox pygmaeus	Brazil, Rio de Janeiro, Guanabara	not endemic	Atlantic Forest	Unspecified number of syntypes NMW	-
Spongovostox schwarzi	Guatemala	not endemic	Amazon	Holotype male NMNH	-
Strongylopsalis dubia	Brazil, São Paulo, Cubatão	endemic	Atlantic Forest	Holotype male MZSP	-
Strongylopsalis iheringi	Brazil, Rio de Janeiro, Itatiaia	endemic	Atlantic Forest	Holotype ANSP	Paratypes 4 females ANSP
Strongylopsalis mathurinii	Brazil, Rio de Janeiro, Bom Sucesso	endemic	Atlantic Forest	Lost holotype MNRJ	Lost holotype MNRJ
Vostox brasilianus	Brazil	endemic	-	Holotype male HMNH	-
Vostox brunneipennis	United States, Pennsylvania, Phila- delphia	not endemic	Amazon/Atlantic Forest/Caa tinga/Cerrado	- Lost male holotype	Lost female paratype
Vostox recurrens	Brazil, Rio de Janeiro, Nova Friburgo	not endemic	Atlantic Forest	Holotype male NHM	-
Vostox vicinus	Brazil, Bahia	endemic	Atlantic Forest/Caatinga	Holotype male NMW	-



Appendix 2. Recorded species of Phasmatodea in Brazil, alphabetically ordered. Records considered updates available until March 31, 2022.

Species	Type locality	Endemic	Biome	Primary types	Secondary type specimens
Agrostia affinis	Brazil, Espirito Santo	endemic	Atlantic Forest	Holotype male NMW	-
Agrostia bipunctata	Brazil, Amazonas, Coari	not endemic	Amazon	Holotype male NMW	
Agrostia cinerea	French Guiana, Montagne de Kaw	not endemic	Amazon	Neotype female MNHN	-
Agrostia dubius	Brazil, São Paulo	endemic	Atlantic Forest	Lost holotype male ESALQ	-
Agrostia ega	Brazil, Amazonas, Tefé	endemic	Amazon	Holotype female NHM	-
Agrostia rugicollis	Brazil, Rio de Janeiro	not endemic	Atlantic Forest	Holotype male MVMA	-
Agrostia sauroptera	Brazil, Amazonas, Tefé	endemic	Amazon	Holotype male ANSP	-
Agrostia sexmaculata	Brazil, Rio de Janeiro, Teresópolis	endemic	Atlantic Forest	Holotype female NMW	-
Anisa flavomaculata	Brazil	endemic	-	Holotype NHM	-
Aplopocranidium waehneri	Brazil, Amazonas, Manaus	not endemic	Amazon	Holotype female SNH	Paratype female PAS
Arumatia anyami	Brazil, Rondônia, Costa Marques	endemic	Amazon	Holotype female MZSP	Paratypes 4 females MZSP
Arumatia aramatia	Brazil, Tocantins, Porto Nacional, Luzimangues	endemic	Cerrado	Holotype female MZSP	Paratype male MZSP
Arumatia crassicercata	Brazil, Goiás, Goiânia	endemic	Cerrado	Holotype female MZSP	Paratypes 3 females, eggs MZSP
Arumatia diamante	Brazil, Bahia, Abaíra, Chapada Diamantina	endemic	Cerrado	Holotype female MZSP	-
Arumatia dubia	Paraguay	not endemic	Cerrado	Holotype female NMNH	-
Arumatia fulgens	Brazil, Mato Grosso, Barra dos Bugres	endemic	Cerrado	Holotype male MPEG	-
Arumatia motenata	Brazil, Minas Gerais, Santana do Riacho	endemic	Cerrado	Holotype female MZSP	Paratypes 6 males 5 females MZSP
Bacteria abnormis	Brazil, São Paulo	endemic	Atlantic Forest	Holotype male ETHZ	-
Bacteria bahiensis	Brazil, Bahia	endemic	Atlantic Forest/Caatinga	Holotype female ESALQ	-
Bacteria brasiliensis	Brazil	endemic	-	Holotype male NMW	-
Bacteria brevitarsata	Brazil, Espirito Santo	endemic	Atlantic Forest	Syntypes 3 males NMW	-
Bacteria capitata	Brazil, Santa Catarina	endemic	Atlantic Forest	Holotype male ZMUH	
Bacteria culmus	Brazil	endemic	-	Holotype male UMO	-
Bacteria gracilis	Brazil, Paraná	endemic	Atlantic Forest	syntypes 2 males and 2 females ZMUH syntypes male and female MLUH	l;-
Bacteria hastata	Brazil, Amazonas, Tefé	endemic	Amazon	Syntypes male and female ZMUH	-
Bacteria laticauda	Brazil, Amazonas, Tefé	endemic	Amazon	Holotype female UMO	-
Bacteria lobulata	Brazil, Rio Grande do Sul, Santa Cruz	endemic	Atlantic Forest/Pampa	Holotype female NMW	-
Bacteria longipes	Brazil, São Paulo, Piracicaba	endemic	Atlantic Forest	Syntypes 2 males ESALQ	-
Bacteria parasanguinolenta	Brazil	endemic	-	Holotype male NMW	-
Bacteria sakai	Brazil, Amazonas, Tefé	endemic	Amazon	Syntypes 2 females UMO	-
Bacteria serricauda	Brazil, Amazonas, Tefé	endemic	Amazon	Holotype male UMO	-
Bacteria straminea	Brazil, Goiás	endemic	Cerrado	Holotype male ANSP	Paratype male ANSP
Bostra arcuata	Brazil, Espírito Santo	endemic	Atlantic Forest	Holotype nymph NMW	-
Bostra magnifica	Brazil	endemic	-	Lost holotype SMNS	-
Bostra pruinosa	Brazil, Bahia, Belmonte	endemic	Atlantic Forest/Caatinga	Holotype female NMW	-
Bostra reductedentata	Brazil, Pará	endemic	Amazon	Syntypes 2 females ETHZ	-
Bostra tabida	Brazil, Espírito Santo	endemic	Atlantic Forest	Holotype female ZMUH	-
Brizoides flavipennis	Brazil	endemic	-	Holotype male SNH	-
Candovia evoneobertii	Brazil, São Paulo, Boa Esperança	endemic	Atlantic Forest	Holotype female MZSP	paratypes 2 females 5 eggs MZSP; paratypes 1female and eggANIC; 3 females and 6 eggs Oliver Zompro Collection
Canuleius bispinosus	Brazil, Bahia, Camargo	endemic	Atlantic Forest/Caatinga	Holotype female MZSP	-
Canuleius corallinus	Brazil, São Paulo, Alto da Serra	endemic	Atlantic Forest	Syntypes 2 males MZSP	-
Canuleius euterpinus	Brazil	endemic	-	Holotype male MZSP	-
Canuleius fischeri	Brazil, Rio de Janeiro	endemic	Atlantic Forest	Holotype male MZSP	-
Canuleius grandis	Brazil, Paraná	endemic	Atlantic Forest	Lectotype female MZSP	Paralectotype female MZSP
Canuleius inermipes	Brazil, São Paulo, Ubatuba	endemic	Atlantic Forest	Syntypes male and female MZSP	_
Canuleius inermis	Brazil, Espírito Santo	endemic	Atlantic Forest	Lectotype male NMW	Paralectotypes male and female ZIN; paralectotypes 2 males 4 females 1 nymph ZMUH; Paralectotypes 3 males 2 females 3 nymphs NMW
Canuleius ingenua	Brazil, Espírito Santo	endemic	Atlantic Forest	Syntypes male and female NMW	-
					Continues



Species	Type locality	Endemic	Biome	Primary types	Secondary type specimens
Canuleius libidinosus	Brazil, São Paulo, Mogi das Cruzes	endemic	Atlantic Forest	lost syntypes male and female ESALQ	-
Canuleius metzi	Brazil, São Paulo	endemic	Atlantic Forest	lost unspecified number of syntypes ZMUH	-
Canuleius nudiceps	Brazil, Espirito Santo	endemic	Atlantic Forest	Holotype male ZMUH	-
anuleius pullus	Brazil, Rio de Janeiro, Teresópolis	endemic	Atlantic Forest	Holotype male RBINS	-
anuleius sanguinolentus	Brazil, São Paulo	endemic	Atlantic Forest	Syntypes 2 males NMW	paralectotype NMW
anuleius similis	Brazil, Rio de Janeiro, Teresópolis	endemic	Atlantic Forest	Holotype female NMW	-
anuleius ubatubae	Brazil, São Paulo, Ubatuba	endemic	Atlantic Forest	Lost holotype female MZSP	-
Canuleius vetus	Brazil, Santa Catarina	endemic	Atlantic Forest	Holotype male MZSP	-
anuleius vigintiquatuorspi- osus	Brazil, Rio de Janeiro, Nova Fri- burgo	endemic	Atlantic Forest	Syntypes 2 males ZMUH	-
Canuleius vigintispinosus	Brazil, Rio de Janeiro	endemic	Atlantic Forest	Holotype male MNMS	-
eroys (Ceroys) albogranulatus	Brazil, São Paulo	endemic	Atlantic Forest	Holotype male ESALQ	-
eroys (Ceroys) cristatus	Brazil	endemic	-	Syntypes male and female NMW	-
eroys (Ceroys) multispinosum	Brazil	endemic	-	Holotype female UMO	-
eroys (Ceroys) perfoliatus	Brazil	not endemic	-	Syntypes male and female NHM	-
eroys (Ceroys) scaber	Brazil, São Paulo, Alto da Serra	endemic	Atlantic Forest	Holotype female MZSP	-
eroys (Ceroys) spinosus	Brazil	endemic	-	Type lost	-
eroys (Miroceroys) brunneri	Brazil, Rio de Janeiro, Macaé	endemic	Atlantic Forest	Holotype female MZSP	-
eroys (Miroceroys) cancelloae	Brazil, Minas Gerais, Extrema	endemic	Atlantic Forest	Holotype female MZSP	Paratypes 3 females, 7 males, nymph and eggs MZSP
eroys (Miroceroys) heymonsi	Brazil, São Paulo	endemic	Atlantic Forest	Holotype female MZSP	-
eroys (Miroceroys) indicattii	Brazil, Rio de Janeiro, Petrópolis	endemic	Atlantic Forest	Holotype female MZSP	Paratype male MZSP
eroys (Miroceroys) redtenba- heri	Brazil, Rio de Janeiro	endemic	Atlantic Forest	Holotype male MZSP	-
eroys (Miroceroys) saevissimus	Brazil	endemic	-	Syntypes 2 females NHM	-
esaphasma modestum	Brazil, Amapá, Serra do Navio	not endemic	Amazon	Holotype male ESALQ	-
ladomorphus ceratocephalus	Brazil	endemic	-	Holotype female UMO	-
ladomorphus marcelloi	Brazil, Paraiba, Areias	endemic	Caatinga	Holotype female ESALQ	-
ladomorphus michaelis	Brazil, Bahia	endemic	Atlantic Forest/Caatinga	Holotype female NMW	-
ladomorphus phyllinus	Brazil	not endemic	-	Lost unspecified type	-
ladomorphus rubus	Brazil, Bahia	endemic	Atlantic Forest/Caatinga	Syntypes 3 females MHNG	-
ladomorphus trimariensis	Brazil, Minas Gerais, Três Marias	endemic	Cerrado	Holotype female UFMG	paratypes 16 males, 6 females UFMG
ladoxerus borellii	Brazil, Mato Grosso, Urucum	endemic	Pantanal	Lectotype female MRSN	Paralectotype 2 females MRSN
ladoxerus brevicornis	Brazil, Rio de Janeiro, Teresópolis	endemic	Atlantic Forest	Syntypes 2 females NHM	-
ladoxerus cryphaleus	Brazil	endemic	-	Holotype male NHM	-
ladoxerus dentatum	Brazil, São Paulo	endemic	Atlantic Forest	Holotype female ESALQ	-
ladoxerus dentipes	Brazil, Rio de Janeiro, Teresópolis	endemic	Atlantic Forest	Holotype female NMW	-
ladoxerus ditomus	Brazil	endemic	-	Holotype male NHM	-
ladoxerus gracilis	Brazil	endemic	-	Lost unspecified type	-
ladoxerus longimanus	Brazil, Bahia	endemic	Atlantic Forest/Caatinga	Syntypes 2 males MHNG	-
ladoxerus ramosum	Brazil	endemic	-	Holotype female MHNG	-
ranidium gibbosum	Brazil, Pará	not endemic	Amazon	Lectotype female ZMHB	Paralectotype female ZMHB
reoxylus duckei	Brazil, Amazonas, Manaus	endemic	Amazon/Pantanal	Holotype female INPA	paratypes 2 females 3 males INPA; paratypes female and male MZSP
reoxylus paradoxus	Brazil, Pará, Santarém	endemic	Amazon	Holotype female NHM	-
reoxylus spinosus	_	not endemic	_	Lost unspecified type	_
amasippus batesianus	Brazil	endemic	Amazon	Holotype female UMO	-
Damasippus discoidalis	Brazil, Rio de Janeiro, Teresópolis	endemic	Atlantic Forest	Syntype female NMW; Syntypes 2 females ZMHB	-
Damasippus piceipennis	Brazil, Minas Gerais	not endemic	Atlantic Forest/Cerrado	Lectotype female ZMUH	Paralectotype male NMW; pa lectotype male ZMUH
Damasippus pulcher	Brazil, Espirito Santo	endemic	Atlantic Forest	Holotype male NMW	-
	Brazil, Rio de Janeiro, Macaé	endemic	Atlantic Forest	Holotype male MZSP	_
Damasippus spatulatus					



Species	Type locality	Endemic	Biome	Primary types	Secondary type specimens
Dinelytron betinho	Brazil, Minas Gerais, Viçosa	endemic	Cerrado	Holotype male UFV	Paratypes 2 males UFV
Dinelytron grylloides	Brazil	endemic	Atlantic Forest	Lost holotype	-
Dinelytron hipponax	Brazil	endemic	-	Lost holotype	-
Dinelytron leukommatos	Brazil, Pernambuco, Camaragibe	endemic	Atlantic Forest	Holotype male UFRPE	-
Dinelytron museunacional	Brazil, Espirito Santo, Sooretama	endemic	Atlantic Forest	Lost holotype MNRJ	-
Dinelytron shuckardi	Brazil	endemic	-	Lost holotype	-
Dinelytron trimaculatus	Brazil, Rio de Janeiro, Rio de Janeiro	pendemic	Atlantic Forest	Lost holotype male MNRJ	-
Dinelytron unilineatus	Brazil, Rio de Janeiro, Nova Fri- burgo	endemic	Atlantic Forest	Lectotype male NMW	Paralectotype male NMW
Dyme atropurpurea	Brazil, Espirito Santo	endemic	Atlantic Forest	Holotype male MHNG	-
Exocnophila exintegra	Brazil, Espirito Santo	endemic	Atlantic Forest	Holotype female NMW	paratype female NMW
Globocrania cyrtocnemis	Brazil, Amazonas, Tefé	endemic	Amazon	Holotype male UMO	-
Heteronemia amazonica	Brazil, Amazonas, Tefé	endemic	Amazon	Syntypes 2 males UMO	-
Heteronemia arampes	Brazil	endemic	-	Unspecified number syntypes, males SMF	-
Heteronemia emortualis	Brazil, Bahia	endemic	Atlantic Forest/Caatinga	Holotype female MHNG	-
Heteronemia maximus	Brazil	endemic	-	Holotype female NMW	-
Heteronemia paucispinosus	Brazil, Rio de Janeiro	endemic	Atlantic Forest	Syntypes 3 females NMW	-
Hirtuleius laeviceps	Brazil	endemic	_	Syntypes 2 females NHRS	_
gnacia amapaensis	Brazil, Amapá, Alto Amapari	endemic	Amazon	holotype female ESALQ	-
sagoras albopyga	Brazil, Minas Gerais, Lavras	endemic	Cerrado	Holotype male ESALQ	Paratype male ESALQ
sagoras aurocaudata	Brazil, Minas Gerais, Lavras	endemic	Cerrado	Holotype female ESALQ	Paratype female ESALQ
sagoras brevipes	Brazil, Espírito Santo	endemic	Atlantic Forest	Syntypes 2 females NMW	_
sagoras jureinei	Brazil, Amazonas, Jurinei	endemic	Amazon	Holotype female MHNG	_
sagoras melzeri	Brazil, São Paulo	endemic	Atlantic Forest	Lost holotype ESALQ	_
sagoras obscurum	Brazil, Bahia	not endemic	Atlantic Forest/Caatinga	Lost holotype	_
sagoras paulensis	Brazil, São Paulo, Ubatuba	endemic	Atlantic Forest	Lost syntypes 2 MZSP	_
sagoras paxillus	Brazil	endemic	_	Holotype male NHM	_
Isagoras plagiatus	Colombia, Bogotá	not endemic	Atlantic Forest	Lectotype male MNHN	paralectotype male MNMS; paralectotypes 5 males 1 nympl NMW; paralectotype male NHI paralectotype male ZMHB; paralectotypes 4 males ZMUH; paralectotypes 2 males ZIN;
sagoras santaritensis	Brazil, Bahia, Santa Rita	endemic	Atlantic Forest/Caatinga	Holotype male ESALQ	Paratype male ESALQ
sagoras sobrali	Brazil, Rio Grande do Norte, Natal	endemic	Atlantic Forest	Holotype male INPA	Paratype male INPA
sagoras tacanae	Brazil, Amazonas	endemic	Amazon	Holotype male SNH	-
sagoras taeniatus	Brazil, São Paulo, Ubatuba	endemic	Atlantic Forest	Holotype male MZSP	-
ibethra unidentata	Brazil	endemic	-	Holotype male NMW	-
.obolibethra ignava	Brazil, Pará	endemic	Amazon	Holotype female NHM	_
Megaphasma dentricus	United States of America, Louisiana Opelousas	,not endemic	Cerrado	Holotype female NHRS	-
Metriophasma (Metriophasma) armatum	Brazil; Colombia, Medellin	not endemic	-	syntype female NMW; syntype male SNH	-
Metriophasma (Metriophasma) rassithorax	Brazil, Santa Catarina	endemic	Atlantic Forest	Lost holotype female ESALQ	-
Metriophasma (Metriophasma) pericles	Brazil	endemic	-	Holotype female NMW	-
Ocnophila armata	Brazil, Espírito Santo	endemic	Atlantic Forest	Holotype female NMW	-
Ocnophila brevifemur	Brazil, Espírito Santo	endemic	Atlantic Forest	Lost holotype NMW	-
Ocnophila cornuta	Brazil, Espírito Santo; Minas Gerais	endemic	Atlantic Forest/Cerrado	Syntypes 2 females NMW	-
Ocnophila fortior	Brazil, Rio de Janeiro	endemic	Atlantic Forest	Syntype female MNHN; syntype female NMW	-
,			Atlantic Forest	Lectotype male NMW	Paralectotypes 2 females
	Venezuela, Porto Cabello	not endemic	/ telutifie i of est		
Ocnophila integra	Venezuela, Porto Cabello Brazil, Rio de Janeiro	endemic endemic	Atlantic Forest	Holotype male NMW	Paratype female NMW
Ocnophila integra Ocnophila nattereri Ocnophila oryx				Holotype male NMW Lost type	
Ocnophila integra Ocnophila nattereri	Brazil, Rio de Janeiro	endemic	Atlantic Forest		

Continues



Appendix 2. Continu		Endam:	Diama	Drimamitima	Cocondary type
Species	Type locality	Endemic	Biome	Primary types	Secondary type specimens
Ocnophila tuberculata	Brazil, Bahia	endemic	Atlantic Forest/Caatinga		-
Olcyphides helvolus	Brazil	endemic	-	Lost type	-
Olinta bubastes	Brazil, Pará	endemic	Amazon	Holotype female NHM	-
Otocrania aurita	Brazil	endemic	_	Syntype female MLUH; syntype female ZMHB	2-
Otocrania imbe	Brazil, Bahia, Água Preta	endemic	Atlantic Forest/Caatinga	Holotype female ESALQ	-
Otocrania imperialis	Brazil	endemic	-	Holotype female ZMHB	-
Otocrania pleuracantha	Brazil, Espírito Santo	endemic	Atlantic Forest	Syntypes 2 females NMW	-
Otocraniella flagelloantennata	Brazil, Minas Gerais, Serra do Cipó	endemic	Cerrado	Holotype male MZSP	-
Paragrostia flavimaculata	Brazil, Acre, Bujari	endemic	Amazon	Holotype male INPA	Paratypes 2 females 1 male INPA
Paraphasma conspersum	Brazil, Pará	endemic	Amazon	syntype female NMW; syntype male ZMHB	_
Paraphasma fasciatum	Brazil	endemic	-	Lost type	-
Paraphasma indistinctum	Brazil, Amazonas, Itacoatiara	endemic	Amazon	Holotype male MZSP	Paratype male MZSP
Paraphasma laterale	Brazil	not endemic	Pantanal	Holotype male NHM	-
Paraphasma marginale	Paraguay, Puerto 14 de Mayo	not endemic	Atlantic Forest/Cerrado/ Pantanal	Lectotype male MSNG	paralectotypes 3 MSNG; para- lectotypes 24 NMW; unspecified amount paralectotype SNH; unspecified amount paralecto- type HNHM; paralectotypes 11 MNHN; paralectotypes 2 ZIN; unspecified amount paralecto- type ZMUH; unspecified amount paralectotype MNMS
Paraphasma minus	Brazil	endemic	Amazon	Holotype female	-
Paraphasma sooretama	Brazil, Espírito Santo, Sooretama	endemic	Atlantic Forest	Holotype male MZSP	Paratypes 5 females 1 male, eggs DZUP, 1 male ESALq, 2 females 1 male MZSP
Paraphasma spinicauda	Ecuador, Napo province, Coca	not endemic	Amazon	Holotype male NHM	Paratype male INPA, paratypes 7 females NHM
Paraphasma umbretta	Surinam	not endemic	Amazon	Lost type	-
Paraprisopus agrion	Brazil, Amazonas, Vila Nova	not endemic	Amazon	Holotype male NHM	-
Paraprisopus vermiculare	Brazil, Espírito Santo	endemic	Atlantic Forest	Syntypes 2 females NMW	_
Parastratocles flavipes	Brazil,	endemic	Amazon	Holotype male NMW	-
Parastratocles multilineatus	Costa Rica, San Carlos	not endemic	Amazon	Holotype male NMNH	_
Parastratocles rosanti	_	not endemic	Amazon	Holotype female MNHN	_
Periphloea amazonica	Brazil, Amazonas, Manaus	endemic	Amazon	Holotype female INPA	_
Periphloea paraensis	Brazil, Pará, Eldorado dos Carajás	endemic	Amazon	Holotype female INPA	-
Periphloea santara	Brazil, Pará, Santarém	not endemic	Amazon	Holotype female NHM	-
Phanocloidea muricata	Brazil, pará	not endemic	Amazon	Syntypes female and male ZMHB	-
Phanocloidea nodulosa	Guiana Francesa	not endemic	Amazon	Lectotype male NMW	paralectotype male NMW; paralectotype male SMNS; paralectotypes 3 males MNHN; paralectotype male MNMS
Phanocloidea pallidenotata	Brazil, Pará	not endemic	Amazon	Holotype male NMW	_
Phanocloidea satyr	Brazil	endemic	Amazon	Syntype male RBINS; Syntype female SNH	-
Phantasca heteronemia	Brazil, Amazonas, São Gabriel da Cachoeira	endemic	Amazon	Holotype male NHRS	-
Phantasca phantasma	Brazil, Pará	not endemic	Amazon	Holotype male NHM	-
Phantasca poeciloptera	Brazil, Amazonas, Fonte boa	not endemic	Amazon	Lectotype male PAS	Paralectotype male SNH
Phantasca puppeia	Brazil, Pará	endemic	Amazon	Holotype male NHM	-
Phthoa bispinosa	Brazil, Paraná, Porto Cabral	endemic	Atlantic Forest	holotype MZSP	-
Phthoa brasiliensis	Brazil, Mato Grosso do Sul, Porto Murtinho	endemic	Pantanal	Holotype female ESALQ	-
Prexaspes brevipennis	Brazil	not endemic	-	Holotype female ZMHB	-
Prexaspes paulensis	Brazil, Santa Catarina	endemic	Atlantic Forest	Holotype male ANSP	-
Prexaspes pholcus	Brazil, Pará, Santarém	endemic	Amazon	Syntypes 2 males NHM	-
Prexaspes quadratus	Brazil, Pará, Santarém	endemic	Amazon	Holotype male UMO	-
Prexaspes quadriguttatus	Brazil, Amazonas, Óbidos	not endemic	Amazon	Holotype female NMW	-
Prexaspes servillei	Brazil	endemic	-	Lost type	-
Prexaspes venosus	Brazil	endemic	-	Holotype female ZMHB	-
Prexaspes vittata	Brazil, São Paulo, Serra da Boracéia	endemic	Atlantic Forest	holotype ESALQ	paratype ESALQ

Continues



Species	Type locality	Endemic	Biome	Primary types	Secondary type specimens
Prisopus amapa	Brazil, Amapá, Serra do Navio	endemic	Amazon	Holotype female ESALQ	-
Prisopus attrobrunneus	Brazil, Rio de Janeiro, Rio de Janeiro	oendemic	Atlantic Forest	Holotype male UFPR	-
Prisopus brunnescens	Brazil, Paraná, Morretes	endemic	Atlantic Forest	Holotype male UFRPE	Paratype male UFRPE
Prisopus caatingaensis	Brazil, Piauí, Caracol	endemic	Caatinga	Holotype male CZMA	Paratype male CZMA
Prisopus horstokkii	Africa (probably in error)	not endemic	Amazon	Holotype female RMNH	-
Prisopus orthmanni	West India (probably in error)	endemic	Amazon	Lost type	-
Prisopus phacellus	Brazil, Amazonas, Tefé	not endemic	Amazon	Holotype male NHM	-
Prisopus sacratus	Brazil, Santa Catarina	not endemic	Atlantic Forest	Neotype male ZMHB	-
Prisopus villosipes	Brazil, Minas Gerais	endemic	Cerrado	Holotype male MNHN	-
Prisopus wolfgangjunki	Brazil	not endemic	Amazon	Holotype female SNH	Paratype female SNH
Pseudophasma amazonicum	Colombia	not endemic	Amazon	Holotype male NMW	Paratype male ICN; paratype male MNMS; paratype female NMW
Pseudophasma andreaszompro	i Brazil, Amazonas, Santo Antônio do Iça	not endemic	Amazon	Holotype male ZMHB	paratypes 1 male 2 females ZMHB
Pseudophasma cambridgei	Brazil, Pará, Santarém	endemic	Amazon	Holotype male NHM	-
Pseudophasma castaneum	Brazil, Pará	not endemic	Amazon	Holotype female UMO	-
Pseudophasma crassifemora	Brazil, Paraíba	endemic	Atlantic Forest/Caatinga	Holotype female ESALQ	-
Pseudophasma dentata	Brazil, Santa Catarina	endemic	Atlantic Forest	Holotype female NMW	-
Pseudophasma flavicorne	Brazil, Bahia/Espirito Santo	endemic	Atlantic Forest/Caatinga	Syntypes 2 females NMW; syntypess 1 female 3 males ZMHB; syntypes 2 males 2 females ZMHB	-
Pseudophasma gracile	Brazil, Amazonas, Tabatinga	not endemic	Amazon	Holotype male NMW	Paratypes male and female MNMS; paratype male OCPC
Pseudophasma marmoratum	Brazil, Rio Grande do Sul; Colom- bia: Bogotá, Medellin, Santa Fé; Ecuador: Cachabi	not endemic	Amazon/Pampas	syntypes 3 females 4 males NMW; syntypes 4 females 1 male ZMHB syntype female ZIN	
Pseudophasma nigrovittatum	Brazil, São Paulo, Salto Grande	endemic	Atlantic Forest	Holotype male ESALQ	-
seudophasma triangularis	Brazil, Pará, Belém	endemic	Amazon	Holotype female ESALQ	-
terinoxylus eucnemis	Brazil	endemic	-	Holotype female ZMHB	-
Pygirhynchus bispinosus	Brazil, Espírito Santo	endemic	Atlantic Forest	syntype female MNHN; syntypes 2 females 2 males NMW; syntypes 2 males ZMUH	-
Pygirhynchus carioca	Brazil, Rio de Janeiro	endemic	Atlantic Forest	Syntypes 2 females ESALQ	
Pygirhynchus coronatus	South America	not endemic	_	Holotype male MNHN	-
Pygirhynchus granulosus	Brazil, Espírito Santo	endemic	Atlantic Forest	holotype ZMUH	_
Pygirhynchus inermis	Brazil, Rio de Janeiro, Itatiaia	endemic	Atlantic Forest	Holotype male ESALQ	_
Pygirhynchus muricatus	Brazil, Espírito Santo	endemic	Atlantic Forest	Syntype female NMW; syntype female ZMUH	-
Pygirhynchus subfoliatus	Brazil	endemic	-	Lost type	-
Pygirhynchus toledopizai	Brazil	endemic	Atlantic Forest	Lost type	-
Pygirhynchus vigilans	Brazil	endemic	-	Syntypes 2 females ZMHB	-
tratocles stabilinus	Brazil, Amazonas	endemic	Amazon	Holotype male UMO	-
enerella cneius	Brazil, Brazil, Amazonas, Vila Nova			syntypes female 2 males NHM; syntype male UMO	_
Tenerella metrica	Brazil, Amazonas, Tefé	endemic	Amazon	Holotype male ANSP	-
ersomia brasiliensis	Brazil, Pernambuco, Iguarassu	endemic	Caatinga	Holotype female NHM	
Tithonophasma cancellatum Tithonophasma tithonus	China [in error] Oriental India (in error, probably Brazil)	endemic endemic	Atlantic Forest Atlantic Forest	Holotype female ZMUH Syntypes 2 females NHM	-
Jrucumania borellii	Paraguai, São Pedro	not endemic	Pantanal	Lectotype male MRSN	paralectotypes 2 males 3 female 1 nymph MRSN
Jrucumania urucumana	Brazil, Mato Grosso do Sul, Urucum	n not endemic	Pantanal	Lectotype female MRSN	paralectotypes 2 females 2 nymphs MRSN
Nattenwylia cearensis	Brazil, Ceará	endemic	Atlantic Forest/Caatinga	Lost syntypes 2 females MZSP	-
Vattenwylia foliata	Brazil, Ceará	endemic	Atlantic Forest/Caatinga	Lost syntypes 4 females MZSP	-
(erosoma canaliculatum	Brazil	endemic	Atlantic Forest	Holotype female MNHN	-
(erosoma michaelis	Brazil, Espírito Santo	endemic	Atlantic Forest	Syntype female NMW; syntype female ZMUH	-
Kerosoma senticosum	Brazil, Bahia	endemic	Atlantic Forest/Caatinga	**	-
(iphophasma debilis	Brazil, Ceará	endemic	Atlantic Forest/Caatinga	Lost holotype male MZSP	-
Kiphophasma fragilis	Brazil, Ceará	endemic	Atlantic Forest/Caatinga	Lost holotype male MZSP	-
Xylodus adumbratus	Brazil, Paraná, Porto Rico	endemic	Atlantic Forest	Holotype female MHNG	_