

ATLANTIC AMPHIBIANS: A DATASET OF AMPHIBIAN COMMUNITIES FROM THE ATLANTIC FORESTS OF SOUTH AMERICA

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Introduction

More than 7,700 amphibian species from around the world have been described (Frost 2017). Among all living vertebrates, amphibians have the widest diversity of reproductive modes (Haddad and Prado 2005, Zamudio et al. 2016), and they are currently the most threatened vertebrate group: over 30% of the world's amphibian species are formally classified as threatened by IUCN and for another 25%, data is insufficient to assess their threat status (Catenazzi 2015, IUCN 2017). Amphibians are highly sensitive to landscape modifications such as habitat loss and fragmentation (Cushman 2006, Nowakowski et al. 2017), and climate change (Hof et al. 2011, Catenazzi 2015). In some geographic areas, they are also affected by emerging diseases (Carey et al. 1999, Paré 2003), including past declines of amphibian populations in Atlantic Forest Biome, associated with spatial distribution an emerging fungal disease (Carvalho et al. 2017). Their susceptibility to such impacts occurs mainly due to (a) small body size and low vagility (Wells 2007); (b) highly permeable skin for numerous functions including respiration, osmoregulation, thermoregulation, protection, reproduction, and communication (Duellman and Trueb 1994, Wells 2007); (c) the need of specific microhabitats related to their reproductive modes (e.g., Haddad and Prado 2005, Zamudio et al. 2016); and (d) a biphasic life cycle in most species (Becker et al. 2007, Becker et al. 2010).

Since the 1970s, amphibian populations have been declining around the planet, and extinctions are increasingly being documented in several countries (Stuart et al. 2004, Eterovick et al. 2005, Wake and Vredenburg 2008). The leading reasons for the decline include habitat loss and fragmentation, global warming, introduction of exotic species, UV-B radiation, chemical pollution, and infectious diseases (Young et al. 2001,

Blaustein and Kiesecker 2002, Collins and Storfer 2003, Blaustein and Bancroft 2007). These facts highlight amphibians' importance, since their decline may indicate a serious change or even loss of ecological functions due to alterations in aquatic and terrestrial ecosystems (Whiles et al. 2006, Collins et al. 2009, Mohnke and Rödel 2009).

The Atlantic Forest Biome is considered a global hotspot for conservation priorities, with special attention on land use modifications, climate change, and invasive species (Myers et al. 2000, Mittermeier et al. 2011, Bellard et al. 2014, Joly et al. 2014). This biome is composed of two main types of phytophysiognomy: Dense Ombrophilous Forest and the Semideciduous Seasonal Forest (Morellato and Haddad 2000). Some other vegetation types can also be found in the transition zones with Cerrado, Pampa, Pantanal and Caatinga Biomes (Ribeiro et al. 2009). The Atlantic Forest has 625 species of amphibians and 485 (about 77%) of these are endemic (Rossa-Feres et al. 2018). This high number of species and endemism in these vegetation formations can be explained by (i) the great environmental heterogeneity that allowed the reproductive specialization of different species throughout the course of evolution, the microenvironment being a powerful selective force favoring the environmental specialization and speciation of anurans (Haddad and Prado 2005); and (ii) the widespread mountainous terrain, which contributed to the speciation process by functioning as a physical barrier to the gene flow between populations (Haddad et al. 2013, Rossa-Feres et al. 2017).

Despite the great diversity of species, only between 11.4% and 16% of original Atlantic Forest vegetation remains (Ribeiro et al. 2009). According to these authors, 80% of the remaining fragments are smaller than 50 hectares and poorly connected to larger forests. In this critical scenario, a comprehensive dataset that compiles information about amphibian communities throughout the Atlantic Forest Biome is a fundamental step in improving efforts to synthesize their ecological diversity and to support conservation decisions making.

In this study, we compiled information about amphibian species composition and, when available, abundance, and described the sampling method and effort applied. The dataset of amphibian communities was assembled from 389 studies (articles, books, theses, and dissertations), representing the communities of 1,163 sites in the Atlantic Forest within Brazil, Argentina, and Paraguay (Figure 1). The ATLANTIC AMPHIBIANS dataset—which is part of ATLANTIC SERIES datapapers—represents a major effort to compile inventories of amphibian communities for the Neotropical region, thus filling a large data gap for the Atlantic Forest hotspot.

METADATA

Class I. Data set descriptors

A. Data set identity

Title: ATLANTIC AMPHIBIANS. A Dataset of Amphibian Communities from the Atlantic Forests of South America.

B. Data set identification code

Suggested data set identity codes:

ATLANTIC_AMPHIBIANS_sites.csv

ATLANTIC_AMPHIBIANS_species.csv

ATLANTIC_AMPHIBIANS_references.csv

C. Data set description

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2. Abstract

Amphibians are among the most threatened vertebrates in the world and this is also true for those inhabiting the Atlantic Forest hotspot, living in ecosystems highly degraded and threatened by anthropogenic activities. We present a dataset containing information about amphibian communities sampled throughout the Atlantic Forest Biome in South America. The data were extracted from 389 bibliographic references (articles, books, theses, and dissertations) representing inventories of amphibian communities from 1940 to 2017. The dataset includes 17,619 records of 528 species with taxonomic certainty, from 1,163 study sites. Of all the records, 14,450 (82%) were classified using the criterion of endemism; of those, 7,787 (44%) were considered endemic and 6,663 (38%) were not. Historically, multiple sampling methods were used to survey amphibians, the most representative methods being active surveys (82.1%), surveys at breeding sites (20%), pitfall traps (15.3%), and occasional encounters (14.5%). Species richness averaged 15.2 ± 11.3 SD, ranging from 1 to 80 species per site. We found a low dominance in the communities, with ten species occurring in about 26% of communities: *Physalaemus cuvieri* (4.1%), *Dendropsophus minutus* (3.8%), *Boana faber* (3.1%), *Scinax fuscovarius* (2.8%), *Leptodactylus latrans* (2.7%), *Leptodactylus fuscus* (2.6%), *Boana albopunctata* (2.3%), *Dendropsophus nanus* (1.6%), *Rhinella ornata* (1.6%), and *Leptodactylus mystacinus* (1.6%). This dataset represents a major effort to compile inventories of amphibian communities for the Neotropical region, filling a large gap in the data on the Atlantic Forest hotspot. We hope this dataset can be used as a credible tool in the proposal of new studies on amphibian sampling and even in the development of conservation planning for these taxa. This information also has great relevance for macroecological studies, being foundational for both conservation and restoration strategies in this biodiversity hotspot.

D. Key words

Biodiversity hotspot, Neotropical region, Atlantic Forest Biome, amphibian communities, anurans, caecilians

E. Description

The dataset was organized based on the delimitation of the Atlantic Forest Biome (Figure 1) that resulted from union of the following limits (*sensu* Muylaert et al. in review): World Wildlife Fund - WWF (Olson et al. 2001); Ministry of the Environment of Brazil (“Ministério do Meio Ambiente” in Portuguese, IBGE 2017a);

Atlantic Forest law (provides for the use and protection of native Atlantic Forest vegetation, as well as other measures, IBGE 2017b); and Ribeiro et al. (2009). The Atlantic Forest Biome occurs in Brazil, Paraguay, and Argentina (Muylaert et al. in review).

We compiled information from 389 references, 60% (231) of which were peer-reviewed articles, 29% (114) were undergrad monographs, theses, and dissertations, and 11% (44) were books or book chapters. Although monographs, theses, and dissertations are not peer-reviewed publications, we decided to include them in our data paper because they are used frequently in Brazilian biodiversity inventories.

This dataset consists of 17,619 specimen records, including 15,788 with taxonomic certainty for 528 species distributed among 1,163 study sites (Figure 1).

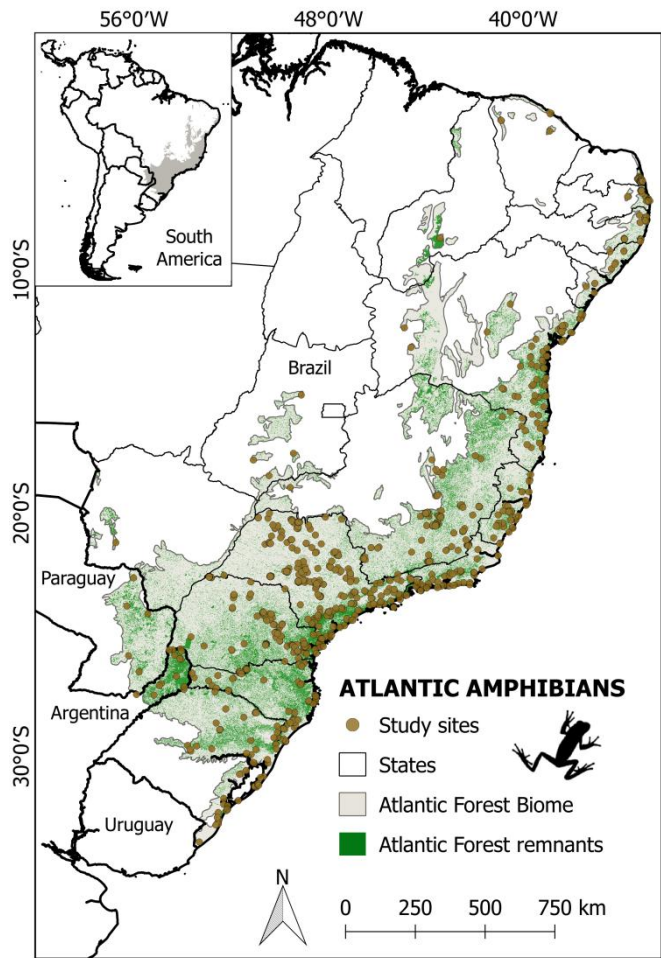


Figure 1. Distribution of the study sites in the ATLANTIC AMPHIBIANS dataset.
The limit of Atlantic Forest Biome according to Muylaert et al. (in review).

192 The taxonomic uncertainties [“species” (sp.), “several species” (spp.), “confer”
193 (cf.), “affinis” (aff.), and “group” (gr.)] and records of *Elachistocleis ovalis*, *Chaunus*
194 *pombali*, *Bufo pombali*, and *Rhinella pombali* represented around 10% (1,831) of all
195 species records. These records have not been taxonomically corrected using the
196 information in Frost (2017) because of the uncertainty associated with the changes that
197 amphibians have undergone in recent years. In 70% (817) of the studies, the species
198 records document composition (only species presence), while only 30% (346) document
199 species abundance (number of individuals found in the sampled period), estimated
200 mainly by use of pitfall traps. We classified 14,450 (82%) records according to the
201 criterion of endemism in the Atlantic Forest Biome (*sensu* Haddad et al. 2013), finding
202 that 7,787 records (44%) were considered endemic species and 6,663 (38%) were not.

203 Considering only studies that described the sampling methods (1,121), most of
204 the sampling used in study sites was conducted by active methods: active survey (82.1%,
205 Crump and Scott Jr. 1994), survey at breeding site (20%, Scott Jr. and Woodward 1994),
206 transect (12.5%, Crump & Scott Jr. 1994), and quadrat sampling (4.5%, Jaeger and
207 Inger 1994). These methods are more common because they are based on the
208 vocalizations of anuran males, facilitating species identification while also allowing
209 quantification of males during calling activity (Figure 2). The passive methods
210 comprised pitfall traps (15.3%, Corn 1994, Cechin and Martins 2000), funnel traps
211 (1.1%), digital recorders (1.1%, Acevedo and Villanueva-Rivera 2006), and artificial
212 shelters (0.8%). Pitfall traps were the most common method for litter amphibians.
213 Complementary methods included accidental encounters (14.5%, Sawaya et al. 2008),
214 third-party records (1.7%), interviews (0.7%), and road riding (0.6%, Sullivan 2012).
215 These methods contribute important complementary sampling, especially the occasional
216 encounter of species found far from breeding areas, or when only pitfall trap lines were
217 used (Figure 2). All our definitions of sampling methods followed the descriptions
218 provided in the original studies. However, the original descriptions often inaccurately
219 defined active surveys and surveys in reproductive sites, so we considered surveys in
220 reproductive sites only when the authors had specified them, and we categorized the
221 active survey of adults, tadpoles, and spawns as active surveys.

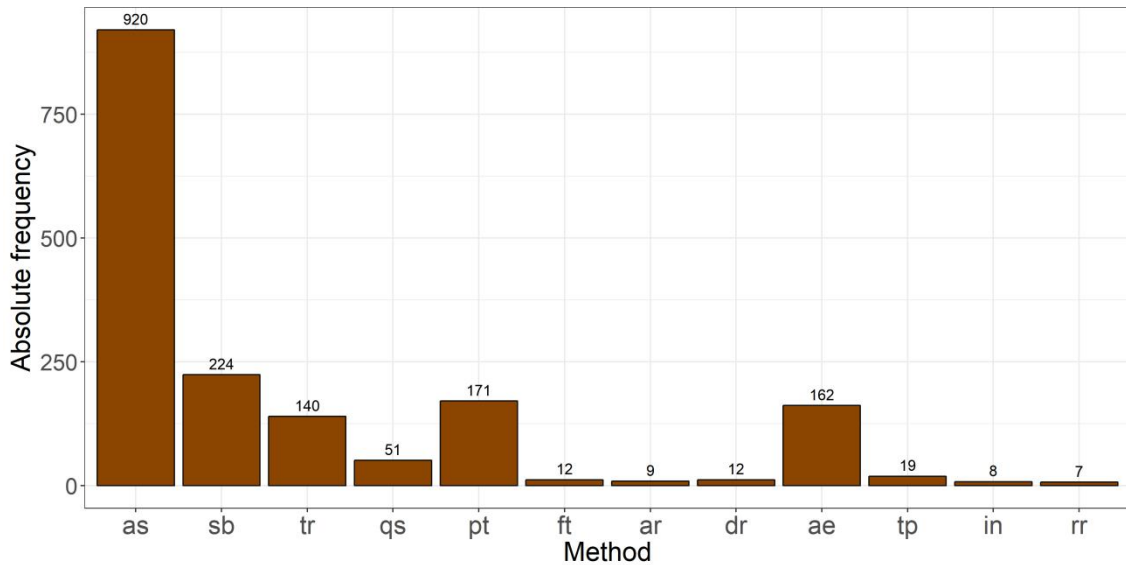


Figure 2. Absolute frequency of the methods used in the ATLANTIC AMPHIBIANS dataset, for a total of 1,121 study sites. Some studies used more than one method in a single site. Abbreviations are: as = active surveys, sb = survey at breeding site, tr = transect, qs = quadrat surveys, pt = pitfall traps, ft = funnel traps, ar = artificial shelters, dr = digital recorders, ae = accidental encounter, tp = third-party records, in = interview, rr = road riding.

Among the study sites for which sampled habitat was reported (1,062), no sampled habitat was predominant (Figure 3), though forest habitat was reported most frequently (40.7%). However, the information about sampled forest habitat should be interpreted with caution. For example, many studies were conducted in water bodies and still reported sampling in forest areas, although the method informed does not allow to conclude whether the forest habitat was actually sampled. Most of the study sites were sampled in water bodies—stream in the forest interior (33.5%), permanent pond (30.2%), lake (28.9%), swamp (28.6%), temporary pond (27.5%), semi-permanent pond (5.8%), and stream in open area (4.5%)—which was expected, since the most frequent methods were active surveys and surveys at breeding sites (Figures 2 and 3). Other sampled habitats were located in the forest interior, mainly leaf litter (21.8%) and bromeliads (17.8%), which represent important habitats for litter-dweller families such as Brachycephalidae and Craugastoridae, as well as specific bromeliad frogs (Figure 3). Samplings in strictly coastal habitats, such as restingas (4.3%) and dunes (2%), were not very representative, since these are highly restricted habitats and generally have low amphibian diversity because of the high salinity (Figure 3).

Despite the classification of water bodies based on duration (permanent, semi-permanent, semi-temporary, or temporary) was inconsistent among works, we adhered to the descriptions found in the original studies.

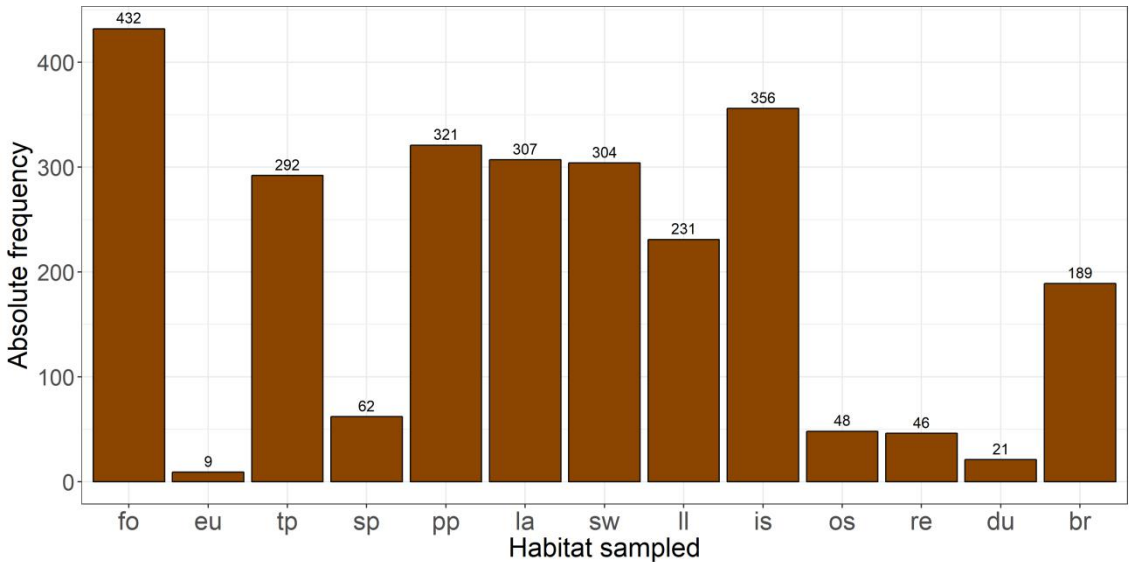


Figure 3. Absolute frequency of the habitat sampled in the ATLANTIC AMPHIBIANS dataset, for a total of 1,062 study sites. Some studies sampled more than one habitat in a single site. The abbreviations are: fo = forest, eu = *Eucalyptus* plantation, tp = temporary pond, sp = semi-permanent pond, pp = permanent pond, la = lake, sw = swamp, ll = leaf litter, is = stream in the forest interior, os = open area stream, re = restinga, du = dunes, br = bromeliads.

Of the 1,107 study sites for which the date of sampling was reported, only 8% of the studies were made before the year 2000; 64% occurred between 2001 and 2010, and 28% between 2011 and 2015 (Figure 4). This fact can be explained mainly by the implementation of the BIOTA-FAPESP program (<http://www.biota.org.br>) in São Paulo State and of other species inventory projects in Brazil, such as “Vertebrate Inventory and Ecology” (<http://dgp.cnpq.br/dgp/espelholinha/866155114331427776840>, Joly et al. 2011).

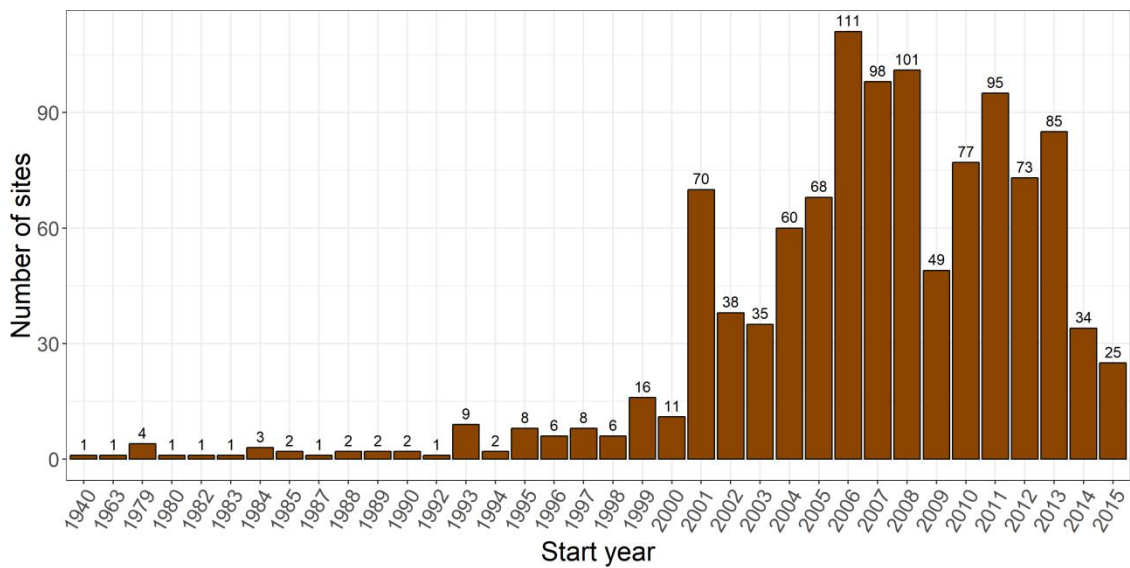


Figure 4. Number of study sites sampled per year in the ATLANTIC AMPHIBIANS dataset, of a total of 1,107 study sites. The start year represents the year in which data collection began in each study site, from 1940 to 2015.

Most of the samplings were carried out in the states of São Paulo (38.4%), Paraná (14.2%), and Minas Gerais (10.1%), collectively representing almost 63% of the surveys (Figure 5). In Figure 6, the kernel density map represents the high clustering of samples in the central region of São Paulo State. This high concentration of samplings may be due to several reasons. First, it was possible to describe two or more study sites for the same reference, which inflated the total number of study sites in this state. Second, there was a historical process of training amphibian researchers in São Paulo State, mainly students of Dr. Werner C. A. Bokermann, followed by researchers such as Drs. Ivan Sazima, Jorge Jim, Adão J. Cardoso, Jaime Bertoluci, Miguel T. Rodrigues, Célio Haddad, and Denise Rossa Feres; the last two cited researchers led the surveys of amphibian sampling in the BIOTA-FAPESP Program. Third, and relatedly, the concentration of large collections of herpetology at the three state universities in São Paulo (UNESP, UNICAMP, and USP) attracted researchers to perform taxonomic works. Finally, the article "Frogs of Boraceia" by Heyer et al. (1990) was a benchmark, being that, Boraceia, a reserve of University of São Paulo, belonging to the municipality of Salesópolis, São Paulo state, was considered one of the world's richest places in amphibian species, which attracted interest to the amphibians of Serra do Mar, a large Conservation Unit on the coast of São Paulo.

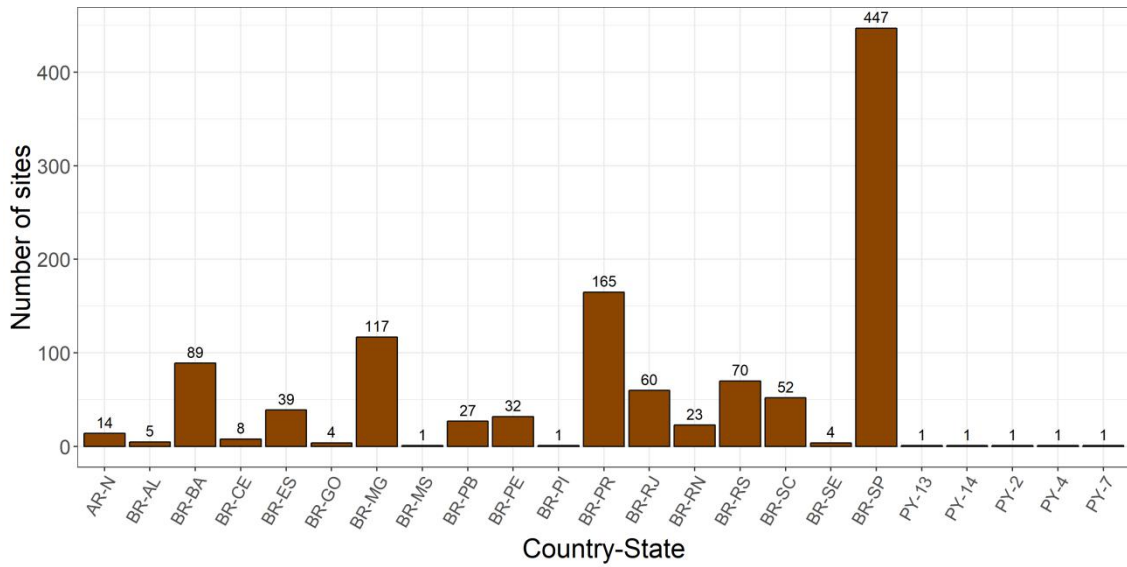


Figure 5. Number of study sites sampled per country-state in the ATLANTIC AMPHIBIANS dataset, for a total of 1,163 study sites. The abbreviation of states follows the ISO 3166-2 (defines codes for the names of the major subdivisions of all countries): AR-N = Misiones, BR-AL = Alagoas, BR-BA = Bahia, BR-CE = Ceará, BR-ES = Espírito Santo, BR-GO = Goiás, BR-MG = Minas Gerais, BR-MS = Mato Grosso do Sul, BR-PB = Paraíba, BR-PE = Pernambuco, BR-PI = Piauí, BR-PR = Paraná, BR-RJ = Rio de Janeiro, BR-RN = Rio Grande do Norte, BR-RS = Rio Grande do Sul, BR-SC = Santa Catarina, BR-SE = Sergipe, BR-SP = São Paulo, PY-13 = Amambay, PY-14 = Canindeyu, PY-2 = San Pedro, PY-4 = Guaira, PY-7 = Itapua. The countries were abbreviated as: AR = Argentina, BR = Brazil and PY = Paraguay.

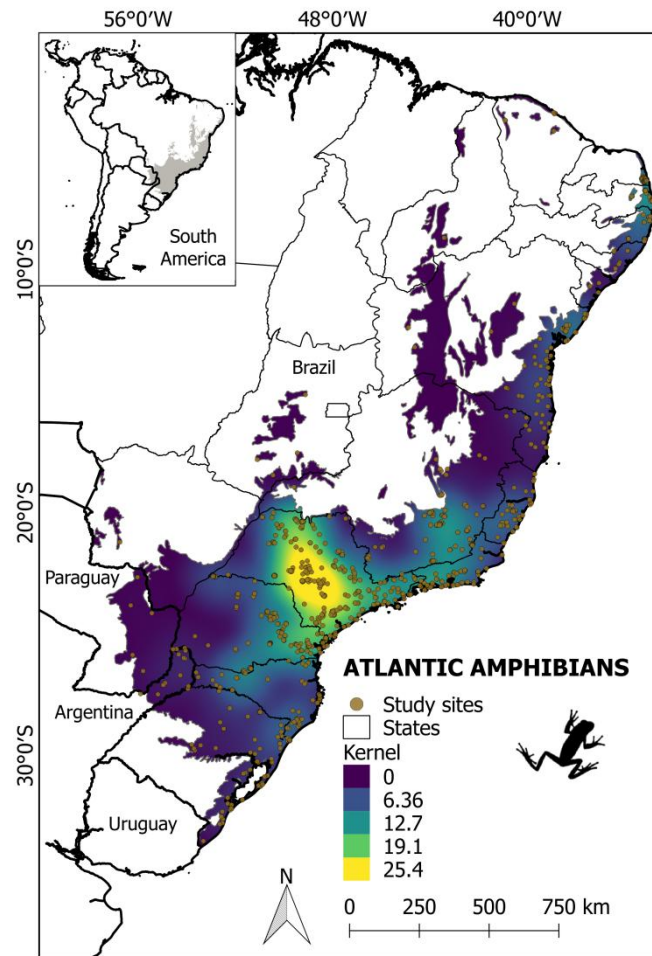


Figure 6. Kernel density of study sites in the ATLANTIC AMPHIBIANS dataset.

Kernel density map for 1,163 study sites, made with 2° (~220 km) of radius and 0.0083° (~1 km) of resolution, using ‘quartic’ kernel method from ‘v.kernel’ module in GRASS GIS (Okabe et al. 2009, Neteler et al. 2012). The color scale was made with five equal intervals, using ‘viridis’ color palette in QGIS. The values must be interpreted as a qualitative analysis, where high values show a high density of points.

For the records of species with taxonomic certainty (15,788), the Hylidae family represented 47% of the records, followed by Leptodactylidae (25%) and Bufonidae (8%), collectively accounting for about 80% of the records (Figure 7), following the composition pattern for the Neotropical region (Duellman 1999). Only Typhlonectidae and Siphonopidae belong to the Order Gymnophiona; the rest of the families belong to the Order Anura.

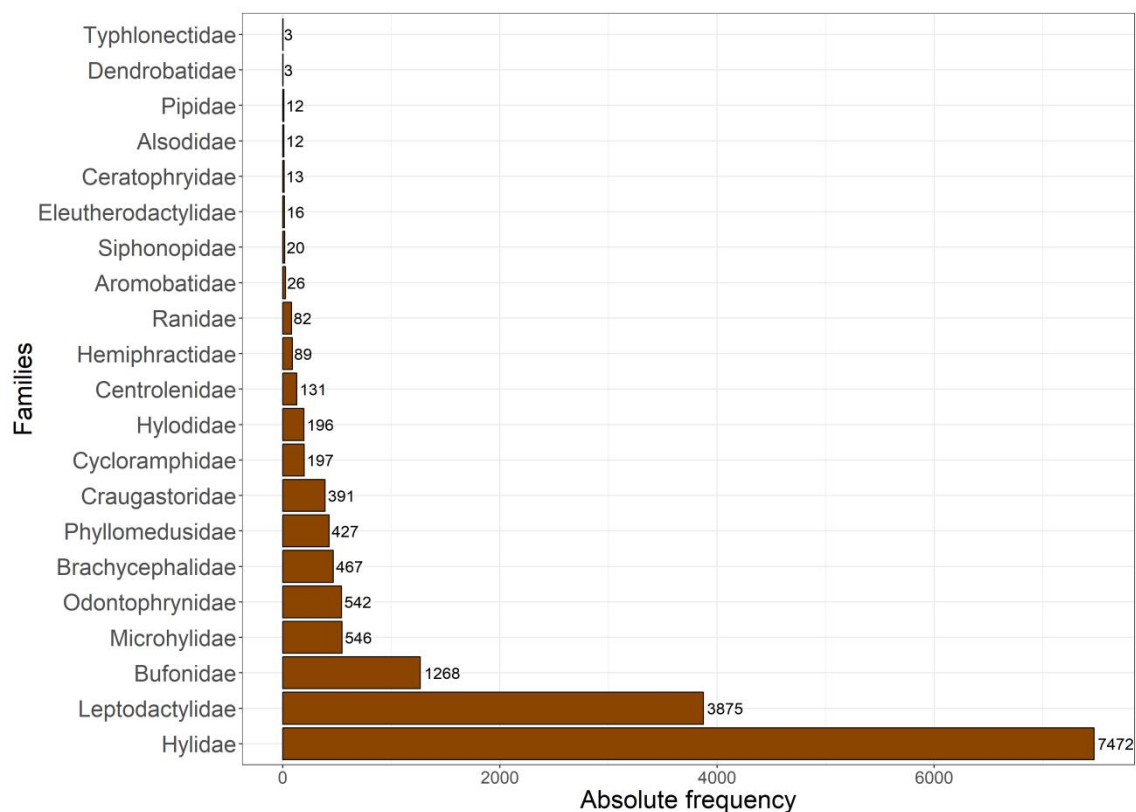


Figure 7. Representativeness of the families in the ATLANTIC AMPHIBIANS dataset. Absolute frequency of the families based on the 15,788 records of species with taxonomic certainty (see above).

The most representative genera were *Boana* (13.9%), *Leptodactylus* (13.3%), *Dendropsophus* (12.5%), *Scinax* (9.7%), *Physalaemus* (9.1%), *Rhinella* (7.3%), *Ololygon* (3.6%), *Ischnocnema* (2.6%), and *Aplastodiscus* (2.4%), which accounted for 74% of the records (Figure 8). Dominance was low in the communities, with ten species occurring in about 26% of the communities: *Physalaemus cuvieri* (4.1%), *Dendropsophus minutus* (3.8%), *Boana faber* (3.1%), *Scinax fuscovarius* (2.8%), *Leptodactylus latrans* (2.7%), *Leptodactylus fuscus* (2.6%), *Boana albopunctata* (2.3%), *Dendropsophus nanus* (1.6%), *Rhinella ornata* (1.6%), and *Leptodactylus mystacinus* (1.6%). This result reflects the ecology of these species, which are habitat generalists with wide geographic distribution (Haddad et al. 2013).

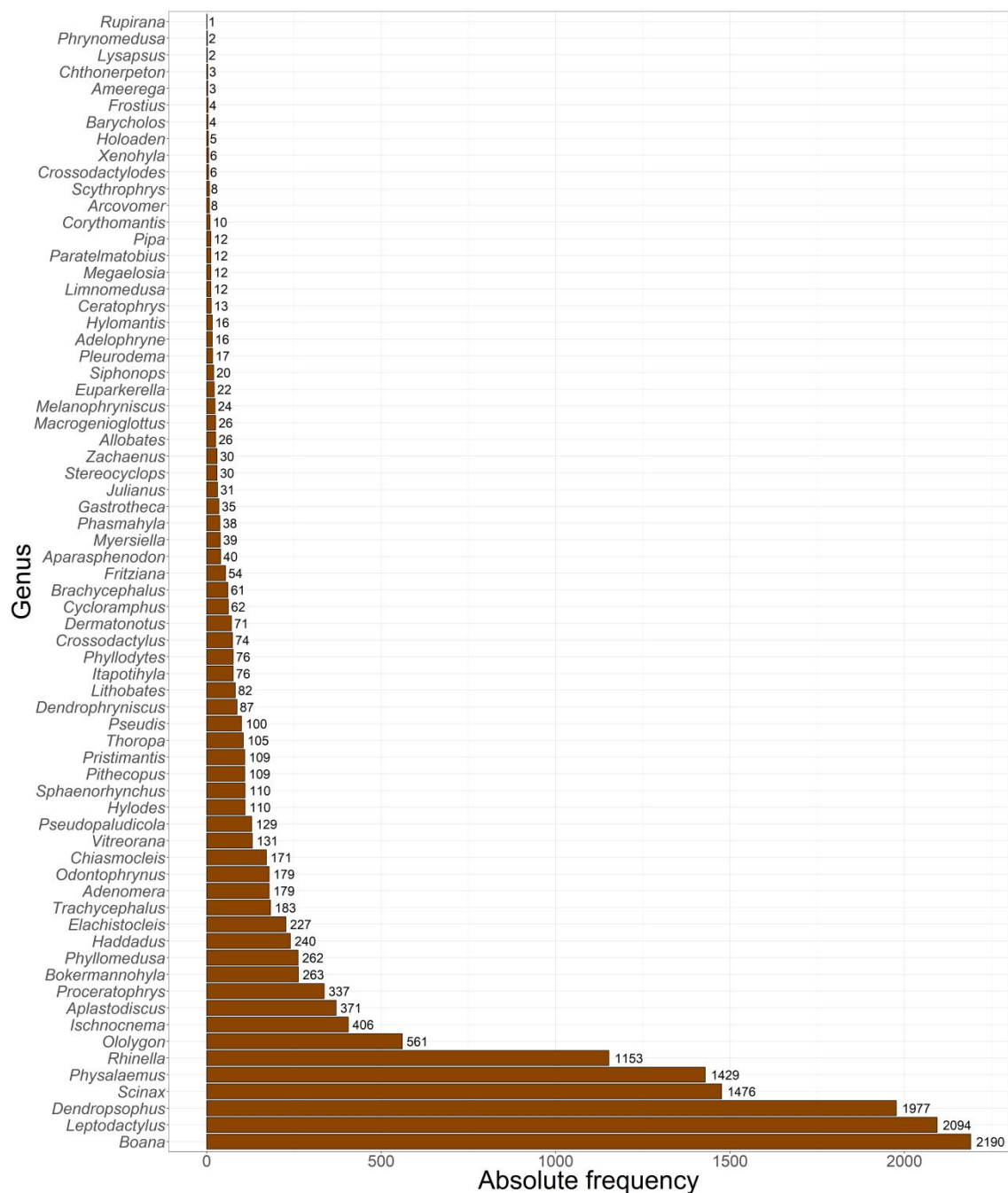


Figure 8. Representativeness of the genera in the ATLANTIC AMPHIBIANS dataset. Absolute frequency of the genera based in the 15,788 records of species with taxonomic certainty (see above).

When we considered all of the reviewed studies, the average number of species per study site was 15.17 ± 11.25 SD, ranging from 1 to 80 species. The sites with the greatest number of species were: Reserva do Patrimônio Natural Serra Bonita, Camacan e Pau-Brasil, Bahia (80); Reserva Ecológica de Guapiaçu, Cachoeiras de Macacu, Rio de Janeiro (76); Maciço da Tijuca, Rio de Janeiro, Rio de Janeiro (69); Parque Estadual

da Serra do Mar - Núcleo Curucutu, Itanhaém, São Paulo (66); Estação Biológica de Boracéia, Salesópolis, São Paulo (65); Pró-Mata, São Francisco de Paula, Rio Grande do Sul (55); Parque Estadual Carlos Botelho, Sete Barras, São Paulo (54); Reserva Natural Salto Morato, Guaraqueçaba, Paraná (54); Reserva Biológica de Santa Lúcia, Santa Teresa, Espírito Santo (53); Reservas legais das empresas Eucatex/SA, Cia. Suzano Celulose, Papel, Pilar do Sul, São Paulo (53); Parque Natural Municipal Nascentes de Paranapiacaba, Santo André, São Paulo (53).

Considering only the studies that describe their sampling effort (1,066), we calculated sampling effort as the total study duration in months, which does not necessarily correspond to the number of months in which the sampling was performed. We used this measure of effort because some studies did not report the months in which the sampling was actually performed, but reported only the study's beginning and end. For these data, the average number of species per study site was 14.74 ± 11.24 SD, and the average effort per site was 14.30 ± 14.07 SD months, ranging from less than one full month of sampling to a maximum of 191 months.

We used a simple linear model to relate the number of species (logarithm) to sampling effort (square root). Although the linear model ($F = 139.4$, $df = 1064$, $P < 0.001$) and the slope (slope = 0.82 ± 0.03 , $t = 11.8$, $P < 0.001$) were significant, the coefficient of determination was low ($R^2 = 0.12$), indicating a slightly positive effect of sampling effort on the number of species (Figure 9). The lack of a stronger relationship between number of species and sampling effort may be due to several factors. It may have been caused by the approximation we made for calculating the sampling effort, which probably overestimated the actual sampling effort of at least part of the studies, as we calculated the total of months in the reported time interval and not the time spent sampling. Alternatively, as sampling was performed in remnants of different sizes and in different regions of the Atlantic Forest, places generally closer to the coast may have had a high number of species with than inland locations with the same sampling effort. Finally, we did not separate the sampling effort used for active survey and survey at breeding site from that used for pitfall traps, even though these methods are completely different. In short, these results should be interpreted with parsimony given the variation among the studies compiled.

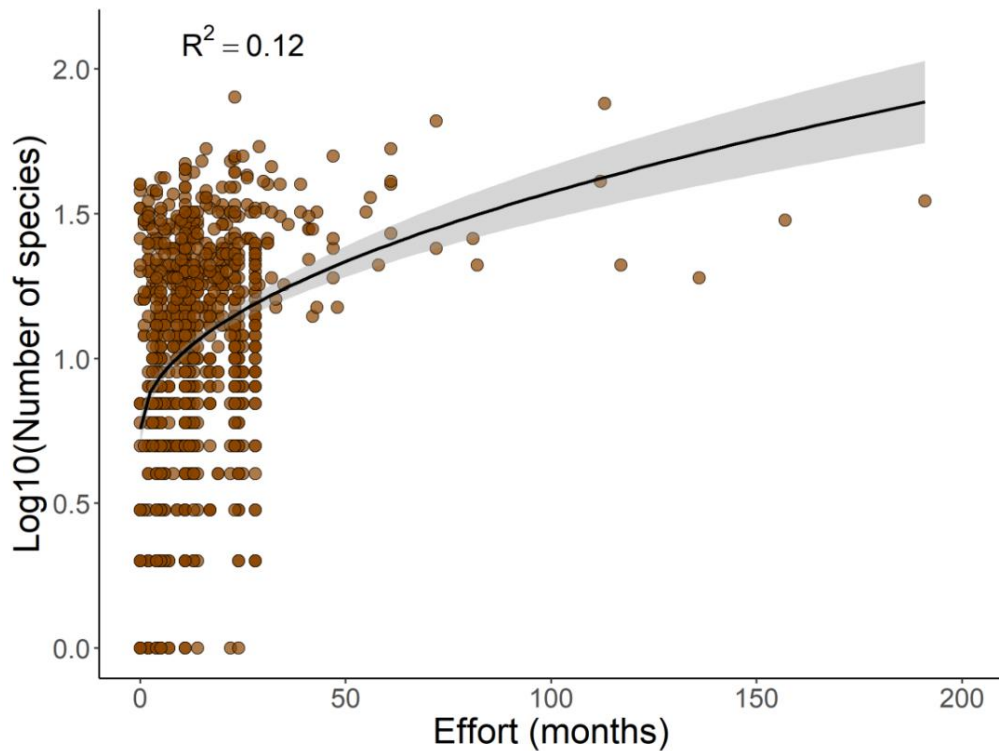


Figure 9. Relationship between the number of species and sampling effort in the ATLANTIC AMPHIBIANS dataset, for a total of 1,066 study sites with confirmed effort. The plot shows untransformed effort values (months). The model shows a slightly positive effect of sampling effort on the number of species observed in the ATLANTIC AMPHIBIANS dataset. The shaded area represents 95% confidence intervals for predicted values.

We extracted the values from following variables to each study site coordinate: a) altitude (meters) from Global Multi-resolution Terrain Elevation Data 2010 (GMTED2010, <https://lta.cr.usgs.gov/GMTED2010>, Danielson and Gesch 2011), b) annual mean temperature (Celsius degrees), and c) annual precipitation (millimeters) from WorldClim v. 2.0 (<http://worldclim.org/version2>, Fick and Hijmans 2017). We used variables with spatial resolution of 0.0083° (~1 km²). The values of each variable in the study sites were plotted in the Figure 10, showing also a histogram with median value. The values of these variables for each study site can be accessed in “altitude”, “temperature”, and “precipitation” columns in the Table 1.

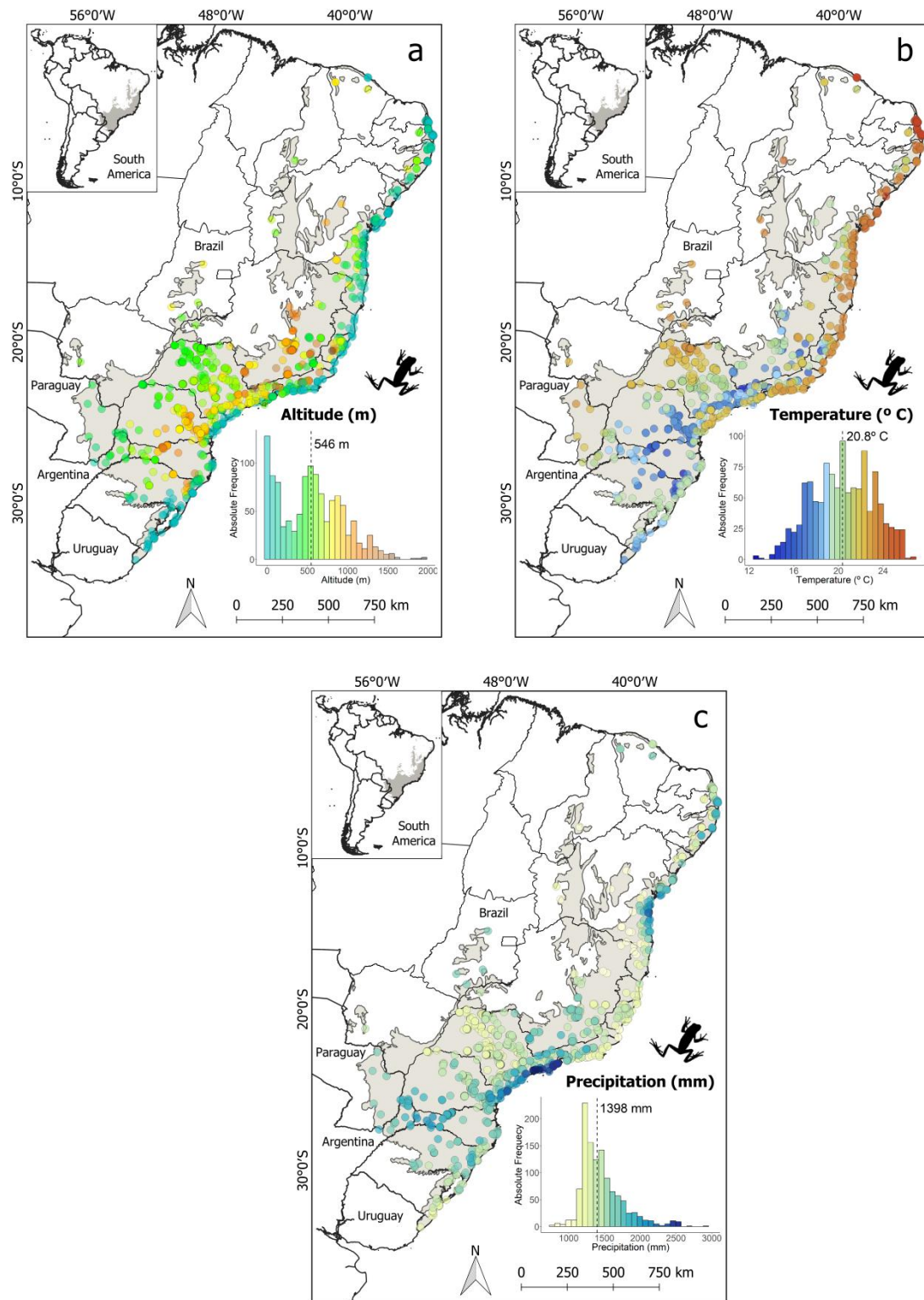


Figure 10. Spatial distributions, histograms and medians (dashed lines) of the values of altitude, annual mean temperature and annual precipitation of the study sites in the ATLANTIC AMPHIBIANS dataset. In the figure: a. altitude in meters; b. temperature in Celsius degrees; and c. precipitation in millimeters.

Class II. Research origin descriptors

A. Overall project description

1. Identity

A compilation of amphibian communities of the Atlantic Forest Biome.

2. Originators

The ATLANTIC AMPHIBIANS project was coordinated by Maurício H. Vancine at the Universidade Estadual Paulista (UNESP), and the database was assembled with help from all the other authors. This is part of ATLANTIC SERIES, which is led by Mauro Galetti and Milton Ribeiro, São Paulo State University (UNESP), Brazil.

3. Period of study

Data sampling ranged from 1940 to 2017.

4. Objectives

The aims of this data paper were (i) to compile the information available in the Portuguese, Spanish, and English literature about amphibian inventories in the Atlantic Forest Biome of South America, focusing on composition, species abundance, methods, and sampling effort; and (ii) to communicate the current state of knowledge on the amphibian communities of the Atlantic Forest Biome to guide future sampling efforts and conservation decisions.

5. Abstract

Same as above.

6. Sources of funding

The compilation of this dataset was supported by São Paulo Research Foundation (FAPESP) grants #2013/02883-7 (MVH), #2013/50421-2 (MCR), #2013/50741-7 (CFBH), #2014/50342-8 (CFBH), #2017/09676-8 (MHV), Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES) grants fellowships (MVH and KSD), and Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq), grants #312045/2013-1 (MCR) and #312292/2016-3 (MCR), and Procad/CAPES project #88881.068425/2014-01 (MCR).

B. Specific subproject description

1. Site description

We adopted a broad delimitation of the Atlantic Forest Biome following Muylaert et al. (in review)—see Figure 1—which encompasses several ecotonal regions, thus ensuring the inclusion of more amphibian inventories performed in regions where an Atlantic Forest formation occurs. The Atlantic Forest Biome originally covered about 1.5 million km², extending from latitudes 3° S to 30° S, and longitudes 35° W to 60° W (Morellato and Haddad 2000). Around 92% of its original distribution was located along the Brazilian coast, sharing complex limits with other biomes such as Pampa (natural open fields), Cerrado (the Brazilian savanna), and Caatinga (the northeast xeric vegetation of Brazil) (Ribeiro et al. 2009, 2011). The Atlantic Forest is composed mainly of two types of phytophysiognomies, the Dense Ombrophilous Forest and the Semideciduous Seasonal Forest, as well as other smaller ecosystems such as oceanic islands, beaches, rocky shores, dunes and restingas, mangroves and marshes, and high-altitude fields and swamps (Morellato and Haddad 2000, Haddad et al. 2013).

This biome holds about 8% of the total number of known species in the world and has a high rate of endemism (Joly et al. 2014), which can be explained by its complex phytophysiological borders with other biomes, great altitudinal variability, and the effects of past climates that created humid refuges (e.g. Morellato and Haddad 2000, Ribeiro et al. 2009, Carnaval et al. 2014). However, since human settlement, particularly after European colonization, the Atlantic Forest has been (and continues to be) altered and degraded, which has threatened its original structure and all its biodiversity (Dean 1996). Today, the largest metropolises and many smaller cities—home to about seventy percent of the Brazilian population (~145 million people, IBGE 2013) as well as industrial parks and farms—exist within this regional context, aggravating the current and future state of this biome's conservation (Tabarelli et al. 2005, 2010).

The high rates of endemism, coupled with high biodiversity and severe anthropogenic impact, have put the Atlantic Forest on a list of 35 biodiversity conservation hotspots around the world (Myers et al. 2000, Mittermeier et al. 2011). In addition, the biome is identified as one of the most vulnerable to global warming, climate change, land use and land cover modifications, and invasive species (Bellard et al. 2014).

2. Experimental or sampling design

a. Literature survey

All data were obtained from the literature, including articles, books, theses, and dissertations. We obtained studies from five main sources: (i) articles in online academic databases (e.g., ISI Web of Knowledge, Scielo, Scopus, Google Scholar, and ResearchGate); (ii) books on amphibian communities; (iii) unpublished literature such as undergrad monographs, theses, and dissertations from digital libraries of state and federal universities; (iv) references cited in articles in the literature; and (v) e-mail correspondence with amphibian experts.

The terms used to search in the online databases were: “amphibian*”, “anuran*”, “Atlantic Forest”, “Atlantic Rain Forest” “communit*”, “anfíbio*” “anuro*”, “Mata Atlântica”, “Floresta Atlântica”, “comunidade*”, “anfíbios”, “comunidade”, and “Bosque Atlántico”, which were combined in different ways using Boolean operators.

3. Research methods

a. Literature data

We included studies that sampled amphibian communities and disregarded papers on species description and geographic distribution based on a single taxon. Studies that did not provide detailed information about species composition or geographic coordinates were also disregarded. For every study, the information was organized according to the habitat sampled, survey methods, periods of the day sampled, sampling effort (initial and final month and year), species composition and abundance, and endemism (this last one according to Haddad et al. 2013). We also included information regarding geographic location (latitude, longitude, country, state/province/department, municipality/department/district, and specific locality). When certain information was not available in a publication, it was labeled “NA”.

We searched the database Brazilian Digital Library of Theses and Dissertations (<http://bdtd.ibict.br/vufind/>) with the search term ANFÍBIO* + MATA ATLÂNTICA to find theses and dissertations in Portuguese. We also used the literature cited in review articles or in articles on specific themes: sand coastal (Oliveira and Rocha 2015, Xavier et al. 2015), bromeliads (Sabagh et al. 2017), tadpoles (Rossa-Feres and Nomura 2006, Fatorelli and Rocha 2008, Borges Jr. and Rocha 2013, Melchior et al. 2017), highland grasslands (Garey and Provete 2016), diversity (Bastos et al. 2003, Vasconcelos et al. 2010, Melchior et al. 2017), Pampa Biome (Santos et al. 2014), Cerrado Biome

(Valdujo 2011, Ribeiro et al. 2017), Caatinga Biome (Camardelli and Napoli 2012), distributions (Garcia et al. 2007), landscape modifications (Thompson et al. 2016, Nowakowski et al. 2017, Palmeirim et al. 2017), leaf litter (Pontes and Rocha 2011), metabolic (Canavero et al. 2017), conservation (Eterovick et al. 2005, Silvano and Segalla 2005), São Paulo State (Haddad 1998, Araújo et al. 2009, Provete et al. 2011, Rossa-Feres et al. 2011), Espírito Santo State (Almeida et al. 2011), Rio de Janeiro State (Rocha et al. 2004), Ceará State (Roberto and Loebmann 2016), Piauí State (Roberto et al. 2013), Paraguay (Brusquetti and Lavilla 2006, Motte et al. 2009, Weiler et al. 2013), and Argentina (Vaira et al. 2012).

Amphibian communities were compiled from Abrunhosa et al. (2006), Adriano (2012), Affonso et al. (2014), Afonso and Eterovick (2007), Aguiar et al. (2014), Albertim et al. (2010), Albuquerque (2016), Almeida-Gomes et al. (2008), Almeida-Gomes et al. (2010), Almeida-Gomes et al. (2014), Alves (2014), Amorim (2009), Andrade (1987), Andrade (2011), Andrade (2012), Andrade et al. (2014), Antunes (2007), Araujo (2017), Araujo and Almeida-Santos (2011), Araujo and Almeida-Santos (2013), Araujo et al. (2009), Araujo et al. (2010), Araujo et al. (2013), Armstrong and Conte (2010), Arzabe (1998), Assis (2009), Assmann et al. (2013), Baldi et al. (2015), Barata et al. (2016), Barbosa and Alves (2014), Barbosa et al. (2017), Bardini Jr. (2012), Bastazini et al. (2007), Bastiani (2012), Batista and Bastos (2014), Becker (2007), Beltramin (2010), Benício and Da Silva (2017), Bernarde and Kokubum (1999), Bernarde and Machado (2001), Bertoluci and Rodrigues (2002a), Bertoluci and Rodrigues (2002b), Bertoluci et al. (2009), Bittencourt-Silva and Silva (2013), Boquimpani-Freitas et al. (2007), Borges-Leite et al. (2014), Borges-Martins et al. (2007), Borges-Nojosa (2007), Both et al. (2008), Both et al. (2009), Both et al. (2014), Brasileiro et al. (2005), Brassaloti (2010), Brassaloti et al. (2010), Bruscagin et al. (2014), Buarque Jr. and Moura (2011), Bueno et al. (2013), Cacciali et al. (2015), Campos and Lourenço-de-Moraes (2017), Camurugi et al. (2010), Canelas and Bertoluci (2007), Caram et al. (2016), Cardoso (1986), Cardoso (2006), Carmona (2007), Carneiro (2011), Carossini (2013), Carvalho (2013), Carvalho et al. (2005), Carvalho-e-Silva et al. (2008), Carvalho-e-Silva et al. (2015), Castanho (2000), Cerezoli (2008), Ceron et al. (2016), Ceron et al. (2017a), Ceron et al. (2017b), Chagas (2017), Chaves et al. (2015), Cicchi (2011), Cicchi et al. (2009), Coelho and Oliveira (2010), Colombo et al. (2008), Colonetti (2005), Condez et al. (2009), Conte (2010), Conte and Machado (2005), Conte and Rossa-Feres (2006), Conte and Rossa-Feres (2007), Conte

et al. (2013), Correa Filho (2013), Correia (2015), Costa (2014), Costa et al. (2013),
Crivellari et al. (2014), Cruz et al. (2009), Cunha (2013), Cunha et al. (2010), Da Silva
(2007), Da Silva et al. (2009), Da Silva et al. (2011), Da Silva et al. (2012), Da Silva et
al. (2017a), Da Silva et al. (2017b), Dal Vechio et al. (2016), Dantas (2009),
D'Anunciação et al. (2013), Dayrell (2009), De Domenico (2008), De Lucca (2009), De
Lucca et al. (2017), Deiques et al. (2007), Dias (2006), Dias (2008), Dias et al. (2014a),
Dias et al. (2014b), Dixo and Metzger (2010), Dixo and Verdade (2006), Dorigo (2012),
Drummond (2009), Entiauspe-Neto et al. (2016), Esteves (2012), Eterovick (1998),
Eterovick (2003), Eterovick and Sazima (2004), Faria et al. (2007), Farias (2014), Feio
and Ferreira (2005), Feio et al. (1998), Feio et al. (2006), Ferrante (2017), Ferreira and
Mendes (2010), Ferreira et al. (2010), Ferreira et al. (2012), Ferreira et al. (2016),
Figueiredo-de-Andrade et al. (2011), Foerster (2014), Folly et al. (2014), Folly et al.
(2016), Fonte et al. (2013), Forlani et al. (2010), Forti (2009), Forti (2013), Freitas
(2005), Fusinato (2008), Gangenova (2017), Garcia et al. (2012), Garey and Da Silva
(2010), Garey and Hartmann (2012), Garey et al. (2014a), Garey et al. (2014b), Gayer et
al. (1988), Giaretta (1999), Giaretta et al. (1997), Giaretta et al. (1999), Giasson (2008),
Gomes (2009), Gomides and Souza (2012), Gondim-Silva et al. (2016), Goyannes-
Araújo et al. (2015), Graipel et al. (1997), Grandinetti and Jacobi (2005), Guerra-
Fuentes et al. (2017), Guimarães (2006), Guix et al. (1994), Guix et al. (2000), Haddad
and Sazima (1992), Hartmann et al. (2008), Hartmann et al. (2010), Herrera (2011),
Heyer et al. (1990), Hiert (2014), Hiert and Moura (2007), Iop et al. (2011), Izecksohn
and Carvalho-e-Silva (2001), Izecksohn and Carvalho-e-Silva (2010), Jordani et al.
(2017), Juares (2011), Juncá (2006), Kopp and Eterovick (2006), Kwet et al. (2010),
Leite and Guilherme (2008), Leite-Filho et al. (2017), Leivas (2014), Leivas and Hiert
(2016), Leivas et al. (2015), Leonal (1992), Lescano et al. (2013), Lima (2012), Lima et
al. (2011), Lima et al. (2014), Linares and Eterovick (2013), Lingnau (2009), Lion et al.
(2014), Lipinski and Santos (2014), Loebman and Figueiredo (2004), Loebman and
Vieira (2005), Loebmann (2010), Lopes (2010), López and Kubisch (2008), López and
Nazer (2009), López and Prado (2012), Lucas and Fortes (2008), Lucas and Marocco
(2011), Luiz et al. (2016), Macedo (2011), Machado (2004), Machado (2006), Machado
(2011), Machado and Bernarde (2003), Machado and Maltchik (2010), Machado et al.
(1999), Machado et al. (2012), Madalozzo et al. (2017), Maffei (2014), Maffei and
Ubaid (2014), Maffei et al. (2011), Maffei et al. (2015), Magalhães (2012), Magalhães
(2015), Magalhães et al. (2015), Malagoli (2013), Maltchik et al. (2008), Mariotto

(2014), Martínez et al. (2016), Martins (2014), Martins et al. (2012a), Martins et al. (2012b), Martins et al. (2014), Mascarenhas et al. (2015), Matos (2012), Melo et al. (2007), Mendes et al. (2013), Mendonça (2008), Mônico et al. (2017), Monteiro-Leonel (2004), Montesinos et al. (2012), Moraes et al. (2007), Morais et al. (2011), Morato et al. (2011), Moreira and Maltchick (2012), Moreira and Maltchick (2014), Moreira et al. (2008), Moura et al. (2012), Narvaes et al. (2009), Nascimento et al. (1994), Nazaretti (2016), Nazaretti and Conte (2015), Nery (2014), Neves et al. (2017), Nomura (2008), Núñez (2012), Oda et al. (2016), Oda et al. (2017), Oliveira (2004), Oliveira (2008), Oliveira (2011), Oliveira (2012), Oliveira (2013), Oliveira (2015), Oliveira and Lirio Jr. (2000), Oliveira et al. (2013a), Oliveira et al. (2013b), Oliveira et al. (2017), Ouverney et al. (2012), Palmeira and Gonçalves (2015), Papp (1997), Paula (2011), Pereira et al. (2016a), Pereira et al. (2016b), Pereira-Ribeiro et al. (2017), Peres (2010), Pertel et al. (2006), Pertel et al. (2010), Pinheiro (2009), Pinto (2015), Pirani et al. (2013), Pombal Jr. and Gordo (2004), Pombal Jr. and Haddad (2005), Pontes (2010), Pontes and Pontes (2016), Pontes et al. (2013), Pontes et al. (2015), Prado and Pombal Jr. (2005), Prado et al. (2009a), Prado et al. (2009b), Preuss et al. (2016), Queissada (2009), Quintela et al. (2009), Quintela et al. (2011), Ramos and Gasparini (2004), Ribeiro et al. (2005), Ribeiro-Júnior and Bertoluci (2009), Rievers (2010), Roberto et al. (2017), Rocha (2013), Rocha et al. (2001), Rocha et al. (2007), Rocha et al. (2008), Rocha et al. (2009), Rocha et al. (2011), Rocha et al. (2013), Rödder et al. (2006), Rödder et al. (2007), Rodrigues et al. (2008), Rolim (2009), Rolim (2013), Rosa (2017), Rossa-Feres and Jim (1996), Rossa-Feres and Jim (2001), Rossa-Feres et al. (2012), Sabbag and Zina (2011), Salles et al. (2009), Santana et al. (2008), Santana et al. (2010), Santos (2003), Santos (2009), Santos (2011), Santos (2013a), Santos (2013b), Santos and Moura (2012), Santos et al. (2007), Santos et al. (2008), Santos et al. (2009), Santos-Pereira et al. (2011), Santos-Pereira et al. (2016), São-Pedro and Feio (2011), Sasso et al. (2017), Sawaya (1999), Scarpellini Jr. (2007), Schiesari and Corrêa (2016), Schineider and Teixeira (2001), Serafim et al. (2008), Shibatta et al. (2009), Sierra-Ramirez (1998), Silva (2007a), Silva (2007b), Silva (2011), Silva (2014), Silva and Moura (2011), Silva et al. (2008), Silva et al. (2011), Silva et al. (2013), Silvano (1999), Silvano and Pimenta (2003), Silva-Soares and Scherrer (2013), Silva-Soares et al. (2010), Siqueira et al. (2009), Siqueira et al. (2011a), Siqueira et al. (2011b), Smith et al. (2016), Soares (2010), Tacioli (2012), Teixeira (2009), Teixeira et al. (2006), Teixeira et al. (2007a), Teixeira et al. (2007b), Teixeira et al. (2008), Teixeira et al. (2015), Telles et al. (2012),

Toledo (2013), Toledo et al. (2003), Tonetto (2008), Tonini et al. (2010), Tonini et al. (2011), Torres (2012), Trevine et al. (2014), Uetanabaro et al. (2007), Valdujo et al. (2009), Valência-Aguilar et al. (2016), Van Sluys et al. (2004), Van Sluys et al. (2007), Vasconcelos and Rossa-Feres (2005), Verdade et al. (2009), Vilela (2012), Vilela et al. (2011), Vrcibradic et al. (2011), Wachlevski and Rocha (2010), Wachlevski et al. (2014), Wood et al. (2013), Xavier and Napoli (2011), Yamamoto and Bertoluci (2013), Yanzen and Costa (2014), Zaher et al. (2005), Zanella et al. (2013), Zank et al. (2013), Zina et al. (2007), Zina et al. (2012), and Zocca et al. (2014).

b. Taxonomic and systematics

The taxonomic arrangement follows FROST v. 6.0 (Frost 2017), accessed in September 2017, and followed Segalla et al. (2016) to update and/or correct the species' taxonomy. This information is described in the "valid_name" column (Table 2). We have maintained all the taxonomic uncertainties (sp., spp., cf., aff., and gr.) and records of *Elachistocleis ovalis*, *Chaunus pombali*, *Bufo pombali*, and *Rhinella pombali* as originally reported; however, these data were not considered in the analyses by the reasons presented above (E. Description section).

c. Statistical analyses

We used descriptive statistical analysis to provide an overview of the data, using mainly bar plots for survey methods, habitat sampled, study sites in each state, clustering of geographic coordinates, and taxonomy. We also built a kernel density map to summarize information about the sampling intensity per pixel of ~ 1 km resolution, and we used a search radius of about 200 km. To analyze the numbers of species and effort, we performed a simple linear regression. Data manipulation was performed using the "data.table" package (Dowle and Srinivasan 2017), analysis and graphics were done using the "ggplot2" package (Wickham 2016), data from rasters were extracted with "raster" package (Hijmans 2017), and colors were used from "cptcity" package (Ibarra-Espinosa 2018), in R statistical software (R Core Team 2017). The maps were generated in QGIS software, and kernel density inference was done using GRASS GIS (Okabe et al. 2009, Neteler et al. 2012).

d. Data limitations and potential enhancements

Gathering and presenting information about the amphibian communities of the Atlantic Forest was an arduous task, mainly due to species biology, sampling, and taxonomy. Among terrestrial vertebrates, amphibians have a generally small body size, and the species occupy very distinct niches, with diverse life histories and various modes of reproduction; thus, a variety of sampling methods are required to ensure a complete listing of their communities (Duellman and Trueb 1994, Wells 2007). Intrinsic characteristics such as vocalization and spawning at specific sites, the aquatic larval stage, metamorphosis, and generally small body size coupled with high camouflage ability make amphibian sampling complex and susceptible to various biases and collection failures (Haddad and Prado 2005, Wells 2007). In addition, the seasonal population fluctuation, with periods of higher abundance and density during the rainy season, hampers sampling in all seasons of the year. In this respect, studies should cover different seasons; however, the heterogeneity of the database limits the comparisons. Finally, only 30% of the surveys reported abundance, since estimating this data for amphibians is complicated and sometimes flawed.

Several sampling methods are used to research amphibian communities, but the active survey (Crump and Scott Jr. 1994) and survey at breeding sites (Scott Jr. and Woodward 1994) are the most common. These methods, however, are limited to seeking amphibians that usually occur in reproductive sites, especially water bodies like ponds, swamps and streams. The use of pitfall traps (Corn 1994, Cechin and Martins 2000) and quadrat sampling (Jaeger and Inger 1994) may complement community sampling, especially for species living in the leaf litter. However, pitfall traps are often used without standardization, with different numbers and sizes of buckets, which can affect the capture rate (Ribeiro-Júnior et al. 2011). Some studies used only the pitfall trap as a sampling method and therefore probably underestimated the communities, particularly the species adapted to live on trees and bushes.

We understand that each sampling has its limitations; however, amphibian surveys are complex and require a combination of survey methods and a consistent sampling effort. The sampling efforts in the surveys that we analyzed were heterogeneous and not standardized, with varying sampling designs, numbers of traps, sampled days, and sampling periods. In addition, the measure of study duration adopted here was the number of months from beginning to end of each study. We are aware that this cannot be considered as a sampling effort, since the samplings in the different

studies generally followed different methodologies and were more intense during the rainy season.

Some areas of the Atlantic Forest Biome have been studied much more than others, generating a strong sampling bias. Such has been the case with the states of São Paulo, Paraná, and Minas Gerais, in which most of the samplings occurred, for reasons already described above. Conversely, few studies have considered the Atlantic Forest areas contained within the states of Sergipe and Alagoas, for example; and the situation is similar for portions of the Atlantic Forest in Paraguay and Argentina. Lastly, in several studies that adopted a broad delimitation of the biome, surveys were carried out in transition areas between the Atlantic Forest and other biomes (Cerrado, Caatinga, and Pampa); false sampling gaps may also have resulted, since the search for studies was carried out using keywords for amphibians of the Atlantic Forest (see 2. Experimental or sampling design and 3. Research Methods sections above).

Regarding taxonomy, we know that there are several problems in the species' identification of species, even some of those identified with taxonomic certainty. However, to avoid an imbalance in this information, we assumed that the species identification in the original source was correct and simply updated the taxonomy based on Frost (2017). Nevertheless, the fact that taxonomic uncertainties exist in 10% of the records shows that the taxonomy of this group is complicated, given the diversity among amphibians and the lack of knowledge about this group. Finally, the relative ease or difficulty of detecting each species may have affected which species were listed. Variability in sampling success may be related to differences in life history, behavior, and abundance among species.

Finally, we did not include data from records of museums or scientific collections in this database. This would be a challenge task, primarily because of the large volume of data deposited in several institutions. Although a considerable part of these data are available online at the speciesLink (<http://splink.cria.org.br>) and Global Biodiversity Information Facility (GBIF, <https://www.gbif.org>) databases, the same have several taxonomic and/or georeferencing errors that would demand numerous corrections. Second, because a considerable amount of data is deposited mainly in the collections of universities of Rio de Janeiro and São Paulo states, and these data are not yet totally digitized or are still in record books or even in labels inside the bottles where specimens are kept. Therefore, it is important to point out that non-digitized records of collections and doubtful digital data quality impose difficulties to the scientific advance

in taxonomic, systematic, and ecological research not only for amphibians but also for other taxa in Brazil.

Class III. Data set status and accessibility

A. Status

1. Latest update

December 2017.

2. Latest archive date

December 2017.

3. Metadata status

Last updated April 2018, version submitted.

4. Data verification

The information was compiled as reported before with the exception of taxonomy, where synonymy problems were verified and standardized, following Frost (2017). The updated taxonomic information can be found in the “valid_name” column, as well as the original taxonomic information in the “species” column, both in the Table 2.

Another exception was the geographic coordinates that were converted to decimal degrees using Datum WGS 84. All coordinates were checked and adjusted as necessary using maps and coordinates provided in the studies, or through personal information of the authors and using Google Maps. In the absence of information on the geographic coordinates for the collection site, we used Google Earth to obtain approximate geographic coordinates, and this was specified as “NA” in the “precision_coordinate” column of Table 1.

B. Accessibility

1. Storage location and medium

Original ATLANTIC AMPHIBIANS dataset can be accessed on ECOLOGY repository. Updated versions and additional information will be available at the GitHub (<https://github.com/mauriciovancine/ATLANTIC-Amphibians>).

2. Contact persons

Maurício Humberto Vancine (mauricio.vancine@gmail.com), Kauã da Silva Duarte (kauaduarte@gmail.com), Célio Fernando Baptista Haddad (haddad1000@gmail.com), or Milton Cezar Ribeiro (miltinho.astronauta@gmail.com).

3. Copyright restrictions

None.

4. Proprietary restrictions

a. Release date

None.

b. Citation

Please, cite this data paper when the data are used in publications or teaching events.

c. Disclaimer(s)

None.

5. Costs

None.

Class IV. Data structural descriptors

We divided the dataset into three complementary files. The first (ATLANTIC_AMPHIBIANS_sites.csv) describes the characteristics of the sampled localities. The second (ATLANTIC_AMPHIBIANS_species.csv) contains information regarding species composition or abundance, with taxomic descriptors (class, superfamily, family, subfamily, genus, original species description, valid name, individuals number, and endemism) at each locality. The third (ATLANTIC_AMPHIBIANS_references.csv) contains the references cited and email to contact authors.

A. Data set file

1. Identity: ATLANTIC_AMPHIBIANS_sites.csv

2. Size: 22 columns and 1164 rows records, including header row, 171 KB.

3. Format and storage mode: comma-separated values (.csv).

4. Header information: See column descriptions in section B.

5. Alphanumeric attributes: Mixed.

1. Identity: ATLANTIC_AMPHIBIANS_species.csv

2. Size: 9 columns and 17620 rows records, including header row, 1.43 MB.

3. Format and storage mode: comma-separated values (.csv).

4. Header information: See column descriptions in section B.

5. Alphanumeric attributes: Mixed.

1. Identity: ATLANTIC_AMPHIBIANS_references.csv

2. Size: 5 columns and 390 rows records, including header row, 96.9 KB.

3. Format and storage mode: comma-separated values (.csv).

4. Header information: See column descriptions in section B.

5. Alphanumeric attributes: Mixed.

B. Variable information

1) Table 1. Site information in the ATLANTIC AMPHIBIANS dataset. Description of the fields related with the study site of the ATLANTIC_AMPHIBIANS_sites.csv.

Variable identify	Variable description	Levels	Example
id	Identification code for each study site	amp1001- amp2163	amp1676
reference_number	The reference number which report amphibian communities	1001-1389	1228
species_number	Total of species for each study site	1-80	24
records	Type of records of species: <ul style="list-style-type: none">• co: composition• ab: abundance	co, ab	co
sampled_habitat	Type of habitat sampled: <ul style="list-style-type: none">• fo: forest• eu: <i>Eucalyptus</i> plantation• tp: temporary pond• sp: semi-permanent pond• pp: permanent pond• la: lake	fo, eu, tp, sp, pp, la, sw, ll, is, os, re, du, br	pp,la,ll,is

	<ul style="list-style-type: none"> • sw: swamp • ll: leaf litter • is: stream in the forest interior • os: open area stream • re: restinga • du: dunes • br: bromeliads 		
active_methods	Type of sampling active methods: <ul style="list-style-type: none"> • as: active surveys • sb: survey at breeding site • tr: transect • qs: quadrat surveys 	as, sb, tr, qs	as
passive_methods	Type of sampling passive methods: <ul style="list-style-type: none"> • pt: pitfall traps • ft: funnel traps • ar: artificial shelters • dr: digital recorders 	pt, ft, as, dr	NA
complementary_methods	Type of sampling complementary methods: <ul style="list-style-type: none"> • ae: accidental encounter • tp: third-party records • in: interview • rr: road riding 	ae, tp, in, rr	tp
period	Periods of the day sampled: <ul style="list-style-type: none"> • mo: morning (05-12 a.m.) • da: day (12 a.m.-06 p.m.) • tw: twilight (06-08 p.m.) • ni: night (08 p.m.-05 a.m.) 	mo, da, tw, ni	da, tw, ni
month_start	Month of the beginning of the study	1-12	3
year_start	Year of the beginning of the study	1940-2015	1988
month_finish	Month of the end of study	1-12	2
year_finish	Year of the end of study	1983-2017	1989
effort_months	Total of months of study (from begging to end of study)	1-191	12
country	English name of the country of the	Brazil,	Brazil

	study site	Paraguay, Argentina	
state	State, Province or Department of the study site derived based on the geographic coordinates	23	São Paulo
state_abbreviation	Abbreviation of State, Province, or Department of the study site based on the geographic coordinates, following ISO 3166-2	23	BR-SP
municipality	Municipality, Department, or District of the study site based on the geographic coordinates	411	Jundaí
site	Local name of the study site based on the information in the reference	566	Serra do Japi
latitude	Corrected and transformed coordinates of the latitude in decimal degrees (Datum WGS84). The precision of the reported coordinates in the reference papers was mostly inexact. A correction was conducted with the help of the clues in the reference, such as vegetation type, approximate coordinates, trails, rivers, and reserve names. These clues were cross-validated against Google Earth satellite images.	decimal degrees	-23.22694
longitude	Corrected and transformed coordinates of the longitude. See “latitude” for the same information	decimal degrees	-46.96667
coordinate_precision	Coordinate precision of the study site: <ul style="list-style-type: none"> • dm: the coordinates of the Municipality are reported, or the coordinates mismatch the written information in the reference paper • dms: the grid, transect, or vegetation patch coordinates are reported • dd: the coordinates are report in decimal degrees 	dm, dms, dd, utm	dm

	<ul style="list-style-type: none"> utm: the coordinates are report in meters in the UTM system 		
altitude	Altitude (meters) from Global Multi-resolution Terrain Elevation Data 2010 (GMTED2010; Danielson and Gesch 2011)	0-1950	971
temperature	Annual mean temperature (Celsius degrees) from WorldClim v. 2.0 (Fick and Hijmans 2017)	12.47- 26.55	17.67
precipitation	Annual precipitation (millimeters) from WorldClim v. 2.0 (Fick and Hijmans 2017)	773- 2909	1327

793

794 **2) Table 2. Species information in the ATLANTIC AMPHIBIANS dataset.**

795 Description of the fields related to amphibian species information of the
796 ATLANTIC_AMPHIBIANS_species.csv.

Variable identify	Variable description	Levels	Example
id	Identification code for each site where the species were registered	amp1001-amp2163	amp1676
order	Taxonomic order according to Frost 2017	Anura, Gymnophiona	Anura
superfamily	Taxonomic superfamily according to Frost 2017	Brachycephaloidea, Dendrobatoidea	Brachycephaloidea
family	Taxonomic family according to Frost 2017	21	Brachycephalidae
subfamily	Taxonomic subfamily according to Frost 2017	18	NA
species	Species name reported in the study	1878	<i>Brachycephalus ephippium</i>
valid_name	Valid name according to Frost 2017	357	<i>Brachycephalus ephippium</i>
abundance	Number of captured individuals	1-11,404	NA
endemism	Endemic of Atlantic Forest Biome according to Haddad et al. (2013):	0, 1	1

	<ul style="list-style-type: none"> • 0: not endemic • 1: endemic 		
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797

798 **3) Table 3. Reference information in the ATLANTIC AMPHIBIANS dataset.**

799 Description of the fields related to the reference information of the
800 ATLANTIC_AMPHIBIANS_references.csv.

Variable identify	Variable description	Levels	Example
reference_number	The numbers of references that report amphibian communities	1001-1389	1228
reference_type	Type of bibliography: <ul style="list-style-type: none"> • a: article • b: book • t: undergrad monographs, theses, and dissertations 	a, b, t	b
citation	Citation in Ecology style	factor	Haddad and Sazima 1992
reference	Reference in Ecology style	factor	Haddad, C. F. B., and I. Sazima. 1992. Anfíbios anuros da Serra do Japi, pp. 188–211. In L. P. C. Morellato (eds.), História natural da Serra do Japi: ecologia e preservação de uma área florestal no sudeste do Brasil. Editora Unicamp e Fapesp, Campinas, Brazil.

email	Email from first author reported in the study	factor	NA
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C. Data anomalies: If no information is available for a given record, this is indicated by “NA”.

Class V. Supplemental descriptors

F. Publications and results

Vancine (2015), Duarte (2015) and D'Anunciação (2018) used part of this dataset to investigate the effects of landscape modifications in the persistence and lost of functional traits of amphibians in the Atlantic Forest Biome.

G. History of data set usage

1. Data request history: None.

2. Data set updates history: None.

3. Review history: None.

4. Question and comments from secondary users: None.

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