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, Mohneke 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. No copyright or proprietary restrictions are associated with the use of this data set. Please cite this data paper when the data are used in publications or teaching events.

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).

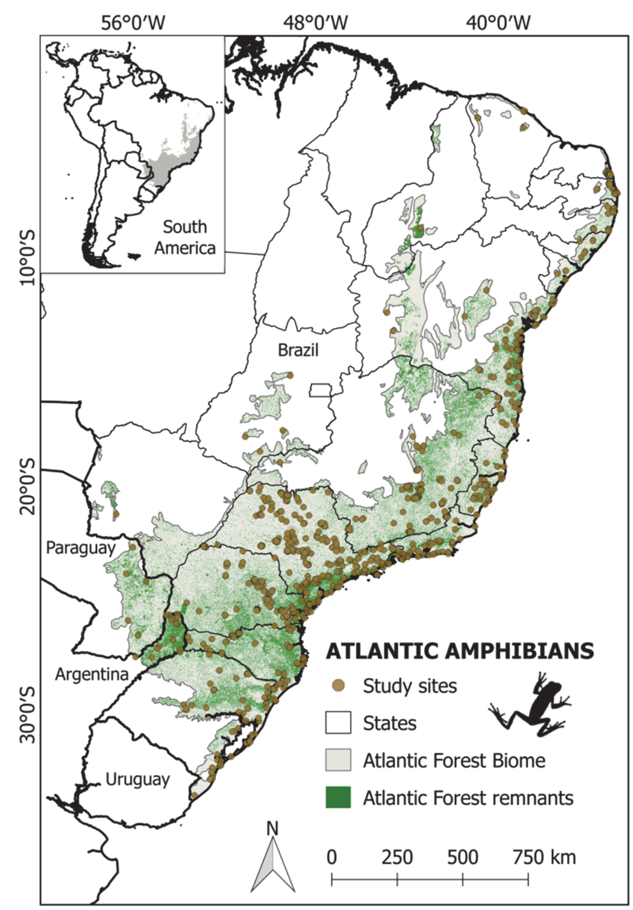

Figure 1. Distribution of the study sites in the ATLANTIC AMPHIBIANS dataset. The limit of Atlantic Forest Biome according to Muylaert et al. (in review).

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

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

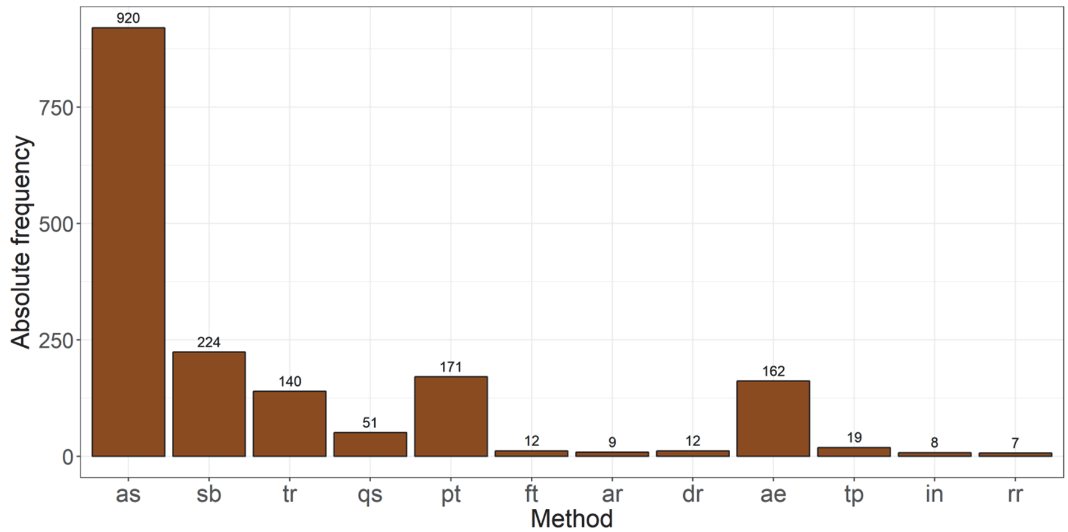

Figure 2. Absolute frequency of the methods used in the ATLANTIC AMPHIBIANS dataset, for a total of 1,121 study sites. Some studies used more than one method in a single site. Abbreviations are: as = active surveys, sb = survey at breeding site, tr = transect, qs = quadrat surveys, pt = pitfall traps, 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 Brachycepalidae 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.

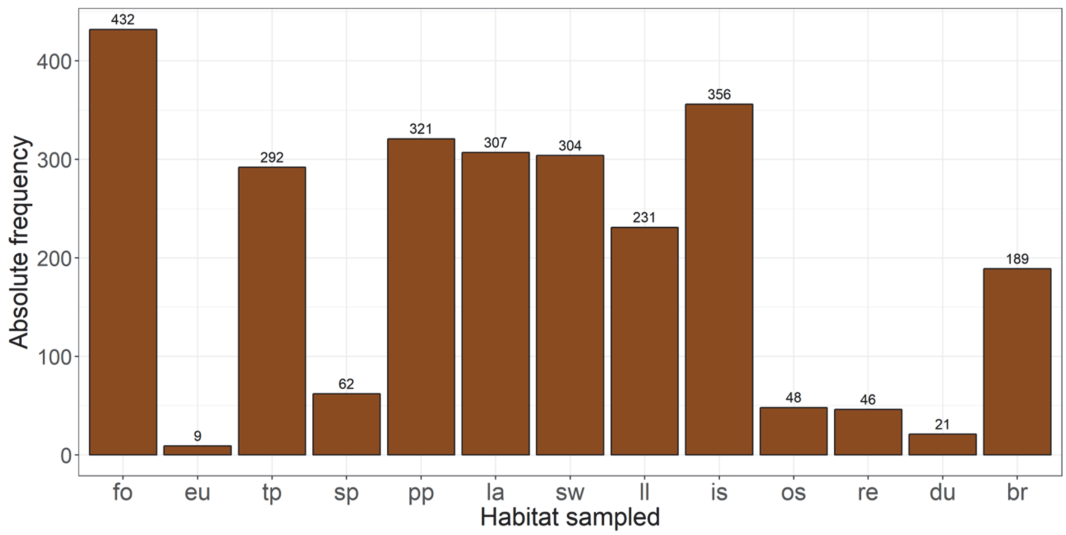

Figure 3. Absolute frequency of the habitat sampled in the ATLANTIC AMPHIBIANS dataset, for a total of 1,062 study sites. Some studies sampled more than one habitat in a single site. The abbreviations are: fo = forest, eu = *Eucalyptus* plantation, tp = temporary pond, sp = semi-permanent pond, pp = 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/8661551143314277776840, Joly et al. 2011).

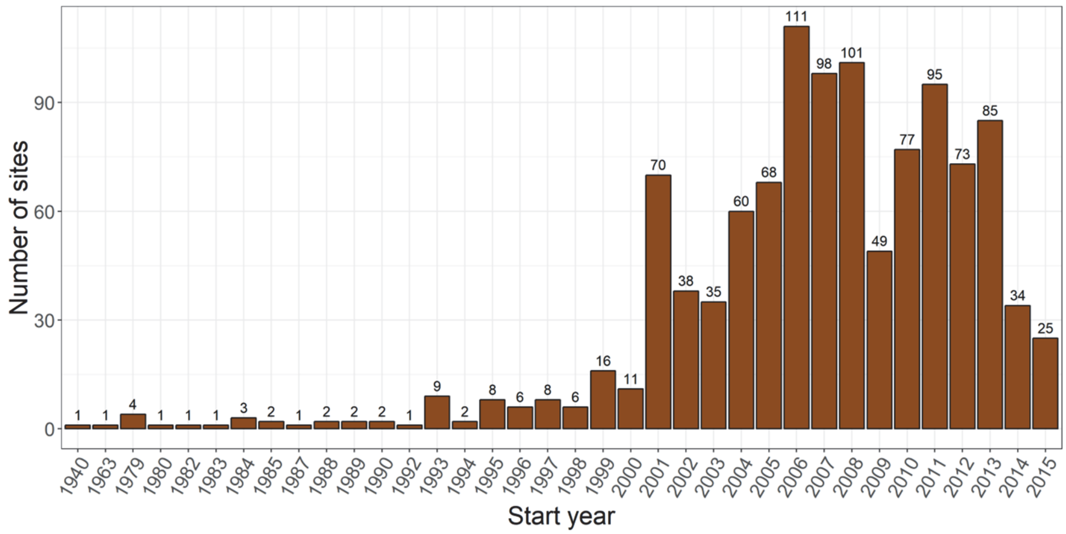

Figure 4. Number of study sites sampled per year in the ATLANTIC AMPHIBIANS dataset, of a total of 1,107 study sites. The start year represents the year in which data collection began in each study site, from 1940 to 2015.

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.

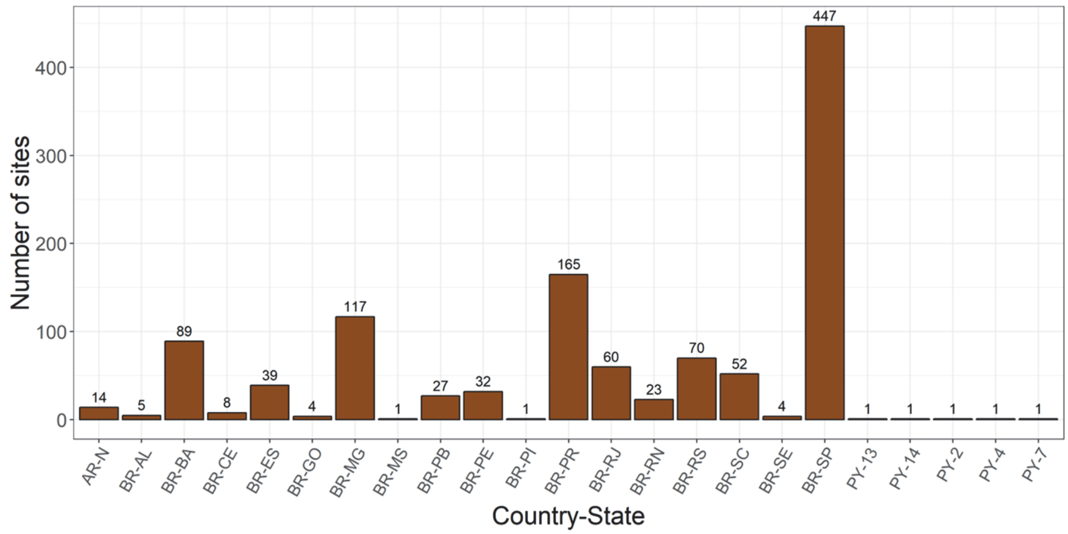

Figure 5. Number of study sites sampled per country-state in the ATLANTIC AMPHIBIANS dataset, for a total of 1,163 study sites. The abbreviation of states follows the ISO 3166-2 (defines codes for the names of the major subdivisions of all countries): AR-N = Misiones, BR-AL = Alagoas, BR-BA = Bahia, 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.

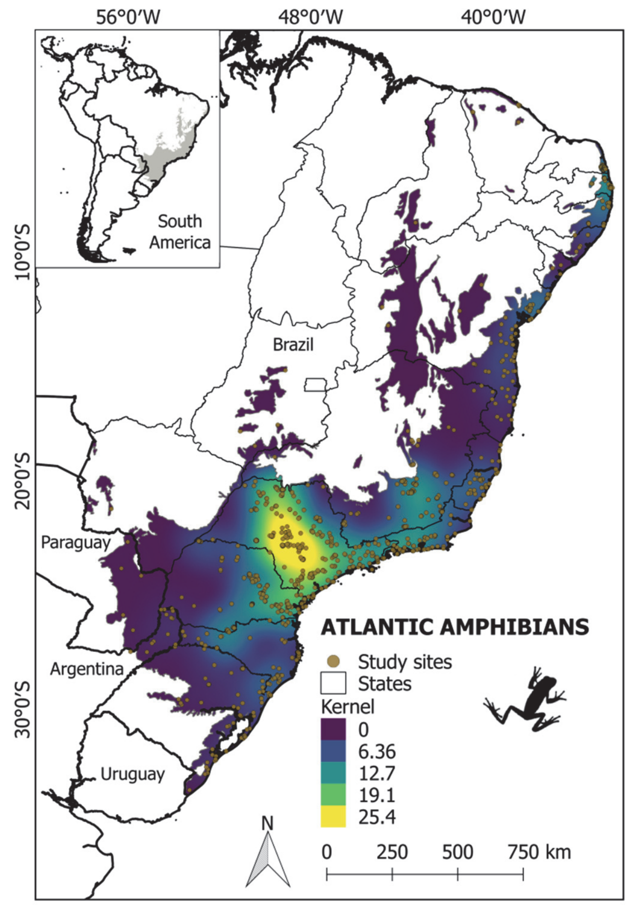

Figure 6. Kernel density of study sites in the ATLANTIC AMPHIBIANS dataset. Kernel density map for 1,163 study sites, made with 2º (~220 km) of radius and 0.0083º (~1 km) of resolution, using 'quartic' kernel method from 'v.kernel' module in GRASS GIS (Okabe et al. 2009, Neteler et al. 2012). The color 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.

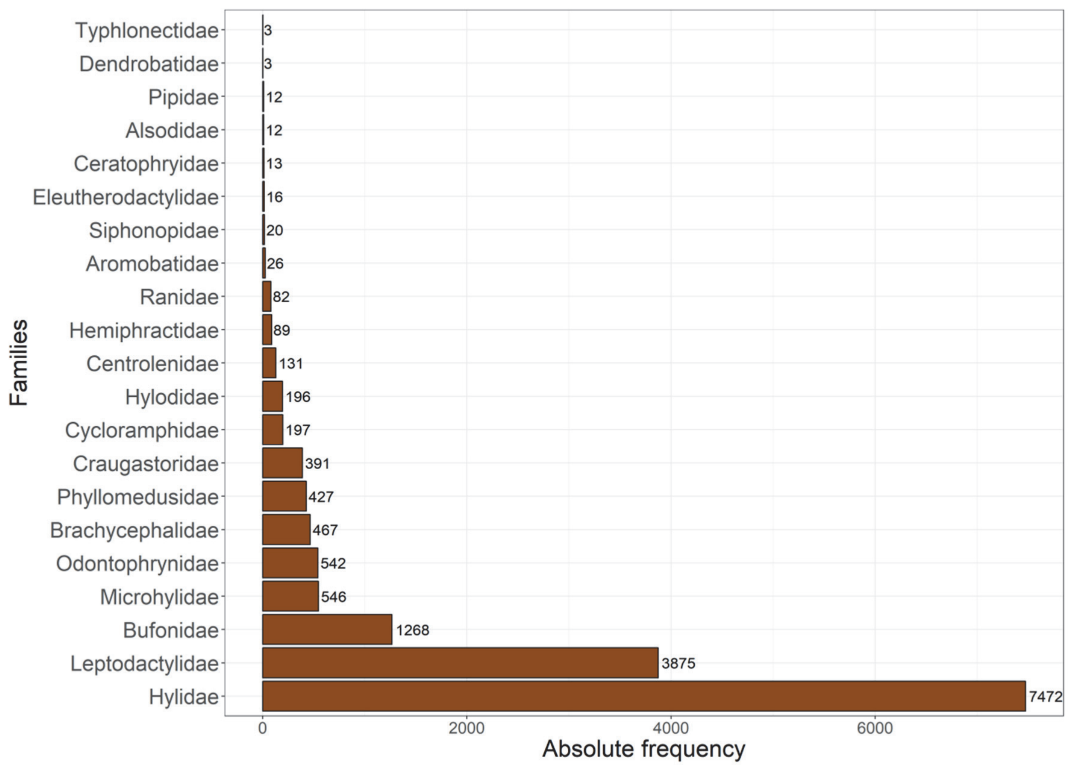

Figure 7. **Representativeness of the families in the ATLANTIC AMPHIBIANS dataset.** Absolute frequency of the families based on the 15,788 records of species with taxonomic certainty (see above).

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).

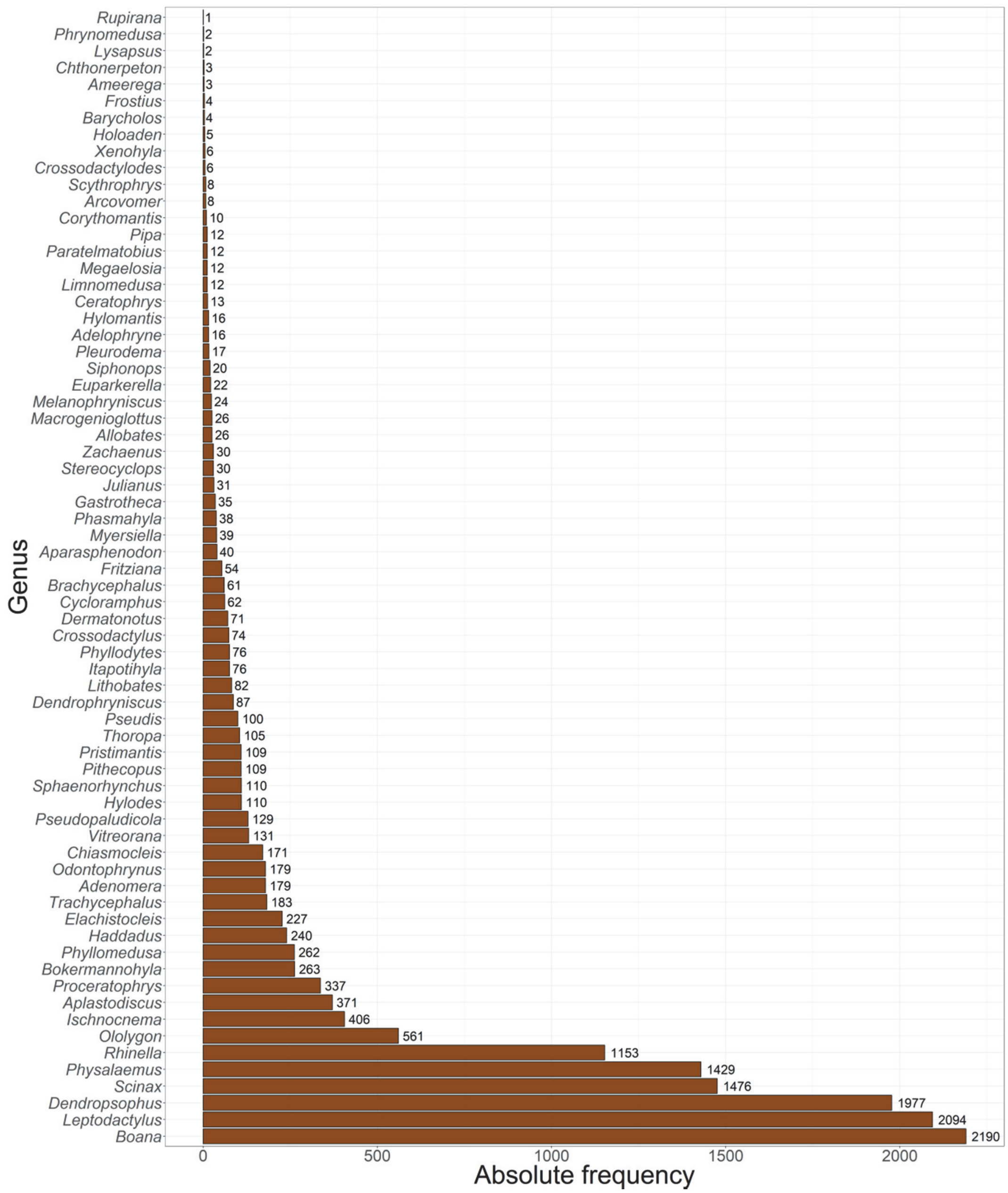

Figure 8. **Representativeness of the genera in the ATLANTIC AMPHIBIANS dataset.** Absolute frequency of the genera based in the 15,788 records of species with taxonomic certainty (see above).

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 Biológia 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 onw 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.

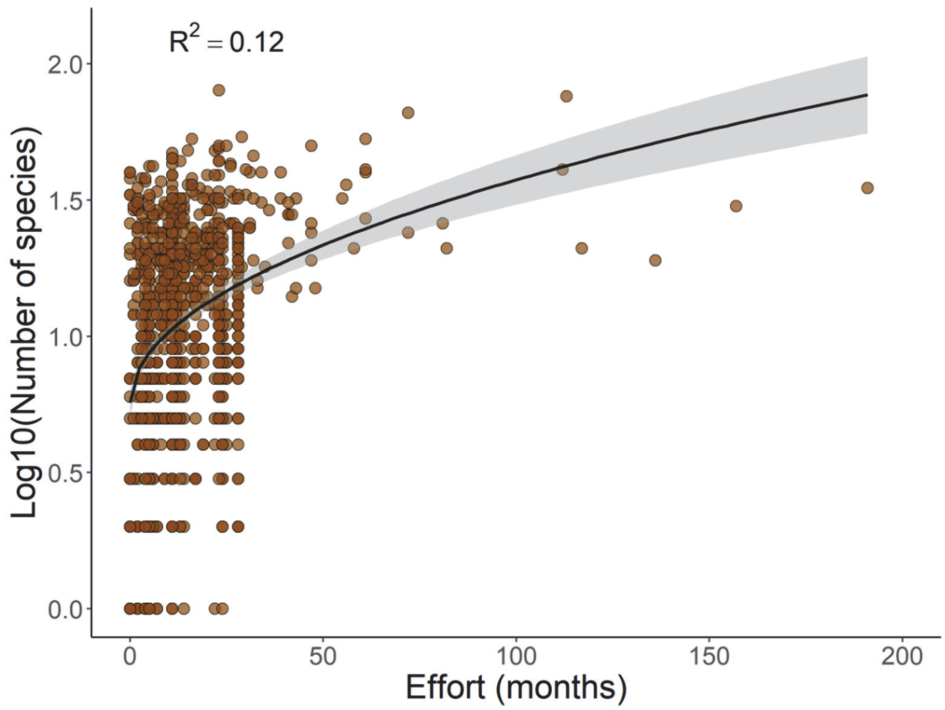

Figure 9. Relationship between the number of species and sampling effort in the ATLANTIC AMPHIBIANS dataset, for a total of 1,066 study sites with confirmed effort. The plot shows untransformed effort values (months). The model shows a slightly positive effect of sampling effort on the number of species 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 0.0083º (~1 km^2). 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.

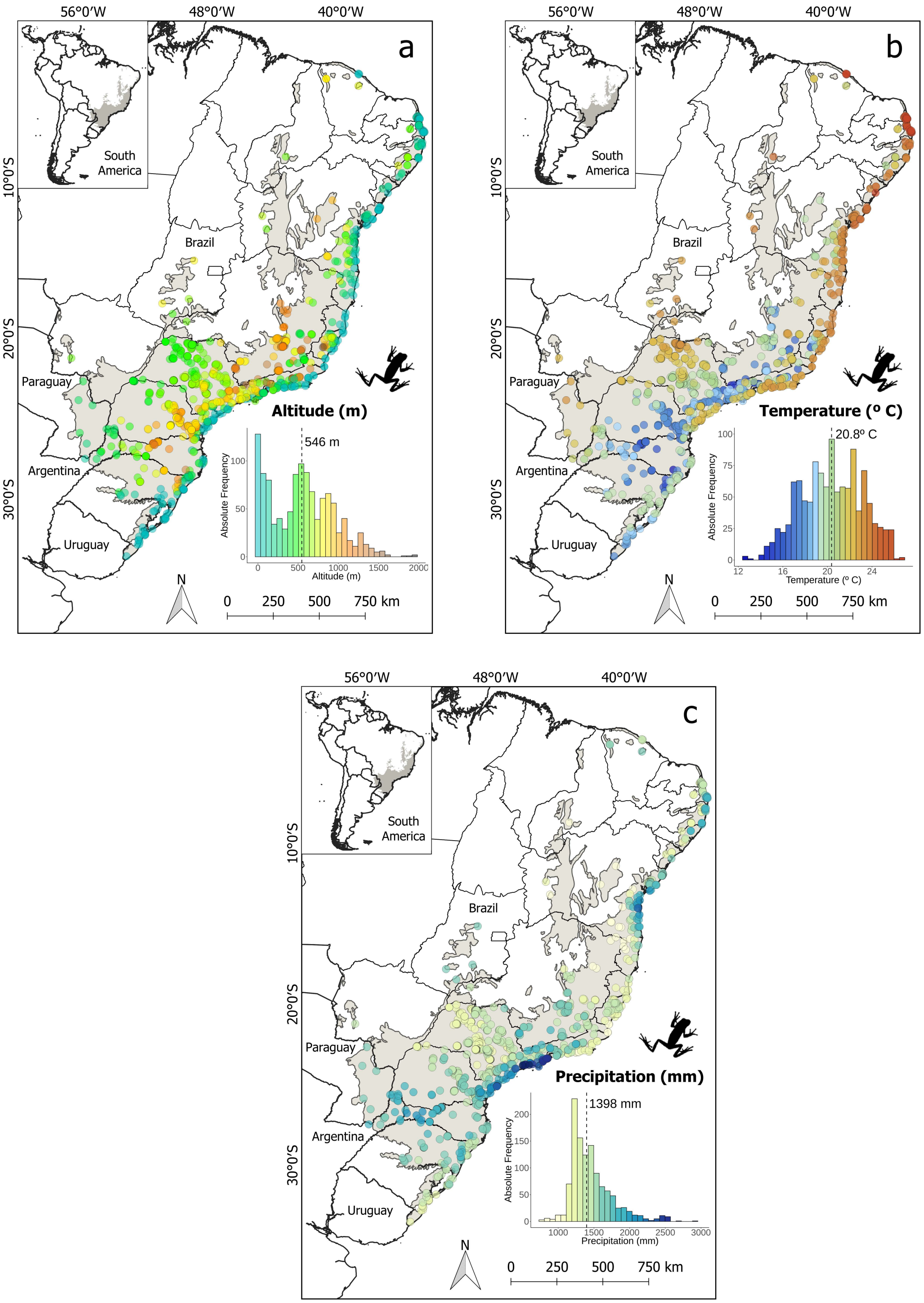

Figure 10. Spatial distributions, histograms and medians (dashed lines) of the values of altitude, annual mean temperature and annual precipitation of the study sites in the ATLANTIC AMPHIBIANS dataset. In the figure: a. altitude in meters; b. temperature in Celsius degrees; and c. precipitation in millimeters.

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 Aparfeiçoamento 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 km^2, 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", "comunidad", 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), Fusinatto (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 Lírio Jr. (2000), Oliveira et al. (2013a), Oliveira et al. (2013b), Oliveira et al. (2017), Ouvernay 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 as supporting information to this Data Paper publication in *Ecology*. Updated versions and additional information are available at Zenodo (http://doi.org/10.5281/zenodo.1233686).

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: • co: composition • ab: abundance	co, ab	co
sampled_habitat	Type of habitat sampled: • fo: forest • eu: *Eucalyptus* 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

	• 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: • 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: • pt: pitfall traps • ft: funnel traps • ar: artificial shelters • dr: digital recorders	pt, ft, as, dr	NA
complementary_methods	Type of sampling complementary methods: • ae: accidental encounter • tp: third-party records • in: interview • rr: road riding	ae, tp, in, rr	tp
period	Periods of the day sampled: • 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: • 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

	• 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

2) Table 2. Species information in the ATLANTIC AMPHIBIANS dataset. Description of the fields related to amphibian species information of the 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	*Brachycephalus ephippium*
valid_name	Valid name according to Frost 2017	357	*Brachycephalus ephippium*
abundance	Number of captured individuals	1-11,404	NA
endemism	Endemic of Atlantic Forest Biome according to Haddad et al. (2013):	0, 1	1

	• 0: not endemic • 1: endemic		

3) Table 3. Reference information in the ATLANTIC AMPHIBIANS dataset. Description of the fields related to the reference information of the 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: • 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

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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Literature cited

Abrunhosa, P. A., H. Wogel, and J. P. Pombal Jr. 2006. Anuran temporal occupancy in a temporary pond from the Atlantic Rain Forest, south-eastern Brazil. Herpetol. J. 16: 115–122.

Acevedo, M. A., and L. J. Villanueva-Rivera. 2006. Using automated digital recording systems as effective tools for the monitoring of birds and amphibians. Wildl. Soc. Bull. 34: 211–214.

Adriano, L. R. 2012. Influência do efeito de borda sobre a anurofauna do Parque Estadual Carlos Botelho (SP). M.S. thesis, Universidade de São Paulo, Escola Superior de Agricultura "Luiz de Queiroz", Piracicaba.

Affonso, I. P., E. G. Cafofo, R. L. Delariva, F. H. Oda, L. C. Karling, and R. Lourenço-de-Moraes. 2014. List of anurans (Amphibia: Anura) from the rural zone of the municipality of Maringá, Paraná state, southern Brazil. Check List 10: 878–882.

Afonso, L. G., and P. C. Eterovick. 2007. Spatial and temporal distribution of breeding anurans in streams in southeastern Brazil. J. Nat. Hist. 41: 949–963.

Aguiar, A., D. H. Morais, P. J. P. Cicchi, and R. J. Silva. 2014. Evaluation of helminths associated with 14 amphibian species from a Neotropical Island near the southeast coast of Brazil. Herpetol. Rev. 45: 227–236.

Albertim, K. M., E. V. E. Andrade, I. V. C. Melo, and G. J. B. Moura. 2010. Anuros e lagartos associados a bromélias em um fragmento de Mata Atlântica no Estado de Pernambuco, Nordeste brasileiro. Sitientibus ser. Ci. Biol. 10: 289–298.

Albuquerque, P. R. A. 2016. A diversidade filogenética e acústica de anuros com base em levantamento acústico de curta duração. B.S. thesis, Universidade Federal da Paraíba, João Pessoa.

Almeida, A. P., J. L. Gasparini, and P. L. V. Peloso. 2011. Frogs of the state of Espírito Santo, southeastern Brazil - The need for looking at the 'coldspots'. Check List 7: 542–560.

Almeida-Gomes, M., C. C. Siqueira, V. N. T. Borges-Júnior, D. Vrcibradic, L. A. Fusinatto, and C. F. D. Rocha. 2014. Herpetofauna da Reserva Ecológica de Guapiaçu (REGUA) e das áreas do entorno, no estado do Rio de Janeiro, Brasil. Biota Neotrop. 14: e20130078.

Almeida-Gomes, M., D. Vrcibradic, C. C. Siqueira, M. C. Kiefer, T. Klaion, P. Almeida-Santos, D. Nascimento, C. V. Ariani, V. N. T. Borges-Junior, R. F. Freitas-Filho, M. Van Sluys, and C. F. D. Rocha. 2008. Herpetofauna of an Atlantic Rainforest area (Morro São João) in Rio de Janeiro State, Brazil. An. Acad. Bras. Ciênc. 80: 291–300.

Almeida-Gomes, M., M. Almeida-Santos, P. Goyannes-Araújo, V. N. T. Borges-Júnior, D. Vrcibradic, C. C. Siqueira, C. V. Ariani, A. S. Dias, V. V. Souza, R. R. Pinto, M. Van Sluys, and C. F. D. Rocha. 2010. Anurofauna of an Atlantic Rainforest fragment and its surroundings in northern Rio de Janeiro State. Braz. J. Biol. 70: 871–877.

Alves, B. C. F. 2014. Influência antrópica sobre a riqueza e abundância de anfíbios anuros em alagados de um remanescente de Mata Atlântica, Paraíba, Brasil. M.S. thesis, Universidade Estadual da Paraíba, Campina Grande.

Amorim, F. O. 2009. Diversidade e distribuição espacial e temporal da anurofauna (Amphibia, Anura) em fragmento de Mata Atlântica de Igarassu, Pernambuco. M.S. thesis, Universidade Federal de Pernambuco, Recife.

Andrade, C. A. F. 2011. Anfíbios anuros da restinga de Iquiparí, São João da Barra, Rio de Janeiro, Brasil. M.S. thesis, Universidade Federal do Rio de Janeiro, Rio de Janeiro.

Andrade, E. V. E. 2012. Influência das rodovias PE–060 e PE–076 sobre a anurofauna de solo da Reserva Biológica Saltinho. M.S. thesis, Universidade Federal de Pernambuco, Recife.

Andrade, E. V. E., I. J. L. Palhas, and G. J. B. Moura. 2014. Diurnal habitat segregation by tadpoles in two temporary ponds in an Atlantic Rainforest remnant, Northeastern Brazil. Hydrobiologia 723: 181–194.

Andrade, G. V. 1987. Reprodução e vida larvária de anuros (Amphibia) em poça de área aberta na Serra do Japi, Estado de São Paulo. M.S. thesis, Universidade Estadual de Campinas, Campinas.

Antunes, A. P. 2007. Descrição taxonômica e história natural de uma nova espécie de *Hypsiboas* da Mata Atlântica do alto da Serra de Paranapiacaba, Estado de São Paulo (Amphibia, Anura, Hylidae). M.S. thesis, Universidade Estadual Paulista, Rio Claro.

Araujo, C. O. 2017. Herpetofauna from Estação Ecológica de Bauru, a fragment of Atlantic Forest in the State of São Paulo, Brazil. Rev. Inst. Flor. 29: 71–89.

Araujo, C. O., and S. M. Almeida-Santos. 2011. Herpetofauna de um remanescente de Cerrado no estado de São Paulo, sudeste do Brasil. Biota Neotrop. 11: 47–62.

Araujo, C. O., and S. M. Almeida-Santos. 2013. Composição, riqueza e abundância de anuros em um remanescente de Cerrado e Mata Atlântica no estado de São Paulo. Biota Neotrop. 13: 265–275.

Araujo, C. O., D. T. Corrêa, and S. M. A. Santos. 2013. Anuros da Estação Ecológica de Santa Bárbara, um remanescente de formações abertas de Cerrado no estado de São Paulo. Biota Neotrop. 13: 230–240.

Araujo, C. O., T. H. Condez, and R. J. Sawaya. 2009. Anfíbios anuros do Parque Estadual das Furnas do Bom Jesus, sudeste do Brasil, e suas relações com outras taxocenoses no Brasil. Biota Neotrop. 9: 77–98.

Araujo, C. O., T. H. Condez, R. P. Bovo, F. C. Centeno, and A. M. Luiz. 2010. Anfíbios e répteis do Parque Estadual Turístico do Alto Ribeira (PETAR), SP: um remanescente de Mata Atlântica do Sudeste do Brasil. Biota Neotrop. 10: 257–274.

Araújo, O. G. S., L. F. Toledo, P. C. A. Garcia, and C. F. B. Haddad. 2009. The amphibians of São Paulo State. Biota Neotrop. 9: 197–209.

Armstrong, C. G., and C. E. Conte. 2010. Taxocenose de anuros (Amphibia: Anura) em uma área de Floresta Ombrófila Densa no Sul do Brasil. Biota Neotrop. 10: 39–46.

Arzabe, C. 1998. Anfíbios anuros em fragmentos de Mata Atlântica no Nordeste do Brasil. Ph.D. dissertation, Universidade Federal do Paraná, Curitiba.

Assis, B. 2009. Riqueza, distribuição temporal e utilização de habitats por anfíbios anuros na Serra do Brigadeiro, Minas Gerais. M.S. thesis, Universidade Federal de Viçosa, Viçosa.

Assmann, B. R., G. Dariva, and J. R. Marinho. 2013. Amphibian anurans of an Araucarian rainforest fragment in Southern Brazil. Perspectiva, Erechim 37: 133–140.

Baldi, L. C., F. B. Santos, K. E. Esteves, F. C. Ferreira, M. T. Rocha, J. M. Santana, P. C. Teixeira, and C. M. Ferreira. 2015. Anuran communities in different riparian habitats: native forest, secondary forest, and sugarcane. South Am. J. Herpetol. 10: 195–204.

Barata, I. M., C. M. Correia, and G. B. Ferreira. 2016. Amphibian species composition and priorities for regional conservation at the Espinhaço Mosaic, Southeastern Brazil. Herpetol. Conserv. Biol. 11: 293–303.

Barbosa, A. R., and I. T. L. S. Alves. 2014. Diversidade e uso de hábitat da anurofauna em um fragmento de um brejo de altitude. Gaia Scientia 8: 215–225.

Barbosa, V. N., E. N. Pereira, and E. S. Maranhão. 2017. Anfíbios da Estação Ecológica de Caetés Paulista, Pernambuco - Atualização da Lista de Espécies. Revista de Ciências Ambientais 11: 39–49.

Bardini Jr., C. 2012. Riqueza e abundância de anuros de serapilheira em florestas em regeneração do estado de São Paulo. M.S. thesis, Universidade de São Paulo, Escola Superior de Agricultura “Luiz de Queiroz”, Piracicaba.

Bastazini, C. V., J. F. V. Munduruca, P. L. Rocha, and M. F. Napoli. 2007. Which environmental variables better explain changes in anuran community

composition? A case study in the restinga of Mata de São João, Bahia, Brazil. Herpetologica 63: 459–471.
Bastiani, V. I. M. 2012. Anfíbios anuros (Amphibia, Anura) de um remanescente de Floresta Estacional no sul do Brasil. M.S. thesis, Universidade Comunitária da Região de Chapecó, Chapeco.
Bastos, R. P., J. A. O. Motta, L. P. Lima, and L. D. Guimarães. 2003. Anfíbios da Floresta Nacional de Silvânia, Estado de Goiás. Stylo, Goiânia, Brazil.
Batista, V. G., and R. P. Bastos. 2014. Anurans from a Cerrado-Atlantic Forest ecotone in Campos Gerais region, southern Brazil. Check List 10: 574–582.
Becker, C. G. 2007. Desconexão de habitats e o declinio global dos anfibios. M.S. thesis, Universidade Estadual de Campinas, Campinas.
Becker, C. G., C. R. Fonseca, C. F. B. Haddad, R. F. Batista, and P. I. Prado. 2007. Habitat split and the global decline of amphibians. Science 318: 1775–1777.
Becker, C. G., C. R. Fonseca, C. F. B. Haddad, and P. I. Prado. 2010. Habitat split as a cause of local population declines of amphibians with aquatic larvae. Conserv. Biol. 24: 287–294.
Bellard, C., C. Leclerc, B. Leroy, M. Bakkenes, S. Veloz, W. Thuiller, and F. Courchamp. 2014. Vulnerability of biodiversity hotspots to global change. Glob. Ecol. Biogeogr. 23: 1376–1386.
Beltramin, A. S. 2010. Efeito da heterogeneidade do ambiente na estruturação de uma comunidade de anuros. B.S. thesis, Universidade Federal do Paraná, Curitiba.
Benício, R. A., and F. R. Da Silva. 2017. Amphibians of Vassununga State Park, one of the last remnants of semideciduous Atlantic Forest and Cerrado in northeastern São Paulo state, Brazil. Biota Neotrop. 17: e20160197.
Bernarde, P. S., and M. N. C. Kokubum. 1999. Anurofauna do Município de Guararapes, Estado de São Paulo, Brasil (Amphibia: Anura). Acta Biológica Leopoldensia 21: 89–97.
Bernarde, P. S., and R. A. Machado. 2001. Riqueza de espécies, ambientes de reprodução e temporada de vocalização da anurofauna em Três Barras do Paraná, Brasil (Amphibia: Anura). Cuad. Herpetol. 14: 93–104.
Bertoluci, J., and M. T. Rodrigues. 2002a. A Utilização de habitats reprodutivos e micro-habitats de vocalização em uma taxocenose de anuros (Amphibia) na Mata Atlântica. Pap. Avulsos Zool. 42: 287–297.
Bertoluci, J., and M. T. Rodrigues. 2002b. Seasonal patterns of breeding activity of Atlantic Rainforest anurans at Boracéia, Southeastern Brazil. Amphib-Reptilia 23: 161–167.
Bertoluci, J., R. A. Brassaloti, J. W. Ribeiro-Júnior, V. M. F. N. Vilela, and H. O. Sawakuchi. 2007. Species composition and similarities among anuran assemblages of forest sites in southeastern Brazil. Scientia Agricola 64: 364–374.
Bertoluci, J., M. A. S. Canelas, C. C. Eisemberg, C. F. S. Palmuti, and G. G. Montingelli. 2009. Herpetofauna da Estação Ambiental de Peti, um fragmento de Mata Atlântica do estado de Minas Gerais, sudeste do Brasil. Biota Neotrop. 9: 147–155.

Bittencourt-Silva, G. B., and H. R. Silva. 2013. Insular anurans (Amphibia: Anura) of the coast of Rio de Janeiro, Southeast, Brazil. Check List 9: 225–234.

Blaustein, A. R., and J. M. Kiesecker. 2002. Complexity in conservation: lessons from the global decline of amphibian populations. Ecol. Lett. 5: 597–608.

Blaustein, A. R., and B. A. Bancroft. 2007. Amphibian population declines: evolutionary considerations. BioScience 57: 437–444.

Boquimpani-Freitas, L., R. V. Marra, M. Van Sluys, and C. F. D. Rocha. 2007. Temporal niche of acoustic activity in anurans: interspecific and seasonal variation in a Neotropical assemblage from south-eastern Brazil. Amphibia-Reptilia 28: 269–276.

Borges Jr., V. N. T., and C. F. D. Rocha. 2013. Tropical tadpole assemblages: which factors affect their structure and distribution? Oecologia Australis 17: 217–228.

Borges-Leite, M. J., J. F. M. Rodrigues, and D. M. Borges-Nojosa. 2014. Herpetofauna of a coastal region of northeastern Brazil. Herpetol. Notes 7: 405–413.

Borges-Martins, M., P. Colombo, C. Zank, F. G. Becker, and M. T. Q. Melo. 2007. Anfíbios, pp. 276–291. In F. G. Becker, R. A. Ramos, and L. A. Moura (eds.), Biodiversidade: regiões da Lagoa do Casamento e dos Butiazais de Tapes, planície costeira do Rio Grande do Sul. Ministério do Meio Ambiente/Secretaria de Biodiversidade e Florestas, Brasília, Brazil.

Borges-Nojosa, D. M. 2007. Diversidade de anfíbios e répteis da Serra de Baturité, Ceará, pp. 225–247. In T. S. Oliveira, and F. S. Araújo (eds.), Diversidade e conservação da biota na Serra de Baturité, Ceará. Edições UFC, Fortaleza, Brazil.

Both, C., I. L. Kaefer, T. G. Santos, and S. T. Z. Cechin. 2008. An austral anuran assemblage in the Neotropics: seasonal occurrence correlated with photoperiod. J. Nat. Hist. 42: 205–222.

Both, C., M. Solé, T. G. Santos, and S. Z. Cechin. 2009. The role of spatial and temporal descriptors for Neotropical tadpole communities in southern Brazil. Hydrobiologia 124: 125–138.

Both, C., B. Madalozzo, R. Lingnau, and T. Grant. 2014. Amphibian richness patterns in Atlantic Forest areas invaded by American bullfrogs. Austral Ecol. 39: 864–874.

Brasileiro, C. A., R. J. Sawaya, M. C. Kiefer, and M. Martins. 2005. Amphibians of open cerrado fragment in southeastern Brazil. Biota Neotrop. 5: 1–17.

Brassaloti, R. A. 2010. Diversidade e estrutura de taxocenoses de anfíbios anuros em uma paisagem fragmentada no Centro-Oeste paulista. M.S. thesis, Universidade Estadual Paulista, São José do Rio Preto.

Brassaloti, R. A., D. C. Rossa-Feres, and J. Bertoluci. 2010. Anurofauna da Floresta Estacional Semidecidual da Estação Ecológica dos Caetetus, sudeste do Brasil. Biota Neotrop. 10: 275–291.

Bruscagin, R. T., T. H. Condez, M. Dixo, and J. Bertoluci. 2014. Diversity of leaf-litter anurans in a fragmented landscape of the Atlantic Plateau of São Paulo State, southeastern Brazil. J. Nat. Hist. 48: 1–16.

Brusquetti, F. A., and E. O. Lavilla. 2006. Lista comentada de los anfibios de Paraguay. Cuad. Herpetol. 20: 3–79.

Buarque Jr., D. V., and G. J. B. Moura. 2011. Anurofauna da cidade de Barreiros, remanescentes de Mata Atlântica - Nordeste do Brasil - PE, pp. 149–162. In G. J. B. Moura, E. M. Santos, M. A. B. Oliveira, and M. C. C. Cabral (eds.), Herpetologia do Estado de Pernambuco. Ministério do Meio Ambiente, Brasília, Brazil.

Bueno, C. M., C. V. Cademartori, E. D. Forneck, and T. C. Cabral. 2013. Anurofauna de uma área do domínio da Mata Atlântica no Sul do Brasil, Morro do Coco, Viamão, RS. Revista de Ciências Ambientais 14: 11–20.

Cacciali, P., F. Bauer, and N. Martínez. 2015. Herpetofauna de la Reserva Natural del Bosque Mbaracayú, Paraguay. Kempffiana 11: 29–47.

Camardelli, M., and M. F. Napoli. 2012. Amphibian conservation in the Caatinga Biome and semiarid region of Brazil. Herpetologica 68: 31–47.

Campos, F. S., and R. Lourenço-de-Moraes. 2017. Anurans from the mountain chain Serra do Mar: a critical area for amphibian conservation in the Atlantic Forest, Brazil. Herpetol. Notes 10: 547–560.

Camurugi F., T. M. Lima, E. A. Mercês, and F. A. Juncá. 2010. Anurans of the reserva ecologica da michelin, municipality of igrapiuna, state of Bahia, Brazil. Biota Neotrop. 10: 305–312.

Canavero, A., M. Arim, F. Pérez, F. M. Jaksic, and P. A. Marquet. 2017. A metabolic view of amphibian local community structure: the role of activation energy. Ecography 40: 1–12.

Canelas, M. A. S., and J. Bertoluci. 2007. Anuros da Serra do Caraça, sudeste do Brasil: composição de espécies e padrões sazonais de atividade vocal. Iheringia, Sér. Zool. 97: 21–26.

Caram, J., M. R. Gomes, C. Luna-Dias, and S. P. Carvalho-e-Silva. 2016. Updated list of anurans from Floresta Nacional Mário Xavier, Seropédica, Rio de Janeiro, Brazil: changes from 1990 to 2012. Check List 12: 1997.

Cardoso, A. J. 1986. Utilização de recursos para reprodução em comunidade de anuros no Sudeste do Brasil. Ph.D. dissertation, Universidade Estadual de Campinas, Campinas.

Cardoso, M. W. 2006. Uso de ambientes por uma comunidade de anuros de São Luís do Purunã, município de Balsa Nova, estado do Paraná. B.S. thesis, Universidade Federal do Paraná, Curitiba.

Carey C., N. Cohen, and L. Rollins-Smith. 1999. Amphibian declines: an immunological perspective. Dev. Comp. Immunol. 23: 459–472.

Carmona, R. U. 2007. Estudo da comunidade de anfíbios e répteis em um fragmento de Mata Atlântica e em áreas perturbadas no Estado de São Paulo: subsídios para conservação e manejo de áreas protegidas. M.S. thesis, Universidade de São Paulo, Escola Superior de Agricultura "Luiz de Queiroz", Piracicaba.

Carnaval, A. C, E. Waltari, M. T. Rodrigues, D. Rosauer, J. VanDerWal, R. Damasceno, I. Prates, M. Strangas, Z. Spanos, D. Rivera, M. R. Pie, C. R. Firkowski, M. R. Bornschein, L. F. Ribeiro, and C. Moritz. 2014. Prediction of phylogeographic endemism in an environmentally complex biome. Proc. R. Soc. B 281: 20141461.

Carneiro, P. C. F. 2011. Ocorrência e distribuição espacial e temporal das larvas de anuros (Amphibia) em diferentes sistemas aquáticos da Ilha Grande (Rio de Janeiro). M.S. thesis, Universidade do Estado do Rio de Janeiro, Rio de Janiero.

Carossini, A. 2013. Resposta da comunidade de anuros de serrapilheira ao gradiente de sucessão ecológica em um fragmento de Floresta Atlântica interior da Região Sudeste do Brasil. M.S. thesis, Universidade Federal de Viçosa, Viçosa.

Carvalho, C. M., J. C. Vilar, and F. F. Oliveira. 2005. Répteis e anfíbios, pp. 39–61. In C. M. Carvalho, and J. C. Vilar (eds.), Parque Nacional Serra de Itabaiana - levantamento da biota, Ibama. Biologia Geral e Experimental - UFS, Aracaju, Brazil.

Carvalho, R. M. 2013. Herpetofauna de fragmentos de floresta estacional semidecidual na região de Sorocaba - SP. B.S. thesis, Universidade de São Paulo, Ribeirão Preto.

Carvalho, T., C. G. Becker, and L. F. Toledo. 2017. Historical amphibian declines and extinctions in Brazil linked to chytridiomycosis. Proc. R. Soc London B 284:20162254.

Carvalho-e-Silva, A. M. T., G. R. Silva, and S. P. Carvalho-e-Silva. 2008. Anuros da Reserva Rio das Pedras, Mangaratiba, RJ, Brasil. Biota Neotrop. 8: 199–209.

Carvalho-e-Silva, S. P., A. M. P. T. Carvalho-e-Silva, and C. Luna-Dias. 2015. Anfíbios (Lissamphibia) da Reserva Biológica de Pedra Talhada, pp. 333–355. In A. Studer, L. Nusbaumer, and R. Spichiger (eds.), Biodiversidade da Reserva Biológica de Pedra Talhada (Alagoas, Pernambuco – Brasil). Boissiera, Geneve, Switzerland.

Castanho, L. 2000. História natural de uma comunidade de anuros da região de Guaraqueçaba, litoral norte do estado do Paraná. Ph.D. dissertation, Universidade Estadual Paulista, Rio Claro.

Catenazzi, A. 2015. State of the world's amphibians. Annu. Rev. Environ. Resour. 40: 91–119.

Cechin, S. Z., and M. Martins. 2000. Eficiência de armadilhas de queda (pitfall traps) em amostragens de anfíbios e répteis no Brasil. Rev. Bras. Zool. 17: 729–749.

Cerezoli, J. P. M. 2008. Anurofauna em riachos de fragmentos florestais da Chapada das Perdizes, Serra de Carrancas, Sul de Minas Gerais. M.S. thesis, Universidade Federal de Lavras, Lavras.

Ceron, K., M. O. Olivo, R. A. Mendonça, F. Carvalho, and J. J. Zocche. 2016. Herpetofauna de uma Área de Floresta Atlântica no Sul do Brasil. Revista Tecnologia e Ambiente 22.

Ceron, K., E. M. Lucas, and J. J. Zocche. 2017a. Anurans of Parque Estadual da Serra Furada, Santa Catarina, Southern Brazil. Herpetol. Notes 10: 287–296.

Ceron, K., H. B. Martins, and J. J. Zocche. 2017b. Anurans of a remnant forest in Urussanga, Santa Catarina, southern of Brazil. Check List 12: 2014.

Chagas, D. G. 2017. Estruturação de uma metacomunidade de anfíbios anuros no Sudeste do Brasil: Influências ambientais, fenotípicas e filogenéticas. M.S. thesis, Universidade Estadual de Campinas, Campinas.

Chaves, L. S., V. Silva, G. K. M. Rocha, R. S. Lira, E. G. Santos, M. R. M. Daher, E. M. S. Nogueira, and G. J. B. Moura. 2015. Anfíbios anuros, pp. 15–89. In G. J. B. Moura, E. M. S. Nogueira, E. Medeiros, and C. Neto (eds.), Os anfíbios e répteis da Reserva Madeiras, Estado de Alagoas, Nordeste do Brasil. UEFS Editora, Feira de Santana, Brazil.

Cicchi, P. J. P., H. Serafim, M. A. Sena, F. C. Centeno, and J. Jim. 2009. Herpetofauna em uma área de Floresta Atlântica na Ilha Anchieta, município de Ubatuba, sudeste do Brasil. Biota Neotrop. 9: 201–212.

Cicchi, P. J. P. 2011. Herpetofauna do Parque Estadual da Ilha Anchieta, litoral norte de São Paulo, Brasil: relações históricas e impacto dos mamíferos introduzidos. Ph.D. dissertation, Universidade Estadual Paulista, Botucatu.

Coelho, H. E. A., and R. S. Oliveira. 2010. Anurofauna de um fragmento de Mata Atlântica em Lauro de Freitas - Bahia. Candombá – Revista Virtual 6: 52–60.

Collins, J. P., and A. Storfer. 2003. Global amphibian declines: sorting the hypotheses. Divers. Distrib. 9: 89–98.

Collins, J. P., M. L. Crump, and T. E. Lovejoy. 2009. Extinction in our times: global amphibian declines. Oxford University Press, Oxford, England.

Colombo, P., A. Kindel, G. Vinciprova, and L. Krause. 2008. Composição e ameaças à conservação dos anfíbios anuros do Parque Estadual de Itapeva, Município de Torres, Rio Grande do Sul, Brasil. Biota Neotrop. 8: 229–240.

Colonetti, S. 2005. Levantamento da anurofauna (Amphibia) na Lagoa do Verdinho, Município de Criciúma/SC. M.S. thesis, Universidade do Extremo Sul Catarinense, Criciúma.

Condez, T. H., R. J. Sawaya, and M. Dixo. 2009. Herpetofauna dos remanescentes de Mata Atlântica da região de Tapiraí e Piedade, SP, sudeste do Brasil. Biota Neotrop. 9: 157–186.

Conte, C. E. 2010. Diversidade de anfíbios da floresta com Araucária. Ph.D. dissertation, Universidade Estadual Paulista, São José do Rio Preto.

Conte, C. E., and D. C. Rossa-Feres. 2006. Diversidade e ocorrência temporal da anurofauna (Amphibia, Anura) em São José dos Pinhais, Paraná, Brasil. Rev. Bras. Zool. 23: 162–175.

Conte, C. E., and D. C. Rossa-Feres. 2007. Riqueza e distribuição espaço-temporal de anuros em um remanescente de Floresta de Araucária no sudeste do Paraná. Rev. Bras. Zool. 24: 1025–1037.

Conte, C. E., and R. A. Machado. 2005. Riqueza de espécies e distribuição espacial e temporal em comunidade de anuros (Amphibia, Anura) em uma localidade de Tijucas do Sul, Paraná, Brasil. Rev. Bras. Zool. 22: 940–948.

Conte, C. E., D. R. Silva, and A. P. Rodrigues. 2013. Anurofauna da bacia do Rio Tijuco, Minas Gerais, Brasil e sua relação com taxocenoses de anfíbios do Cerrado e suas transições. Iheringia, Sér. Zool. 103: 280–288.

Corn, P. S. 1994. Straight-line drift fences and pitfall traps, pp. 109–117. In W. R. Heyer, M. A. Donnelly, R. W. McDiarmid, L. A. C. Hayek, and M. S. Foster (eds.), Measuring and monitoring biological diversity: standard methods for amphibians. Smithsonian Institution Press, Washington DC, EUA.

Corrêa Filho, D. T. 2013. Estruturação de uma metacomunidade de girinos e adultos de anuros no Cerrado: influências ambientais e filogenéticas. M.S. thesis, Universidade Estadual de Campinas, Campinas.

Correia, C. M. 2015. Estrutura de uma comunidade de anfíbios anuros em savana tropical brasileira: uso dos ambientes e sazonalidade. M.S. thesis, Universidade Federal de Ouro Preto, Ouro Preto.

Costa, C. O. R. 2014. Influência dos efeitos da borda sobre a comunidade de anfíbios anuros de serapilheira da Mata Atlântica da Estação Biológica de Boracéia, SP. M.S. thesis, Universidade de São Paulo, Escola Superior de Agricultura "Luiz de Queiroz", Piracicaba.

Costa, W. P., S. C. Almeida, and J. Jim. 2013. Anurofauna em uma área na Depressão Periférica, no centro-oeste do estado de São Paulo, Brasil. Biota Neotrop. 13: 163–174.

Crivellari, L. B., P. T. Leivas, J. C. M. Leite, D. S. Gonçalves, C. M. Mello, D. C. Rossa-Feres, and C. E. Conte. 2014. Amphibians of grasslands in the state of Paraná, southern Brazil (Campos Sulinos). Herpetol. Notes 7: 639–654.

Crump, M. L., and N. J. Scott Jr. 1994. Visual encounter surveys, pp. 84–92. In W. R. Heyer, M. A. Donnelly, R. W. Mcdiarmid, L. A. C. Hayek, and M. S. Foster (eds.), Measuring and monitoring biological diversity: standard methods for amphibians. Smithsonian Institution Press, Washington DC, EUA.

Cruz, C. A. G., R. N. Feio, and U. Caramaschi. 2009. Amphibians of Ibitipoca. Editora Bicho do Mato, Belo Horizonte, Minas Gerais, Brazil.

Cunha, A. K., I. S. Oliveira, and M. T. Hartmannn. 2010. Anurofauna da Colônia Castelhanos, na Área de Proteção Ambiental de Guaratuba, Serra do Mar paranaense, Brasil. Biotemas 23: 123–134.

Cunha, G. G. 2013. A influência da intensificação do ciclo agrícola na diversidade de anuros (Amphibia, Anura) em arrozais no Sul do Brasil. M.S. thesis, Universidade do Vale do Rio dos Sinos, São Leopoldo.

Cushman, S. 2006. Effects of habitat loss and fragmentation on amphibians: a review and prospectus. Biol. Conserv. 128: 231–240.

Da Silva, F. R. 2007. A importância de fragmentos florestais na diversidade de anfíbios anuros em Icém, Região Noroeste do Estado de São Paulo. M.S. thesis, Universidade Estadual Paulista, São José do Rio Preto.

Da Silva, F. R., R. S. Santos, M. A. Nunes, and D. C. Rossa-Feres. 2009. Anuran captured in pitfall traps in three agrossystems in northwestern São Paulo State, Brazil. Biota Neotrop. 9: 253–255.

Da Silva, F. R., J. P. Gibbs, and D. C. Rossa-Feres. 2011. Breeding habitat and landscape correlates of frog diversity and abundance in a tropical agricultural landscape. Wetlands 31: 1079–1087.

Da Silva, F. R., C. P. Candeira, and D. C. Rossa-Feres. 2012. Dependence of anuran diversity on environmental descriptors in farmland ponds. Biodivers. Conserv. 21: 1411–1424.

Da Silva, F. R., M. L. Lyra, C. F. B. Haddad, and D. C. Rossa-Feres. 2017a. Expanding the knowledge about the occurrence of anurans in the highest amphibian diversity area of Atlantic Forest: Parque Estadual da Serra do Mar, São Paulo, Brazil. Biota Neotrop. 17: e20160282.

Da Silva, F. R., D. B. Provete, L. K. Gerassi, and R. P. Bovo. 2017b. What do data from fieldwork and scientific collections tell us about species richness and composition of amphibians and reptiles? South Am. J. Herpetol. 12: 99–106.

Dal Vechio, F., M. Teixeira Jr., R. S. Recoder, M. T. Rodrigues, and H. Zaher. 2016. The herpetofauna of Parque Nacional da Serra das Confusões, state of Piauí, Brazil, with a regional species list from an ecotonal area of Cerrado and Caatinga. Biota Neotrop. 16: e20150105.

Danielson, J. J., and D. B. Gesch. 2010. Global Multi-resolution Terrain Elevation Data 2010 (GMTED2010). U.S. Geological Survey Open-File Report 2011-1073, 2011. 26 p.

Dantas, R. B. 2009. Composição e distribuição espacial e sazonal de anfíbios em unidade de conservação da Mata Atlântica, Alfredo Chaves, Espírito Santo. M.S. thesis, Universidade Federal de Viçosa, Viçosa.

D'Anunciação, P. E. R., M. F. V. Silva, L. Ferrante, D. S. Assis, T. Casagrande, A. Z. G. Coelho, B. C. S. Amâncio, T. R. Pereira, and V. X. Silva. 2013. Forest fragments surrounded by sugar cane are more inhospitable to terrestrial amphibian abundance than fragments surrounded by pasture. International Journal of Ecology 2013: 1–8.

D'Anunciação, P. E. R. 2018. Landscape and Climate Changes Influence on Taxonomicand Functional Richness of Amphibians. Ph.D. dissertation, Universidade Federal de Lavras, Lavras.

Dayrell, J. S. 2009. Estrutura da comunidade de anfíbios em poças temporárias em um fragmento de Mata Atlântica de Minas Gerais. M.S. thesis, Universidade Federal de Viçosa, Viçosa.

De Domenico, E. A. 2008. Herpetofauna do Mosaico de Unidades de Conservação do Jacupiranga (SP). M.S. thesis, Universidade de São Paulo, São Paulo.

De Lucca, G. S. 2009. Efeito dos resíduos da extração de carvão na diversidade de anfíbios anuros no município de Treviso, Santa Catarina. B.S. thesis, Universidade Comunitária de Criciúma, Criciúma.

De Lucca, G. S., F. A. P. Barros, J. V. Oliveira, J. Dal Magro, and E. M. Lucas. 2017. The role of environmental factors in the composition of anuran species in several ponds under the influence of coal mining in southern Brazil. Wetlands Ecology and Management (in press).

Dean, W. 1996. With broadax and firebrand: The Destruction of the Brazilian Atlantic Forest. University of California Press, Berkeley, EUA.

Deiques, C. H., L. F. Stahnke, M. Reinke, and P. Schmitt. 2007. Guia ilustrado dos anfíbios e répteis do Parque Nacional de Aparados da Serra, Rio Grande do Sul, Santa Catarina. USEB, Pelotas, Brazil.

Dias, F. O. 2006. Riqueza de espécies e ambientes de reprodução de uma comunidade de anuros (Amphibia, Anura) na região do Mono, no Parque Nacional da Serra do Itajaí, sul do Brasil. B.S. thesis, Universidade Regional de Blumenau, Blumenau.

Dias, I. R., C. V. Mira-Mendes, and M. Solé. 2014b. Rapid inventory of herpetofauna at the APA (Environmental Protection Area) of the Lagoa Encantada and Rio Almada, Southern Bahia, Brazil. Herpetol. Notes 7: 627–637.

Dias, I. R., T. T. Medeiros, M. F. V. Nova, and M. Solé. 2014a. Amphibians of Serra Bonita, southern Bahia: a new hotpoint within Brazil's Atlantic Forest hotspot. ZooKeys 449: 105–130.

Dias, N. Y. N. 2008. Estrutura de taxocenose de girinos de Mata Atlântica. M.S. thesis, Universiade Estadual Paulista, São José do Rio Preto.

Dixo, M., and J. P. Metzger. 2010. The matrix-tolerance hypothesis: an empirical test with frogs in the Atlantic Forest. Biodivers. Conserv. 19: 3059–3071.

Dixo, M., and V. K. Verdade. 2006. Herpetofauna de serrapilheira da Reserva Florestal de Morro Grande, Cotia (SP). Biota Neotrop. 6: 1–20.

Dowle, M., and A. Srinivasan. 2017. data.table: Extension of `data.frame`. R package version 1.10.4. https://CRAN.R-project.org/package=data.table.

Dorigo, T. A. 2012. A comunidade de anuros em uma área de Floresta Ombrófila Densa Montana do Parque Estadual dos Três Picos, sudeste do Brasil. M.S. thesis, Universidade do Estado do Rio de Janeiro, Rio de Janeiro.

Drummond, L. O. 2009. Efeito do fogo na composição, distribuição e dieta de uma taxocenose de anfíbios anuros de campos rupestres em Ouro Preto, MG. M.S. thesis, Universidade Federal de Ouro Preto, Ouro Preto.

Duarte, K. S. 2015. Efeitos da desconexão de habitat na diversidade funcional de anfíbios anuros (Amphibia: Anura) na Mata Atlântica. B.S. thesis, Universidade Estatual Paulista, Rio Claro.

Duellman, W. E., and L. Trueb. 1994. Biology of amphibians. The Johns Hopkins University Press, Baltimore, EUA.

Duellman, W. E. 1999. Patterns of distribution of amphibians: A Global Perspective. The Johns Hopkins University Press, Baltimore, EUA.

Entiauspe-Neto, O. M., T. D. Perleberg, and M. A. Freitas. 2016. Herpetofauna from an urban Pampa fragment in Southern Brazil: composition, structure and conservation. Check List 12: 1964.

Esteves, M. C. S. 2012. Ecologia de uma comunidade de anuros em Botucatu, SP. M.S. thesis, Universidade Estadual Paulista, Botucatu.

Eterovick, P. 1998. Estrutura espacial e temporal de uma comunidade de anuros (Amphibia) na Serra do Cipó, Minas Gerais. M.S. thesis, Universidade Estadual de Campinas, Campinas.

Eterovick, P. 2003. Distribution of anuran species among montane streams in south-eastern Brazil. J. Trop. Ecol. 19: 219–228.

Eterovick, P. C., A. C. O. Q. Carnaval, D. M. Borges-Nojosa, D. L. Silvano, M. V. Segalla, and I. Sazima, I. 2005. Amphibian declines in Brazil: an overview. Biotropica 37: 166–179.

Eterovick, P. C., and I. Sazima. 2004. Anfíbios da Serra do Cipó, Minas Gerais - Brasil. PUC Minas, Belo Horizonte, Brazil.

Faria, D., M. L. B. Paciencia, M. Dixo, R. R. Laps, and J. Baumgarten. 2007. Ferns, frogs, lizards, birds and bats in forest fragments and shade cacao plantations in two contrasting landscapes in the Atlantic forest, Brazil. Biodivers. Conserv. 16: 2335–2357.

Farias, D. L. 2014. Colonização de poças artificiais por anfíbios anuros na Mata Atlântica, Sul do Brasil. M.S. thesis, Universidade Federal de Santa Catarina, Florianópolis.

Fatorelli, P., and C. F. D. Rocha. 2008. O que molda a distribuição das guildas de girinos tropicais? Quarenta anos de busca por padrões. Oecol. Bras. 12: 733–742.

Feio, R. N., and P. L. Ferreira. 2005. Anfíbios de dois fragmentos de Mata Atlântica no município de Rio Novo, Minas Gerais. Rev. Bras. Zoocienc. 7: 111–128.

Feio, R. N., L. B. Nascimento, C. A. G. Cruz, P. L. Ferrerira, and D. L. Pantoja. 2006. Anfíbios das áreas prioritáias dos rios Jequitinhonha e Mucuri, pp. 94–119. In L. P. S. Pinto, and L. C. Bede (eds.), Biodiversidade e conservação nos vales dos rios Jequitinhonha e Mucuri. Ministério do Meio Ambiente, Brasília, Brazil.

Feio, R. N., U. M. L. Braga, H. Wiederhecker, and P. S. Santos. 1998. Anfíbios do Parque Estadual do Rio Doce (Minas Gerais). Universidade Federal de Viçosa e Instituto Estadual de Florestas, Viçosa, Brazil.

Ferrante, L. 2017. A síndrome das florestas vazias e a importância dos pequenos fragmentos para a conservação dos anfíbios. M.S. thesis, Instituto Nacional de Pesquisas da Amazônia, Manaus.

Ferreira, R. B., and S. L. Mendes. 2010. Herpetofauna no Campus da Universidade Federal do Espírito Santo, área urbana de Vitória, Brasil. Sitientibus ser. Ci. Biol. 10: 279–285.

Ferreira, R. B., K. H. Beard, and M. L. Crump. 2016. Breeding guild determines frog distributions in response to edge effects and habitat conversion in the Brazil's Atlantic Forest. PLoS ONE 11: e0156781.

Ferreira, R. B., R. B. Dantas, and J. F. R. Tonini. 2012. Distribuição espacial e sazonal de anfíbios em quatro poças na região serrana do Espírito Santo, sudeste do Brasil: influência de corredores florestais. Iheringia, Sér. Zool. 102: 163–169.

Ferreira, R. B., T. Silva-Soares, and D. Röoder. 2010. Amphibians of Vitória, an urban area in south-eastern Brazil: first approximation. Salamandra (Frankf.) 46: 187–196.

Figueiredo-de-Andrade, C. A., D. Goes, J. Kirchmeyer, and S. P. Carvalho-e-Silva. 2011. Anfíbios e répteis na Reserva Biológica União, pp. 42–45. In Contando os segredos científicos da Reserva Biológica União. ICMBIO, Rio de Janeiro, Brazil.

Fick, S. E., and R. J. Hijamns. 2017. WorldClim 2: new 1-km spatial resolution climate surfaces for global land areas. Int. J. Climatol. 37: 4302–4315.

Foerster, N. E. 2014. Partilha acústica, uso do sítio de vocalização e influência da heterogeneidade ambiental em uma taxocenose de anuros em um remanescente de Floresta Ombrófila Mista. M.S. thesis, Universidade Federal do Paraná, Curitiba.

Folly, M., A. M. Bezerra, J. Ruggeri, F. Hepp, A. M. P. T. Carvalho-e-Silva, M. R. Gomes, and S. P. Carvalho-e-Silva. 2016. Anuran fauna of the high-elevation areas of the Parque Nacional da Serra dos Órgãos (PARNASO), Southeastern Brazil. Oecologia Australis 20: 109–120.

Folly, M., J. Kirchmeyer, M. R. Gomes, F. Hepp, J. Ruggeri, C. LunaDias, A. M. Bezerra, L. C. Amaral, and S. P. Carvalho-e-Silva. 2014. Amphibians from the Centro Marista São José das Paineiras, in Mendes, and surrounding municipalities, State of Rio de Janeiro, Brazil. Herpetol. Notes 7: 489–499.

Fonte, L. F. M., L. A. Fusinatto, G. Volkmer, M. D. Freire, C. Zank, and P. Colombo. 2013. Anfíbios, pp. 93–144. In P. B. R. Witt. (eds.), Fauna e flora da Reserva Biológica Lami José Lutzenberger. Secretaria Municipal do Meio Ambiente (SMAM), Porto Alegre, Brazil.

Forlani, M. C., P. H. Bernardo, C. F. B. Haddad, and H. Zaher. 2010. Herpetofauna of the Carlos Botelho State Park, São Paulo State, Brazil. Biota Neotrop. 10: 265–309.

Forti, L. R. 2009. Temporada reprodutiva, micro-habitat e turno de vocalização de anfíbios anuros em lagoa de Floresta Atlântica, no sudeste do Brasil. Zoociências 11: 89–98.

Forti, L. R. 2013. Organização acústica e microespacial de agregações reprodutivas de anfíbios anuros da Mata Atlântica: competição ou confusão? Ph.D. dissertation, Universidade de São Paulo, Escola Superior de Agricultura "Luiz de Queiroz", Piracicaba.

Freitas, M. 2005. A fauna e a flora da Chesf em Salvador: um guia para o visitante. CHESF, Salvador, Brazil.

Frost, D. R. 2017. Amphibian Species of the World: an Online Reference. Version 6.0 (01/12/2017). Electronic Database accessible at http://research.amnh.org/herpetology/amphibia/index.html. American Museum of Natural History, New York, USA.

Fusinatto, L. A. 2008. Padrão de distribuição espacial e temporal da herpetofauna de serapilheira em um fragmento de Mata Atlântica na Reserva Biológia União, Rio de Janeiro. M.S. thesis, Universidade Federal do Rio de Janeiro, Rio de Janeiro.

Gangenova, E. 2017. Efectos de la degradación del hábitat sobre la composición del ensamble de anuros del Bosque Atlántico en Misiones (Argentina). Ph.D. dissertation, Universidad Nacional de La Plata, Argentina.

Garcia, P. C. A., B. M. Berneck, N. Y. N. Dias, C. O. R. Costa, L. F. Silveira, and M. Yamamoto. 2012. Anfíbios anuros da Serra do Itapeti, pp. 259–271. In M. S. C. Morini, and V. F. O. Miranda (eds.), Livro Serra do Itapeti, aspectos históricos, sociais e naturalísticos. Canal 6, Bauru, Brazil.

Garcia, P. C. A., E. Lavilla, J. A. Langone, and M. V. Segalla. 2007. Anfíbios da região subtropical da América do Sul: padrões de distribuição. Ciência e Ambiente 35: 65–100.

Garey, M. V., and D. B. Provete. 2016. Species composition, conservation status, and sources of threat of anurans in mosaics of highland grasslands of southern and southeastern Brazil. Oecologia Australis 20: 94–108.

Garey, M. V., and M. T. Hartmann. 2012. Anuros da Reserva Natural Salto Morato, Guaraqueçaba, Paraná, Brasil. Biota Neotrop. 12: 137–145.

Garey, M. V., and V. X. Da Silva. 2010. Spatial and temporal distribution of anurans in an agricultural landscape in the Atlantic Semi-Deciduous Forest of Southeastern Brazil. South Am. J. Herpetol. 5: 64–72.

Garey, M. V., M. J. Sturaro, V. X. Silva, and M. Sacramento. 2014a. A comunidade de anfíbios e répteis, pp. 112–138. In R. S. Laurindo, R. L. M. Novaes, ans M. C. W. Vieira (eds.), RPPN Fazenda Lagoa: educação, pesquisa e conservação da natureza, Minas Gerais. ISMECN, Belo Horizonte, Brazil.

Garey, M. V., D. B. Provete, I. A. Martins, C. F. B. Haddad, and D. C. Rossa-Feres. 2014b. Anurans from the Serra da Bocaina National Park and surrounding buffer area, southeastern Brazil. Check List 10: 308–316.

Gayer, S. M. P., l. Krause, and N. Gomes. 1988. Lista preliminar dos anfíbios da Estação Ecológica do Taim, Rio Grande do Sul, Brasil. Rev. Bras. Zool. 5: 419–425.

Giaretta, A. A. 1999. Diversidade e densidade de anuros de serapilheira num gradiente altitudinal na Mata Atlântica costeira. Ph.D. dissertation, Universidade Estadual de Campinas, Campinas.

Giaretta, A. A., K. G. Facure, R. J. Sawaya, J. H Meyer, and N. Chemin. 1999. Diversity and abundance of litter frogs in a montane forest of Southeastern Brazil: seasonal and altitudinal changes. Biotropica 31: 669–674.

Giaretta, A. A., R. J. Sawaya, G. Machado, M. S. Araújo, K. G. Facure, H. F. Medeiros, and R. Nunes. 1997. Diversity and abundance of litter frogs at altitudinal sites at Serra do Japi, southeastern Brazil. Rev. Bras. Zool. 14: 341–346.

Giasson, L. O. M. 2008. Atividade sazonal e uso do ambiente por anfíbios da Mata Atlântica no alto da Serra do Mar. Ph.D. dissertation, Universidade Estadual Paulista, Rio Claro.

Gomes, F. B. R. 2009. Uso de habitats e ecomorfologia de girinos na Serra da Mantiqueira, SP. M.S. thesis, Universidade Estadual Paulista, São José do Rio Preto.

Gomides, S. C., and B. M. Souza. 2012. Levantamento preliminar da herpetofauna da Serra do Relógio, Minas Gerais, sudeste do Brasil. Rev. Bras. Zoocienc. 14: 45–56.

Gondim-Silva, F. A. T., A. R. S. Andrade, R. O. Abreu, J. S. Nascimento, G. P. Corrêa, L. Menezes, C. C. Trevisan, S. S. Camargo, and M. F. Napoli. 2016. Composition and diversity of anurans in the Restinga of the Conde municipality, northern coast of the state of Bahia, northeastern Brazil. Biota Neotrop. 16: e20160157.

Goyannes-Araújo, P., C. C. Siqueira, R. C. Laia, M. Almeida-Santos, D. M. Guedes, and C. F. D. Rocha. 2015. Anuran species distributon along an elevatonal gradiente and seasonal comparisons of leaf liter frogs in an Atlantc Rainforest area of southeastern Brazil. Herpetol. J. 25: 75–81.

Graipel, M. J., J. J. Cherem, D. A. Machado, P. C. Garcia, M. E. Menezes, and M. Soldateli. 1997. Vertebrados da Ilha de Ratones Grande, Santa Catarina, Brasil. Biotemas 10: 105–122.

Grandinetti, L., and C. M. Jacobi. 2005. Distribuição estacional e espacial de uma taxocenose de anuros (Amphibia) em uma área antropizada em Rio Acima - MG. Lundiana 6: 21–28.

Guerra-Fuentes, R. A., K. Kato, J. M. B. Ghellere, and M. Dixo. 2017. Numa selva de pedra uma Ilha de Mata Atlântica: a herpetofauna da Reserva Biológica Tamboré, Santana de Parnaíba, SP. Oecologia Australis 21: 292–301.

Guimarães, L. D. 2006. Ecologia e conservação de anfíbios anuros do Estado de Goiás. M.S. thesis, Universidade Federal de Goiás, Goiânia.

Guix, J. C., G. Llorente, A. Montorl, M. A. Carretero, and X. Santos. 2000. Una nueva area de elevada riqueza de anuros en el Bosque Lluvioso Atlantico de Brasil. Bol. Esp. Herpetol. Esp. 11: 100–105.

Guix, J. C., V. S. Nunes, and J. R. Miranda. 1994. Autochthonous and colonizing species of frogs in Carlos Botelho State Reserve, southeastern Brazil. Bol. Esp. Herpetol. Esp. 5: 8–13.

Haddad, C. F. B. 1998. Biodiversidade dos anfíbios do Estado de São Paulo, pp. 17–26. In R. M. C. Castro (eds.). Biodiversidade do Estado de São Paulo, Brasil: síntese do conhecimento ao final do século XX. Editora Fapesp, São Paulo, Brazil.

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.

Haddad, C. F. B., and C. P. A. Prado. 2005. Reproductive modes in frogs and their unexpected diversity in the Atlantic Forest of Brazil. BioScience 55: 207–217.

Haddad, C. B. F., L. F. Toledo, C. P. A. Prado, D. Loebmann, J. L. Gasparini, and I. Sazima. 2013. Guide to the amphibians of the Atlantic Forest: diversity and biology. Anolis Books, São Paulo, Brazil.

Hartmann, M. T., P. A. Hartmann, and C. F. B Haddad. 2010. Reproductive modes and fecundity of an assemblage of anuran amphibians in the Atlantic rainforest, Brazil. Iheringia, Sér. Zool. 100: 207–215.

Hartmann, M. T., P. C. A. Garcia, L. O. M. Giasson, and P. A. Hartmann. 2008. Anfíbios, pp. 89–110. In J. J. Cherem, and M. Kammers (eds.), A fauna das áreas de influência da Usina Hidrelétrica Quebra Queixo. Habilis Editora, Erechim, Brazil.

Herrera, J. B. 2011. Efeitos da heterogeneidade e área sobre a comunidade de anfíbios em uma paisagem fragmentada na Floresta Atlântica. M.S. thesis, Universidade Federal da Bahia, Salvador.

Heyer, W. R., A. S. Rand, C. A. G. Cruz, O. L. Peixoto, and C. E. Nelson. 1990. Frogs of Boracéia. Arq. Zool. 31: 231–410.

Hiert, C. 2014. Mecanismos de estruturação de uma comunidade de anuros em área de ecótono na Floresta Atlântica. Ph.D. dissertation, Universidade Federal do Paraná, Curitiba.

Hiert, C., and M. O. Moura. 2007. Anfíbios do Parque Municipal das Araucárias, Guarapuava - Paraná. Editora Unicentro, Guarapuava, Brazil.

Hijmans, R. J. 2017. raster: Geographic Data Analysis and Modeling. R package version 2.6-7. https://CRAN.R-project.org/package=raster.

Hof, C., M. B. Araújo, W. Jetz, and C. Rahbek. 2011. Additive threats from pathogens, climate and land-use change for global amphibian diversity. Nature 480: 516–519.

Ibarra-Espinosa, S. 2018. cptcity: incorporating the cpt-city archive into R. R package version 1.0.0. https://CRAN.R-project.org/package=cptcity.

(IBGE) Brazilian Institute of Geography and Statistics. 2013. Atlas do censo demográfico 2010. IBGE, Rio de Janeiro, Brazil.

(IBGE) Brazilian Institute of Geography and Statistics. 2017a. Download de dados geográficos (http://mapas.mma.gov.br/i3geo/datadownload.htm). IBGE, Rio de Janeiro, Brazil.

(IBGE) Brazilian Institute of Geography and Statistics. 2017b. Download de dados geográficos (http://www.mma.gov.br/biomas/mata-atlantica/mapa-da-area-de-aplicacao). IBGE, Rio de Janeiro, Brazil.

Iop, S., V. M. Caldart, T. G. Santos, and S. Z. Cechin. 2011. Anurans of Turvo State Park: testing the validity of Seasonal Forest as a new Biome in Brazil. J. Nat. Hist. 45: 2443–2461.

(IUCN) International Union for Conservation of Nature. 2017. The IUCN Red List of threatened species (http://www.iucnredlist.org). Version 2017–2.

Izecksohn, E., and S. P. Carvalho-e-Silva. 2001. Anfíbios da Floresta Nacional Mário Xavier, município de Seropédica, estado do Rio de Janeiro, Brasil (Amphibia: Anura). Contrib. Avulsas sobre Hist. Nat. Brasil 39: 1–3.

Izecksohn, E., and S. P. Carvalho-e-Silva. 2010. Anfíbios do Município do Rio de Janeiro, 2nd ed. Editora UFRJ, Rio de Janeiro, Brazil.

Jaeger, R. G., and R. F. Inger. 1994. Quadrat sampling, pp. 97–102. In W. R. Heyer, M. A. Donnelly, R. W. Mcdiarmid, L. A. C. Hayek, and M. S. Foster (eds.), Measuring and monitoring biological diversity: standard methods for amphibians. Smithsonian Institution Press, Washington DC, EUA.

Joly, C. A., C. F. B. Haddad, L. M. Verdade, M. C. Oliveira, V. S. Bolzani, and R. G. S. Berlinck. 2011. Diagnóstico da pesquisa em biodiversidade no Brasil. Rev. USP 89: 114–133.

Joly, C. A., J. P. Metzger, and M. Tabarelli. 2014. Experiences from the Brazilian Atlantic Forest: ecological findings and conservation initiatives. New Phytol. 204: 459–473.

Jordani, M. X., L. S. O. Melo, C. S. Queiroz, D. C. Rossa-Feres, and M. V. Garey. 2017. Tadpole community structure in lentc and lotc habitats: richness and diversity in the Atlantc Rainforest lowland. Herpetol. J. 27: 299–306.

Juares, A. M., 2011. Diversidade de anfíbios anuros na Serra da Mantiqueira, na região do Pico dos Marins. M.S. thesis, Universidade Estadual Paulista, São José do Rio Preto.

Juncá, F. A. 2006. Diversidade e uso de hábitat por anfíbios anuros em duas localidades de Mata Atlântica, no norte do estado da Bahia. Biota Neotrop. 6: 1–17.

Kopp, K., and P. C. Eterovick. 2006. Factors influencing spatial and temporal structure of frog assemblages at ponds in southeastern Brazil. J. Nat. Hist. 40: 1813–1830.

Kwet, A., R. Lingnau, and M. Di-Bernardo. 2010. Pró-Mata: anfíbios da Serra Gaúcha, sul do Brasil - Amphibien der Serra Gaúcha, Südbrasilien - Amphibians of the Serra Gaúcha, South of Brazil. 2nd ed. Brasilien-Zentrum, University of Tübingen, Germany.

Leite, F. S. F., and M. B. F. Guilherme. 2008. Anfíbios e répteis / herpetofauna, pp. 165–186. In Biodiversidade da Mata Samuel de Paula, AngloGold Ashanti, Belo Horizonte, Brazil.

Leite-Filho, E., F. A. Oliveira, F. J. Eloi, C. N. Liberal, A. O. Lopes, and Daniel O. 2017. Evolutionary and ecological factors influencing an anuran community structure in an Atlantic Rainforest urban fragment. Copeia 105: 64–74.

Leivas, P. T. 2014. Estrutura de comunidades de anuros em Ilhas: padrões locais e regionais. Ph.D. dissertation, Universidade Federal do Paraná, Curitiba.

Leivas, P. T., A. S. Beltramin, R. A. Machado, and M. O. Moura. 2015. Anuran richness (Amphibia: Anura) in remnant forest fragments of Araucaria Forest and Atlantic Rainforest in Paraná, Brazil. Herpetol. Notes 8: 661–667.

Leivas, P. T., and C. Hiert. 2016. Anuran richness in remnants of Araucaria Forest, Paraná, Brazil. Herpetol. Notes 9: 15–21.

Leonel, E. 1992. Distribuição espacial e temporal de anfíbios em poça temporária na região de Corumbataí (Amphibia, Anura). M.S. thesis, Universidade Estadual Paulista, Rio Claro.

Lescano, J. N., M. F. Bonino, and M. S. Akmentins. 2013. Composición y riqueza de anfbios y sus relaciones con las características de los sitios de reproducción en un sector de la Selva Atlántica de Misiones, Argentina. Cuad. Herpetol. 27: 35–46.

Lima, M. S. C. S., J. Pederassi, and C. A. S. Souza. 2014. Anurans of Serra D'Água, northwest of Cunhambebe State Park, Rio de Janeiro, Brazil. Herpetol. Notes 7: 231–233.

Lima, M. Z. 2012. Comparação da anurofauna em remanescentes florestais e em reflorestamentos no Reservatório Capivara, Rio Paranapanema, Paraná, Brasil. M.S. thesis, Universidade Federal de Londrina, Londrina.

Lima, R. O., R. Fonseca Neto, J. D. Cavalcante, E. V. E. Andrade, G. J. B. Moura, and M. C. Guarnieri. 2011. Abundância, riqueza e especificidade microambiental da anurofauna em açude permanente (antropizado), Nazaré da Mata - PE, pp. 163–175. In G. J. B. Moura, E. M. Santos, M. A. B. Oliveira, and M. C. C. Cabral. (eds.), Herpetologia do Estado de Pernambuco. Ministério do Meio Ambiente, Brasília, Brazil.

Linares, A. M., and P. C. Eterovick. 2013. Herpetofaunal surveys support successful reconciliation ecology in secondary and human-modified habitats at the Inhotim Institute, Southeastern Brazil. Herpetologica 69: 237–256.

Lingnau, R. 2009. Distribuição temporal, atividade reprodutiva e vocalizações em uma assembleia de anfíbios anuros de uma Floresta Ombrófila Mista em Santa Catarina, Sul do Brasil. Ph.D. dissertation, Pontifícia Universidade Católica do Rio Grande do Sul, Porto Alegre.

Lion, M. B., A. A. Garda, and C. R. Fonseca. 2014. Split distance: a key landscape metric shaping amphibian populations and communities in forest fragments. Diversity Distrib. 20: 1245–1257.

Lipinski, V. M., and T. G. Santos. 2014. Estrutura e organização espacial de duas comunidades de anuros do Bioma Pampa. Iheringia, Sér. Zool. 104: 462–469.

Loebmann, D. 2010. Herpetofauna do Planalto da Ibiapaba, Ceará: composição, aspectos reprodutivos, distribuição espaço-temporal e conservação. Ph.D. dissertation, Universidade Estadual Paulista, Rio Claro.

Loebmann, D., and M. R. C. Figueiredo. 2004. Lista dos anuros da área costeira do município de Rio Grande, Rio Grande do Sul, Brasil. Comun. Mus. Cienc. Tecnol. PUCRS, Ser. Zool. 17: 91–96.

Loebmann, D., and P. Vieira. 2005. Relação dos anfíbios do Parque Nacional da Lagoa do Peixe, Rio Grande do Sul, Brasil. Rev. Bras. Zool. 22: 339–341.

Lopes, P. C. 2010. Distribuição e abundância de anfíbios e répteis neotropicais em paisagem silvicultural em São Paulo, Brasil. M.S. thesis, Universidade de São Paulo, Escola Superior de Agricultura "Luiz de Queiroz", Piracicaba.

López, A., and W. Prado. 2012. Anfibios y reptiles de Misiones: guia de campo. María Luisa Petraglia de Bolzón Editora, Buenos Aires, Argentina.

López, C. A., and E. Kubisch. 2008. Relevamiento in situ de la herpetofauna del Refugio Silvestre Yacutinga, Provincia de Misiones (Argentina). APRONA Bol. Cient. 40: 1–12.

López, C. A., and S. J. E. Nazer. 2009. Anfibios y reptiles de la Reserva Privada Yaguaroundí (Misiones, Argentina). Bol. Soc. Zool. Uruguay 18: 13–34.

Lucas, E. M., and J. C. Marocco. 2011. Anurofauna (Amphibia, Anura) em um remanescente de Floresta Ombrófila Mista no Estado de Santa Catarina, Sul do Brasil. Biota Neotrop. 11: 377–384.

Lucas, E. M., and V. B. Fortes. 2008. Diversidade de anuros na Floresta Nacional de Chapecó, Floresta Atlântica do sul do Brasil. Biota Neotrop. 8: 51–61.

Luiz, A. M., T. A. Leão-Pires, and R. J. Sawaya. 2016. Geomorphology drives amphibian beta diversity in Atlantic Forest lowlands of Southeastern Brazil. PLoS ONE 11: e0153977.

Macedo, N. A. 2011. Levantamento da anurofauna da Escola do Meio Ambiente, Botucatu - SP. B.S. thesis, Universidade Estatual Paulista, Botucatu.

Machado, I. F. 2006. Diversidade de larvas de anuros (Amphibia, Anura) em áreas úmidas do Rio Grande do Sul. M.S. thesis, Universidade do Vale do Rio dos Sinos, São Leopoldo.

Machado, I. F. 2011. Diversidade e conservação de anuros em áreas úmidas costeiras no Sul do Brasil. Ph.D. dissertation, Universidade do Vale do Rio dos Sinos, São Leopoldo.

Machado, I. F., and L. Maltchik. 2010. Can management practices in rice fields contribute to amphibian conservation in southern Brazilian wetlands? Aquatic Conserv: Mar. Freshw. Ecosyst. 20: 39–46.

Machado, I. F., L. F. B. Moreira, and L. Maltchik. 2012. Effects of pine invasion on anurans assemblage in southern Brazil coastal ponds. Amphib-reptil. 33: 227–237.

Machado, R. A. 2004. Ecologia de assembleias de anfíbios anuros no município de Telêmaco Borba, Paraná, Sul do Brasil. Ph.D. dissertation, Universidade Federal do Paraná, Curitiba.

Machado, R. A., and P. S. Bernarde. 2003. Anurofauna da Bacia do Rio Tibagi, pp. 297–306. In M. E. Medri, E. Bianchini, O. A. Shibatta, and J. A. Pimenta (eds.), A Bacia do Rio Tibagi. MC-Grafica, Londrina, Brazil.

Machado, R. S., P. S. Bernarde, S. A. A. Morato, and L. Anjos. 1999. Análise comparada da riqueza de anuros entre duas áreas com diferentes estados de conservação no município de Londrina, Paraná, Brasil (Amphibia, Anura). Rev. Bras. Zool. 16: 997–1004.

Madalozzo, B., T. G. Santos, M. B. Santos, C. Both, and S. Cechin. 2017. Biodiversity assessment: selecting sampling techniques to access anuran diversity in grassland ecosystems. Wildl. Res. 44: 78–91.

Maffei, F. 2014. Relações entre variáveis ambientais e anfíbios anuros em áreas de Cerrado e Floresta Estacional Semidecidual. M.S. thesis, Universidade Estadual Paulista, Botucatu.

Maffei, F., and F. K. Ubaid. 2014. Amphibians of Rio Claro farm, Lençóis Paulista, São Paulo, Brazil. Editora Canal 6, Bauru, Brazil.

Maffei, F., B. T. M. Nascimento, G. M. Moya, and R. J. Donatelli. 2015. Anurans of the Agudos and Jaú municipalities, state of São Paulo, Southeastern Brazil. Check List 11: 1645.

Maffei, F., F. K. Ubaid, and J. Jim. 2011. Anurans in an open cerrado area in the municipality of Borebi, São Paulo state, Southeastern Brazil: habitat use, abundance and seasonal variation. Biota Neotrop, 11: 201–213.

Magalhães, A. C. F. 2015. Composição, distribuição espacial e sazonal da anurofauna de córrego e lagoa em uma região montana no sudeste do Brasil. M.S. thesis, Universidade Federal de Ouro Preto, Ouro Preto.

Magalhães, A. P. 2012. Composição e diversidade da anurofauna de serrapilheira da Serra do Ouro Branco, Minas Gerais. M.S. thesis, Universidade Federal de Ouro Preto, Ouro Preto.

Magalhães, F. M., D. O. Laranjeiras, T. B. Costa, F. A. Juncá, D. O. Mesquita, D. L. Röhr, W. P. Silva, G. H. C. Vieira, and A. A. Garda. 2015. Herpetofauna of protected areas in the Caatinga IV: Chapada Diamantina National Park, Bahia, Brazil. Herpetol. Notes 8: 243–261.

Malagoli, L. R. 2013. Diversidade e distribuição dos anfíbios anuros do Núcleo Curucutu, Parque Estadual da Serra do Mar, SP. M.S. thesis, Universidade Estadual Paulista, Rio Claro.

Maltchik, L., C. D. Peixoto, C. Stenert, L. F. B. Moreira, and I. F. Machado. 2008. Dynamics of the terrestrial amphibian assemblage in a flooded riparian forest fragment in a Neotropical region in the south of Brazil. Braz. J. Biol. 68: 763–769.

Mariotto, L. R. 2014. Anfíbios de um gradiente altitudinal em Mata Atlântica. M.S. thesis, Universidade Federal do Paraná, Curitiba.

Martínez, N., F. Bauer, and M. Motte. 2016. Herpetofauna del Parque Nacional Cerro Corá, Amambay, Paraguay. Bol. Mus. Nac. Hist. Nat. Parag. 20: 83–92.

Martins, A. R., S. F. Bruno, and A. Q. Navegantes. 2012a. Herpetofauna of Núcleo Experimental de Iguaba Grande, Rio de Janeiro state, Brazil. Braz. J. Biol. 72: 553–562.

Martins, R., M. R. F. Borges, R. Iartelli, and G. Puorto. 2012b. Fauna da Reserva Legal da Pedreira Itapeti, pp 231–258. In M. S. C. Morini, and V. F. O. Miranda (eds.), Livro Serra do Itapeti, aspectos históricos, sociais e naturalísticos. Canal 6, Bauru, Brazil.

Martins, A., R. Pontes, C. Mattedi, J. Fratani, R. A. Murta-Fonseca, L. Ramos, and A. L. R. Brandão. 2014. Anuran community of a coastal Atlantic Forest fragment in the state of Rio de Janeiro, southeastern Brazil. Salamandra (Frankf.) 50: 27–39.

Martins, J. P. V. 2014. Caracterização ecológica dos anfíbios Anuros de áreas reflorestadas do entorno da represa de Volta Grande, no Rio Grande, MG/SP. M.S. thesis, Universidade Federal de Rio Presto, Rio Preto.

Mascarenhas, L., C. Tisoa, A. M. Linaresa, C. F. O. Mouraa, T. L. Pezzutib, F. S. F. Leite, and P. C. Eterovick. 2015. Improved local inventory and regional contextualization for anuran diversity assessment at an endangered habitat in southeastern Brazil. J. Nat. Hist. 50: 1–17.

Matos, M. A. 2012. Efeito da redução da cobertura florestal sobre anuros e lagartos de serapilheira em paisagens da Mata Atlântica da Bahia, Brasil. M.S. thesis, Universidade Federal da Bahia, Salvador.

Melchior, L. G., D. C. Rossa-Feres, and F. R. Da Silva. 2017. Evaluating multiple spatial scales to understand the distribution of anuran beta diversity in the Brazilian Atlantic Forest. Ecol. Evol. 7: 2403–2413.

Melo, G. V., D. C. Rossa-Feres, and J. Jim. 2007. Variação temporal no sítio de vocalização em uma comunidade de anuros de Botucatu, Estado de São Paulo, Brasil. Biota Neotrop. 7: 93–102.

Mendes, C. V. M., P. T. M. Camargo, H. Z. Fischer, E. O. Serapicos, F. A. S. Tonolli, L. M. Castanho, L. A. C. Cintra, and R. C. Gonzalez. 2013. Herpetofauna do Parque Municipal Governador Mário Covas no Município de Sorocaba, São Paulo, Sudeste do Brasil. Rev. Inst. Flor. 25: 91–105.

Mendonça, R. A. 2008. Taxocenose de anfíbios anuros do entorno da barragem do rio São Bento (BRSB), Siderópolis, SC. M.S. thesis, Universidade do Extremo Sul Catarinense, Criciúma.

Mittermeier, R. A., W. R. Turner, F. W. Larsen, T. M. Brooks, and C. Gascon. 2011. Global biodiversity conservation: the critical role of hotspots, pp. 2–22. In F. E. Zachos, and J. C. Habel (eds.), Biodiversity hotspots: distribution and protection of conservation priority areas. Springer-Verla, Heidelberg, Germany.

Mohneke, M., and M. Rödel. 2009. Declining amphibian populations and possible ecological consequences – a review. Salamandra 45: 203–210.

Mônico, A. T., R. B. G. Clemente-Carvalho, S. R. Lopes, and P. L. V. Peloso. 2017. Anfíbios anuros de brejos e lagodas de São Roque do Canaã, Espírito Santo, Sudeste do Brasil. Pap. Avulsos Zool. 57: 197–206.

Monteiro-Leonel, A. C. 2004. Herpetofauna do planalto de Poços de Caldas, sul de Minas Gerais. M.S. thesis, Universidade de São Paulo, São Paulo.

Montesinos, R., P. L. V. Peloso, D. A. Koski, A. P. Valadares, and J. L. Gasparini. 2012. Frogs and toads of the Pedra Azul–Forno Grande biodiversity corridor, southeastern Brazil. Check List 8: 102–111.

Moraes, R. A., R. J. Sawaya, and W. Barrela. 2007. Composição e diversidade de anfíbios anuros em dois ambientes de Mata Atlântica no Parque Estadual Carlos Botelho, São Paulo, sudeste do Brasil. Biota Neotrop. 7: 27–36.

Morais, A. R., L. Signorelli, P. G. Gambale, K. Kopp, F. Nomura, L. D. Guimarães, W. Vaz-Silva, J. Ramos, and R. P. Bastos. 2011. Anuran amphibians associated to water bodies in Southwest of Goiás State (Brazil). Biota Neotrop. 11: 1–9.

Morato, S. A. A., A. M. X. Lima, D. C. P. Staut, R. G. Faria, J. P. Souza-Alves, S. F. Gouveia, M. R. C. Scupino, R. Gomes, and M. J. Silva. 2011. Amphibians and reptiles of the Refúgio de Vida Silvestre Mata do Junco, municipality of Capela, state of Sergipe, northeastern Brazil. Check List 7: 756–762.

Moreira, L. B. F., I. F. Machado, A. R. G. M. Lace, and L. Maltchik. 2008. Anuran amphibians dynamics in an intermittent pond in southern Brazil. Acta Limnol. Bras. 20: 205–212.

Moreira, L. F. M., and L. Maltchik. 2012. Assessing patterns of nestedness and co-occurrence in coastal pond anuran assemblages. Amphib-reptil. 33: 261–271.

Moreira, L. F. M., and L. Maltchik. 2014. Does organic agriculture benefit anuran diversity in rice fields? Wetlands 34: 725–733.

Morellato, L. P. C., and C. F. B. Haddad. 2000. Introduction: The Brazilian Atlantic Forest. Biotropica 32: 786–792.

Motte, M., K. Núñez, P. Cacciali, F. Brusquetti, N. Scott, and A. L. Aquino. 2009. Categorización del estado de conservación de los anfibios y reptiles de Paraguay. Cuad. herpetol. 23: 5–18.

Moura, M. R., A. P. Motta, V. D. Fernandes, and R. N. Feio. 2012. Herpetofauna da Serra do Brigadeiro, um remanescente de Mata Atlântica em Minas Gerais, Sudeste do Brasil. Biota Neotrop. 12: 1–27.

Muylaert, R. L., M. H. Vancine, R. Bernardo, J. E. F. Oshima, T. Sobral-Souza, V. R. Tonett, B. B. S. Niebuhr, and M. C. Ribeiro. Limites territoriais inclusivos para estudos ecológicos e biogeográficos na Mata Atlântica. Oecologia Australis (in review).

Myers, N., R. A. Mittermeier, C. G. Mittermeier, G. A. B. da Fonseca, and J. Kent. 2000. Biodiversity hotspots for conservation priorities. Nature 403: 853–858.

Narvaes, P., J. Bertoluci, and M. T. Rodrigues. 2009. Composição, uso de hábitat e estações reprodutivas das espécies de anuros da floresta de restinga da Estação Ecológica Juréia-Itatins, sudeste do Brasil. Biota Neotrop. 9: 117–123.

Nascimento, L. B., A. C. Miranda, and A. M. Balstaedt. 1994. Distribuição estacional e ocupação ambiental dos anfíbios anuros da Área de Proteção da Captação da Mutuca (Nova Lima, MG). Bios 2: 5–12.

Nazaretti, E. M. 2016. Diversidade, distribuição espaço-temporal e caracterização de anuros do Parque Nacional do Iguaçu. M.S. thesis, Universidade Federal do Paraná, Curitiba.

Nazaretti, E. M., and C. E. Conte 2015. Anurofauna de um remanescente alterado de floresta estacional semidecidual as margens do Rio Paranapanema. Iheringia, Sér. Zool. 105: 420–429.

Nery, T. C. 2014. Diversidade de anfíbios anuros em áreas antropizadas em Vitória da Conquista - BA. M.S. thesis, Universidade Estadual do Sudoeste da Bahia, Itapetinga.

Neteler, M., M. H. Bowm, M. Landac, and M. Metz. 2012. GRASS GIS: A multi-purpose open source GIS. Environ. Model. Softw. 31: 124–130.

Neves, M. O. N., E. A. Pereira, L. M. C. Lima, H. Folly, E. F. Oliveira, D. J. Santana, and R. N. Feio. 2017. Anurans of Serra Negra da Mantiqueira, Zona da Mata of Minas Gerais, Brazil: a priority area for biodiversity conservation. Herpetol. Notes 10: 297–311.

Nomura, F. 2008. Padrões de diversidade e estrutura de taxocenoses de anfíbios anuros: análise em multi escala espacial. Ph.D. dissertation, Universidade Estadual Paulista, Rio Claro.

Nowakowski, A. J., M. E. Thompson, M. A. Donnelly, and B. D. Todd. 2017. Amphibian sensitivity to habitat modification is associated with population trends and species traits. Global Ecol. Biogeogr. 26: 700–712.

Núñez, K. 2012. La herpetofauna de un fragmento de Bosque Atlántico en el Departamento de Itapúa, Paraguay. Bol. Esp. Herpetol. Esp. 23: 47–52.

Oda, F. H., S. Gonçalves, T. M. Oda, L. C. R. Tschope, A. L. F. Briso, M. R. F. Oliveira, R. M. Takemoto, and T. S. Vasconcelos. 2017. Influence of vegetation heterogeneity and landscape characteristics on anuran species composition in aquatic habitats along an urban-rural gradient in southeastern Brazil. Zool. Ecol. 27: 235–244.

Oda, F. H., V. G. Batista, P. G. Gambale, F. T. Mise, F. Souza, S. Bellay, J. C. G. Ortega, and R. M. Takemoto. 2016. Anuran species richness, composition, and breeding habitat preferences: a comparison between forest remnants and agricultural landscapes in Southern Brazil. Zool. Stud. 55: 34.

Okabe, A., T. Satoh, and K. Sugihara. 2009. A kernel density estimation method for networks, its computational method and a GIS-based tool. Int. J. Geogr. Inf. Sci. 23: 7–32.

Oliveira, A. K. C. 2011. Estudo de comunidade de anuros e citogenética do gênero *Scinax* em área de ecótone no Paraná. M.S. thesis, Universidade Federal do Paraná, Curitiba.

Oliveira, A. K. C. 2015. Estruturação de assembleias de girinos sujeitas ao hidroperíodo: uma abordagem em diferentes escalas. Ph.D. dissertation, Universidade Federal do Paraná, Curitiba

Oliveira, F. F., and G. P. L. Lírio Jr. 2000. Anfíbios anuros do Campus da Universidade Federal de Sergipe. Biol. Geral Exp. 1: 42–74.

Oliveira, J. C. F., E. Pralon, L. Coco, R. V. Pagotto, and C. F. D. Rocha. 2013a. Environmental humidity and leaf-litter depth affecting ecological parameters of a leaf-litter frog community in an Atlantic Rainforest area. J. Nat. Hist. 47: 2115–2124.

Oliveira, J. C. F., and C. F. D. Rocha. 2015. Journal of coastal conservation: a review on the anurofauna of Brazil's sandy coastal plains. How much do we know about it? J. Coast. Conserv. 19: 35–49.

Oliveira, M. C. L. M., M. B. Santos, D. Loebmann, A. Hartman, and A. M. Tozetti. 2013b. Diversity and associations between coastal habitats and anurans in southernmost Brazil. An. Acad. Bras. Ciênc. 85: 575–583.

Oliveira, M. M. 2013. Diversidade de anuros no Parque Municipal da Matinha, em Itapetinga, Bahia. M.S. thesis, Universidade Estadual do Sudoeste da Bahia, Itapetinga.

Oliveira, S. H. 2004. Diversidade de anuros de serapilheira em fragmentos de Floresta Atlântica e plantios de *Eucalyptus saligna* no Município de Pilar do Sul, SP. M.S. thesis, Universidade de São Paulo, Escola Superior de Agricultura "Luiz de Queiroz", Piracicaba.

Oliveira, T. A. L. 2012. Anurofauna em uma área de ecótono entre Cerrado e Floresta Estacional: diversidade, distribuição e a influência de características ambientais. M.S. thesis, Universidade Estadual Paulista, São José do Rio Preto.

Oliveira, T. M. 2008. Uso de hábitat, micro-hábitat e coexistênica com predadores em taxocenoses de girinos de anuros no noroeste paulista. M.S. thesis, Universidade Estadual Paulista, São José do Rio Preto.

Oliveira, J. C. F., G. R. Winck, J. Pereira-Ribeiro, and C. F. D. Rocha. 2017. Local environmental factors influence the structure of frog communities on the sandy coastal plains of Southeastern Brazil. Herpetologica 73: 307–312.

Olson, D. M., E. Dinerstein, E. D. Wikramanayake, N. D. Burgess, G. V. N. Powell, E. C. Underwood, J. A. D'amico, I. Itoua, H. E. Strand, J. C. Morrison, C. J. Loucks, T. F. Allnutt, T. H. Ricketts, Y. Kura, J. F. Lamoreux, W. W. Wettengel, P. Hedao, and K. R. Kassem. 2001. Terrestrial ecoregions of the world: a new map of life on Earth. BioScience 51: 933–938.

Ouvernay, D., L. M. S. C. Fiuza, T. R. Barbosa, I. G. L. C. Albuquerque, and A. F. B. Araujo. 2012. Amphibia, Anura, Parque Estadual do Cunhambebe Itaguaí municipality, Rio de Janeiro state. Check List 8: 1047–1051.

Palmeira, C. N. S., and U. Gonçalves. 2015. Anurofauna de uma localidade na Mata Atlântica setentrional, alagoas, Brasil. Bol. Mus. Biol. Mello Leitão (N. Sér.) 37: 141–163.

Palmeirim, A. F., M. V. Vieira, and C. A. Peres. 2017. Herpetofaunal responses to anthropogenic forest habitat modification across the neotropics: insights from partitioning β-diversity. Biodivers. Conserv. 26: 2877–2891.

Papp, M. G. 1997. Reprodução de anuros (Amphibia) em duas lagoas de altitude na Serra da Mantiqueira. M.S. thesis, Universidade Estadual de Campinas, Campinas.

Paré, J. A. 2003. Fungal diseases of amphibians: an overview. Vet. Clin. North. Am. Exot. Anim. Pract. 6: 315–326.

Paula, C. D. 2011. Patologia comparada deinfecções selecionadas de anfíbios anuros de vida livre do Bioma da Mata Atlântica: estudo prospectivo. Ph.D. dissertation, Universidade de São Paulo, São Paulo.

Pereira, E. A., M. O. Neves, P. S. Hote, D. J. Santana, and R. N. Feio. 2016b. Anurans of the municipality of Barão de Monte Alto, State of Minas Gerais, southeastern Brazil. Check List 12: 1977.

Pereira, E. N., E. M. Santos, and M. F. Rodrigues. 2016a. Guia dos anfíbios do Parque Estadual de Dois Irmãos. EDUFRPE, Recife, Brazil.

Pereira-Ribeiro, J., A. C. Ferreguetti, H. G. Bergallo, and C. F. D. Rocha. 2017. Use of polyvinyl chloride pipes (PVC) as potential artificial shelters for amphibians in a coastal plain forest of southeastern Brazil. J. Coast. Conserv. 21: 327–331.

Peres, P. B. 2010. Taxocenose de anfíbios anuros do parque ecoturistico e ecologico de Pedras Grandes, Sul de Santa Catarina, Brasil. B.S. thesis, Universidade Comunitária de Criciúma, Criciúma.

Pertel, W., R. L. Teixeira, and D. Rödder. 2006. Anurans inhabiting soil bromeliads in Santa Teresa, southeastern Brazil. Amphibia 5: 16–19.

Pertel, W., R. L. Teixeira, and R. B. Ferreira. 2010. Comparison of diet and use of bromeliads between a bromelicolous and a bromeligenous anuran at an inselberg in the Southeastern of Brazil. Caldasia 32: 149–159.

Pinheiro, S. C. P. 2009. Anurofauna de serapilheira de diferentes formações vegetais ao longo de um gradiente altitudinal no Parque Estadual da Ilha do Cardoso, município de Cananéia, SP. M.S. thesis, Universidade de São Paulo, Escola Superior de Agricultura "Luiz de Queiroz", Piracicaba.

Pinto, J. S. 2015. Diversidade e distribuição espaço-temporal de anuros ocorrentes em Floresta Ombrófila Mista. M.S. thesis, Universidade Federal do Paraná, Curitiba.

Pirani, R. M., L. B. Nascimento, and R. N. Feio. 2013. Anurans in a forest remnant in the transition zone between cerrado and Atlantic rain forest domains in southeastern Brazil. An. Acad. Bras. Ciênc. 85: 1093–1104.

Pombal Jr., J. P., and C. F. B. Haddad. 2005. Estratégias e modos reprodutivos de anuros (Amphibia) em uma poça permanente da Serra de Paranapiacaba, Sudeste do Brasil. Pap. Avulsos Zool. 45: 215–229.

Pombal Jr., J. P., and M. Gordo. 2004. Anfíbios anuros da Juréia, pp. 243–256. In O. V. Maques, and D. Wânia (eds.), Estação Ecológica Juréia-Itatins: ambiente físico, flora e fauna. Holos, Ribeirão Preto, Brazil.

Pontes, J. A. L. 2010. A riqueza e diversidade de anfíbios anuros da Serra do Mendanha, Estado do Rio de Janeiro: grau de conservação da floresta, variação altitudinal e uso de recursos hídricos. Ph.D. dissertation, Universidade do Estado do Rio de Janeiro, Rio de Janeiro.

Pontes, J. A. L., and C. F. D. Rocha. 2011. Os anfíbios da serrapilheira da Mata Atlântica Brasileira: estado atual do conhecimento. Oecologia Australis 15: 750–761.

Pontes, J. A. L., R. C. Pontes, R. F. Rocha, P. M. Lindenberg, K. P. Silva, W. A. Santos,N. A. Lemos, P. G. A. Hassan, A. O. Alves, L. F. B. A. Lopes, L. C. T. Perro, A. P. Boldrini, E. C. F. Nunes, L. F. Costa, R. W. Kisling, and C. F. D. Rocha. 2015. Unidades de conservação da cidade do Rio de Janeiro: hotspots da herpetofauna carioca, pp. 176–194. In J. A. L. Pontes (eds.), Biodiversidade Carioca: segredos revelados. Technical Books, Rio de Janeiro, Brazil.

Pontes, R. C., and J. A. L. Pontes. 2016. Anfíbios da Serra da Tiririca: diversidade e conservação, pp. 19–68. In M. G. Santos (eds.), Biodiversidade e sociedade no leste metropolitano do Rio de Janeiro. EdEUERJ, Rio de Janeiro, Brazil.

Pontes, R. C., R. C. Pontesa, R. T. Santori, F. C. Gonçalves e Cunha, and J. A. L. Pontes. 2013. Habitat selection by anurofauna community at rocky seashore in coastal Atlantic Forest, Southeastern Brazil. Braz. J. Biol. 73: 533–542.

Prado, G. M., and J. P. Pombal Jr. 2005. Distribuição espacial e temporal dos anuros em um brejo da reserva biológica de duas bocas, sudeste do Brasil. Arq. Mus. Nac. 63: 685–705.

Prado, V. H. M., F. R. Da Silva, N. Y. N. Dias, J. S. R. Pires, and D. C. Rossa-Feres. 2009a. Anura, Estação Ecológica de Jataí, São Paul state, southeastern Brazil. CheckList 5: 495–502.

Prado, V. H. M., M. G. Fonseca, F. V. R. Almeida, O. Necchi Jr., and D. C. Rossa-Feres. 2009b. Niche occupancy and the relative role of micro-habitat and diet in resource partitioning among pond dwelling tadpoles. South Am. J. Herpetol. 4: 275–285.

Preuss, J. F., C. Lambertini, D. S. Leite, L. F. Toledo, and E. M. Lucas. 2016. Crossing the threshold: an amphibian assemblage highly infected with *Batrachochytrium dendrobatidis* in the southern Brazilian Atlantic forest. Stud. Neotrop. Fauna E. 51: 68–77.

Provete, D. B., M. V. Garey, F. R. Da Silva, and D. C. Rossa-Feres. 2011. Anuranfauna from northwestern region of the State of São Paulo: species list and taxonomic key for adults. Biota Neotrop. 11: 377–391.

Queissada, I. C. S. T. 2009. Diversidade da herpetofauna de uma área de Mata Atlântica do Estado de Alagoas: a reserva particular da Usina Porto Rico, Campo Alegre. M.S. thesis, Universidade Estadual Paulista Júlio de Mesquita Filho, São Paulo.

Quintela, F. M., L. F. M. Neves, I. G. Medvedovisky, M. B. Santos, M. C. L. M. Oliveira, and M. R. C. Figueiredo. 2009. Relação dos anfíbios da Ilha dos Marinheiros, estuário da Lagoa dos Patos, Rio Grande do Sul, Brasil. Rev. Bras. Biocienc. 7: 231–233.

Quintela, F. M., R. M. Pinheiro, and D. Loebmann. 2011. Composição e uso do habitat pela herpetofauna em uma área de mata paludosa da Planície Costeira do Rio Grande do Sul, extremo sul do Brasil. Rev. Bras. Biocienc. 9: 6–11.

R Core Team. 2017. R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. https://www.R-project.org/.

Ramos, A. D., and J. L. Gaspaini. 2004. Anfíbios do Goiapaba-Açu, Fundão, Estado do Espírito Santo. Vitória: Gráfica Santo Antônio, Vitória, Brazil.

Ribeiro, J., G. R. Colli, and A. M. V. M. Soares. 2017. The anurofauna of a vanishing savanna: the case of the Brazilian Cerrado. Biodivers. Conserv. (in press).

Ribeiro, M. C., A. C. Martensen, J. P. Metzger, M. Tabarelli, F. Scarano, and M. Fortin. 2011. The Brazilian Atlantic Forest: a shrinking biodiversity hotspot, pp. 405–434. In F. E. Zachos, and J. C. Habe (eds.), Biodiversity hotspots: distribution and protection of conservation priority areas. Springer-Verlag, Heidelberg, Germany.

Ribeiro, M. C., J. P. Metzger, A. C. Martensen, F. J. Ponzoni, and M. M. Hirota. 2009. The Brazilian Atlantic Forest: how much is left, and how is the remaining forest distributed? Implications for conservation. Biol. Conserv. 142: 1141–1153.

Ribeiro, R. S., G. T. B. T. Egito, and C. F. B. Haddad. 2005. Chave de Identificação: anfíbios anuros da vertente de Jundiaí da Serra do Japi, Estado de São Paulo. Biota Neotrop. 5: 1–15.

Ribeiro-Júnior, M. A., R. V. Rossi, C. L. Miranda, and T. C. S. Ávila-Pires. 2011. Influence of pitfall trap size and design on herpetofauna and small mammal studies in a Neotropical forest. Zoologia 28: 80–91.

Ribeiro-Júnior, J. W., and J. Bertoluci. 2009. Anuros do cerrado da Estação Ecológica e da Floresta Estadual de Assis, sudeste do Brasil. Biota Neotrop. 9: 207–216.

Rievers, C. R. 2010. Anfíbios anuros de serrapilheira do Parque Estadual do Rio Doce: resposta à disponibilidade de recursos e aos fatores climáticos. M.S. thesis, Universidade Federal de Ouro Preto, Ouro Preto.

Roberto, I. J., and D. Loebmann. 2016. Composition, distribution patterns, and conservation priority areas for the herpetofauna of the state of Ceará, northeastern Brazil. Salamandra, 52: 134–152.

Roberto, I. J., C. R. Oliveira, J. A. A. Filho, H. F. Oliveira, and R. W. Ávila. 2017. The herpetofauna of the Serra do Urubu mountain range: a key biodiversity area for conservation in the Brazilian Atlantic Forest. Pap. Avulsos Zool. 57: 347–373.

Roberto, I. J., S. C. Ribeiro, and D. Loebmann. 2013. Amphibians of the state of Piauí, Northeastern Brazil: a preliminary assessment. Biota Neotrop. 13: 322–330.

Rocha, C. F. D., D. Vrcibradic, M. C. Kiefer, C. C. Siqueira, M. Almeida-Gomes, V. N. T. Borges-Júnior, F. H. Hatano, A. F. Fontes, J. A. L. Pontes, T. Klaion, L. O. Gil, and M. Van Sluys. 2011. Parameters from the community of leaf-litter frogs from Estação Ecológica Estadual Paraíso, Guapimirim, Rio de Janeiro State, southeastern Brazil. An. Acad. Bras. Ciênc. 83: 1259–1267.

Rocha, C. F. D., D. Vrcibradic, M. C. Kiefer, M. Almeida-Gomes, V. N. T. Borges-Júnior, P. C. F. Carneiro, R. V. Marra, P. Almeida-Santos, C. C. Siqueira, P. Goyannes-Araújo, C. G. A. Fernandes, E. C. N. Rubião, and M. Van Sluys. 2007. A survey of the leaf-litter frog assembly from an Atlantic forest area (Reserva Ecológica de Guapiaçu) in Rio de Janeiro state, Brazil, with an estimate of frog densities. Tropical Zoology 20: 99–108.

Rocha, C. F. D., D. Vrcibradic, M. C. Kiefer, M. Almeida-Gomes, V. N. T. Borges-Junior, V. A. Menezes, C. V. Ariani, J. A. L. Pontes, P. Goyannes-Araújo, R. V. Marra, D. M. Guedes, C. C. Siqueira, and M. Van Sluys. 2013. The leaf-litter frog community from Reserva Rio das Pedras, Mangaratiba, Rio de Janeiro State, Southeastern Brazil: species richness, composition and densities. North-West J. Zool. 9: 151–156.

Rocha, C. F. D., F. H. Hatano, D. Vrcibradic, and M. Van Sluys. 2008. Frog species richness, composition and β-diversity in coastal Brazilian restinga habitats. Braz. J. Biol. 68: 109–115.

Rocha, C. F. D., H. G. Bergallo, M. A. S. Alves, M. Van Sluys, R. Mazzoni, and S. B. Santos. 2009. Fauna de ambientes de interiores, pp. 163–245. In M. Bastos, and C.

H. Callado (eds.), O Ambiente da Ilha Grande. EURJ/CEADS, Rio de Janeiro, Brazil.

Rocha, C. F. D., M. Van Sluys, M. A. S. Alves, H. G. Bergallo, and D. Vrcibradic. 2001. Estimates of forest floor litter frog communities: a comparison of two methods. Austral Ecol. 26: 14–21.

Rocha, C. F. R., H. G. Bergallo, J. P. Pombal Jr., L. Geise, M. Van Sluys, R. Fernandes, and U. Caramaschi. 2004. Fauna de anfíbios, répteis e mamíferos do Estado do Rio de Janeiro, Sudeste do Brasil. Publ. Avul. Mus. Nac. 104: 3–23.

Rocha, V. C. 2013. Variação espacial e temporal da comunidade de anfíbios anuros em remanescentes de Floresta Ombrófila Densa da Ilha de Santa Catarina, Florianópolis – SC. B.S. thesis, Universidade Federal de Santa Catarina, Florianópolis.

Rödder, D., R. B. Narcizo, R. L. Teixeira, and W. Pertel. 2006. Bemerkungen zur Anurendiversitat und -ökologie in einem Reservat im Atlantischen Regenwald in Südost Brasilien. Sauria, 28: 27–38

Röder, D., R. L. Teixeira, R. B. Ferreira, R. B. Dantas, W. Pertel, and G. J. Guarneire. 2007. Anuran hotspots: the municipality of Santa Teresa, Espírito Santo, Southeastern Brazil. Salamandra (Frankf.) 43: 91–110.

Rodrigues, R. G., I. F. Machado, and A. U. Christoff. 2008. Anurofauna em área antropizada no Campus Ulbra, Canoas, Rio Grande do Sul, Brasil. Biodivers. Pampeana 6: 39–43.

Rolim, 2009. Bioecologia de *Odontophrynus moratoi* (Amphibia, Anura, Cycloramphidae). M.S. thesis, Universidade Estadual Paulista, Botucatu.

Rolim, 2013. Estrutura da comunidade de anfíbios da região de Bauru, SP. Ph.D. dissertation, Universidade Estadual Paulista, Botucatu.

Rosa, A. 2017. Levantamento preliminar da herpetofauna do Parque Nacional de São Joaquim, Santa Catarina, Brasil. B.S. thesis, Universidade Federal de Santa Catarina, Florianópolis.

Rossa-Feres, D. C., and J. Jim. 1996. Distribuição espacial em comunidades de girinos na região de Botucatu, São Paulo (Amphibia, Anura). Rev. Bras. Biol., 56: 309–316.

Rossa-Feres, D. C, and J. Jim. 2001. Similaridade do sítio de vocalização em uma comunidade de anfíbios anuros na região noroeste do Estado de São Paulo. Rev. Bras. Zool. 18: 439–454.

Rossa-Feres, D. C., and F. Nomura. 2006. Caracterização e chave taxonômica para girinos (Amphibia: Anura) da região noroeste do estado de São Paulo, Brasil. Biota Neotrop. 6: 1–26.

Rossa-Feres, D. C., R. J. Sawaya, J. Faivovich, J. G. R. Giovanelli, C. A. Brasileiro, L. Schiesari, J. Alexandrino, and C. F. B. Haddad. 2011. Amphibians of São Paulo State, Brazil: state-of-art and perspectives. Biota Neotrop. 11: 1–19.

Rossa-Feres, D. C., V. H. M., Prado, F. R. Da Silva, and H. J. Almeida. 2012. Diversidade de anuros em fragmentos florestais remanescentes na região noroeste do estado de São Paulo, pp. 207–222. In O. Necchi Jr. (eds.), Fauna e Flora de

Fragmentos florestais remanescentes da região noroeste do Estado de São Paulo. Fapesp, São José do Rio Preto, Brazil.

Rossa-Feres, D. C., M. V. Garey, U. Caramaschi, M. F. Napoli, F. Nomura, A. A. Bispo, C. A. Brasileiro, M. T. C. Thomé, R. J. Sawaya, C. E. Conte, C. A. G. Cruz, L. B. Nascimento, J. L. Gasparini, A. P. Almeida, and C. F. B. Haddad. 2017. Anfíbios da Mata Atlântica: lista de espécies, histórico dos estudos, biologia e conservação, pp. 237-314. In E. L. A. Monteiro-Filho and C. E. Conte (eds.), Revisões em zoologia: Mata Atlântica. Ed. UFPR, Curitiba, Brazil.

Sabbag, A. F., and J. Zina. 2011. Anurofauna de uma mata ciliar no município de São Carlos, estado de São Paulo, Brasil. Biota Neotrop. 11: 179–188.

Sabagh, L. T., R. B. Ferreira, and C. F. D. Rocha. 2017. Host bromeliads and their associated frog species: further considerations on the importance of species interactions for conservation. Symbiosis 73: 201–211.

Salles, R. O. L., L. N. Weber, and T. Silva-Soares. 2009. Amphibia, Anura, Parque Natural Municipal da Taquara, municipality of Duque de Caxias, state of Rio de Janeiro, southeastern Brazil. Check List 5: 840–854.

Santana, D. J., V. A. São Pedro, P. S. Hote, H. M. Roberti, A. C. Sant'Anna, C. A. Figueiredo-de-Andrade, and R. N. Feio. 2010. Anurans in the region of the high Muriaé river, state of Minas Gerais, Brazil. Herpetol. Notes 3: 1–10.

Santana, G. G., W. L. S. Vieira, G. A. Pereira-Filho, F. R. Delfim, Y. C. C. Lima, and K. S. Vieira. 2008. Herpetofauna em um fragmento de Floresta Atlântica no Estado da Paraíba, Região Nordeste do Brasil. Biotemas 21: 75–84.

Santos, E. J. 2013b. Diversidade de anfíbios anuros em fragmentos de Floresta Estacional Semidecidual. M.S. thesis, Universidade Federal do Paraná, Curitiba.

Santos, E. M. 2011. Anfíbios anuros do Refúgio Ecológico Charles Darwin, Igarassu, Pernambuco, Brasil, pp. 125–134. In G. J. B. Moura, E. M. Santos, M. A. B. Oliveira, and M. C. C. Cabral (eds.), Herpetologia do Estado de Pernambuco. Ministério do Meio Ambiente, Brasília, Brazil.

Santos, E. M., and G. J. B. Moura. 2012. Os anfíbios da Estação Ecológica do Tapacurá, p. 235–268. In G. J. B. Moura, S. M. A. Júnior, and A. C. A. El-Deir (eds.), A biodiversidade da Estação Ecológica do Tapacurá: uma proposta de manejo e conservação. UFRPE, Recife, Brazil.

Santos, P. S. 2003. Utilização de habitats, padrões de atividade reprodutiva e fenologia larval de uma taxocenose de anuros da Mata Atlântica do sudeste do Brasil. Ph.D. dissertation, Universidade Federal de Minas Gerais, Belo Horizonte.

Santos, P. S. 2013a. Herpetofauna do corredor Sossego-Caratinga, Mata Atlântica no Sudeste do Brasil: estruturas das comunidades e influência da paisagem. Ph.D. dissertation, Universidade Federal de Minas Gerais, Belo Horizonte.

Santos, S. P. L. 2009. Diversidade e distribuição temporal de anfíbios anuros na RPPN Frei Caneca, Jaqueira, Pernambuco. B.S. thesis, Universidade Federal de Pernambuco, Recife.

Santos, T. G. S., K. Kopp, M. R. Spies, R. Trevisan, and S. Z. Cechin. 2008. Distribuição temporal e espacial de anuros em área de Pampa, Santa Maria, RS. Iheringia, Sér. Zool. 98: 244–253.

Santos, T. G., D. C. Rossa-Feres, and L. Casatti. 2007. Diversidade e distribuição espaço-temporal de anuros em região com pronunciada estação seca no sudeste do Brasil. Iheringia, Sér. Zool. 97: 37–49.

Santos, T. G., S. Iop, and S. S. Alves. 2014. Anfíbios dos Campos Sulinos: diversidade, lacunas de conhecimento, desafios para conservação e perspectivas. Herpetologia Brasileira 3: 51–59.

Santos, T. G., T. S. Vasconcelos, D. C. Rossa□Feres, and C. F. B. Haddad. 2009. Anurans of a seasonally dry tropical forest: Morro do Diabo. J. Nat. Hist. 43: 973–993.

Santos-Pereira, M., A. Candaten, D. Milani, F. B. Oliveira, J. Gardelin, and C. F. D. Rocha. 2011. Seasonal variation in the leaf-litter frog community (Amphibia: Anura) from an Atlantic Forest area in the Salto Morato Natural Reserve, southern Brazil. Zoologia 28: 755–761.

Santos-Pereira, M., D. Milani, L. F. Barata-Bittencourt, T. M. Iapp, and C. F. D. Rocha. 2016. Anuran species of the Salto Morato Nature Reserve in Paraná, southern Brazil: review of the species list. Check List 12: 1907.

São-Pedro, V. A., and R. N. Feio. 2011. Anuran species composition from Serra do Ouro Branco, southernmost Espinhaço Mountain Range, state of Minas Gerais, Brazil. CheckList 7: 671–680.

Sasso, T., C. M. Lopes, A. Valentini, T. Dejean, K. R. Zamudio, C. F. B. Haddad, and M. Martins. 2017. Environmental DNA characterization of amphibian communities in the Brazilian Atlantic forest: potential application for conservation of a rich and threatened fauna. Biol. Conserv. 215: 225–232.

Sawaya, R. J. 1999. Diversidade, densidade e distribuição altitunal da anurofauna de serapilheira da Ilha de São Sebastião, SP. M.S. thesis, Universidade de São Paulo, São Paulo.

Sawaya, R. J., O. A. V. Marques, and M. Martins. 2008. Composição e história natural das serpentes de Cerrado de Itirapina, São Paulo, sudeste do Brasil. Biota Neotrop. 8: 127–149.

Scarpellini Jr., D. G. 2007. Anfíbios anuros de remanescentes de mata e entorno na região de Botucatu, SP (Amphibia, Anura). M.S. thesis, Universidade Estadual Paulista, Botucatu.

Schiesari, L., and D. T. Corrêa. 2016. Consequences of agroindustrial sugarcane production to freshwater biodiversity. GCB Bioenergy 8: 644–657.

Schineider, J. A. P., and R. L. Teixeira. 2001. Relationship between anuran amphibians and bromeliads of the sandy coastal plain of Regência, Linhares, Espírito Santo, Brazil. Iheringia, S. Zool. 91: 41–48.

Scott Jr., N. J., and B. D. Woodward. 1994. Standard techniques for inventory and monitoring: surveys at breeding sites, pp. 118–125. In W. R. Heyer, M. A. Donnelly, R. W. Mcdiarmid, L. A. C. Hayek, and M. S. Foster (eds.), Measuring and monitoring biological diversity: standard methods for amphibians. Smithsonian Institution Press, Washington DC, EUA.

Segalla, M. V., U. Caramaschi, C. A. G. Cruz, T. Grant, C. F. B. Haddad, P. C. A. Garcia, B. V. M. Berneck, and J. Langone. 2016. Brazilian amphibians: list of species. Herpetologia Brasileira 5: 34–46.

Serafim, H., S. Ienne, P. J. P. Cicchi, and J. Jim. 2008. Anurofauna de remanescentes de floresta Atlântica do município de São José do Barreiro, Estado de São Paulo, Brasil. Biota Neotrop. 8: 69–78.

Shibatta, O. A., W. Galves, W. P. D. Carmo, I. P. Lima, E. V. Lopes, and R. A. Machado. 2009. A fauna de vertebrados do campus da Universidade Estadual de Londrina, região norte do estado do Paraná, Brasil. Semina: Ciênc. Biol. Saúde 30: 3–26.

Sierra-Ramírez, N. M. 1998. Análise comparativa entre comunidades de anfíbios anuros do Sudeste Brasileiro e uma região dos Andes Baixos da Venezuela. Ph.D. dissertation, Universidade Estadual de Campinas, Campinas.

Silva, A. O. 2014. Análise comparativa dos nichos espacial e alimentar de anuros em áreas de Caatinga e Mata Atlântica de Sergipe, Brasil. M.S. thesis, Universidade Federal de Sergipe, São Cristovão.

Silva, A. S. F. L., S. Siqueira Jr., and J. Zina. 2013. Checklist of amphibians in a transitional area between the Caatinga and the Atlantic Forest, central-southern Bahia, Brazil. Check List 9: 725–732.

Silva, D. O. F. 2011. Estrutura de comunidades de anfíbios e lagartos da Baía de Sepetiba e do Parque Estadual do Cunhambebe (RJ). M.S. thesis, Universidade Federal Rural do Rio de Janeiro, Rio de Janeiro.

Silva, H. R., A. L. G. Carvalho, and G. B. Bittencourt-Silva. 2008. Frogs of Marambaia: a naturally isolated Restinga and Atlantic Forest remnant of southeastern Brazil. Biota Neotrop. 8: 167–174.

Silva, H. R., A. L. G. Carvalho, and G. B. Bittencourt-Silva. 2011. Selecting a hiding place: anuran diversity and the use of bromeliads in a threatened coastal sand dune habitat in Brazil. Biotropica 43: 218–227.

Silva, J. S. B. 2007b. A influência do habitat em comunidades de anuros em uma área no limite sul de distribuição da Mata Atlântica: implicações no manejo e conservação. M.S. thesis, Universidade Federal do Rio Grande do Sul, Porto Alegre.

Silva, R. A. 2007a. Influência da heterogeneidade ambiental na diversidade, uso de hábitat e bioacústica de anuros de área aberta no noroeste paulista. M.S. thesis, Universidade Estadual Paulista, São José do Rio Preto.

Silva, R. G., and G. J. B. Moura. 2011. Abundância, riqueza e especificidade microambiental da anurofauna no complexo da Mata Atlântica de Aldeia - PE, pp. 135–148. In G. J. B. Moura, E. M. Santos, M. A. B. Oliveira, and M. C. C. Cabral (eds.), Herpetologia do Estado de Pernambuco, Ministério do Meio Ambiente, Brasília, Brazil.

Silvano, D. L. 1999. Padrões de distribuição espacial e temporal e potencial indicador de qualidade ambiental dos anuros (Amphibia) na região da APA São José e entorno, MG, Brasil. M.S. thesis, Universidade Federal de Minas Gerais, Belo Horizonte.

Silvano, D. L., and B. V. S. Pimenta. 2003. Diversidade e distribuição de anfíbios na Mata Atlântica do sul da Bahia. In P. I. Prado, E. C. Landau, R. T. Moura, L. P. S. Pinto, G. A. B. Fonseca, and K. Alger K. (eds.), Corredor de biodiversidade na Mata Atlântica do sul da Bahia. CD–ROM,IESB/CI/CABS/UFMG/UNICAMP, Ilhéus, Brazil.

Silvano, D. L., and M. V. Segalla. 2005. Conservação de anfíbios no Brasil. Megadiversidade 1: 79–86.

Silvano, D. L., and M. V. Segalla. 2005. Conservation of Brazilian amphibians. Conserv. Biol. 19: 653–658.

Silva-Soares, T., and P. V. Scherrer 2013. Amphibians of Parque Estadual do Forno Grande, State of Espírito Santo, Southeastern Brazil: species composition and conservation. North-West J. Zool. 9: 113–120.

Silva-Soares, T., F. Hepp, P. N. Costa, C. Luna-Dias, M. R. Gomes, A. M. P. T. Carvalho e Silva, and S. P. Carvalho e Silva. 2010. Anfíbios anuros da RPPN Campo Escoteiro Geraldo Hugo Nunes, Município de Guapimirim, Rio de Janeiro, sudeste do Brasil. Biota Neotrop. 10: 225–233.

Siqueira, C. C., D. Vrcibradic, M. Almeida-Gomes, V. A. Menezes, V. N. T. Borges-Junior, F. H. Hatano, J. A. L. Pontes, P. Goyannes-Araújo, D. M. Guedes, M. Van Sluys, and C. F. D. Rocha. 2011a. Species composition and density estimates of the anurofauna of a site within the northernmost large Atlantic Forest remnant (Parque Estadual do Desengano) in the state of Rio de Janeiro, Brazil. Biota Neotrop. 11: 131–137.

Siqueira, C. C., D. Vrcibradic, M. Almeida-Gomes, V. N. T. Borges-Junior, P. Almeida-Santos, M. Almeida-Santos, C. V. Ariani, D. M. Guedes, P. Goyannes-Araújo, T. A. Dorigo, M. Van Sluys, and C. F. D. Rocha. 2009. Density and richness of leaf litter frogs (Amphibia: Anura) of an Atlantic Rainforest area in the Serra dos Órgãos, Rio de Janeiro State, Brazil. Rev. Bras. Zool. 26: 97–102.

Siqueira, C. C., D. Vrcibradic, T. A. Dorigo, and C. F. D. Rocha. 2011b. Anurans from two high-elevation areas of Atlantic Forest in the state of Rio de Janeiro, Brazil. Zoologia 29: 457–464.

Smith, P., K. Atkinson, J. Brouard, and H. Pheasey. 2016. Reserva Natural Laguna Blanca, Departamento San Pedro: Paraguay's first important area for the conservation of amphibians and reptiles? Russ. J. Herpetol. 23: 25–34.

Soares, T. S. 2010. Análise histológica do tegumento de anfíbios anuros da Serra dos Órgãos, Município de Teresópolis, Estado do Rio de Janeiro, Sudeste do Brasil. M.S. thesis, Universidade Federal do Rio de Janeiro, Rio de Janeiro.

Stuart, S. N., J. S. Chanson, N. A. Cox, B. E. Young, A. S. L. Rodrigues, D. L. Fischman, and R. W. Waller. 2004. Status and trends of amphibian declines and extinctions worldwide. Science 306: 1783–1786.

Sullivan, B. K. 2012. Road riding, pp. 215–218. In R. W. McDiarmid, M. S. Foster, C. Guyer, J. W. Gibbons, and N. Chernoff (eds.), Reptile biodiversity: standard methods for inventory and monitoring. University of California Press, Berkeley, EUA.

Tabarelli, M., L. P. Pinto, J. M. C. Silva, M. M. Hirota, and L. C. Bedê. 2005. Desafios e oportunidades para a conservação da biodiversidade na Mata Atlântica brasileira. Megabiodiversidade 1: 132–138.

Tabarelli, M., A. V. Aguiar, M. C. Ribeiro, J. P. Metzger, and C. A. Peres. 2010. Prospects for biodiversity conservation in the Atlantic Forest: lessons from aging human-modified landscapes. Biological Conservation 143: 2328–2340.

Tacioli, A. 2012. Padrão temporal de atividade de vocalização da anurofauna de dois ambientes aquáticos em uma área de compensação ambiental, Serra de Paranapiacaba, SP. M.S. thesis, Universidade Estadual Paulista, Rio Claro.

Teixeira, M. G. 2009. Distribuição espacial e temporal de comunidade de anfíbios anuros de remanescente de mata na região de Botucatu, SP. M.S. thesis, Universidade Estadual Paulista, Botucatu.

Teixeira, R. L., D. Rödder, G. I. Almeida, A. P. Schineider, G. Zeidan, and S. Lopes. 2007b. Artzusammensetzung und jahreszeitliche Abundanzmuster in drei Anurengesellschafen an der Kuste Südost–Brasiliens. Sauria 29: 33–45.

Teixeira, R. L., P. S. M. Mili, and D. Rödder. 2006. Ecology of anurans inhabiting bromeliads in a saxicolous habitat of southeastern Brazil. Salamandra (Frankf.) 42: 155–163.

Teixeira, R. L., R. B. Ferreira, and D. Rödder. 2008. Diversity and abundance variations of anurans at a permanent pond in Suruaca's Valley, Linhares, Espirito Santo, southeastern Brazil. Amphibia 7: 20–25.

Teixeira, R. L., R. B. Ferreira, R. B. Dantas, and W. Pertel. 2007a. Diversidade anfibios anuros no entorno da Reserva Biológica Augusto Ruschi, Sudeste do Brasil, pp. 95–100. In L. A. Vieira, and A. M. Assis (eds.), Planejando paisagens sustentaveis no corredor central da Mata Atlantica uma experiência na Região Centro-Serrana do Espírito Santo. Associação de Produtores e Moradores da Area de Influência da Reserva Biologica Augusto Ruschi, Santa Teresa, Brazil.

Teixeira, R. L., R. B. Ferreira, T. Silva-Soares, M. M. Mageski, W. Pertel, D. Rödder, E. H. Barros, and J. O. Engler. 2015. Anuran community of a cocoa agroecosystem in southeastern Brazil. Salamandra (Frankf.) 51: 1–4.

Telles, F. B. S., V. A. Menezes, T. Maia-Carneiro, T. Arnt Dorigo, G. R. Winck, and C. F. D. Rocha. 2012. Anurans from the “Restinga” of Parque Natural Municipal de Grumari, state of Rio de Janeiro, southeastern Brazil. Check List 8: 1267–1273.

Thompson, M. E., Nowakowski, A. J., and Donnelly, M. A. 2016. The importance of defining focal assemblages when evaluating amphibian and reptile responses to land use. Conserv. Biol. 30: 249–258.

Toledo, G. M. 2013. Supracomunidade de helmintos associados a anfíbios: uso do hábitat, modo reprodutivo dos hospedeiros e distribuição espacial dos parasitas. M.S. thesis, Universidade Estadual Paulista, Botucatu.

Toledo, L. F., J. Zina, and C. F. B. Haddad. 2003. Distribuição espacial e temporal de uma comunidade de anfíbios anuros do município de Rio Claro, São Paulo, Brasil. Holos Environment 3: 136–149.

Tonetto, M. 2008. Avaliação do efeito da toxicidade das águas superficiais de rizicultura sobre a diversidade de anfíbios, Turvo (SC). M.S. thesis, Universidade do Extremo Sul Catarinense, Criciúma.

Tonini, J. F. R., I. S. Mendonça, A. B. Coutinho, and J. L. Gasparini. 2011. Anurans from Costa Bela, state of Espírito Santo, southeastern Brazil: inventory at an urban area and the re-discovery of Allobates in the state. Herpetol. Notes 4: 435–444.

Tonini, J. F. R., L. M. Carão, I. S. Pinto, J. L. Gasparini, Y. L. R. Leite, and L. P. Costa. 2010. Non-volant tetrapods from Reserva Biológica de Duas Bocas, State of Espírito Santo, Southeastern Brazil. Biota Neotrop. 10: 339–351.

Torres, P. F. 2012. Uso de ambientes por anfíbios anuros em seis parques urbanos de Belo Horizonte, Minas Gerais. M.S. thesis, Universidade Federal de Minas Gerais, Belo Horizonte.

Trevine, V., M. C. Forlani, C. F. B. Haddad, and H. Zaher. 2014. Herpetofauna of Paranapiacaba: expanding our knowledge on a historical region in the Atlantic forest of southeastern Brazil. Zoologia 31: 126–146.

Uetanabaro, M., F. L. Souza, P. L. Filho, A. F. Beda, and R. A. Brandão. 2007. Anfíbios e répteis do Parque Nacional da Serra da Bodoquena, Mato Grosso do Sul, Brasil. Biota Neotrop. 7: 279–289.

Vaira, M., M. Akmentins, M. Attademo, D. Baldo, D. Barrasso, S. Barrionuevo, N. Basso, B. Blotto, S. Cairo, R. Cajade, J. Céspedez, V. Corbalán, P. Chilote, M. Duré, C. Falcione, D. Ferraro, F. R. Gutierrez, M. R. Ingaramo, C. Junges, R. Lajmanovich, J. N. Lescano, F. Marangoni, L. Martinazzo, R. Marti, L. Moreno, G. S. Natale, J. M. P. Iglesias, P. Peltzer, L. Quiroga, S. Rosset, E. Sanabria, L. Sanchez, E. Schaefer, C. Úbeda, and V. Zaracho. 2012. Categorización del estado de conservación de los anfibios de la República Argentina. Cuad. herpetol. 26: 131–159.

Valdujo, P. H. 2011. Diversidade e distribuição de anfíbios no Cerrado: o papel dos fatores históricos e dos gradientes ambientais. Ph.D. dissertation, Universidade de São Paulo, São Paulo.

Valdujo, P. H., R. S. Recoder, M. M. Vasconcellos, and A. S. Portella. 2009. Amphibia, Anura, São Desidério, western Bahia uplands, northeastern Brazil. Check List 5: 903–911.

Valencia-Aguilar, A., L. F. Toledo, M. V. C. Vital, and T. Mott. 2016. Seasonality, environmental factors, and host behavior linked to disease risk in stream-dwelling tadpoles. Herpetologica 72: 98–106.

Van Sluys, M., C. D. F. Rocha, F. H. Hatano, L. Boquimpani-Freitas, and R. V. Marra. 2004. Anfíbios da restinga de Jurubatiba: composição e história natural, pp. 165–178. In C. F. D. Rocha, F. R. Scarano, and F. A. Esteves (eds.), Pesquisas de longa duração na Restinga de Jurubatiba: ecologia, história natural e conservação. RiMa, São Carlos, Brazil.

Van Sluys, M., D. Vrcibradic, M. A. S. Alves, H. G. Bergallo, and C. F. D. Rocha. 2007. Ecological parameters of the leaf-litter frog community of an Atlantic Rainforest area at Ilha Grande, Rio de Janeiro State, Brazil. Austral Ecol. 32: 254–260.

Vancine, M. H. 2015. Efeito da fragmentação sobre a persistência de anfíbios anuros (Amphibia: Anura) na Mata Atlântica. B.S. thesis, Universidade Estatual Paulista, Rio Claro.

Vasconcelos, T. S., and D. C. Rossa-Feres. 2005. Diversidade, distribuição espacial e temporal de anfíbios anuros (Amphibia, Anura) na região noroeste do estado de São Paulo, Brasil. Biota Neotrop. 5: 1–14.

Vasconcelos, T. S., T. G. Santos, C. F. B. Haddad, and D. C. Rossa-Feres. 2010. Climatic variables and altitude as predictors of anuran species richness and number of reproductive modes in Brazil. J. Trop. Ecol. 26: 423–432.

Verdade, V. K., M. T. Rodrigues, and D. Pavan. 2009. Anfíbios anuros da região da Estação Biológica do Alto da Serra de Paranapiacaba, pp. 579–604. In M. I. M. S. Lopes, M. Kirizawa, and M. M. R. F. Melo (eds.), Patrimônio da Reserva Biológica do Alto da Serra de Paranapiacaba: a antiga estação biológica do Alto da Serra. Editora Secretaria do Meio Ambiente do Estado de São Paulo, São Paulo, Brazil.

Vilela, V. M. F. N. 2012. Anfíbios anuros em áreas em processo de restauração florestal após mineração de bauxita, Poços de Caldas-MG. M.S. thesis, Universidade de São Paulo, Escola Superior de Agricultura "Luiz de Queiroz", Piracicaba.

Vilela, V. M. F. N., R. A. Brassaloti, and J. Bertoluci. 2011. Anurofauna da floresta de restinga do Parque Estadual da Ilha do Cardoso, Sudeste do Brasil: composição de espécies e uso de sítios reprodutivos. Biota Neotrop. 11: 83–93.

Vrcibradic, D., C. F. D. Rocha, M. C. Kiefer, F. H. Hatano, A. F. Fontes, M. Almeida-Gomes, C. C. Siqueira, J. A. L. Pontes, V. N. T. Borges-Junior, L. O. Gil, T, Klaion, E, C. N. Rubião, and M. Van Sluys. 2011. Herpetofauna, Estação Ecológica Estadual do Paraíso, state of Rio de Janeiro, southeastern Brazil. Check List 7: 245–249.

Wachlevski, M., and C. F. D. Rocha. 2010. Amphibia, Anura, restinga of Baixada do Maciambu, municipality of Palhoça, state of Santa Catarina, southern Brazil. Check List 6: 602–604.

Wachlevski, M., L. K. Erdtmann, and P. C. A. Garcia. 2014. Anfíbios anuros em uma área de Mata Atlântica da Serra do Tabuleiro, Santa Catarina. Biotemas, 27: 97–107.

Wake, D. B., and V. T. Vredenburg. 2008. Are we in the midst of the sixth mass extinction? A view from the world of amphibians. PNAS 105: 11466–11473.

Weiler, A., K. Nuñez, K. Airaldi, E. Lavilla, S. Peris, and D. Baldo. 2013. Anfibios del Paraguay. Facultad de Ciencias Exactas y Naturales, Universidad Nacional de Asunción. Universidad de Salamanca, San Lorenzo, Paraguay.

Wells, K. D. 2007. The ecology and behavior of amphibians. University of Chicago Press, Chicago, EUA.

Whiles, M. R., K. R. Lips, C. M. Pringle, S. S. Kilham, R. J. Bixby, R. Brenes, S. Connelly, J. C. Colon-Gaud, M. Hunte-Brown, A. D. Huryn, C. Montgomery, and S. Peterson. 2006. The effects of amphibian population declines on the structure and function of Neotropical stream ecosystems. Frontiers in Ecology and the Environment 4: 27–34.

Wickham, H. 2016. ggplot2: elegant graphics for data analysis, 2nd ed. Springer-Verlag New York, 2009.

Wood, K. A., E. O. Lavilla, and B. R. Garcete-Barrett. 2013. Anuros de la Reserva de Recursos Manejados Ybyturuzú. Un enfoque sobre su estado de conservación. Rep. cient. FACEN 4: 21–33.

Xavier, A. L., and M. F. Napoli. 2011. Contribution of environmental variables to anuran community structure in the Caatinga Domain of Brazil. Phyllomedusa 10: 45–64.

Xavier, A. L., T. B. Guedes, and M. F. Napoli. 2015. Biogeography of anurans from the poorly known and threatened coastal sandplains of eastern Brazil. PLoS ONE 10: e0128268.

Yamamoto, M., and J. Bertoluci. 2013. Anfíbios e anuros em áreas de floresta plantada no Vale do Paraíba, Estado de São Paulo: uma contribuição para a conservação da Biodiversidade. 3i Editora, Belo Horizonte, Brazil.

Yanzen, R., and T. R. N. Costa. 2014. Anurofauna, pp. 236–244. In A. M. Gealh, and M. S. Melo (eds.), Rio São João, Carambeí-PR: fonte de vida, cuidados devidos. Editora UEPG, Ponta Grossa, Brazil.

Young, B. E., K. R. Lips, J. K. Reaser, R. Ibáñez, A. W. Salas, J. R. Cedeño, L. A. Coloma, S. Ron, E. La Marca, J. R. Meyer, A. Muñoz, F. Bolaños, G. Chaves, and D. Romo. 2001. Population declines and priorities for amphibian conservation in Latin America. Conserv. Biol. 15: 1213–1223.

Zaher, H., E. Aguiar, and J. P. Pombal Júnior. 2005. *Paratelmatobius gaigeae* (Cochran 1938) re-discovered (Amphibia, Anura, Leptodactylidae). Arq. Mus. Nac. 63: 321–328.

Zamudio, K. R., R. C. Bell, R. C. Nali, C. F. B. Haddad, and C. P. A. Prado. 2016. Polyandry, predation, and the evolution of frog reproductive modes. Am. Nat. 188: 41–61.

Zanella, N., A. Paula, S. A. Guaragni, and L. S. Machado. 2013. Herpetofauna do Parque Natural Municipal de Sertão, Rio Grande do Sul, Brasil. Biota Neotrop. 13: 290–298.

Zank, C., M. D. Freire, and P. Colombo. 2013. Anfíbios, 134–137. In D. Castro. (eds.), Atlas ambiental da bacia hidrográfica do rio Tramandaí. Via Sapiens, Porto Alegre, Brazil.

Zina, J., C. P. A. Prado, C. A. Brasileiro, and C. F. B. Haddad. 2012. Anurans of the sandy coastal plains of the Lagamar Paulista, state of São Paulo, Brazil. Biota Neotrop. 12: 251–260.

Zina, J., J. Ennser, S. C. P. Pinheiro, C. F. B. Haddad, and L. F. Toledo. 2007. Taxocenose de anuros de uma mata semidecídua do interior do Estado de São Paulo e comparações com outras taxocenoses do Estado, sudeste do Brasil. Biota Neotrop. 7: 49–58.

Zocca, C., J. F. R. Tonini, and R. B. Ferreira. 2014. Uso do espaço por anuros em ambiente urbano de Santa Teresa, Espírito Santo. Bol. Mus. Biol. Mello Leitão (N. Sér.) 35: 105–117.