



## Species composition and geographic distribution of amphibians in the Brazilian semi-arid Caatinga region

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### ABSTRACT

Understanding species' spatial distributions in megadiverse regions, such as the Neotropics, has fascinated researchers since the first naturalists of the 19th century. Geographic distributions of many species are poorly known, a problem known as the Wallacean deficit, which constitutes a huge bottleneck for effective conservation planning. Intending to reduce the Wallacean deficit for amphibians inhabiting the Caatinga, we conducted a review of primary research and presented an updated compilation of the geographic distribution of the amphibian species in the Caatinga. For the first time, we provided detailed maps for all amphibians known to occur in the Caatinga and descriptions of their geographic distributions and conservation status. Furthermore, we provided data on distribution patterns of species richness, sampling gaps, and levels of endemism. An amphibian database for the Caatinga was created through the direct analysis of 30,981 occurrence records. We registered 119 amphibian species for the Caatinga, belonging to 18 families and 37 genera, out of which 22 species are strictly endemic (16.10%). The richest family was Hylidae (51 species, 43.2%), followed by Leptodactylidae (31 species, 25.4%).

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## Introduction

Understanding the spatial distribution of species in megadiverse regions such as the Neotropics has fascinated naturalists since the 19th century (Wallace 1852). There is a consensus that current species ranges resulted from interactions between historical contingencies and ecological factors (Lomolino et al. 2005). Nevertheless, obtaining accurate information about species occurrences is imperative to unravel the ecological and evolutionary dimensions intrinsic to each species, but such large-scale knowledge is often incipient. This gap, known as the Wallacean deficit, hampers the achievement of relevant guidelines for effective biodiversity conservation (Whittaker et al. 2005), is especially problematic in the Neotropics (Antonelli et al. 2018), and even more so in neglected areas such as the Brazilian semiarid region included in the Caatinga Region (Guedes et al. 2014).

The Caatinga is an ecological region restricted to Brazil. It contains the largest continuous core of seasonally dry tropical forests in South America (STDF), covering an area of approximately 11% of the Brazilian territory (Pennington et al. 2000; Ab'Sáber 2003). Its general landscape comprises a mosaic of xerophytic and deciduous vegetation, consisting mainly of low trees and profusely branched shrubs, often with thorns or spikes, with small leaves, interspersed with succulent plants such as terrestrial bromeliads and cacti (Fernandes and Queiroz 2018). There are also rain-forest, cerrado, and *campos rupestres* formations in highland areas, and highland forests known as Brejos-de-Altitude (Andrade-Lima 1982; Ab'Sáber 2003; Pôrto et al. 2004), which are wet enclaves found at higher altitudes (above 500 m a.s.l.) that experience orographic rainfall and milder climates than surrounding

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areas (Ab'Sáber 2003). In addition, they present communities phylogenetically related to the Amazon and/or Atlantic rainforests, often with a pool of species differing from those found in the surrounding semiarid Caatinga (Santos et al. 2007; Loebmann and Haddad 2010; Roberto and Loebmann 2016; Araújo et al. 2022).

The Caatinga's biota is the result of complex evolutionary processes, with different sources of migrating species, local diversification, and extinction modeled by climatic cycles (Fernandes et al. 2022). Increased aridity during the Pleistocene led to conspicuous demographic expansion for many species (Thomé et al. 2016; Gehara et al. 2017), and recent genetic studies have highlighted the importance of these ancient diversification processes (Werneck et al. 2012; Lanna et al. 2018), niche differentiation (Fonseca et al. 2018), climate (Oliveira et al. 2018b; Thomé et al. 2021), bottlenecks (Magalhaes et al. 2014), founding effects (Oliveira et al. 2015), the role of rivers as barriers (Werneck et al. 2015; Coelho et al. 2022), and the former connections between the Amazon and the Atlantic Forest (Ledo and Colli 2017; Coelho et al. 2022). However, despite the increasing understanding of the dynamics that influence the evolution of the Caatinga biota, current patterns of biodiversity distribution are just beginning to be understood. For example, most amphibian species endemic to the Caatinga Region have only been described in the last 20 years (Garda et al. 2018).

Amphibians are the most threatened terrestrial vertebrates on the planet, with 34.8% of species under some degree of threat (IUCN 2023). Currently, 8,463 species of amphibians are known (Frost 2025), with Brazil being a prominent country with the greatest diversity of amphibians in the world, reaching more than 1,000 species (Segalla et al. 2021). The latest review of amphibians from the Caatinga Region recognized 98 species (Garda et al. 2017), but recent studies indicated that these numbers are underestimated because new amphibian species continue to be described, such as *Pristimantis relictus* (Roberto et al. 2022) and *Proceratophrys velhochico* (Mângia et al. 2022).

So far, there has yet to be a synthesis of the diversity and biogeography of the amphibian fauna in arid and semiarid regions of the world. Here, we present a synthesis from an updated database we built on the distribution of the Caatinga amphibians. We present a species list and up-to-date distribution maps for each species. We also summarize the current knowledge on species richness and sampling gaps with maps by municipalities of the Caatinga. Our research is in synergy with the Action Plan for the Conservation of Brazilian Amphibians, in which the first goal is to build

robust georeferenced databases for the entire country (Verdade et al. 2012). Such data constitutes crucial support for ecological and evolutionary studies, being a powerful tool in the decision-making processes selecting priority areas for conservation with methodologies such as systematic conservation planning (Margules and Pressey 2000).

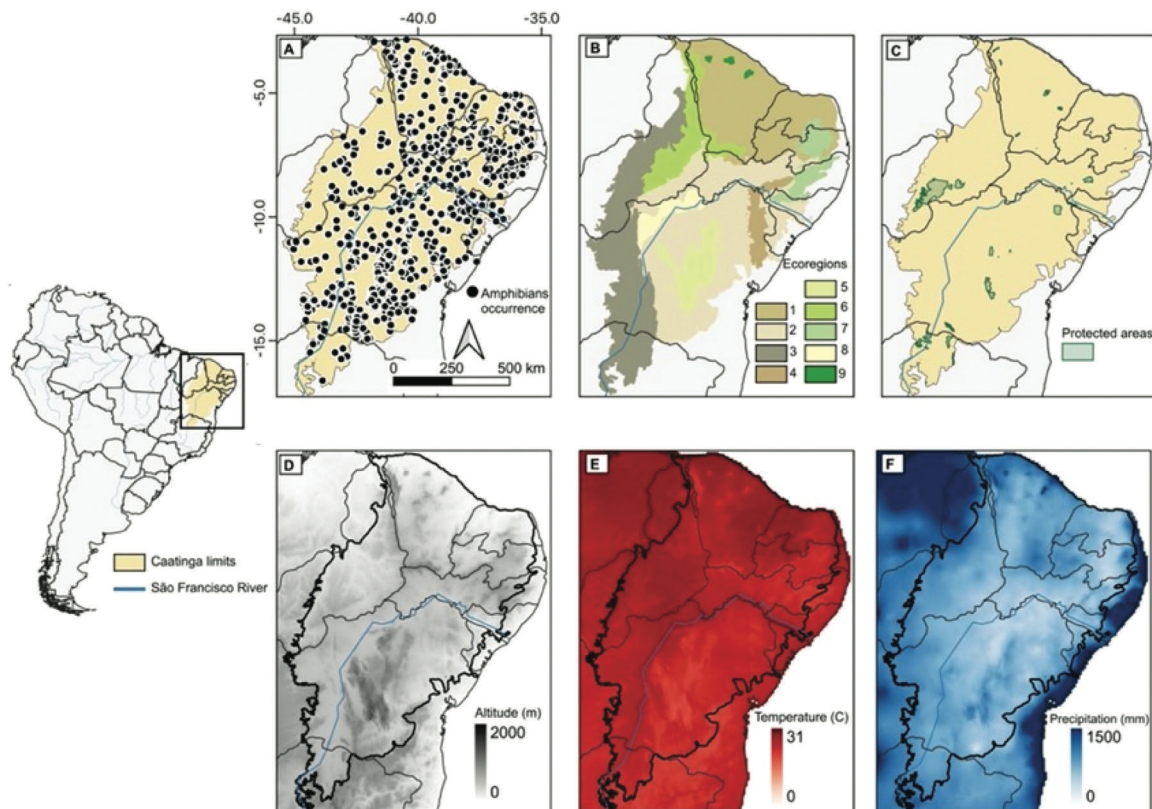
## Material and methods

### Study area

The Caatinga (Figure 1A) is a heterogeneous ecological region that can be divided into nine ecoregions (Figure 1B) and includes the largest continuous block of seasonally dry tropical forests (SDTFs) in the Americas, covering almost all of northeastern Brazil (Pennington et al. 2000; de Queiroz et al. 2017). According to an updated delimitation of the Caatinga's boundaries (Silva JMC et al. 2017), the Caatinga occupies an area of 912,529 km<sup>2</sup>, which corresponds to 10.7% of the Brazilian territory (Silva JMC et al. 2017), but only 1.75% of its area is protected by strict use protected areas and 7% by sustainable use protected areas (Figure 1C; Antongiovanni et al. 2018).

A mosaic of different vegetation types evolved according to soil types and water availability found in the Caatinga (Antongiovanni et al. 2018). The region is mainly in lowlands, characterized by its seasonality, high levels of solar radiation, high average annual temperature, low relative humidity rates, and sparse and unpredictable rainfall (Figure 1D-F) (Ab'Sáber 1974; Prado 2003; Antongiovanni et al. 2018). Approximately half of the region receives less than 750 mm of annual precipitation and is largely drained by intermittent and seasonal rivers, conditions that confer high environmental heterogeneity (Ab'Sáber 1974; Velloso et al. 2002; Prado 2003). The most arid zones lie in the core of the Caatinga, while western subregions are influenced by the Cerrado and eastern ones by the Atlantic Forest (Antongiovanni et al. 2018). To the south, the Chapada Diamantina plateau features an important center of endemism, representing the northern portion of the Brazilian Espinhaço range (Silva and Souza 2018).

The relief varies among geological formations, with lower altitude areas such as the 'Depressão Sertaneja Setentrional' and elevated regions where fragments of mesic forests known as 'Brejos de Altitude' are often found (Velloso et al. 2002; Prado 2003). These rainforest enclaves are found above 600 m altitude (Pôrto et al. 2004) and share species with SDTFs and the neighboring Atlantic and Amazon rainforests.



**Figure 1.** View of the Caatinga region, northeastern Brazil. A) outline of the Caatinga boundaries with occurrence points for all amphibian species recorded in the present study. B) the nine ecoregions of the Caatinga (1-*Depressão Sertaneja Setentrional*, 2-*Depressão Sertaneja Meridional*, 3-*São Francisco-Gurgéia*, 4-*Raso da Catarina*, 5-*Complexo Chapada Diamantina*, 6-*Complexo Ibiapaba-Araripe*, 7-*Planalto da Borborema*, 8-*Dunas do São Francisco*, 9-*Brejos*). C) protected areas. D) altitudinal profile. E) mean of annual temperature profile. F) mean annual precipitation profile. Caatinga boundaries follow J. M. C. Silva et al. (2017), ecoregions follow Velloso et al. (2002), protected areas limits follow WWF (2023), environmental profiles follow Fick and Hijmans (2017). Coordinate reference system adopted was EPSG 4326.

Although some studies historically did not consider humid enclaves as part of the Caatinga (equating Caatinga to SDTFs), we here consider the official definition provided by the Brazilian Institute of Geography and Statistics, IBGE (IBGE 2019), as well as the argument that the Caatinga is a system, where not just SDTFs occur (e.g. Velloso et al. 2002; Camardelli and Napoli 2012; Guedes et al. 2014; Silva and Souza 2018; Araújo et al. 2022). The geographical boundaries of the Caatinga considered in this study are those from J. M. C. Silva et al. (2017) (Figure 1).

#### Data sources

Our primary data were obtained from point occurrences obtained from examination of vouchered specimens deposited in 53 biological collections housed in public and private research institutions (Appendix A).

We critically examined each specimen's record before including it in the database concerning its taxonomic identification and geographic accuracy. We validated the species identification by the following combination of data: known geographic distribution limits for the species, available photographs, analysis of the voucher specimen, information acquired by consulting collectors or the collection curator, and/or the available data on its external morphology, color patterns of external body surfaces, advertisement call, molecular data (e.g. molecular phylogenies), and ecological data. The complete database is available in Appendix B.

We complemented the database by incorporating information from the scientific literature, considering inventory and taxonomic articles, ecological studies, notes on natural history and geographic distribution, and books to represent the amphibian species of the Caatinga and their geographic distributions

(Appendix B). The research was standardized on online scientific databases: ISI Web of Knowledge portal, CAPES journals portal, Web of Science, and Google Scholar, using the following combination of keywords: ('amphibia' AND 'anura' OR 'name of species' AND 'name of the state' OR 'Caatinga'), published until March 2022. The publications were accessed, and the content of interest (list of species and geographic distribution) was compiled based on the information provided in the publications.

The final database only included species records tied to voucher specimens to minimize species identification errors. Furthermore, these records should have collecting sites (at least at the municipality level) available in online databases or biological collections where specimens were deposited. Without this information, we consulted the collection curators, collectors, or authors of published articles. We considered a species present in the Caatinga if at least one specimen was recorded within its boundaries. A species was considered endemic to the Caatinga if its geographic distribution was restricted within the Caatinga's limits adopted here (sensu Silva JMC et al. 2017).

### Taxonomic choices

To minimize species misidentification, we followed the current nomenclature proposed by Frost (2025). Spatial occurrence data are subject to taxonomic uncertainty inherent to the publication date and the difficulties in identifying species based only on preserved specimens (Neves et al. 2020). To avoid problems related to possible taxonomic bias, we excluded from the analyses species cited as undetermined in the original publications, recorded as 'sp.' (unidentified species), 'gr.' (grege), 'cf.' (confer), and 'aff.' (affinis) (Papavero 1994). We consider taxonomic changes and geographic additions to our species list by December 2022.

### Mapping

We obtained geographic coordinates from each examined specimens through direct consultation locality data associated to each voucher and available in the collection book record, from scientific publications, gazetteers, Google Earth (<https://earth.google.com/web/>), or by inspecting georeferenced layers during mapping. Only in the absence of precise or approximate information, we standardized the use the centroid of the municipality where the specimen was collected.

We constructed geographical distribution maps using the software QGIS v3.34.2Prizren and the Coordinate Reference System adopted was EPSG

4326. Altitude ranges, mean of annual temperature and mean of annual precipitation were determined from data provided by Fick and Hijmans (2017) in raster format. To increase geographic accuracy, we seek outliers individually by projecting the coordinates and visually inspecting distant occurrence points for all amphibian species included in our analysis.

## Results

We registered 119 amphibian species distributed in two orders (accounts below and in Table 1), 18 families and 37 genera, of which 115 species were anurans (96.6%), and four species were caecilians (3.4%). The analytical process considered 30,699 amphibian point occurrences within limits established for the Caatinga. The richest families were Hylidae, 51 species (43.2%), and Leptodactylidae, 31 species (25.4%). The Cycloramphidae and Craugastoridae families had only one species each.

Most municipalities in the Caatinga (841 out of 1227 municipalities; 68.5%) have no confirmed records of amphibian species (Figure 2). The municipalities with the highest number of records are Aiuaba in the state of Ceará (2,616), Poço Redondo in the state of Sergipe (2,096), Cabaceiras in the state of Paraíba (1,973), and Macaíba in the state of Rio Grande do Norte (1,233). Only 12 municipalities (~1%) have more than 500 records. The taxonomic richness was higher in the municipalities of Macaíba (40 species), Maranguape in the state of Ceará (35 species), and Palmeiras, Caetitê, and Mucugê in the state of Bahia (39, 37, and 34 species, respectively; Figure 2). All these municipalities lie in altitude areas (Maranguape, Palmeiras, Caetitê, and Mucugê) or transition zones with neighboring humid forests (Macaíba).

### Species accounts

All species are illustrated with photographs in Figures 3, 4, 5, 6, 7, 8, 9. Individual maps with species distributions within the Caatinga region are found in Appendix B.

#### Order: Anura

#### Family: Bufonidae Gray

#### *Rhinella casconi* Roberto, Brito & Thomé

*Type locality.* Guaramiranga municipality, Ceará state, Brazil (Roberto et al. 2014).

**Table 1.** Amphibians of the Caatinga region, northeastern Brazil. Average temperature, precipitation, and altitude values for the localities where animals were recorded are shown along with ranges. Conservation status is shown for both the red book for Brazilian fauna (ICMBio) and the International Union for Nature conservation (IUCN). Categories: data deficient (dd), least concern (LC), near threatened (nt), vulnerable (VU), endangered (en), critically endangered (cr). Endemic species are marked with \*. Distribution: defines the dominant distribution pattern for each species; am (Amazon), W (widespread), Ce (cerrado), Ca (Caatinga), E (endemic of Caatinga region), AF (Atlantic forest), Ca/Ce (Caatinga-cerrado), AF-Ca (Atlantic forest/Caatinga).

Species	Temperature (°C)	Precipitation (mm)	Altitude (m)	ICMBio	IUCN	Distribution
	Max – Min (Med)	Max – Min (Med)	Max – Min (Med)			
<b>Anura</b>						
<b>Bufonidae</b>						
<i>*Rhinella casconi</i>	24.9–21.2 (21.7)	1632–1372 (1600)	831–483 (788)	CR	EN	E
<i>Rhinella crucifer</i>	23.5–18.8 (21.1)	1161–599 (949)	1380–257 (730)	LC	LC	AF
<i>Rhinella diptycha</i>	27.6–19.4 (24.9)	1372–378 (661)	1107–12 (394)	LC	LC	W
<i>Rhinella granulosa</i>	27.8–19.1 (24.2)	1509–378 (766)	1107–3 (403)	LC	LC	Ca
<i>Rhinella margaritifera</i>	25.4–24.9 (25.4)	1372–962 (979)	483–149 (163)	LC	LC	AM
<i>Rhinella mirandaribeiroi</i>	24.2–23.6 (24.0)	960–935 (946)	629–543 (576)	LC	LC	Ce
<i>Rhinella rubescens</i>	24.7–18.5 (20.5)	1092–534 (899)	1309–475 (987)	LC	LC	Ce
<b>Ceratophryidae</b>						
<i>Ceratophrys aurita</i>	23.6–19.7 (22.7)	830–613 (738)	1057–233 (537)	LC	LC	AF
<i>Ceratophrys joazeirensis</i>	25.9–21.4 (25.1)	1216–501 (608)	745–48 (349)	LC	LC	E
<b>Craugastoridae</b>						
<i>*Haddadus aramunha</i>	23.0–18.5 (20.3)	1104–721 (928)	1336–523 (964)	LC	VU	E
<b>Cycloramphidae</b>						
<i>Thoropa megalotympanum</i>	20.9	884	834	LC	LC	Ce
<b>Eleutherodactylidae</b>						
<i>*Adelophryne baturitensis</i>	24.9–21.2 (22.6)	1632–573 (1327)	855–188 (672)	LC	LC	E
<i>*Adelophryne maranguapensis</i>	26.3–24.9 (25.8)	1372–1320 (1339)	483–18 (186)	CR	CR	E
<i>*Adelophryne nordestina</i>	24.2–23.2 (23.7)	601–453 (527)	781–149 (465)	—	—	AF
<b>Hylidae</b>						
<i>Boana albomarginata</i>	26.5–18.5 (23.1)	1305–73 (1064)	1309–32 (377)	LC	LC	AF
<i>Boana albopunctata</i>	24.8–18.5 (20.3)	1104–534 (951)	1441–443 (1029)	LC	LC	Ce
<i>Boana crepitans</i>	27.0–18.7 (22.8)	1161–416 (694)	1312–152 (569)	LC	LC	W
<i>Boana faber</i>	24.3–18.7 (21.4)	1161–476 (821)	1312–236 (710)	LC	LC	AF
<i>Boana lundii</i>	21.0–20.6 (20.7)	888–663 (738)	840–838 (839)	LC	LC	Ce
<i>Boana multifasciata</i>	26.2–21.7 (22.8)	1343–824 (1134)	855–188 (605)	LC	LC	Ce
<i>Boana punctata</i>	28.2	9	1316–449 (882)	LC	LC	AM
<i>Boana raniceps</i>	27.6–21.2 (24.8)	1632–378 (817)	947–10 (353)	LC	LC	W
<i>Bokermannohyla alvarengai</i>	20.9–18.5 (20.0)	1073–884 (962)	1321–834 (1016)	LC	LC	Ce
<i>Bokermannohyla circumdata</i>	21.2	805	926	LC	LC	AF
<i>*Bokermannohyla diamantina</i>	24.0–17.8 (18.9)	1085–756 (1050)	1441–514 (1365)	LC	LC	E
<i>*Bokermannohyla flavopicta</i>	21.1–17.8 (19.2)	1092–869 (997)	1603–830 (1292)	LC	NT	E
<i>*Bokermannohyla itapoty</i>	23.0–18.7 (21.0)	1104–754 (1005)	1191–450 (801)	LC	LC	E
<i>*Bokermannohyla juiju</i>	19.3	941	1019	DD	EN	E
<i>*Bokermannohyla oxente</i>	24.7–18.5 (20.9)	1104–534 (884)	1683–367 (896)	LC	LC	E
<i>Corythomantis botoaque</i>	23.6–20.0 (20.2)	918–613 (901)	1107–395 (1067)	—	—	Ca/Ce
<i>Corythomantis greeningi</i>	27.6–18.7 (23.9)	1383–416 (801)	1312–28 (507)	LC	LC	Ca/Ce
<i>Dendropsophus branneri</i>	25.8–19.1 (23.2)	1305–471 (1019)	1116–32 (420)	LC	LC	AF
<i>Dendropsophus minusculus</i>	26.4–21.2 (24.9)	1632–874 (1294)	931–99 (208)	LC	LC	AM
<i>Dendropsophus minutus</i>	26.2–18.5 (22.9)	1372–461 (1013)	1441–32 (596)	LC	LC	W
<i>Dendropsophus nanus</i>	27.6–19.5 (25.4)	1372–378 (740)	1169–12 (400)	LC	LC	W
<i>Dendropsophus novaisi</i>	25.2–19.5 (21.6)	995–514 (619)	1025–250 (570)	LC	LC	AF/Ca
<i>Dendropsophus oliveirai</i>	25.7–19.5 (22.8)	1305–495 (931)	1057–32 (486)	LC	LC	AF/Ca
<i>Dendropsophus rubicundulus</i>	27.5–22.5 (25.8)	1320–813 (930)	643–70 (274)	LC	LC	Ce
<i>Dendropsophus soaresi</i>	26.6–21.3 (24.1)	1372–416 (736)	896–32 (438)	LC	LC	AF/Ca
<i>Dendropsophus tapacurensis</i>	24.9–22.8 (24.2)	1372–1370 (1371)	700–483 (555)	—	DD	AF
<i>Hylomantis aspera</i>	23.2	989	291	LC	LC	AF
<i>Hylomantis granulosa</i>	20.6	689	727	LC	LC	AF
<i>Julianus camposseabrai</i>	24.7–20.2 (22.2)	861–401 (708)	877–317 (608)	LC	LC	AF/Ca
<i>*Nyctimantis galeata</i>	20.1–20.1 (20.1)	770–724 (762)	1031–901 (983)	LC	EN	E
<i>Phyllodytes acuminatus</i>	21.7–21.4 (21.7)	790–759 (789)	884–710 (764)	LC	LC	AF
<i>Phyllodytes gyrinaethes</i>	23.23	601	601	—	EN	AF
<i>Phyllomedusa bahiana</i>	25.2–18.7 (21.7)	1104–515 (821)	1312–152 (724)	LC	LC	AF
<i>Pithecopus azureus</i>	24.8–24.0 (24.1)	1026–995 (998)	495–456 (491)	LC	LC	Ce
<i>Pithecopus gonzagai</i>	25.7–20.1 (22.8)	1372–416 (828)	1008–32 (531)	LC	LC	AF/Ca
<i>Pithecopus megacephalus</i>	21.2–20.4 (20.8)	897–832 (865)	1058–1005 (1032)	LC	LC	Ce
<i>Pithecopus nordestinus</i>	27.6–19.5 (24.1)	1571–378 (749)	1065–3 (404)	LC	LC	AF/Ca
<i>Pseudis bolbodactyla</i>	25.6–24.7 (24.8)	814–787 (800)	450–430 (446)	LC	LC	Ce
<i>Scinax auratus</i>	25.8–20.1 (22.0)	1161–483 (888)	997–65 (497)	LC	LC	AF
<i>Scinax eurydice</i>	24.5–19.5 (20.9)	1006–613 (746)	1116–317 (710)	LC	LC	AF
<i>Scinax fuscumarginatus</i>	26.6–20.0 (23.7)	1305–628 (1010)	1107–21 (467)	LC	LC	W
<i>*Scinax montivagus</i>	22.4–18.5 (20.6)	1073–610 (825)	1321–692 (934)	LC	LC	E
<i>Scinax nebulosus</i>	26.8–21.7 (23.3)	1343–573 (1199)	855–25 (387)	LC	LC	W

(Continued)

Table 1. (Continued).

Species	Temperature (°C)	Precipitation (mm)	Altitude (m)	ICMBio	IUCN	Distribution
	Max – Min (Med)	Max – Min (Med)	Max – Min (Med)			
<i>Scinax pachycrus</i>	25.7–19.5 (23.3)	1305–416 (602)	997–32 (425)	LC	LC	Ca
<i>Scinax tropicalia</i>	24.9–21.2 (22.5)	1632–1131 (1480)	831–483 (705)	NE	NE	AF/Ca
<i>Scinax x-signatus</i>	27.6–17.8 (24.1)	1632–378 (655)	1603–14 (385)	LC	LC	AF/Ca
<i>Trachycephalus atlas</i>	25.4–19.7 (23.0)	1026–515 (711)	1099–190 (560)	LC	LC	AF/Ca
<i>Trachycephalus mambaiensis</i>	24.6–24.6 (24.6)	1005–1005 (1005)	463–463 (463)	LC	LC	Ce
<i>Trachycephalus nigromaculatus</i>	24.8–20.0 (23.1)	1026–530 (814)	1036–262 (519)	LC	LC	AF
<i>Trachycephalus typhonius</i>	25.8–21.2 (23.7)	1632–709 (1137)	855–188 (533)	LC	LC	Ce
<i>Xenohyla eugenioi</i>	24.1–22.1 (22.8)	832–672 (725)	409–225 (348)	LC	LC	AF/Ca
<b>Hylodidae</b>						
<i>Crossodactylus trachystomus</i>	22.6–20.7 (22.2)	922–886 (895)	979–547 (653)	LC	NT	Ce
<b>Leptodactylidae</b>						
<i>Adenomera hylaedactyla</i>	26.4–21.2 (23.8)	1372–741 (1022)	840–25 (551)	LC	LC	W
<i>Adenomera juikitam</i>	26.7–23.5 (25.1)	794–29 (411)	794–27 (410)	LC	LC	Ce
<i>Leptodactylus caatingae</i>	26.5–21.1 (24.8)	1327–378 (779)	896–19 (344)	LC	LC	Ca
<i>Leptodactylus fuscus</i>	27.6–18.5 (24.5)	1492–378 (810)	1321–23 (396)	LC	LC	W
<i>Leptodactylus latrans</i>	26.7–19.0 (23.8)	1161–515 (951)	1309–14 (369)	LC	LC	AF
<i>Leptodactylus luctator</i>	24.2–19.0 (19.6)	1092–830 (1046)	1336–543 (1197)	LC	LC	W
<i>Leptodactylus macrosternum</i>	27.6–18.7 (24.4)	1372–378 (711)	1312–3 (444)	LC	LC	W
<i>Leptodactylus mystaceus</i>	26.6–18.7 (24.0)	1632–426 (1063)	1312–19 (406)	LC	LC	W
<i>Leptodactylus mystacinus</i>	23.1–18.7 (21.2)	1343–622 (973)	1312–526 (861)	LC	LC	W
<i>Leptodactylus natalensis</i>	25.7–20.7 (23.0)	1632–674 (1099)	831–32 (385)	LC	LC	AF
* <i>Leptodactylus oreomantis</i>	22.0–18.5 (20.0)	1104–617 (928)	1683–597 (1039)	LC	LC	E
<i>Leptodactylus payaya</i>	23.8–18.7 (22.1)	1104–651 (821)	1312–361 (692)	LC	LC	AF/Ca
<i>Leptodactylus podicipinus</i>	26.4–24.2 (25.3)	1026–378 (692)	493–288 (406)	LC	LC	W
<i>Leptodactylus pustulatus</i>	26.4–21.2 (22.6)	1632–804 (1478)	831–25 (645)	LC	LC	Ce
<i>Leptodactylus syphax</i>	26.6–21.4 (24.3)	1383–416 (956)	884–99 (458)	LC	LC	W
<i>Leptodactylus troglodytes</i>	27.6–19.5 (24.4)	1372–378 (763)	1116–25 (425)	LC	LC	W
<i>Leptodactylus vastus</i>	27.6–19.5 (24.1)	1372–416 (789)	1107–25 (503)	LC	LC	W
<i>Physalaemus albifrons</i>	27.6–20.0 (24.9)	1372–378 (765)	1107–25 (388)	LC	LC	Ca
<i>Physalaemus centralis</i>	25.4–20.7 (23.2)	1104–465 (944)	959–321 (568)	LC	LC	W
<i>Physalaemus cicada</i>	27.6–18.5 (24.1)	1178–378 (688)	1321–124 (385)	LC	LC	Ca
<i>Physalaemus cuvieri</i>	27.6–18.5 (23.7)	1383–534 (897)	1336–12 (548)	LC	LC	W
<i>Physalaemus kroyeri</i>	26.3–19.1 (22.4)	1104–497 (768)	1107–65 (602)	LC	LC	AF/Ca
<i>Physalaemus nattereri</i>	26.2–23.7 (24.4)	1026–881 (976)	657–310 (482)	LC	LC	Ce
<i>Pleurodema alium</i>	22.5–18.7 (20.6)	1092–590 (870)	1312–584 (982)	LC	LC	Ca/Ce
<i>Pleurodema diplolister</i>	27.8–19.5 (24.8)	1325–378 (680)	1025–3 (388)	LC	LC	W
<i>Pseudopaludicola florencei</i>	23.7	1090	353	LC	LC	AF/Ca
<i>Pseudopaludicola jaredi</i>	23.7	1302	740	LC	LC	AF/Ca
<i>Pseudopaludicola mystacalis</i>	27.2–21.7 (24.8)	1372–754 (1160)	855–25 (387)	LC	LC	W
<i>Pseudopaludicola pocoto</i>	27.6–21.1 (25.3)	1372–482 (681)	700–19 (434)	LC	LC	Ca
* <i>Rupirana cardosoi</i>	23.8–18.7 (20.8)	1104–569 (883)	1312–367 (873)	LC	VU	E
* <i>Rupirana kaatinga</i>	21.8	757	974	-	-	E
<b>Microhylidae</b>						
<i>Chiasmocleis cordeiroi</i>	20.0–18.7 (19.3)	980–918 (949)	1312–1107 (1210)	LC	LC	AD
<i>Dermatonotus muelleri</i>	27.6–20.0 (24.7)	1327–378 (687)	1036–14 (306)	LC	LC	W
<i>Elachistocleis cesarii</i>	26.4–22.6 (25.4)	1327–501 (974)	543–19 (201)	LC	LC	W
<i>Elachistocleis piauienses</i>	27.6–23.1 (25.3)	1302–618 (956)	740–12 (353)	LC	LC	Ca
<b>Odontophrynidae</b>						
<i>Odontophrynus carvalhoi</i>	24.9–18.7 (21.5)	1632–523 (898)	1312–292 (796)	LC	LC	AF/Ca
<i>Odontophrynus juquinha</i>	21.1–17.8 (20.2)	1085–814 (886)	1603–787 (1093)	LC	LC	Ca/Ce
* <i>Proceratophrys ararype</i>	25.4–21.6 (24.7)	1090–618 (937)	840–360 (453)	CR	CR	E
<i>Proceratophrys cristiceps</i>	27.6–21.1 (24.4)	1372–378 (795)	906–12 (369)	LC	LC	AF/Ca
* <i>Proceratophrys minuta</i>	23.2–20.0 (21.7)	918–763 (771)	1107–504 (699)	LC	LC	E
* <i>Proceratophrys redacta</i>	22.9–19.7 (20.3)	830–470 (734)	1092–608 (981)	LC	EN	E
<i>Proceratophrys renalis</i>	26.3–21.2 (23.0)	1372–476 (657)	700–151 (486)	LC	LC	AF
* <i>Proceratophrys velhochico</i>	22.5–21.5 (22.2)	545–523 (529)	938–725 (778)	NE	NE	E
<b>Pipidae</b>						
<i>Pipa carvalhoi</i>	26.8–20.1 (22.9)	1305–416 (672)	1008–32 (547)	LC	LC	AF/Ca
<i>Pipa pipa</i>	26.5	1592	27	LC	LC	AM
<b>Ranidae</b>						
<i>Lithobates palmipes</i>	25.7–21.8 (22.0)	1305–1161 (1167)	494–32 (476)	LC	LC	AM
<b>Strabomantidae</b>						
<i>Pristimantis ramagii</i>	25.7–21.2 (22.7)	1305–476 (988)	647–32 (410)	LC	LC	AF/Ca
* <i>Pristimantis relictus</i>	26.0–21.2 (23.0)	1632–1032 (1386)	831–79 (671)	NE	NE	E
* <i>Pristimantis rupicola</i>	21.6–19.0 (19.5)	1092–735 (982)	1309–926 (1238)	NE	NE	E
<b>Gymnophiona</b>						
<b>Caeciliidae</b>						
<i>Caecilia tentaculata</i>	24.8–21.8 (23.4)	1.492–1.372 (1.432)	738–483 (611)	LC	LC	AM
<b>Siphonopidae</b>						
<i>Siphonops annulatus</i>	21.1–21.1 (21.1)	617–617 (617)	597–597 (597)	LC	LC	W

(Continued)

Table 1. (Continued).

Species	Temperature (°C) Max – Min (Med)	Precipitation (mm) Max – Min (Med)	Altitude (m) Max – Min (Med)	ICMBio	IUCN	Distribution
<i>Siphonops paulensis</i> <b>Typhlonectidae</b>	27.2–21.1 (22.3)	1343–752 (1157)	832–81 (692)	LC	LC	W
* <i>Chthonerpeton arii</i>	27.1–24.4 (26.4)	841–447 (725)	303–73 (138)	LC	LC	E

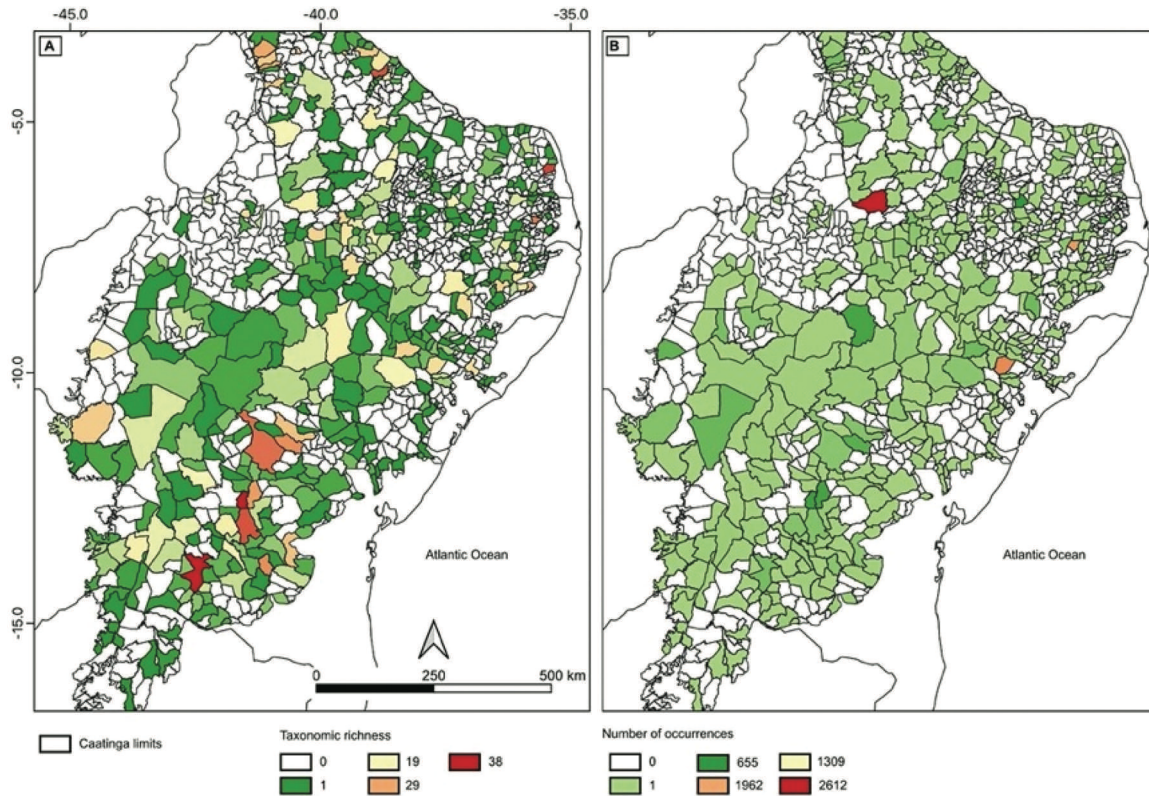


Figure 2. Geographic distribution map of (A) amphibian species richness and (B) total number of individuals reported for each municipality in the Caatinga region.

**Distribution.** The species was reported for Guaramiranga municipality in the Ceará state (Roberto et al. 2014).

#### ***Rhinella diptycha* (Cope)**

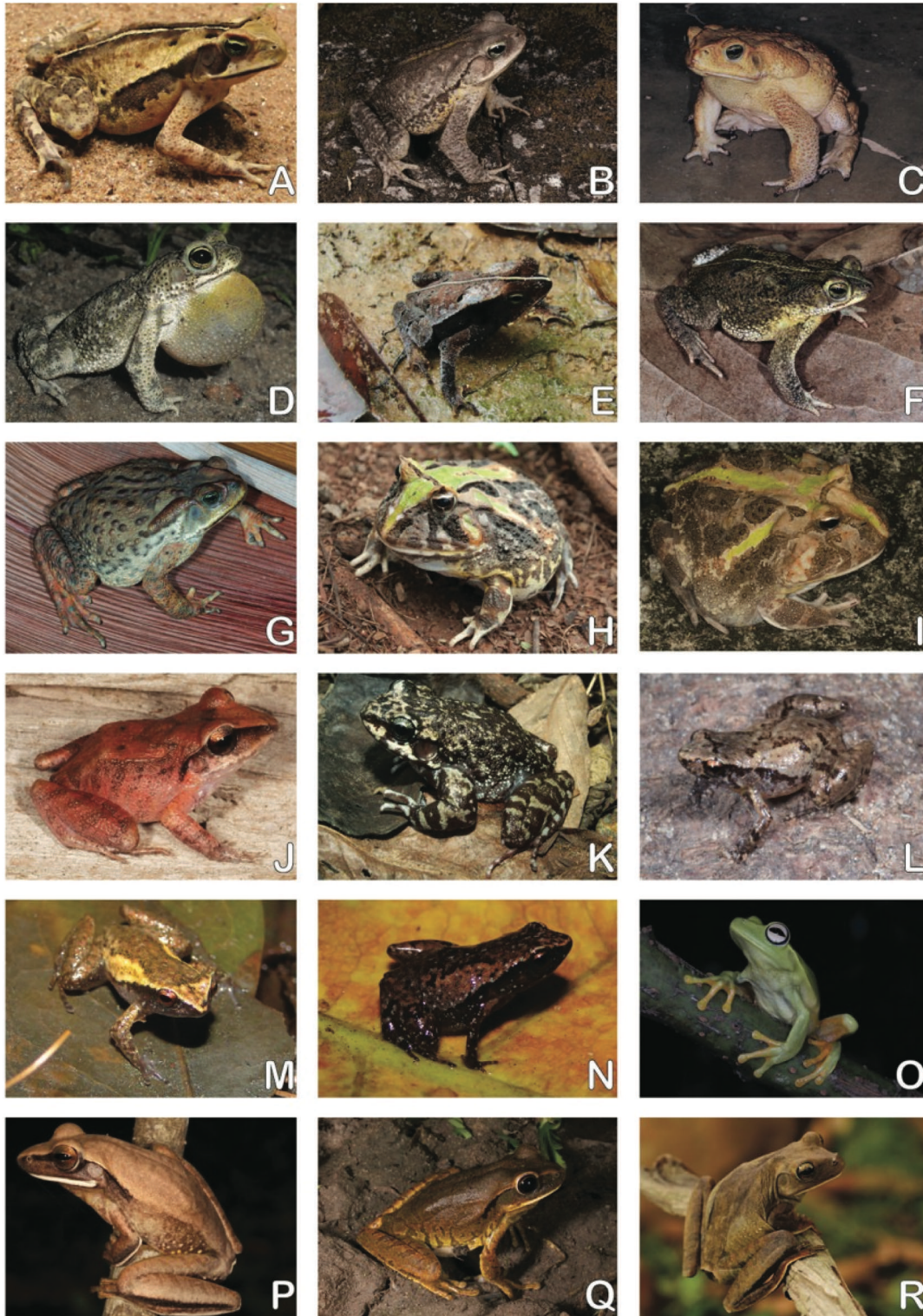
**Type locality.** Not specified.

#### ***Rhinella crucifer* (Wied-Neuwied)**

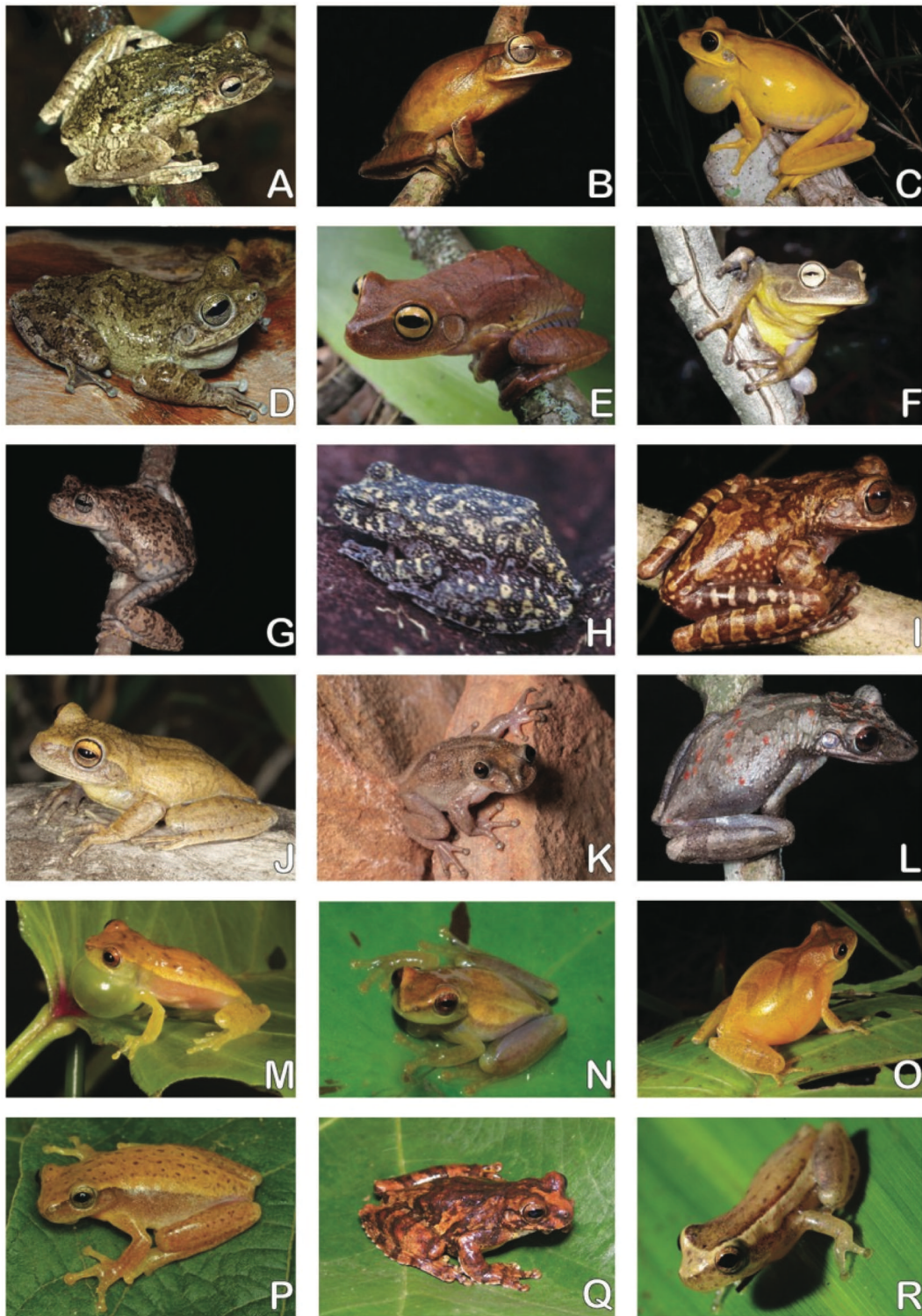
**Type locality.** Between the Piabanda and Issara streams, both tributaries of the Ilhéus River, about 40 km north of Itabuna (Bokermann 1966).

**Distribution.** The species was reported for Chapada Diamantina and upland forests and floodplains in the Bahia state (Xavier and Napoli 2011), as well as for the Brejos-de-Altitude of Paraíba (Barbosa and Alves 2014) and Pernambuco states (Freitas et al. 2019, 2023).

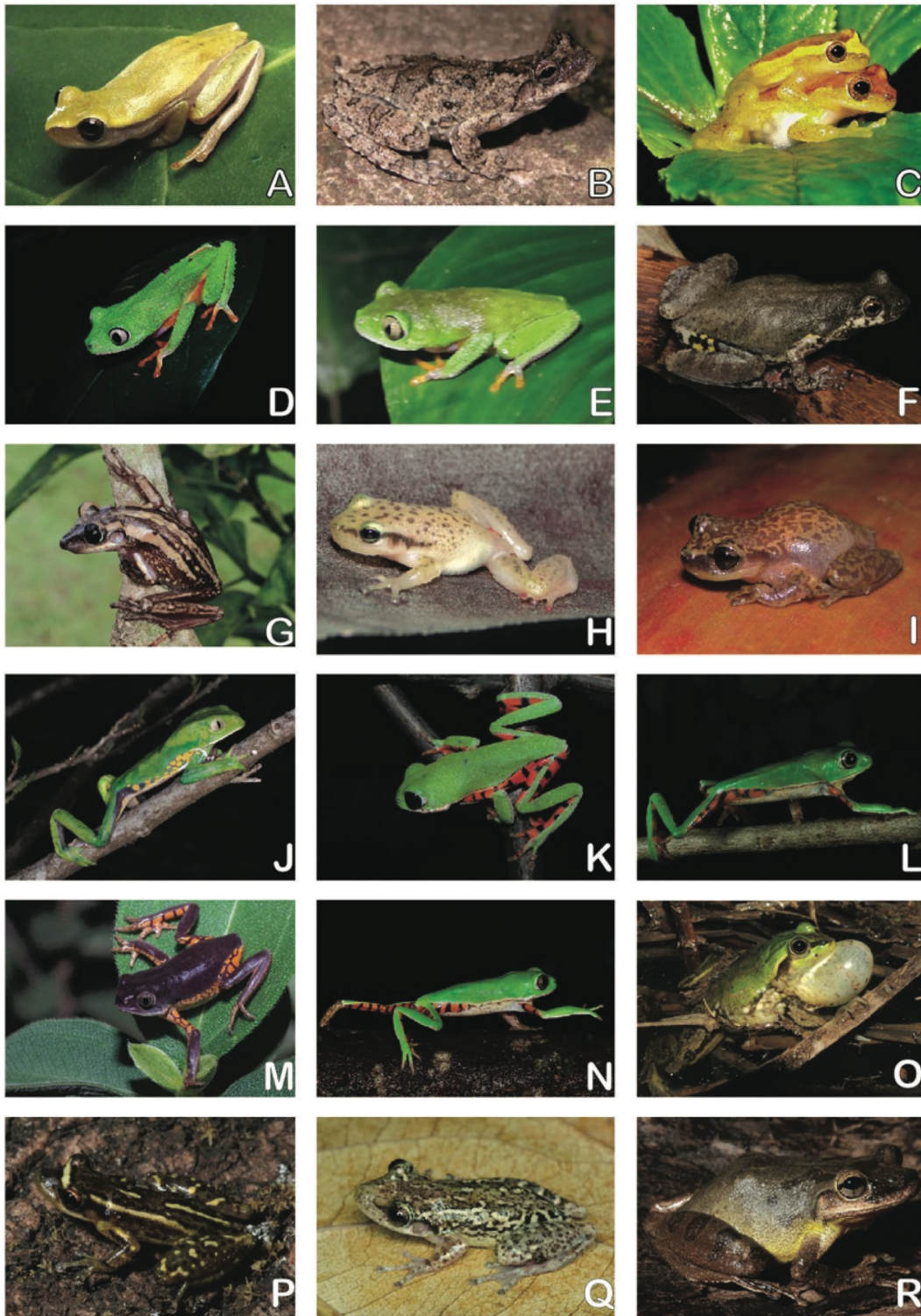
**Distribution.** Widespread in the Caatinga, having been observed in the states of Alagoas (Almeida et al. 2016), Bahia (e.g. Garda et al. 2013, present study; Santana and Juncá 2007; Xavier and Napoli 2011), Ceará (Loebmann and Haddad 2010; Ribeiro et al. 2012; Borges-Leite et al. 2014; Santana DJ et al. 2015; Roberto and Loebmann 2016; Costa et al. 2018; Silva-Neta et al. 2018; Caldas et al. 2019; Castro et al. 2019; Oliveira CR et al. 2021), Paraíba (Stevaux 2002; Vieira et al. 2007; Barbosa and Alves 2014; Cascon and Langguth 2016; Moura et al. 2016), Pernambuco



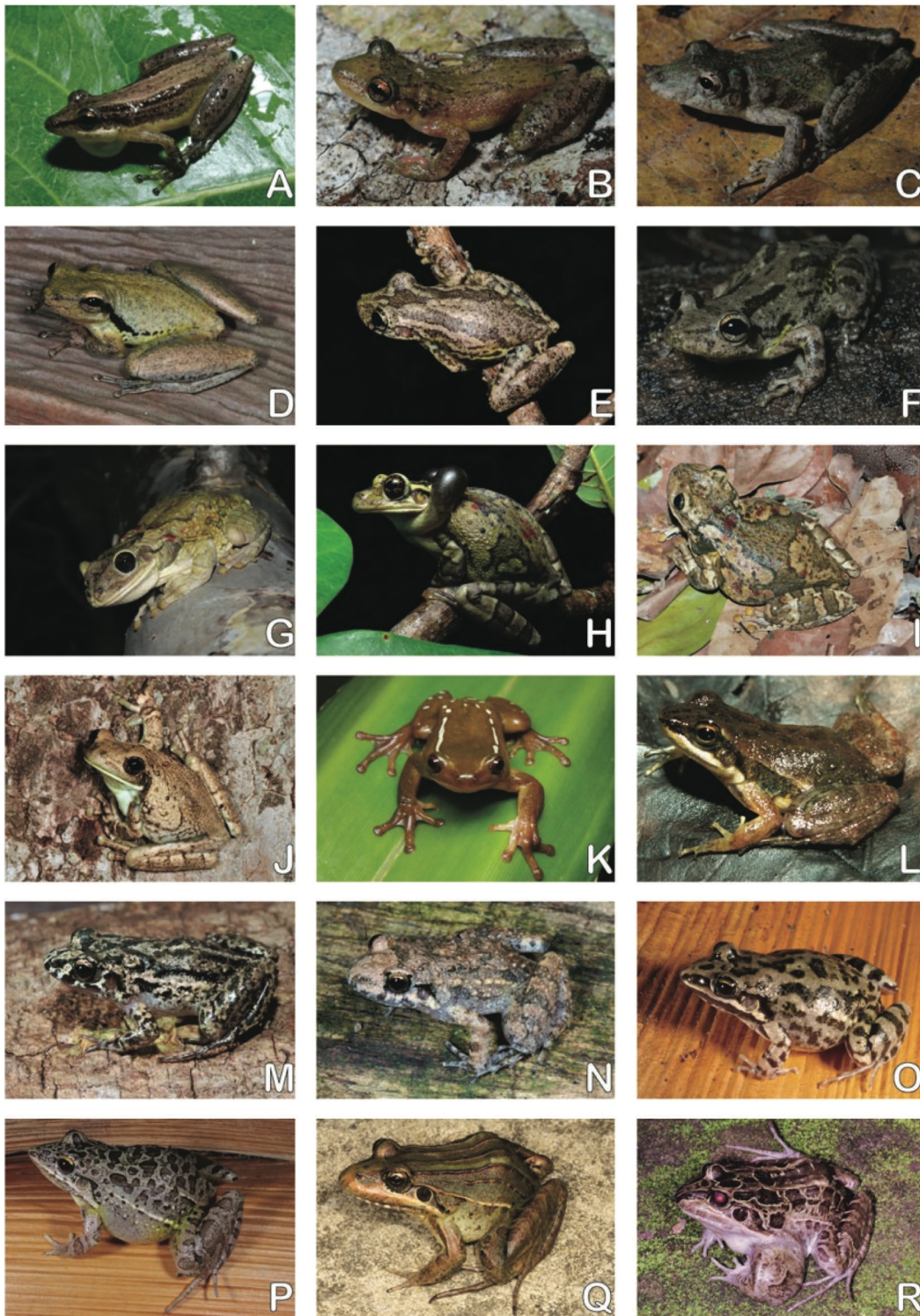
**Figure 3.** Anura. Bufonidae: (A) *Rhinella casconi*, (B) *R. crucifer*, (C) *R. diptycha*, (D) *R. granulosa*, (E) *R. margaritifera*, (F) *R. mirandaribeiroi*, (G) *R. rubescens*. Ceratophryidae: (H) *Ceratophrys aurita*, (I) *C. joazeirensis*. Craugastoridae: (J) *Haddadus aramunha*. Cycloramphidae: (K) *Thoropa megatympanum*. Eleutherodactylidae: (L) *Adelophryne baturitensis*, (M) *A. maranguapensis*, (N) *A. nordestina*. Hylidae: (O) *Boana albomarginata*, (P) *B. albopunctata*, (Q) *B. crepitans*, (R) *B. faber*. Photographs: A, E, and M, Igor J. Roberto; H, Rafael O. Abreu; K, Felipe S. F. Leite; N, Leandro Drummond. Remaining photographs Adrian A. Garda.



**Figure 4.** Hylidae: (A) *Boana lundii*, (B) *B. multifasciata*, (C) *B. raniceps*, (D) *Bokermannohyla alvarengai*, (E) *B. circumdata*, (F) *B. diamantina*, (G) *B. flavopicta*, (H) *B. itapoty*, (I) *B. juiu*, (J) *B. oxente*, (K) *Corythomantis botoque*, (L) *C. greeningi*, (M) *Dendropsophus branneri*, (N) *D. minusculus*, (O) *D. minutus*, (P) *D. nanus*, (Q) *D. novaisi*, (R) *D. oliveirai*. Photographs: A, E, and P, Rafael O. Abreu; B and R, Diego J. Santana; D, Leandro Drummond; F and H, Flora A. Juncá; G and I, Felipe S. F. Leite; K, Ricardo Marques; N, Igor J. Roberto; Q, Vitor D. Orrico. Remaining photographs, Adrian A. Garda.



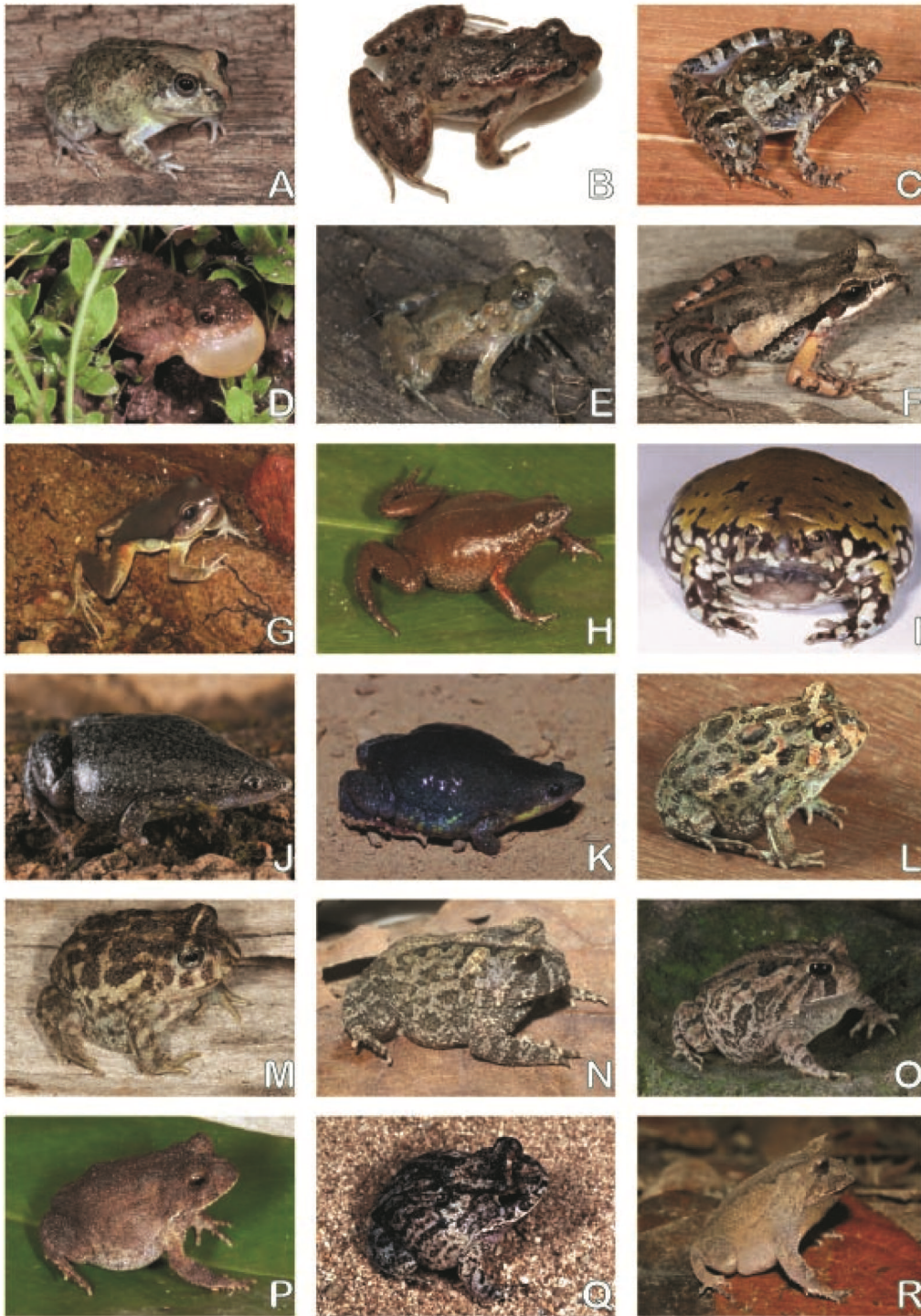
**Figure 5.** Hylidae: (A) *Dendropsophus rubicundulus*, (B) *D. soaresi*, (C) *D. tapacurensis*, (D) *Hylomantis aspera*, (E) *H. granulosa*, (F) *Julianus camposseabrai*, (G) *Nyctimantis galeata*, (H) *Phyllodytes acuminatus*, (I) *P. gyrinaethes*, (J) *Phyllomedusa bahiana*, (K) *Pithecopus azureus*, (L) *P. gonzagai*, (M) *P. megacephalus*, (N) *P. nordestinus*, (O) *Pseudis bolbodactyla*, (P) *Scinax auratus*, (Q) *S. cretatus*, (R) *S. eurydice*, Photographs: A, Victor D. Orrico; B, C, N, O, and R, Diego Santana; D, E, H, I, and Q, Igor J. Roberto; E, F, and P, Rafael O. Abreu; G, I, K, and M, Adrian A. Garda; L, Tiago Pezzuti.



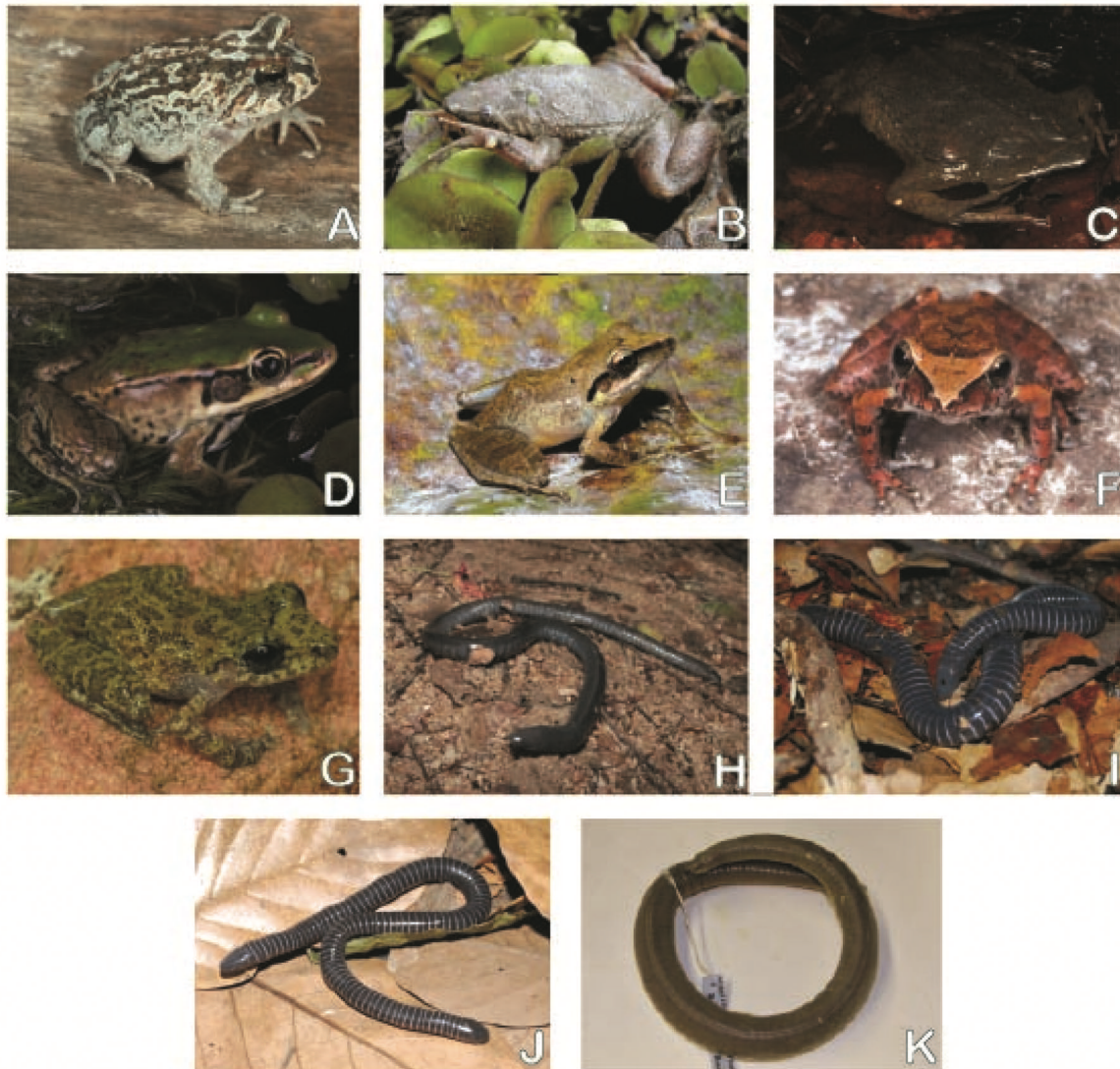
**Figure 6.** Hylidae: (A) *Scinax fuscomarginatus*, (B) *S. montivagus*, (C) *S. nebulosus*, (D) *S. pachycrus*, (E) *S. tropicalia*, (F) *S. x-signatus*, (G) *Trachycephalus atlas*, (H) *T. mambaiensis*, (I) *T. nigromaculatus*, (J) *T. typhoni*, (K) *Xenohyla eugenioi*. Hylodidae: (L) *Crossodactylus trachystomus*. Leptodactylidae: (M) *Adenomera hylaedactyla*, (N) *A. juikitam*, (O) *Leptodactylus caatingae*, (P) *L. fuscus*, (Q) *L. latrans*, (R) *L. luctator*. Photographs: A, B, C, and F, Diego Santana; E and I, Rafael O. Abreu; G, Sarah Mângia; H: Leandro Silva; K, Rony Peterson; L, Felipe S. F. Leite; remaining photographs, Adrian A. Garda.



**Figure 7.** Leptodactylidae: (A) *Leptodactylus macrosternum*, (B) *L. mystaceus*, (C) *L. mystacinus* (D) *L. natalensis*, (E) *L. oreomantis*, (F) *L. payaya*, (G) *L. podicipinus*, (H) *L. pustulatus*, (I) *L. syphax*, (J) *L. troglodytes*, (K) *L. vastus*, (L) *P. albifrons*, (M) *P. centralis*, (N) *P. cicada*, (O) *P. cuvieri*, (P) *P. kroyeri*, (Q) *P. nattereri*, (R) *Pleurodema alium*. Photographs: D and H, Diego Santana; G, Rafael Abreu; M and P, Igor J. Roberto; remaining photographs, Adrian A. Garda.



**Figure 8.** Leptodactylidae: (A) *Pleurodema diplolister*, (B) *Pseudopaludicola florencei*, (C) *P. jaredi*, (D) *P. mystacalis*, (E) *P. pocoto*, (F) *Rupirana cardosoi*, (G) *R. kaatinga*. Microhylidae: (H) *Chiasmocleis cordeiroi*, (I) *Dermatonotus muelleri*, (J) *Elachistocleis cesarii*, (K) *Elachistocleis piauiensis*, (L) *Odontophrynus cultripes*, (M) *O. juquinha*, (N) *Proceratophrys ararype*, (O) *P. cristiceps*, (P) *P. minuta*, (Q) *P. redacta*, (R) *P. renalis*. Photographs: B, Felipe Andrade; G, Sarah Mangia, K and R, Igor J. Roberto; N, Robson Ávila; remaining photographs, Adrian A. Garda.



**Figure 9.** Leptodactylidae: (A) *P. velhochico*. Pipidae: (B) *Pipa carvalhoi*, (C) *P. pipa*. Ranidae: (D) *Lithobates palmipes*. Strabomantidae: (E) *Pristimantis ramagii*, (F) *P. relictus*, (G) *P. rupicola*. Gymnophiona: Caecillidae: (H) *Caecilia tentaculata*; Siphonopidae: (I) *Siphonops annulatus*, (K) *S. paulensis*. Typhlonectidae: (K) *Chthonerpeton arii*. Photographs: A, Ricardo Marques; B, Diego Santana; C, D, and E, Adrian A. Garda; F and H, Rafael Abreu; G, Kássio Araújo.

(Pedrosa et al. 2014; Horta et al. 2015; Pereira et al. 2015; Oliveira et al. 2018; Freitas et al. 2019), Piauí (Roberto et al. 2013; Cavalcanti et al. 2014; Benício et al. 2015; Dal Vechio et al. 2016), Rio Grande do Norte (Jared et al. 2009; Magalhães et al. 2013; Caldas et al. 2016), and Sergipe (Gouveia and Farias 2015).

### ***Rhinella granulosa* (Spix)**

**Type locality.** Bahia state, Brazil (Spix 1824).

**Distribution.** Widespread in the Caatinga, except in northern Minas Gerais state. The species occurs in the states of Alagoas (Narvaes and Rodrigues 2009; Almeida et al. 2016), Bahia (Santana and Juncá 2007; Narvaes and Rodrigues 2009; Xavier and Napoli 2011; Garda et al. 2013), Ceará (Narvaes and Rodrigues 2009; Ribeiro et al. 2012; Borges-Leite et al. 2014, Borges-Nojosa & Cascon, 2005; Santana DJ et al. 2015; Roberto and Loebmann 2016; Costa et al. 2018; Silva-Neta et al. 2018; Caldas et al. 2019; Castro et al. 2019; Oliveira CR et al. 2021), Paraíba (Arzabe et al. 2005; Vieira et al.

2007; Narvaes and Rodrigues 2009; Barbosa and Alves 2014; Filho et al. 2015; Moura et al. 2016), Pernambuco (Narvaes and Rodrigues 2009; Pedrosa et al. 2014; Pereira et al. 2015; Freitas et al. 2019), Piauí (Narvaes and Rodrigues 2009; Roberto et al. 2013; Benício et al. 2015; Dal Vechio et al. 2016), Rio Grande do Norte (Narvaes and Rodrigues 2009; Magalhães et al. 2013; Prates et al. 2013; Caldas et al. 2016), and Sergipe (Gouveia and Farias 2015).

### ***Rhinella margaritifera* (Laurenti)**

**Type locality.** Somewhere in eastern Amazonia, south of the Amazon River in Brazil (Fouquet et al. 2024).

**Distribution.** The species has been reported in upland forests of Serra do Baturité, Ceará state (Roberto and Loebmann 2016; Avila et al. 2018; Pereyra et al. 2021), and Água Preta, Pernambuco.

### ***Rhinella mirandaribeiroi* (Gallardo)**

**Type locality.** Ilha do Marajó, mouth of the Amazon River, Pará state, Brazil (Gallardo 1965).

**Distribution.** The species has been reported for the municipalities of Correntina, Cocos, and Jaborandi, western Bahia state (present study), in the Piauí state in ecotone areas between the Caatinga and the Cerrado ecological regions, such as the Sete Cidades National Park and APA Delta do Parnaíba (Araújo et al. 2020a, 2020b).

### ***Rhinella rubescens* (Lutz)**

**Type locality.** Near the state of Goiás, in the highlands of eastern Brazil (Lavilla 1992).

**Distribution.** The species was recorded in the upland forests of the Chapada Diamantina in the Bahia state (Magalhães et al. 2015).

## **Family: Ceratophryidae Tschudi**

### ***Ceratophrys aurita* (Raddi)**

#### **Type locality**

Serra da Estrela, municipality of Inhomirim, Rio de Janeiro [state], Brazil (Bokermann 1966).

#### **Distribution**

The species was reported for the municipalities of Serrinha, Igaporã, Morro do Chapéu, Contendas do Sincorá, and Ibiassuce, all in Bahia state.

### ***Ceratophrys joazeirensis* Mercadal**

#### **Type locality**

Joazeiro (Estado de Bahia), NE de Brasil [Juazeiro (Bahia state), Northeastern Region of Brazil] (Mercadal 1986).

#### **Distribution**

The species has been reported in the states of Bahia, Alagoas (Almeida et al. 2016), Sergipe (Santana et al. 2014), Paraíba (Vieira KS et al. 2006), Pernambuco (Santos et al. 2009), Piauí (Roberto et al. 2013), and Rio Grande do Norte (Vieira KS et al. 2006; Jorge et al. 2015).

## **Family: Craugastoridae Hedges, Duellman & Heinicke**

### ***Haddadus aramunha* (Cassimiro, Verdade & Rodrigues)**

#### **Type locality**

Serra do Sincorá, Espinhaço range, 998 m a.s.l., municipality of Mucugê, Bahia state, Brazil (Cassimiro et al. 2008).

#### **Distribution**

This species is endemic to the Caatinga region, occurring in the Chapada Diamantina and other high altitude areas in the Bahia state (Napoli et al. 2010; Xavier and Napoli 2011; Amaro et al. 2013; Costa et al. 2014).

## **Family: Cycloramphidae Bonaparte**

### ***Thoropa megatympanum* Caramaschi and Sazima**

#### **Type locality**

Road from Vespasiano to Conceição do Mato Dentro (km 115), municipality of Jaboticatubas, Serra do Cipó, Minas Gerais [state], Brazil (Caramaschi and Sazima 1984).

#### **Distribution**

The species has been recorded in the municipality of Licínio de Almeida, Bahia state (Sabbag et al. 2018).

**Family: Eleutherodactylidae Lutz*****Adelophryne baturitensis* Hoogmoed, Borges & Cascon****Type locality**

Serra de Baturité, Povoado de Santa, municipality of Pacoti, Ceará state, Brazil (Hoogmoed et al. 1994).

**Distribution**

This species is endemic to the Caatinga, occurring in the Ceará state at altitudes ranging from 600 to 1000 m a.s.l. in the highlands of Serra de Baturité, Serra de Maranguape, Serra da Aratanha, Ubajara National Park, Planalto da Ibiapaba, Tianguá, Guaramiranga, Pacoti, Ubajara, and Viçosa do Ceará municipalities (Hoogmoed et al. 1994; Loebmann and Haddad 2010; Roberto and Loebmann 2016; Castro et al. 2019).

***Adelophryne maranguapensis* Hoogmoed, Borges & Cascon****Type locality**

Municipality of Maranguape, Serra de Maranguape, Pico da Rajada, Ceará state, Brazil (Hoogmoed et al. 1994).

**Distribution**

This species is endemic to the Caatinga, occurring in the highlands of the Ceará state from 800 to 900 m a.s.l. in the Serra de Maranguape (Hoogmoed et al. 1994; Cassiano-Lima et al. 2011; de Lima et al. 2016; Roberto and Loebmann 2016).

***Adelophryne nordestina* Lourenço-de-Moraes, Lisbon, Drummond, Moura, Moura, Lyra, Guarnieri, Mott, Hoogmoed & Santana****Type locality**

Estação Ecológica de Murici (ESEC Murici) [Murici Ecological station], Alagoas [state], Brazil (Lourenço-de-Moraes et al. 2021).

**Distribution**

The species occurs in Brejo dos Cavalos, [Caruaru municipality], Pernambuco state (Loebmann et al. 2011; Lourenço-de-Moraes et al. 2021).

**Family: Hylidae Rafinesque*****Boana albomarginata* (Spix)****Type locality**

‘Salvador’ or ‘Ilhéus’ [municipalities], Bahia [state], Brazil (Bokermann 1966).

**Distribution**

The species occurs in the states of Alagoas (Almeida et al. 2016), Bahia (plateau of the Chapada Diamantina and lowlands of the state; present study), Paraíba (Barbosa and Alves 2014), Pernambuco (at Atlantic Forest remnants namely brejos-de-altitude) (Carnaval 2002; Freitas et al. 2019), and in Rio Grande do Norte (Magalhães et al. 2013).

***Boana albopunctata* (Spix)****Type locality**

Unknown.

**Distribution**

The species occurs in the mountainous region of Chapada Diamantina (Magalhães et al. 2015) and floodplains in Bahia state (present study).

***Boana crepitans* (Wied-Neuwied)****Type locality**

Tamburil, municipality of Condeúbas, Bahia state, Brazil (Bokermann 1966).

**Distribution**

The species has been observed in the states of Alagoas (Almeida et al. 2016), Bahia (Xavier and Napoli 2011; Garda et al. 2013), Sergipe (Gouveia and Farias 2015), Pernambuco (Pedrosa et al. 2014; Freitas et al. 2019), and Paraíba (Barbosa and Alves 2014; Cascon and Langguth 2016).

***Boana faber* (Wied-Neuwied)****Type locality**

Fazenda Santa Inês, Bahia state, Brazil (Vanzolini and Myers 2015).

**Distribution**

The species is found in the states of Bahia (Xavier and Napoli 2011, Present study), Paraíba (Barbosa and Alves 2014), Pernambuco (at Atlantic Forest remnants namely brejos-de-altitude, Freitas et al. 2019, 2023), and Sergipe (present study).

***Boana lundii* (Burmeister)****Type locality**

Lagoa Santa [municipality], state of Minas Gerais, Brazil (Burmeister 1856).

**Distribution**

The species is found in the municipalities of Licínio de Almeida and Morro do Chapéu, Bahia state (present study).

***Boana multifasciata* (Günther)****Type locality**

Belém [municipality], state of Pará, Brazil (Bokermann 1966).

**Distribution**

The species is found in the highlands of the Ceará state in the Planalto da Ibiapaba complex (Loebmann and Haddad 2010; Roberto and Loebmann 2016; Castro et al. 2019).

***Boana punctata* (Schneider)****Type locality**

'Surinam' (Schneider 1799).

**Distribution**

The species is found in the municipality of Cajueiro da Praia, Piauí, Brazil (Araújo et al. 2020b).

***Boana raniceps* (Cope)****Type locality**

'Paraguay' (Cochran 1961).

**Distribution**

The species is found in the states of Alagoas (present study), Bahia (present study), Ceará (Loebmann and Haddad

2010; Ribeiro et al. 2012; Borges-Leite et al. 2014; Santana DJ et al. 2015; Ferreira-Silva et al. 2016; Roberto and Loebmann 2016; Costa et al. 2018; Silva-Neta et al. 2018; Caldas et al. 2019; Castro et al. 2019; Oliveira CR et al. 2021), Paraíba (Arzabe et al. 2005; Vieira et al. 2007; Zina et al. 2010; Barbosa and Alves 2014; Filho et al. 2015; Moura et al. 2016), Pernambuco (Pereira et al. 2015; Freitas et al. 2019, 2023), Piauí (Roberto et al. 2013; Benício et al. 2015), Rio Grande do Norte (Magalhães et al. 2013; Caldas et al. 2016; Jorge et al. 2020), and Sergipe states (Zina et al. 2010; Gouveia and Farias 2015).

***Bokermannohyla alvarengai* (Bokermann)****Type locality**

Serra do Caraça, municipality of Santa Bárbara, state of Minas Gerais, Brazil (Bokermann 1966).

**Distribution**

The species is found in the Chapada Diamantina plateau and in southern Bahia state (present study).

***Bokermannohyla circumdata* (Cope)****Type locality**

State of Rio de Janeiro, Brazil (Bokermann 1966).

**Distribution**

The species is found in the municipality of Miguel Calmon, Bahia state (Napoli et al. 2011).

***Bokermannohyla diamantina* Napoli & Juncá****Type locality**

Riacho do Tijuquinha, Serra dos Barbados, District of Catolés de Cima, municipality of Abaíra, Bahia state, Brazil (Napoli and Juncá 2006).

**Distribution**

This species is endemic to the Caatinga, from the plateau of Chapada Diamantina in the municipalities of Abaíra, Rio de Contas, and Piatã, and in the municipality of Sebastião Laranjeiras, southern Bahia state (Napoli and Juncá 2006).

***Bokermannohyla flavopicta* Leite, Pezzuti & Garcia****Type locality**

Serra das Almas, municipality of Rio de Contas, Bahia state, Brazil (Leite et al. 2012).

**Distribution**

This species is endemic to the Caatinga, having been observed in Serra das Almas and Serra do Itobira, municipality of Rio de Contas, and Serra do Bastião, municipality of Mucugê, 1,500 m a.s.l., southeastern Chapada Diamantina, Bahia state (Leite et al. 2012; Magalhães et al. 2015).

***Bokermannohyla itapoty* Lugli & Haddad****Type locality**

Serra do Sincorá, municipality of Lençóis, Bahia state, Brazil (Lugli and Haddad 2006a).

**Distribution**

This species is endemic to the Caatinga, recorded in Chapada Diamantina at the municipalities of Lençóis, Andaraí, Mucugê, and Palmeiras, Bahia state (Lugli and Haddad 2006a; Leite et al. 2012).

***Bokermannohyla juiju* Faivovich, Lugli, Lourenço & Haddad****Type locality**

Caeté-Açú: Arroio Gerais da Fumaça, municipality of Palmeiras, Bahia state, Brazil (Faivovich et al. 2009).

**Distribution**

This species is endemic to the Caatinga, observed in Serra do Sincorá, municipalities of Palmeiras and Mucugê, in Chapada Diamantina, Cadeia do Espinhaço, Bahia state, northeastern Brazil.

***Bokermannohyla oxente* Lugli & Haddad****Type locality**

Serra do Sincorá, municipality of Lençóis, Bahia state, Brazil (Lugli and Haddad 2006b).

**Distribution**

This species is endemic to the Caatinga, observed in the municipalities of Lençóis, Andaraí, Mucugê, and Palmeiras, all in the Serra do Sincorá in the central portion of the Chapada Diamantina, and also in the municipalities of Miguel Calmon, Rio de Contas, Piaçã, Abaíra, Senhor do Bonfim, Iraquara, Brotas de

Macaúbas and Campo Formoso, Bahia, northeast Brazil (Lugli and Haddad 2006b; Xavier and Napoli 2011, present study).

***Corythomantis botoque* Marques, Haddad & Garda****Type locality**

Parque Nacional da Chapada Diamantina, in the municipality of Palmeiras, Bahia state, Brazil (Marques et al. 2021).

**Distribution**

This species is observed in the municipalities of Palmeiras, Gameleira do Assurá, and Contendas do Sincorá in Bahia, northeastern Brazil (Marques et al. 2021).

***Corythomantis greeningi* Boulenger****Type locality**

State of Espírito Santo, Brazil (Condit 1964). Nevertheless, Marques et al. pointed out that this locality should be a mistake given that there are no other records for the species in the state.

**Distribution**

The species is found in the states of Alagoas (Pombal-Jr et al. 2012, present study), Bahia (Xavier and Napoli 2011), Ceará (Borges-Nojosa & Cascon, 2005; Castro et al. 2019; Costa et al. 2018; Loebmann and Haddad 2010; Oliveira CR et al. 2021; Ribeiro et al. 2012; Roberto and Loebmann 2016; Santana DJ et al. 2015; Silva-Neta et al. 2018), Paraíba (Arzabe et al. 2005; Vieira et al. 2007; Cascon and Langguth 2016), Pernambuco (Pedrosa et al. 2014; Pereira et al. 2015; Freitas et al. 2023), Piauí (Roberto et al. 2013; Benício et al. 2015; Dal Vechio et al. 2016; Araújo et al. 2020a), Rio Grande do Norte (Jared et al. 1999; Magalhães et al. 2013; Caldas et al. 2016), Sergipe (Gouveia and Farias 2015), and Minas Gerais (Godinho et al. 2013).

***Dendropsophus branneri* (Cochran)****Type locality**

Municipality of Bonito, Pernambuco state, Brazil (Cochran 1948).

**Distribution**

The species is found in the states of Alagoas (Almeida et al. 2016), Bahia (Xavier and Napoli 2011), Paraíba (Moura et al. 2016), Pernambuco (Carnaval 2002; Freitas et al. 2019, 2023), Rio Grande do Norte (Magalhães et al. 2013), and Sergipe (present study).

***Dendropsophus minusculus* (Rivero)****Type locality**

Nirgua municipality, Yaracay state, Venezuela (Rivero 1971).

**Distribution**

The species is found in highland mesic forests (regionally known as brejos-de-altitude) and on the coast of Ceará state (Zina et al. 2014; Roberto and Loebmann 2016; Castro et al. 2019); yet, along the coast and areas of the Caatinga-Cerrado ecotone in the Piauí state (Roberto et al. 2013; Araújo et al. 2020a).

***Dendropsophus minutus* (Peters)****Type locality**

Municipality of Nova Friburgo, state of Rio de Janeiro, Brazil (Rivero 1971).

**Distribution**

The species is found in the states of Bahia (Xavier and Napoli 2011), Ceará (Loebmann and Haddad 2010; Ribeiro et al. 2012; Ferreira-Silva et al. 2016; Roberto and Loebmann 2016; Castro et al. 2019), Paraíba (Moura et al. 2016), in Pernambuco (Freitas et al. 2019, 2023), Piauí (Roberto et al. 2013; Benício et al. 2015; Araújo et al. 2020a), and Rio Grande do Norte (Magalhães et al. 2013).

***Dendropsophus nanus* (Boulenger)****Type locality**

Colonia Resistencia, Chaco del Sur, Argentina (Capocaccia 1957).

**Distribution**

The species is found in the states of Bahia (present study) and Ceará (Loebmann and Haddad 2010; Ribeiro et al. 2012; Santana DJ et al. 2015; Roberto and Loebmann 2016; Costa et al. 2018; Silva-Neta

et al. 2018; Castro et al. 2019; Oliveira CR et al. 2021), Paraíba (Barbosa and Alves 2014), Pernambuco (Pereira et al. 2015; Freitas et al. 2023), Piauí (Roberto et al. 2013; Benício et al. 2015; Araújo et al. 2020b), and Rio Grande do Norte (Magalhães et al. 2013; Caldas et al. 2016; Jorge et al. 2020).

***Dendropsophus novaisi* (Bokermann)****Type locality**

'Fazenda Santo Onofre, 10 km east of Maracás, Bahia state, Brazil' (Bokermann 1968).

**Distribution**

The species occurs in the region of Chapada Diamantina, Morro do Chapéu, and northern Bahia state (Bokermann 1968; Garda et al. 2013, present study; Santos-Silva et al. 2012).

***Dendropsophus oliveirai* (Bokermann)****Type locality**

Municipality of Maracás, Bahia state, Brazil (Bokermann 1963).

**Distribution**

The species occurs in the states of Alagoas (Almeida et al. 2016), Bahia (Xavier and Napoli 2011; Garda et al. 2013; Menezes et al. 2021), Paraíba (Menezes et al. 2021), Pernambuco (Pedrosa et al. 2014; Pereira et al. 2015; Barbosa et al. 2018; Freitas et al. 2023), Rio Grande do Norte (Magalhães et al. 2013), and Sergipe (present study).

***Dendropsophus rubicundulus* (Reinhardt & Lütken)****Type locality**

Municipality of Lagoa Santa, Minas Gerais state, Brazil (Häupl et al. 1994).

**Distribution**

This species primarily occurs in ecotonal areas between the Catinga and the Cerrado ecological core regions from northwestern Bahia state (Dória et al. 2015), Planalto da Ibiapaba complex and other ecotonal areas in the Ceará state (Castro et al. 2019, present study; Loebmann and Haddad 2010; Roberto and

Loebmann 2016), and near the coast in the Piauí state (Roberto et al. 2013; Araújo et al. 2020a).

### ***Dendropsophus soaresi* (Caramaschi & Jim)**

#### **Type locality**

Municipality of Picos, state of Piauí, northeastern Brazil (Caramaschi and Jim 1983b).

#### **Distribution**

The species is found in the states of Alagoas (Almeida et al. 2016), Bahia (Garda et al. 2013), Ceará (Loebmann and Haddad 2010; Ribeiro et al. 2012; Roberto and Loebmann 2016; Costa et al. 2018; Silva-Neta et al. 2018; Oliveira CR et al. 2021), Paraíba (Barbosa and Alves 2014; Moura et al. 2016 #4468; Cascon and Langguth 2016 #4463), Pernambuco (Borges-Nojosa and Santos 2005; Vieira et al. 2007; Pedrosa et al. 2014; Pereira et al. 2015; Freitas et al. 2023), Piauí (Caramaschi and Jim 1983b; Roberto et al. 2013; Benício et al. 2015; Dal Vechio et al. 2016; Araújo et al. 2020a), Rio Grande do Norte (Magalhães et al. 2013), and Sergipe (Gouveia and Farias 2015).

### ***Dendropsophus tapacurensis* Oliveira, Magalhães, Teixeira, Moura, Porto, Guimarães, Giarretta & Tinôco**

#### **Type locality**

Estação Ecológica do Tapacurá, municipality of São Lourenço da Mata, Pernambuco state, Brazil (Oliveira RF et al. 2021).

#### **Distribution**

The species is found in the Serra de Maranguape, Serra da Aratanha, and Serra de Baturité, all mountainous regions in the Ceará state, northeastern Brazil (Roberto and Loebmann 2016; Oliveira RF et al. 2021).

### ***Hylomantis aspera* Peters**

#### **Type locality**

'Municipality of Caravelas, Bahia State, Brazil' (Bokermann 1966).

#### **Distribution**

The species occurs at Fazenda Bananeiras, municipality of Santanópolis, eastern Bahia state (present study).

### ***Hylomantis granulosa* (Cruz)**

#### **Type locality**

Horto Zoobotânico Dois Irmãos, Recife, Estado de Pernambuco, Brazil (Cruz 1989 '1988').

#### **Distribution**

In the Caatinga region the species is reported for Brejo dos Cavalos, municipality of Caruaru, Pernambuco State (Freitas et al. 2023).

### ***Julianus camposseabrai* (Bokermann)**

#### **Type locality**

Fazenda Cana Brava, municipality of Maracás, Bahia state, Brazil (Bokermann 1968).

#### **Distribution**

This species has been observed in the states of Bahia (Cândido et al. 2012; Caramaschi & Cardoso, 2006) and in northern Minas Gerais (Caramaschi & Cardoso, 2006).

### ***Nyctimantis galeata* Pombal, Menezes, Fontes, Nunes, Rocha & Van Sluys**

#### **Type locality**

Approximately 12 km northeast of the municipality of Morro do Chapéu, Bahia state, Brazil (Pombal-Jr et al. 2012).

#### **Distribution**

This species is endemic to the Caatinga and observed in the plateau of Chapada Diamantina at 1,000 m a.s.l., 12 km northeast of the municipality of Morro do Chapéu, Bahia state (Pombal-Jr et al. 2012; Dias et al. 2020; Magalhães et al. 2021).

### ***Phyllodytes acuminatus* Bokermann**

#### **Type locality**

Municipality of Mangabeiras, state of Alagoas, Brazil (Bokermann 1966).

**Distribution**

The species occurs in the Catimbau National Park, in the Pernambuco state (Santos and Silva 2010; Pedrosa et al. 2014).

***Phyllodytes gyrinaethes* Peixoto, Caramaschi and Freire****Type locality**

Fazenda Bananeiras, municipality of Murici, state of Alagoas, Brazil (Peixoto et al. 2003).

**Distribution**

The species occurs in the Brejo dos Cavalos, municipality of Caruaru, state of Pernambuco (Freitas et al. 2023).

***Pseudis bolbodactyla* Lutz****Type locality**

Lagoa do Curralinho, Lassance, Minas Gerais, Brazil (Caramaschi and Cruz 1998).

**Distribution**

This species occurs in the municipalities of Bom Jesus da Lapa and Malhada, Western Bahia state (Garda et al. 2010, present study).

***Phyllomedusa bahiana* Lutz****Type locality**

'Municipality of Salvador, Bahia State, Brazil' (Bokermann 1966).

**Distribution**

The species is found in the Bahia state (Silva-Filho and Juncá 2006; Xavier and Napoli 2011; Garda et al. 2013; Röhr et al. 2020b).

***Pithecopus azureus* (Cope)****Type locality**

Restricted to Paraguay by Cochran (1961).

**Distribution**

The species is found in the municipalities of São Félix do Coribe and Santa Rita de Cássia, western Bahia state (Dória et al. 2015).

***Pithecopus gonzagai* Andrade, Haga, Ferreira, Recco-Pimentel, Toledo & Bruschi****Type locality**

Municipality of Limoeiro, Pernambuco State, Northeast Brazil (Andrade et al. 2020).

**Distribution**

The species is found in the states of Alagoas (Almeida et al. 2016; Röhr et al. 2020a), Ceará (Loebmann and Haddad 2010; Ribeiro et al. 2012; Borges-Leite et al. 2014; Santana DJ et al. 2015; Roberto and Loebmann 2016; Costa et al. 2018; Silva-Neta et al. 2018; Bruschi et al. 2019; Caldas et al. 2019; Castro et al. 2019; Oliveira CR et al. 2021), Paraíba (Vieira et al. 2007; Barbosa and Alves 2014; Filho et al. 2015; Cascon and Langguth 2016; Moura et al. 2016; Bruschi et al. 2019; Andrade et al. 2020), Pernambuco (Andrade et al. 2020; Barbosa et al. 2018, Borges-Nojosa & Santos, 2005; Bruschi et al. 2019; Pedrosa et al. 2014; Pereira et al. 2015; Röhr et al. 2020a; Silva et al. 2022), Piauí (Roberto et al. 2013; Benício et al. 2015; Dal Vechio et al. 2016; Araújo et al. 2020a), and Rio Grande do Norte (Magalhães et al. 2013; Caldas et al. 2016; Bruschi et al. 2019; Andrade et al. 2020; Jorge et al. 2020; Röhr et al. 2020a). Although the original description did not sequence specimens throughout the Caatinga, we are assuming here that populations above the São Francisco River are *P. gonzagai*, while the ones below this river are *P. nordestinus*.

***Pithecopus megacephalus* (Miranda-Ribeiro)****Type locality**

State of Rio de Janeiro, Brazil (Miranda-Ribeiro 1926).

**Distribution**

The species occurs in the municipalities of Caetité, Jacaraci, and Igarorã, all from the Bahia state (present study).

***Pithecopus nordestinus* (Caramaschi)****Type locality**

Municipality of Maracás, Bahia state, Brazil (Caramaschi 2006).

**Distribution**

The species is found in the states of Bahia (Caramaschi 2006; Xavier and Napoli 2011; Garda et al. 2013; Bruschi et al. 2019; Röhr et al. 2020a; Silva FP et al. 2020) and Sergipe (Gouveia and Farias 2015).

***Scinax auratus* Wied-Neuwied****Type locality**

Fazenda Santa Inês, [municipality of Santa Inês], Bahia [state], Brazil (Wied-Neuwied and Zu 1821).

**Distribution**

This species occurs in the states of Bahia (Santana et al. 2009; Nunes and Pombal 2011; Juncá et al. 2015), Paraíba, and Rio Grande do Norte (mistakenly identified as *S. cretatus* in Magalhães et al. 2013).

***Scinax eurydice* (Bokermann)****Type locality**

Fazenda Santo Onofre, east of the municipality of Maracás, Bahia state, Brazil (Bokermann 1968).

**Distribution**

In the Caatinga, the species occurs in the states of Bahia (Nunes and Pombal 2011; Xavier and Napoli 2011, Menezes et al., 2016), Paraíba (Mângia et al. 2017), and in the 'brejos-de-altitude' of Pernambuco (Freitas et al. 2019, 2023).

***Scinax fuscomarginatus* (Lutz)****Type locality**

Municipality of Belo Horizonte, state of Minas Gerais, Brazil (Lutz 1973).

**Distribution**

The species is found in the states of Bahia, Ceará (Leite et al. 2008; Loebmann and Haddad 2010; Borges-Leite

et al. 2014; Roberto and Loebmann 2016), Rio Grande do Norte (Magalhães et al. 2013), and Piauí (Roberto et al. 2013; Araújo et al. 2020a).

***Scinax montivagus* Juncá, Napoli, Nunes, Mercs & Abreu****Type locality**

Mata do Campo Limpo, Parque Estadual das Sete Passagens, municipality of Miguel Calmon, Bahia state, Brazil (Juncá et al. 2015).

**Distribution**

This species is endemic to the Caatinga and mainly observed at the Chapada Diamantina plateau in the central region of the Bahia state (Juncá et al. 2015; Lopes et al. 2019).

***Scinax nebulosus* (Spix)****Type locality**

In forest near Tefé, Amazonas State, Brazil. Neotype from Belém, Pará State, Brazil (Hoogmoed and Gruber 1983).

**Distribution**

The species occurs in the states of Ceará (Loebmann and Haddad 2010; Borges-Leite et al. 2014; Roberto and Loebmann 2016; Castro et al. 2019), Pernambuco (Carnaval 2002), Rio Grande do Norte (Magalhães et al. 2013), and Piauí (Roberto et al. 2013; Araújo et al. 2020a).

***Scinax pachycrus* (Miranda-Ribeiro)****Type locality**

Municipality of Poção, Pernambuco state, Brazil (Miranda-Ribeiro 1937).

**Distribution**

The species occurs in the states of Alagoas (Almeida et al. 2016), Bahia (Xavier and Napoli 2011; Garda et al. 2013; Juncá et al. 2015), Paraíba (Arzabe et al. 2005; Barbosa and Alves 2014; Juncá et al. 2015; Cascon and Langguth 2016), Pernambuco (Borges-Nojosa and Santos 2005; Pedrosa et al. 2014; Juncá et al. 2015; Barbosa et al. 2018; Freitas et al. 2019, 2023), Rio

Grande do Norte (Magalhães et al. 2013), and Sergipe (Gouveia and Farias 2015).

***Scinax tropicalia* Novaes-e-Fagundes, Araujo-Vieira, Entiauspe, Roberto, Orrico, Solé, Haddad & Loebmann**

**Type locality**

Campus of the State University of Santa Cruz (UESC), municipality of Ilhéus, Bahia state, Brazil (Novaes-E-Fagundes et al. 2021).

**Distribution**

The species is found in Serra de Baturité, municipalities of Guaramiranga and Pacoti, Ceará (Novaes-E-Fagundes et al. 2021).

***Scinax x-signatus* (Spix)**

**Type locality**

Campus of the State University of Santa Cruz (UESC), Salobrinho, municipality of Ilhéus, Bahia state, Brazil (Araujo-Vieira et al. 2020).

**Distribution**

The species is found in the states of Alagoas (Almeida et al. 2016, present study), Bahia (Juncá et al. 2005; Garda et al. 2013), Ceará (Loebmann and Haddad 2010; Ribeiro et al. 2012; Borges-Leite et al. 2014, Borges-Nojosa & Cascon, 2005; Juncá et al. 2015; Santana DJ et al. 2015; Ferreira-Silva et al. 2016; Roberto and Loebmann 2016; Costa et al. 2018; Silva-Neta et al. 2018; Caldas et al. 2019; Castro et al. 2019; Oliveira CR et al. 2021), Paraíba (Vieira et al. 2007; Barbosa and Alves 2014; Filho et al. 2015; Cascon and Langguth 2016; Moura et al. 2016), Pernambuco (Pedrosa et al. 2014; Pereira et al. 2015; Barbosa et al. 2018; Freitas et al. 2023), Piauí (Roberto et al. 2013; Pedrosa et al. 2014; Benício et al. 2015; Araújo et al. 2020a), Rio Grande do Norte (Magalhães et al. 2013; Caldas et al. 2016; Jorge et al. 2020), and Sergipe (Gouveia and Farias 2015).

***Trachycephalus atlas* Bokermann**

**Type locality**

Santo Onofre farm, municipality of Maracás, Bahia state, Brazil (Bokermann 1966).

**Distribution**

The species occurs in the states of Bahia (Roberto et al. 2011; Garda et al. 2013), Ceará (Roberto et al. 2011; Roberto and Loebmann 2016; Silva-Neta et al. 2018), Pernambuco (Borges-Nojosa & Santos, 2005; Roberto et al. 2011; Vieira et al. 2011; Santos-Silva et al. 2012; Freitas et al. 2023), and Sergipe (present study).

***Trachycephalus mambaiensis* Cintra, Silva, Silva, Garcia & Zaher**

**Type locality**

Municipality of Mambaí, Goiás state, Brazil (Cintra et al. 2009).

**Distribution**

The species occurs in the municipality of Santa Maria da Vitória, western Bahia state (Vieira et al. 2011).

***Trachycephalus nigromaculatus* Tschudi**

**Type locality**

Brazil (Steindachner 1864).

**Distribution**

The species is found in Bahia state (Dória et al. 2015).

***Trachycephalus typhonius* (Linnaeus)**

**Type locality**

At number 1, Kerkplein Street, Paramaribo, Suriname (Lavilla et al. 2010).

**Distribution**

The species is found in the states of Bahia (Dória et al. 2015), Ceará (in the Brejos de Altitude and at the western coast of the state) (Roberto and Loebmann 2016; Castro et al. 2019), Paraíba, and Piauí (Roberto et al. 2013; Araújo et al. 2020a).

***Xenohyla eugenioi* Caramaschi**

**Type locality**

Boca do Mato farm, municipality of Maracás, Bahia state, Brazil (Caramaschi 1998).

**Distribution**

This species was found in the Caatinga of the municipalities of Maracás, at Bahia state, and Pedra Mole in Sergipe state (Almeida et al. 2015).

**Family: Hylodidae Günther*****Crossodactylus trachystomus* (Reinhardt & Lütken)****Type locality**

Municipality of Lagoa Santa, near Belo Horizonte, state of Minas Gerais, Brazil (Reinhardt and Lütken 1862 '1861').

**Distribution**

This species was found in the municipalities of Caetité (Bahia state) and Serranópolis de Minas, Minas Gerais state (Pimenta et al. 2015).

**Leptodactylidae**

Werner

***Adenomera hylaedactyla* (Cope)****Type locality**

'From the Napo or upper Maranon' River, Peru (Cope 1868).

**Distribution**

The species is found in the states of Ceará (Borges-Leite et al. 2014; Roberto and Loebmann 2016, present study), in the state of Piauí (Roberto et al. 2013; Araújo et al. 2020a), Alagoas, Pernambuco and Rio Grande do Norte (present study).

***Adenomera juikitam* Carvalho & Giaretta****Type locality**

Municipality of Teresina, northern Goiás state, Brazil, 840 m a.s.l (Carvalho TR and Giaretta AA 2013).

**Distribution**

The species is found in the states of Ceará (Fouquet et al. 2013; Roberto and Loebmann 2016; Carvalho et al. 2021) and Piauí (Roberto et al. 2013; Araújo et al. 2020a).

***Leptodactylus caatingae* Heyer & Juncá****Type locality**

Municipality of Juazeiro, Bahia state, Brazil (Heyer and Juncá 2003).

**Distribution**

The species is found in the states of Bahia (Heyer and Juncá 2003; Vieira WLS et al. 2006), Ceará (Vieira et al. 2012), Paraíba (Vieira WLS et al. 2006; Vieira et al. 2007; Filho et al. 2015; Cascon and Langguth 2016), Pernambuco (Heyer and Juncá 2003; Pereira et al. 2015), Piauí (present study), and Rio Grande do Norte (Magalhães et al. 2013).

***Leptodactylus fuscus* (Schneider)****Type locality**

'Suriname' (Schneider 1799).

**Distribution**

The species occurs in the states of Alagoas (Almeida et al. 2016, present study), Bahia (Xavier and Napoli 2011; Dória et al. 2015), Ceará (Borges-Nojosa & Cascon, 2005; Caldas et al. 2019; Costa et al. 2018; Loebmann and Haddad 2010; Oliveira CR et al. 2021; Ribeiro et al. 2012; Roberto and Loebmann 2016; Santana DJ et al. 2015; Silva-Neta et al. 2018), Paraíba (Vieira et al. 2007; Filho et al. 2015; Moura et al. 2016), Pernambuco (Borges-Nojosa & Santos, 2005; Pereira et al. 2015), Piauí (Roberto et al. 2013; Benício et al. 2015; Dal Vechio et al. 2016; Araújo et al. 2020a), Rio Grande do Norte (Caramaschi 2008; Magalhães et al. 2013; Caldas et al. 2016), and Sergipe (Oliveira et al. 2014; Gouveia and Farias 2015).

***Leptodactylus latrans* (Steffen)****Type locality**

'Brasília.' Neotype from 'Vale dos Agriões (22°25'S, 42° 58'W, approx. 900 m above sea level), Municipality of Teresópolis, State of Rio de Janeiro, Brazil' (Lavilla et al. 2010).

**Distribution**

The species occurs in the states of Bahia (present study), Pernambuco (Barbosa and Alves 2014), Paraíba (Barbosa and Alves 2014), and Sergipe (Oliveira et al. 2014).

***Leptodactylus luctator* (Hudson)****Type locality**

Near 'Buenos Ayres,' Argentina, according to original publication. Neotype from "Villa Elvira, La Plata municipality, Buenos Aires province, Argentina (Magalhães et al. 2020).

**Distribution**

The species is found in Chapada Diamantina, municipalities of Piatã, Mucugê, Cocos, and Jaborandi, Bahia state (Magalhães et al. 2020).

***Leptodactylus macrosternum* Miranda-Ribeiro****Type locality**

Bahia State, Brazil, according to the original publication. Likely Salvador, Bahia (Bokermann 1966).

**Distribution**

The species is found in the states of Alagoas (Almeida et al. 2016, present study), Bahia (Xavier and Napoli 2011; Garda et al. 2013; Magalhães et al. 2020), Ceará (Ribeiro et al. 2012; Borges-Leite et al. 2014; Roberto and Loebmann 2016; Costa et al. 2018; Silva-Neta et al. 2018; Oliveira CR et al. 2021), Paraíba (Filho et al. 2015; Cascon and Langguth 2016; Costa et al. 2016; Moura et al. 2016; Magalhães et al. 2020), Pernambuco (Pedrosa et al. 2014; Pereira et al. 2015; Felix-Nascimento et al. 2020; Magalhães et al. 2020; Freitas et al. 2023), Piauí (Roberto et al. 2013; Benício et al. 2015; Dal Vechio et al. 2016; Araújo et al. 2020a; Magalhães et al. 2020), Rio Grande do Norte (Magalhães et al. 2013, 2020; Camurugi et al. 2017; Felix-Nascimento et al. 2020), and Sergipe (present study).

***Leptodactylus mystaceus* (Spix)****Type locality**

Restricted to Solimões, Amazonas State, by lectotype designation (Méhely 1904).

**Distribution**

The species occurs in the states of Alagoas (Almeida et al. 2016), Bahia (Silva LA et al. 2020), Ceará (Ribeiro et al. 2012; Borges-Leite et al. 2014; Ferreira-Silva et al. 2016; Roberto and Loebmann 2016; Castro et al. 2019; Silva LA et al. 2020; Oliveira CR et al. 2021), Paraíba

(Barbosa and Alves 2014), in Piauí (Dal Vechio et al. 2016; Araújo et al. 2020a; Medina et al. 2020) and Rio Grande do Norte (Magalhães et al. 2013; Caldas et al. 2016; Silva FP et al. 2020).

***Leptodactylus mystacinus* (Burmeister)****Type locality**

'Rosario, Argentina' (Burmeister 1861).

**Distribution**

The species occurs in the states of Bahia (Heyer and Juncá 2003) and Pernambuco (Freitas et al. 2019).

***Leptodactylus natalensis* Lutz****Type locality**

'Municipality of Natal, state of Rio Grande do Norte, Brazil' (Lutz 1930).

**Distribution**

The species occurs in the states of Ceará (Caramaschi 2008; Roberto & Loebmann), Pernambuco (Heyer and Heyer 2006; Caramaschi 2008; Freitas et al. 2023), Piauí (Araújo et al. 2020b), Paraíba (present study) and Rio Grande do Norte (Magalhães et al. 2013).

***Leptodactylus oreomantis* de Carvalho, Leite & Pezzuti****Type locality**

'Vale do Queiroz, Serra das Almas, municipality of Rio de Contas, Bahia State, Northeast Brazil' (Carvalho TRD et al. 2013).

**Distribution**

This species is endemic to the Caatinga and only registered in Bahia state (Carvalho TRD et al. 2013; Mercês et al. 2015).

***Leptodactylus payaya* Magalhães, Lyra, Carvalho, Baldo, Brusquetti, Burella, Colli, Gehara, Giaretta, Haddad, Langone, López, Napoli, Santana, de Sá & Garda****Type locality**

'Chapada Diamantina, municipality of Jacobina, Bahia state, Brazil' (Magalhães et al. 2020).

**Distribution**

The species occurs in the states of Bahia and Pernambuco (Magalhães et al. 2020).

***Leptodactylus podicipinus* (Cope)****Type locality**

Paraguay (Cope 1862).

**Distribution**

The species occurs in the states of Pernambuco, in the municipality of Santa Maria da Boa Vista (Roberto IJ, personal observation), and Bahia (present study).

***Leptodactylus pustulatus* (Peters)****Type locality**

Ceará State, northeastern Brazil (Peters 1870).

**Distribution**

The species is found in the states of Bahia (present study), Ceará (Borges-Leite et al. 2014; Roberto and Loebmann 2016; Medina et al. 2020), and Piauí (Roberto et al. 2013; Benício et al. 2015; Araújo et al. 2020a).

***Leptodactylus syphax* Bokermann****Type locality**

São Vicente, municipality of Cuiabá, state of Mato Grosso, Brazil (Bokermann 1969).

**Distribution**

The species is found in the states of Ceará (Loebmann and Haddad 2010; Ribeiro et al. 2012; Roberto and Loebmann 2016; Lins et al. 2017; Castro et al. 2019; Oliveira CR et al. 2021), Paraíba (Cascon and Langguth 2016), Pernambuco (Pedrosa et al. 2014), Piauí (Roberto et al. 2013; Cavalcanti et al. 2014; Dal Vechio et al. 2016; Araújo et al. 2020a), and Rio Grande do Norte (Sales et al. 2024).

***Leptodactylus troglodytes* Lutz****Type locality**

Pernambuco State, Brazil (Lutz 1926).

**Distribution**

The species is found in the states of Alagoas (Almeida et al. 2016), Bahia (Juncá 2006; Santana and Juncá 2007; Garda et al. 2013; Silva LA et al. 2020), Ceará (Caramaschi 2008; Ribeiro et al. 2012; Borges-Leite et al. 2014, Borges-Nojosa & Cascon, 2005; Santana DJ et al. 2015; Ferreira-Silva et al. 2016; Roberto and Loebmann 2016; Costa et al. 2018; Silva-Neta et al. 2018; Caldas et al. 2019; Castro et al. 2019; Oliveira CR et al. 2021), Minas Gerais (Silva LA et al. 2020), Paraíba (Vieira et al. 2007; Barbosa and Alves 2014; Filho et al. 2015; Cascon and Langguth 2016), Pernambuco (Borges-Nojosa & Santos, 2005; Caramaschi 2008; Pedrosa et al. 2014; Pereira et al. 2015; Freitas et al. 2023), Piauí (Roberto et al. 2013; Cavalcanti et al. 2014; Benício et al. 2015; Dal Vechio et al. 2016; Araújo et al. 2020a), Rio Grande do Norte (Magalhães et al. 2013; Caldas et al. 2016), and Sergipe (Gouveia and Farias 2015).

***Leptodactylus vastus* Lutz****Type locality**

'Paraíba State, Brazil' (Lutz 1930).

**Distribution**

The species is found in the states of Alagoas (Almeida et al. 2016), Bahia (Xavier and Napoli 2011, present study), Ceará (Caramaschi 2008; Loebmann and Haddad 2010; Ribeiro et al. 2012; Borges-Leite et al. 2014; Teles et al. 2014; Santana DJ et al. 2015; Ferreira-Silva et al. 2016; Roberto and Loebmann 2016; Costa et al. 2018; Silva-Neta et al. 2018; Caldas et al. 2019; Castro et al. 2019; Oliveira CR et al. 2021), Paraíba (Barbosa and Alves 2014; Moura et al. 2016); Pernambuco (Caramaschi 2008; Pedrosa et al. 2014; Pereira et al. 2015), Piauí (Roberto et al. 2013; Cavalcanti et al. 2014; Benício et al. 2015; Dal Vechio et al. 2016; Araújo et al. 2020a), Rio Grande do Norte (Magalhães et al. 2013; Caldas et al. 2016), and Sergipe (Gouveia and Farias 2015).

***Physalaemus albifrons* (Spix)****Type locality**

Bahia State, Brazil (Bokermann 1966).

**Distribution**

The species is found in the states of Alagoas (Palmeira et al. 2011; Almeida et al. 2016), Bahia (present study),

Ceará (Nascimento et al. 2005; Caramaschi 2008; Loebmann and Haddad 2010; Ribeiro et al. 2012; Borges-Leite et al. 2014; Santana DJ et al. 2015; Roberto and Loebmann 2016; Costa et al. 2018; Silva-Neta et al. 2018; Caldas et al. 2019; Oliveira et al. 2019; Araújo et al. 2020b; Oliveira CR et al. 2021), Minas Gerais (Nascimento et al. 2005), Paraíba (Vieira et al. 2007; Barbosa and Alves 2014; Filho et al. 2015; Cascon and Langguth 2016; Protázio et al. 2019), Pernambuco (Pereira et al. 2015), Piauí (Roberto et al. 2013; Benício et al. 2015; Dal Vechio et al. 2016; Araújo et al. 2020a), Rio Grande do Norte (Magalhães et al. 2013; Caldas et al. 2016), and Sergipe (Gouveia and Farias 2015).

### ***Physalaemus centralis* Bokermann**

#### **Type locality**

‘Xingu, Coluene river, state of Mato Grosso, Brazil’ (Bokermann 1962).

#### **Distribution**

The species is found in the states of Bahia (Loebmann et al. 2017), northern Minas Gerais (Nascimento et al. 2005), Piauí (Roberto et al. 2013; Araújo et al. 2020a), and Paraíba (Moura et al. 2016).

### ***Physalaemus cicada* Bokermann**

#### **Type locality**

‘Fazenda Cana Brava, municipality of Maracás, Bahia State, Brazil’ (Bokermann 1966).

#### **Distribution**

The species is found in the states of Alagoas (Lisboa and Haddad 2009; Almeida et al. 2016), Bahia (Nascimento et al. 2005; Santana and Juncá 2007; Garda et al. 2013), Ceará (Nascimento et al. 2005; Caramaschi 2008; Loebmann and Mai 2008; Silva et al. 2013; Santana DJ et al. 2015; Roberto and Loebmann 2016; Costa et al. 2018; Silva-Neta et al. 2018; Caldas et al. 2019; Oliveira et al. 2019; Oliveira CR et al. 2021), Minas Gerais (Nascimento et al. 2005; Caramaschi 2008), Paraíba (Arzabe 1999; Arzabe et al. 2005; Vieira et al. 2007; Vieira WLS and Arzabe C 2008; Filho et al. 2015; Cascon and Langguth 2016; Protázio et al. 2019), Pernambuco (Borges-Nojosa & Santos, 2005; Silva et al. 2013, 2022; Pereira et al. 2015; Vittorazzi et al. 2016), Piauí (Benício et al. 2012, 2015), Rio Grande do Norte (Silva et al. 2013; Caldas et al. 2016), and Sergipe (Gouveia and Farias 2015; Caldas et al. 2016; Vittorazzi et al. 2016).

### ***Physalaemus cuvieri* Fitzinger**

#### **Type locality**

‘America, Brasilia’ (Fitzinger 1826).

#### **Distribution**

The species is found in the states of Alagoas (Almeida et al. 2016), Bahia (Nascimento et al. 2005), Ceará (Loebmann and Haddad 2010; Ribeiro et al. 2012; Borges-Leite et al. 2014, Borges-Nojosa & Cascon, 2005; Santana DJ et al. 2015; Ferreira-Silva et al. 2016; Roberto and Loebmann 2016; Costa et al. 2018; Silva-Neta et al. 2018; Caldas et al. 2019; Castro et al. 2019; Oliveira et al. 2019; Oliveira CR et al. 2021), Paraíba (Barbosa and Alves 2014; Moura et al. 2016), Pernambuco (Pedrosa et al. 2014; Pereira et al. 2015), Piauí (Roberto et al. 2013; Cavalcanti et al. 2014; Benício et al. 2015; Dal Vechio et al. 2016; Araújo et al. 2020a), Rio Grande do Norte (Magalhães et al. 2013; Caldas et al. 2016), and Sergipe (present study).

### ***Physalaemus kroyeri* (Reinhardt & Lütken)**

#### **Type locality**

Cachoeira de São Félix municipality, Rio Paraguaçu, Bahia State, Brazil (Reinhardt and Lütken 1862 ‘1861’).

#### **Distribution**

The species is found in the states of Bahia (Xavier and Napoli 2011, present study), Paraíba (Arzabe et al. 2005), Pernambuco (Freitas et al. 2019, 2023; Silva et al. 2022) and Sergipe in the municipality of Estância (present study).

### ***Physalaemus nattereri* (Steindachner)**

#### **Type locality**

Cuiabá, state of Mato Grosso (Steindachner 1863)

#### **Distribution**

The species occurs in western Bahia state and in Piauí state, in Rio Grande do Piauí municipality (present study).

***Pleurodema alium* Maciel & Nunes****Type locality**

‘Grão Mogol, state of Minas Gerais, Southeast Brazil’ (Maciel and Nunes 2010).

**Distribution**

The species occurs in Bahia state (Maciel and Nunes 2010; Magalhães et al. 2015, present study).

***Pleurodema diplolister* (Peters)****Type locality**

Ceará State, Northeast Brazil (Peters 1870).

**Distribution**

The species is found in the states of Alagoas (Almeida et al. 2016, present study), Bahia (Alves-dos-Santos et al. 2003; Maciel and Nunes 2010; Garda et al. 2013), Ceará (Caramaschi 2008; Loebmann and Haddad 2010; Maciel and Nunes 2010; Ribeiro et al. 2012; Borges-Leite et al. 2014, Borges-Nojosa & Cascon, 2005; Santana DJ et al. 2015; Roberto and Loebmann 2016; Costa et al. 2018; Silva-Neta et al. 2018; Oliveira CR et al. 2021), Paraíba (Arzabe et al. 2005; Vieira et al. 2007; Maciel and Nunes 2010; Barbosa and Alves 2014; Cascon and Langguth 2016; Moura et al. 2016), Pernambuco (Borges-Nojosa & Santos, 2005; Caramaschi 2008; Freitas et al. 2023; Maciel & Nunes; Pedrosa et al. 2014; Pereira et al. 2015), Piauí (Caramaschi 2008; Maciel and Nunes 2010; Benício et al. 2015), Rio Grande do Norte (Magalhães et al. 2013; Caldas et al. 2016; Jared et al. 2019), and Sergipe (Gouveia and Farias 2015).

***Pseudopaludicola florencei* de Andrade, Haga, Lyra, Leite, Kwet, Haddad, Toledo & Giaretta****Type locality**

‘Municipality of Andaraí, Chapada Diamantina, Bahia State, Brazil’ (Andrade et al. 2018).

**Distribution**

The species is found in Bahia state (Andrade et al. 2018).

***Pseudopaludicola jaredi* de Andrade, Magalhães, Nunes-de-Almeida, Veiga-Menoncello, Santana, Garda, Loebmann, Recco-Pimentel, Giaretta & Toledo****Type locality**

‘Serra das Flores, municipality of Viçosa do Ceará, Ceará State, Brazil’ (Andrade et al. 2016).

**Distribution**

This species occurs in the Serra das Flores, part of the Serra da Ibiapaba mountain range, in Ceará state (Andrade et al. 2016; Roberto and Loebmann 2016).

***Pseudopaludicola mystacalis* (Cope)****Type locality**

Chapada dos Guimarães, 30 miles northeast of Cuiabá, and close to the headwaters of the Xingu, an important tributary of the Amazon, in the state of Mato Grosso, Brazil (Cope 1887).

**Distribution**

The species is found in the states of Ceará (Ribeiro et al. 2012; Borges-Leite et al. 2014; Magalhães et al. 2014; Benício et al. 2015; Roberto and Loebmann 2016; Silva-Neta et al. 2018; Castro et al. 2019; Araújo et al. 2020b; Oliveira CR et al. 2021), Piauí (Roberto et al. 2013; Benício et al. 2015; Araújo et al. 2020a), and Rio Grande do Norte (Magalhães et al. 2013).

***Pseudopaludicola pocoto* Magalhães, Loebmann, Kokubum, Haddad & Garda****Type locality**

Municipality of Santa Quitéria, Ceará State, Brazil (Magalhães et al. 2014).

**Distribution**

This species occurs in the states of Bahia (Andrade et al. 2017, 2018), Ceará (Magalhães et al. 2014; Santana DJ et al. 2015; Roberto and Loebmann 2016; Silva CS et al. 2017; Andrade et al. 2018; Costa et al. 2018; Silva-Neta et al. 2018; Caldas et al. 2019; Oliveira CR et al. 2021), Paraíba (Magalhães et al. 2014; Lantyer-Silva et al. 2016; Moura et al. 2016), Pernambuco (Borges-Nojosa & Santos, 2005; Pereira et al. 2015; Lantyer-Silva et al. 2016; Silva CS et al. 2017; Silva et al. 2022), Piauí (Silva CS et al. 2017),

and Rio Grande do Norte (Magalhães et al. 2014; Caldas et al. 2016).

### ***Rupirana cardosoi* Heyer**

#### **Type locality**

‘Municipality of Mucujê, Bahia State, Brazil (Heyer 1999).

#### **Distribution**

This species is endemic to the Caatinga, observed at high altitudes in the Chapada Diamantina region, Bahia state (Heyer 1999; Juncá and Lugli 2009).

### ***Rupirana kaatinga* Mangia, Amaral, Müller & Santana**

#### **Type locality**

‘Cafundó, Gentio do Ouro municipality, Bahia state, Brazil’ (Mângia et al. 2025).

#### **Distribution**

This species is endemic to the Caatinga, known from three higher altitudes localities in Serra do Assuruá region, Gentio do Ouro, Bahia state (Mângia et al. 2025).

### **Family: Microhylidae Günther**

### ***Chiasmocleis cordeiroi* Caramaschi & Pimenta**

#### **Type locality**

‘Município de Camamu, Projeto de Assentamento Zumbi dos Palmares, estado da Bahia’ (Caramaschi and Pimenta 2003).

#### **Distribution**

In the Caatinga the species is known for Palmeiras Municipality, Bahia State, in the Chapada Diamantina (Magalhães et al. 2015).

### ***Dermatonotus muelleri* (Boettger)**

#### **Type locality**

‘Paraguay’ (Boettger 1885).

#### **Distribution**

The species is found in the states of Alagoas (Almeida et al. 2016), Bahia (Juncá et al. 2005; Garda et al. 2013; Oliveira et al. 2018a), Ceará (Loebmann and Haddad 2010; Ribeiro et al. 2012, 2015; Borges-Leite et al. 2014, Borges-Nojosa & Cascon, 2005; Santana DJ et al. 2015; Roberto and Loebmann 2016; Alcantara et al. 2018; Costa et al. 2018; Oliveira et al. 2018a; Silva-Neta et al. 2018; Caldas et al. 2019; Oliveira CR et al. 2021), Minas Gerais (Oliveira et al. 2018a), Paraíba (Arzabe et al. 2005; Vieira et al. 2007; Filho et al. 2015; Cascon and Langguth 2016; Oliveira et al. 2018a), Pernambuco (Borges-Nojosa & Santos, 2005; Pedrosa et al. 2014; Pereira et al. 2015; Oliveira et al. 2018a; Silva et al. 2022), Piauí (Roberto et al. 2013; Benício et al. 2015; Dal Vechio et al. 2016; Araújo et al. 2020a), Rio Grande do Norte (Magalhães et al. 2013; Caldas et al. 2016), and Sergipe (Gouveia and Farias 2015; Oliveira et al. 2018a).

### ***Elachistocleis cesarii* (Miranda-Ribeiro)**

#### **Type locality**

‘São Paulo, Brazil’ (Cochran 1955 ‘1954’).

#### **Distribution**

The species occurs in the states of Bahia and Rio Grande do Norte (Magalhães et al. 2012, 2013).

### ***Elachistocleis piauiensis* Caramaschi & Jim**

#### **Type locality**

‘Municipality of Picos, state of Piauí, Northeast Brazil’ (Caramaschi and Jim 1983a).

#### **Distribution**

The species is found in the states of Ceará (Santos et al. 2005; Loebmann and Haddad 2010; Ribeiro et al. 2012; Borges-Leite et al. 2014; Santana DJ et al. 2015; Roberto and Loebmann 2016; Costa et al. 2018; Silva-Neta et al. 2018; Oliveira CR et al. 2021) and Piauí (Roberto et al. 2013; Benício et al. 2015; Araújo et al. 2020a, 2020b).

### **Family: Odontophrynidae Lynch**

### ***Odontophrynus carvalhoi* Savage & Cei**

#### **Type locality**

‘Municipality of Poção, Pernambuco State, Brazil’ (Savage and Cei 1965).

**Distribution**

The species is found in the states of Bahia (Xavier and Napoli 2011; Caramaschi and Napoli 2012), Ceará (Loebmann and Haddad 2010; Caramaschi and Napoli 2012; Roberto and Loebmann 2016), Paraíba (Caramaschi and Napoli 2012), and Pernambuco (Caramaschi and Napoli 2012; Pedrosa et al. 2014; Pereira et al. 2015; Barbosa et al. 2018; Silva-Neta et al. 2018; Freitas et al. 2019).

***Odontophrynus juquinha Rocha, Sena, Pezzuti, Leite, Svartman, Rosset, Baldo & Garcia*****Type locality**

‘Serra do Cipó, municipality of Santana do Riacho, state of Minas Gerais, Brazil’ (Rocha et al. 2017).

**Distribution**

The species is found in Chapada Diamantina, in the municipalities of Palmeiras and Rio de Contas, Bahia state (Rocha et al. 2017, present study).

***Proceratophrys ararype Mângia, Koroiva, Nunes, Roberto, Ávila, Sant’Anna, Santana & Garda*****Type locality**

‘Mata do Clube Recreativo Granjeiro, municipality of Crato, Ceará State, Brazil’ (Mângia et al. 2018).

**Distribution**

This species is endemic to the Caatinga, observed in the humid forest on the slopes of Chapada do Araripe, municipalities of Barbalha, Crato, and Missão Velha, Ceará state (Mângia et al. 2018; Mascarenhas et al. 2021).

***Proceratophrys cristiceps (Müller)*****Type locality**

‘Caatinga and adjacent areas, Brazil’ (Mângia et al. 2020).

**Distribution**

The species is found in the states of Alagoas (Almeida et al. 2016; Mângia et al. 2018), Bahia (Garda et al. 2013; Mângia et al. 2018), Ceará (Loebmann and Haddad 2010; Brito et al. 2012; Cruz et al. 2012; Ribeiro et al. 2012;

Borges-Leite et al. 2014, Borges-Nojosa & Cascon, 2005; Santana DJ et al. 2015; Mângia et al. 2018; Silva-Neta et al. 2018; Caldas et al. 2019; Castro et al. 2019; Santos et al. 2019; Oliveira CR et al. 2021), Paraíba (Vieira et al. 2007; Vieira KS et al. 2008; Cruz et al. 2012; Filho et al. 2015; Cascon and Langguth 2016; Moura et al. 2016; Mângia et al. 2018), Pernambuco (Vieira KS et al. 2008; Cruz et al. 2012; Pedrosa et al. 2014; Pereira et al. 2015; Mângia et al. 2018), Piauí (Roberto et al. 2013; Benício et al. 2015; Dal Vechio et al. 2016; Araújo et al. 2020a), Rio Grande do Norte (Vieira KS et al. 2008; Cruz et al. 2012; Magalhães et al. 2013; Caldas et al. 2016; Mângia et al. 2020), and Sergipe (Gouveia and Farias 2015; Mângia et al. 2018).

***Proceratophrys minuta Napoli, Cruz, Abreu & Del Grande*****Type locality**

‘Riacho do Dandá, Parque Estadual das Sete Passagens, municipality of Miguel Calmon, Bahia State, Brazil’ (Napoli et al. 2011).

**Distribution**

This species is endemic to the Caatinga, observed in Chapada Diamantina, Bahia state (Napoli et al. 2011; Nascimento et al. 2019).

***Proceratophrys redacta Teixeira, Amaro, Recoder, Vechio & Rodrigues*****Type locality**

Municipality of Morro do Chapéu, Bahia State, Brazil (Teixeira-Jr et al. 2012).

**Distribution**

This species is endemic to the Caatinga, observed in the municipality of Morro do Chapéu, Bahia state (Teixeira-Jr et al. 2012; Simões et al. 2020).

***Proceratophrys renalis Miranda-Ribeiro*****Type locality**

Municipality of Itabuna, Bahia State, Brazil (Prado and Pombal-Jr 2008).

**Distribution**

The species is found in the states of Ceará, in the Serras de Maranguape and Aratanha (Prado and Pombal-Jr

2008; Roberto and Loebmann 2016), Paraíba (Prado and Pombal-Jr 2008), and Pernambuco (Carnaval 2002; Prado and Pombal-Jr 2008; Freitas et al. 2019, 2023).

***Proceratophrys velhochico* Mângia, Magalhães, Leite, Cavalheri & Garda**

**Type locality**

‘District of Delfino, municipality of Campo Formoso, Bahia State,’ 850 masl’ (Mângia et al. 2022)

**Distribution**

This species is endemic to the Caatinga, and it is known from two localities (both above 800 m.a.s.l) within the Environmental Protection Area (APA) Boqueirão da Onça, in the municipalities of Campo Formoso and Umburanas, both in Bahia state (Mângia et al. 2022).

**Family: Pipidae Gray**

***Pipa carvalhoi* Miranda-Ribeiro**

**Type locality**

Poção Municipality, Pernambuco State, Brazil (Caramaschi 1989).

**Distribution**

The species is found in the states of Alagoas (Lima et al. 2020; Silva-Santos et al. 2020), Bahia (present study), Ceará (Schubart 1942; Ribeiro et al. 2012, 2015; Ferreira-Silva et al. 2016; Silva-Neta et al. 2018; Lima et al. 2020), Paraíba (Trueb and Cannatella 1986; Cascon and Langguth 2016; Lima et al. 2020), Pernambuco (Trueb and Cannatella 1986; Caramaschi 1989; Pedrosa et al. 2014; Lima et al. 2020; Silva et al. 2022), Rio Grande do Norte (Magalhães et al. 2013; Jorge et al. 2015; Lima et al. 2020), and Sergipe (Santana et al. 2014).

***Pipa pipa* (Linnaeus)**

**Type locality**

Suriname (Linnaeus 1758).

**Distribution**

This species is considered exotic. Individuals of the species were recorded only in Lagoa do Itaperi and

Parangaba, municipality of Fortaleza, Ceará state (Serra et al. 2015; Roberto and Loebmann 2016).

**Family: Ranidae Batsch**

***Lithobates palmipes* (Spix)**

**Type locality**

‘Amazon River, State of Amazonas, Brazil’ (Glaw and Franzen 2006).

**Distribution**

This species occurs in the municipality of Macaíba, in Rio Grande do Norte state (Magalhães et al. 2013), and in the municipality of Areia, in Paraíba state (Barbosa and Alves 2014).

**Family: Strabomantidae Hedges, Duellman & Heinecke**

***Pristimantis ramagii* (Boulenger)**

**Type locality**

‘Municipality of Igarassu, in the Pernambuco State, Brazil’ (Boulenger 1888).

**Distribution**

The species occurs in the states of Alagoas (Almeida et al. 2016), Bahia (Garda et al. 2013), Paraíba (present work), Pernambuco (Freitas et al. 2019, 2023), and Rio Grande do Norte (Magalhães et al. 2013).

***Pristimantis relictus* Roberto, Loebmann, Lyra, Haddad & Ávila**

**Type locality**

‘Parque Nacional de Ubajara, municipality of Ubajara, Ceará State, Brazil’ (Roberto et al. 2022).

**Distribution**

This species is endemic to the Caatinga. It occurs in the ‘brejos-de-altitude’ of the Ceará state: Plateau of Ibiapaba, in the municipalities of Ipu, Tianguá, Ubajara, Granja, and Viçosa do Ceará; Serra de Maranguape, in the municipality of Maranguape; Serra da Aratanha, in the municipality of Pacatuba; Serra de Baturité, municipalities of Guaramiranga,

Pacoti, Aratuba, and Mulungu; Serra da Uruburetama, in the municipality of Uruburetama; and Serra da Meruoca, in the municipality of Meruoca (Roberto et al. 2022).

***Pristimantis rupicola* Taucce, Nascimento, Trevisan, Leite, Santana, Haddad & Napoli**

**Type locality**

‘Vale do Queiroz, Serra das Almas, municipality of Rio de Contas, Bahia State, Brazil’ (Taucce et al. 2020),

**Distribution**

This species is endemic to the Caatinga, observed in the upland forests of the Chapada Diamantina, from 870 to 1,800 m, in the municipalities of Ipujiara, Piatã, Rio de Contas, and Gentio do Ouro, all in the Bahia state, Brazil (Taucce et al. 2020).

**Order Gymnophiona**

**Family: Caeciliidae Rafinesque**

***Caecilia tentaculata* Linnaeus**

**Type locality**

‘America’ (Linnaeus 1758).

**Distribution**

This species occurs at Serra de Maranguape and Serra do Baturité mountains, both in the Ceará state (Borges-Nojosa et al. 2017).

**Family: Siphonopidae Bonaparte,**

***Siphonops annulatus* (Mikan)**

**Type locality**

Rio de Janeiro (Gemel et al. 2019).

**Distribution**

This species occurs in the municipality of Jequié, Bahia state (Lantyer-Silva et al. 2013).

***Siphonops paulensis* Boettger**

**Type locality**

São Paulo (Mertens 1967).

**Distribution**

This species occurs in the states of Ceará (Loebmann and Haddad 2010; Gogliath et al. 2015; Roberto and Loebmann 2016), Bahia (Mott et al. 2016), Pernambuco (Amorim et al. 2016; Freitas et al. 2019), Sergipe (Santana DO et al. 2015), Rio Grande do Norte (Mott et al. 2016), and Piauí (Cavalcanti et al. 2014).

**Family: Typhlonectidae Taylor**

***Chthonerpeton arii* Cascon & Lima-Verde**

**Type locality**

Municipality of Limoeiro do Norte, Ceará state (Cascon and Lima-Verde 1994).

**Distribution**

This species is endemic to the Caatinga and found in the state of Ceará (Cascon and Lima-Verde 1994), in the Luiz Gonzaga hydroelectric dam at the border of Pernambuco and Bahia states, and in the municipality of Paulo Afonso, Bahia state (Maciel et al. 2013).

**Discussion**

Compared to rainforests such as Amazonia and the Atlantic Forest, for which Brazil is well known, environmental conditions in the Caatinga appear particularly unfavorable to amphibians. The first studies on Caatinga’s herpetofauna considered its faunistic composition a subset of the Cerrado’s and the Atlantic Forest’s faunas (Vanzolini 1976; Vanzolini et al. 1980). Nevertheless, despite its semiarid climate, we herein report the occurrence of 119 species of amphibians, 22 of them endemic to the Caatinga. The last two most inclusive studies regarding Caatinga’s herpetofauna reported 73 and 98 amphibian species, respectively (Camardelli and Napoli 2012; Garda et al. 2017), to which we added the occurrence of 21 additional species. Despite the synonymization of two endemic taxa (Mângia et al. 2020) since the previous list, which reported 20 endemics (Garda et al. 2017), our present work indicates 22 endemic species. Therefore, since 2017 four new endemic species have been described for the Caatinga, all from higher altitude areas (*Pristimantis relictus*, *P. rupicola*, *Proceratophrys velhochico*, and *Rupirana kaatinga*). This indicates a significant increase and also the likelihood that many other endemics still await description, further underscoring the importance of higher altitude areas in the biome.

The visual inspection of the species' geographic distribution maps revealed spatial and ecological patterns for some amphibians within the Caatinga. For example, the gladiator frog *Bokermannohyla oxente* is distributed throughout the highest altitude areas of Chapada Diamantina, which also harbor anuran species with restricted geographic distributions (e.g. *Pristimantis relictus* and other species of the genus *Bokermannohyla*), while others are found exclusively in lowland areas (e.g. *Leptodactylus caatingae*). On the other hand, some species are widely distributed throughout the Caatinga, such as the hylids *Corythomantis greeningi* and *Pithecopus nordestinus* and the microhylid *Dermatonotus muelleri*. Some taxa, conversely, are found in ecotone areas, such as those with the Atlantic Forest to the east, where the ranid *Lithobates palmipes* is found. To the west and to the south, ecotones with the Cerrado allow the marginal occurrence of species from this ecological region into the Caatinga, such as the bufonid *Rhinella mirandaribeiroi*, the hylid *Trachycephalus mambaiensis* and the leptodactylid *Physalaemus nattereri*. Furthermore, all endemic hylid species within the Caatinga occur exclusively in the Chapada Diamantina region, while the endemic eleutherodactylids (*Adelophryne* spp.) are restricted to the 'brejos-de-altitude' from the Ceará state.

According to the recently published list of endangered Brazilian Fauna (MMA 2022) and the IUCN (2023), most species of the Caatinga are not threatened with extinction (Table 1). This result, however, conveys a false sense of protection because less than 2% of the Caatinga region is within strict protected areas (Antongiovanni et al. 2018). Furthermore, current numbers indicate an increase compared to previous assessments compiled in the literature for the Biome (Garda et al. 2017). In IUCN's evaluation in 2016, two species were listed: *Adelophryne baturitensis* (Vulnerable) and *Adelophryne maranguapensis* (Endangered, IUCN 2016). Now, the IUCN list includes eight species, two of them Vulnerable, four Endangered, and two Critically Endangered (IUCN 2023), while the Brazilian official list has three critically endangered species (Table 1).

Such increase is expected given the refinement of the databases used and the description of more geographically restricted, less conspicuous species. Most of these species are associated with mountainous mesic enclaves, and aside from *R. cardosoi*, none are found inside protected areas. The importance of these high-altitude areas was previously indicated in a parsimony analysis of endemism (Camardelli and Napoli 2012), which recovered five areas of endemism

for the Caatinga Region, two from the Chapada Diamantina region to the south, and two 'brejos-de-altitude' from the Ceará and Pernambuco states to the north.

In northeastern Brazil, the forest patches restricted to high altitudes (Atlantic Forest enclaves or 'brejos de altitude,' Menezes et al. 2021) have been considered areas of speciation and biotic refuges that remained stable throughout the Quaternary climate changes (Carnaval 2002; Carnaval and Moritz 2008). In addition, they must also have been important in determining the current distribution patterns of the Caatinga's amphibians. Most of these mountainous forest patches do not have a common biogeographical origin and have different levels of Atlantic Forest and Amazonia influence on their species composition (Carnaval and Bates 2007; Santos et al. 2007). Genetic studies of species from these forest enclaves suggested different evolutionary histories (Carnaval 2002; Carnaval and Bates 2007). These species probably come from different colonization episodes from neighboring humid biomes that occurred both in very ancient (Oligocene-Miocene for *Adelophryne*, Fouquet et al. 2012) and in more recent periods (Pleistocene for *Lithobates*, Coelho et al. 2022).

A phylogeographical study on two anuran species (*Proceratophrys renalis* and *Pristimantis ramauii*) inhabiting 'brejos-de-altitude' and the Atlantic Forest on the northeastern Brazilian coast evidenced shallow genetic distances among populations (Carnaval and Bates 2007). Nevertheless, species found in the 'brejos-de-altitude' but predominantly distributed in Amazonia (e.g. *Lithobates palmipes*) or with sister species in Amazonia (e.g. *Proceratophrys ararype*) support the existence of past connections between eastern Amazonia and northern Atlantic Forest (Ledo and Colli 2017). Genetically, these species/populations diverged only recently from Amazonian clades (Pleistocene). Yet, ancient connections are also represented in the 'brejo-de-altitude' relict species, such as those from the genera *Pristimantis* and *Adelophryne* from the Atlantic Forest and 'brejos-de-altitude' which diverged from Amazonian clades millions of years ago (Fouquet et al. 2012; Trevisan et al. 2020).

### Sampling bias

The sampling effort is not homogeneously distributed in the Caatinga (Figure B). Our sampling gap map shows a situation similar to that documented for other vertebrates, and well-sampled areas match the location of universities and scientific collections (see Guedes et al. 2018). Highways are also concentrated

along the coast where major cities of the Northeast are found, facilitating sampling in these areas. This sampling bias in most of the Caatinga can seriously influence biodiversity estimates, given that some areas were never surveyed, and several others were visited outside the peak of reproductive periods (Garda et al. 2017).

Balancing omission and commission errors in map production is far from trivial, and finding the best mapping procedure for a given region, taxon, or research priority is a complex challenge (Elith et al. 2006; Duputié et al. 2013). However, by using high-quality verified georeferenced point localities, we provide a solid foundation for future studies, allowing the use of polygon maps (Roll et al. 2017), grid maps (Guedes et al. 2018), expert drawn (Elith et al. 2006; Ficetola et al. 2014), and species distribution modeling (Elith et al. 2006; Costa et al. 2007).

Although anchored on specimen vouchers, there may be better options than point locality maps for regions with high variation in sampling efforts for describing species ranges and resulting patterns. Especially in metrics related to species richness (Graham and Hijmans 2006), maps can provide fundamental data for understanding the area of coverage, generating a high-quality starting point for different ecological approaches, a central task of the sciences of biogeography and biodiversity (Beck et al. 2013; Duputié et al. 2013; Nogueira et al. 2019).

Recently, a surge of windmill projects in northeastern Brazil has taken many biologists to work on environmental impact and monitoring surveys the region. Unfortunately, licenses for monitoring and environmental impact assessments for infrastructure projects in Brazil do not allow specimens to be collected. This hampers, in the context of the present paper and species list, any kind of incorporation of that data, which exists as lists with no vouchers or pictures necessarily associated with them. We urge licensing agencies in Brazil to consider mandatory for such surveys and monitoring efforts to collect vouchers and deposition of pictures of specimens registered in open databases, like iNaturalist. This would likely increase the availability of occurrence data dramatically for all taxa.

We are confident that two of the most serious and widespread problems of point locality records have been at least minimized in our database: taxonomic and geographic position errors. Our records have been obtained from voucher-supported taxonomic reviews or faunal studies, and our localities have been carefully georeferenced to the most accurate coordinates possible. We know that even verified and well-selected records of georeferenced points are not error-

free. Some locations can be relatively inaccurate, especially older records not aided by GPS technologies. It must, however, be emphasized that even the oldest records allow accurate georeferencing when collectors have carefully described specimen collection sites (see Wallace 1876).

### **Final considerations**

Many central questions in biogeography, ecology, and evolutionary biology can only be addressed and answered if species distribution is properly documented (Whittaker et al. 2013). Detailed, updated, and reliable data on species occurrences are precious, especially in regions that combine high biological complexity, sampling gaps in biological knowledge, and high anthropic pressure, such as the Caatinga. Our high-quality distribution maps become even more relevant in times of unprecedented habitat loss, climate change, and biodiversity crisis (Duputié et al. 2013; Pimm and Raven 2017). Furthermore, distribution maps are a valuable communication tool between science and the general public (Jetz et al. 2012; Ward 2012).

It is important to highlight the importance of citing primary sources in our database (Appendix A) because using incorrect secondary information is one of the main reasons for perpetuating misconceptions about the biology of organisms (Martins et al. 2021). Perhaps one of the greatest uses of the geographic distribution data on organisms is to support conservation actions, which include management and monitoring of populations, creation or expansion of protected areas, and actions aimed at disseminating knowledge and raising awareness, such as scientific dissemination and environmental education, as it is difficult to imagine such actions without solid knowledge about the range of the target species (Martins et al. 2021).

Distribution and natural history information are important in virtually all approaches to conservation biology, from assessing the risk of population extinction to effective conservation actions (Vitt 2013; Martins et al. 2021). Extinction risk assessments and other ways of prioritizing species are invariably based on criteria of basic information such as geographic distribution, species abundance, and habitat (Martins et al. 2021). Likewise, conservation planning, which includes the detection of priority areas (i.e. areas that should be transformed into reserves), greatly benefits from this information, especially with the incorporation of functional, phylogenetic, and taxonomic diversity (Margules and Pressey 2000; Martins et al. 2021).

Despite knowledge gaps and areas with few documented records in the Caatinga, we confirmed the occurrence of 116 amphibian species. The geographic distribution of the species mapped here reveals patterns of endemism in highland mesic enclaves that urgently require deeper analyses. We also emphasize that all species with some degree of threat in the Caatinga occur in the ‘brejos-de-altitude’ of the Ceará state, and given this information, we point out that these environments deserve special attention in conservation efforts at the federal, state, and municipal levels.

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### Authors contributions

AAG, TBG, and JPSS conceptualized the paper, AME, MFN, IJR, MBL, DOM, and FAJ collected specimens in the field, provided new registers and revised identifications. JPSS, AME, and MFN constructed the database of species occurrences. JPSS, AAG and TBG produced maps and tables and the first version of the manuscript. AAG built figures with species photographs. All authors to writing and revising the manuscript.

### Disclosure statement

No potential conflict of interest was reported by the author(s).

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## Appendix A

AAGUFU - Coleção de Anuros do Museu de Biodiversidade do Cerrado, BMNH - British Museum Natural History, CAS - California Academy of Sciences, CASA - Coleção Audiovisual do Semiárido, CAS-SU - California Academy of Sciences (Stanford University), CFBH - Coleção Célio F. B. Haddad, CHFURG - Coleção Herpetológica Universidade Federal do Rio Grande do Sul, CHJJ - Coleção Herpetológica Jorge Jim, CHPUFRPE - Coleção de Herpetologia e Paleoherpetológica da Universidade Federal Rural de Pernambuco, CHUFC - Coleção Herpetológica da Universidade Federal do Ceará, CHUFPPB - Coleção Herpetológica da Universidade Federal da Paraíba, CHUFPE - Coleção Herpetológica da Universidade Federal de Pernambuco, CHUFRPE - Coleção Herpetológica da Universidade Federal Rural de Pernambuco, CHUFS - Coleção Herpetológica da Universidade Federal de Sergipe, CHUNB - Coleção Herpetológica da Universidade de Brasília, CLAR - Coleção do Laboratório de Anfíbios e Répteis da Universidade Federal do Rio Grande do Norte, DBEZ - Departamento de Botânica e Zoologia - Universidade Federal do Rio Grande do Norte, JZ - Juliana Zina, LABAN - Laboratory of Amphibian Biosystematics - Federal University of Campina Grande, LABEVA - Laboratório de Biologia e Ecologia de Vertebrados da Universidade Federal de Sergipe, MCT-PUC - Museu de Ciências e Tecnologia da PUC, MCZ - Museum of Comparative Zoology - Harvard University, MFCH - Museu de Fauna da Caatinga Coleção Herpetológica, MHNCI - Museu de História Natural Capão da Imbuia, MHNJCH - Museu de História Natural de Jequié Coleção Herpetológica, MNRJ - Museu Nacional do Rio de Janeiro, MPEG - Museu Paraense Emílio Goeldi, MZUEFS - Museu de Zoologia da Universidade Estadual de Feira de Santana, MUFAL - Museu da Universidade Federal de Alagoas, MZUESC - Museu de Zoologia da Universidade Estadual de Santa Cruz, MZUFV - Museu de Zoologia da Universidade Federal de Viçosa, MZUSP - Museu de Zoologia da Universidade de São Paulo, NHMB - Natural historisches Museum Basel Switzerland, PUC-MG - Pontifícia Universidade Católica de Minas Gerais, RMNH - Rijksmuseum van Natuurlijke Historie, UESB - Universidade Estadual do Sudoeste da Bahia, UFBA - Museu de História Natural da Universidade Federal da Bahia, UFCA - Universidade Federal do Cariri, UFCG - Laboratório de Zoologia da Universidade Federal de Campina Grande, UFMG - Universidade Federal de Minas Gerais, UFMT-A - Coleção Zoológica de Vertebrados da Universidade Federal de Mato Grosso, UFRB - Universidade Federal do Recôncavo da Bahia, UFRN - Universidade Federal do Rio Grande do Norte, UFS - Universidade Federal de Sergipe, UK - Museum of Natural History - University of Kansas, UMMZ - University of Michigan Museum of Zoology, Coleção de Herpetologia da Universidade Regional do Cariri URCA-H, USNM - United States National Museum, WCAB - Werner C. A. Bokermann Collection, ZUEC - Museu de Zoologia Prof. Adão José Cardoso - UNICAMP, ZUFRRJ - Coleção de Anfíbios da Universidade Federal do Rio de Janeiro, CHIB - Coleção Herpetológica do Instituto Butantan.

Appendix B

