



Lizards (Reptilia: Squamata) from the Caatinga, northeastern Brazil: Detailed and updated overview

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Abstract

The Caatinga is the largest seasonal dry tropical forest in South America and it has been historically neglected in terms of its biodiversity. Regarding lizards, different studies led to the current knowledge of diversity and endemism in Caatinga, but detailed syntheses are scarce in the literature. We present the most detailed and up-to-date synthesis of knowledge about Caatinga lizards by providing a detailed (i) list of species; (ii) taxonomic richness patterns; (iii) knowledge gaps and spatial biases; and (iv) detailed distribution maps of all species that contain at least one occurrence record within Caatinga limits. We created a distribution database using occurrences of lizards in Caatinga based on scientific collections, field collection, and literature. We produce up-to-date distribution maps, calculate the Extent of Occurrence and provide the environmental and bioclimatic profile for each species recorded. We draw taxonomic richness and sampling gap maps. Our database has 20,538 records of occurrence of lizards of the Caatinga. We recorded 93 lizard species (13 families), 52.7% of which are endemic. Forty-four percent of the species present restricted distributions. We identified that 53% of the Caatinga area (or 70% of the municipalities) has no record of occurrence of lizards. The data presented are an important step towards synthesizing in detail the accumulated knowledge about Caatinga lizards and is crucial for accurate strategies for the conservation planning. It directs actions to advance our knowledge on Caatinga lizards: to concentrate inventories in sample void areas; continuous update of the species occurrence database, advance in the generation of autoecology data for species.

Keywords

Endemism, geographic distribution, Neotropical, sampling gaps, species composition, taxonomic richness

Introduction

The Neotropical region presents extraordinary levels of biological diversity, accumulating about 70% of known species of the planet, and harboring six out of the 25 world's biodiversity hotspots (Mittermeier et al. 1998; Myers et al. 2000; Lewinsohn and Prado 2005). Therefore, the Neotropical region is a priority target for research and conservation (Brandon et al. 2005; Oliveira et al. 2017a). To know the magnitude of the species richness, and to understand the mechanisms of evolution and maintenance of biodiversity in this region, as well as ensuring its conservation, are the greatest challenges for the future (Antonelli et al. 2018). These efforts have become urgent given the exponential growth of activities that promote biodiversity loss in the region (e.g., Silva Jr. et al. 2020; Tomas et al. 2021; Vale et al. 2021).

More than half of the Neotropics' land surface consists of rangelands (Olson et al. 2001; ILRI et al. 2021). The Caatinga, located in Northeast Brazil, is the largest seasonal dry tropical forest region in South America and the most biodiverse semi-arid region globally (Silva et al. 2017). Despite its growing recognition, the Caatinga has been historically neglected in biodiversity studies and incorrectly described as a region poor in species and endemism (Vanzolini 1963; Mares et al. 1981; Willig and Mares 1989). Accordingly, the Caatinga became one of Brazil's least known natural regions due to a combination of inadequate investments, low regional research capacity, and difficult working conditions (Lessa et al. 2019). Such biases have hampered the development of public and conservation policies for the Caatinga, making it one of the least preserved regions in the Neotropics (Leal et al. 2005; Guedes et al. 2014a; Lessa et al. 2019). The Caatinga is the third most degraded region in Brazil; about 52% of its area has been altered by anthropic actions, and only 1.13% is currently protected (Leal et al. 2005; Silva et al. 2017; Garda et al. 2018). This scenario means that the biogeographic patterns and processes that explain and ensure the maintenance of the Caatinga's biodiversity are unprotected and threatened (Guedes et al. 2014a).

Lizard studies underpinned much of the knowledge on the diversity and endemism of Caatinga reptiles and guided the first recommendations of conservation priority areas for the region (e.g., Rodrigues 1991a, 1991b, 1991c, 2003, 2004), followed by snake studies (Guedes et al. 2014a, 2014b). Currently, the Caatinga is a reptile diversity hotspot and a global conservation priority area, especially for lizards and snakes (Guedes et al. 2014a, 2014b; Roll et al. 2017). Recent data show that the Caatinga harbors 218 species of reptiles, including 79 lizards (38 endemics), 114 snakes (24 endemics), and 25 amphisbaenians (12 endemics) (Guedes et al. 2014a, 2014b; Mesquita et al. 2017; Marques et al. 2017; Almeida et al. 2018; Ribeiro et al. 2020). This number of species tends to increase, as the Caatinga is also a hotspot for discovering new vertebrate species, particularly reptiles (Moura and Jetz 2021). Thus, ensuring the conservation of the Caatinga's biodiversity is an

urgent task. In the face of several factors that promote biodiversity loss, Caatinga species appear to be even more susceptible to climate change impacts (Torres et al. 2017; IPCC 2021).

Systematic data collection of the lizard fauna has efficiently contributed to demonstrate the biological value of the Caatinga (e.g., Rodrigues 2003; Loebmann and Haddad 2010). Moreover, lizards have also been excellent models for understanding the factors associated with historical and ecological drivers of diversification in the Caatinga (e.g., Werneck and Colli 2006; Fonseca et al. 2018; Lanna et al. 2018; Tonini et al. 2021). However, despite recent advances, data on the distribution of Caatinga lizard species remain scattered in the scientific literature in herpetological surveys, taxonomic approaches, and distribution and natural history notes (e.g., Recoder et al. 2014; Werneck et al. 2015; Castro et al. 2019). Compiling this information into a detailed synthesis will provide robust data to assess patterns of species richness and diversity, support the identification of priority areas for conservation and future surveys, and explore the impacts of climate and environmental change on Caatinga lizards (Oliveira et al. 2012; Torres et al. 2017).

Here, we present the most detailed and up-to-date synthesis of knowledge on Caatinga lizards. We provide (i) a detailed species list, (ii) taxonomic richness patterns, (iii) information on sampling gaps and spatial biases in knowledge, and (iv) detailed distribution maps of all species with at least one occurrence record within the Caatinga boundaries. Based on this information, we discuss the status of knowledge, priorities for future surveys, and conservation strategies for the lizards and the Caatinga.

Methods

Study area

The Caatinga (Fig. 1) is located predominantly in northeastern Brazil, occupying nine Brazilian states and an area of 912,529 km², which corresponds to 10.7% of the Brazilian territory (Ab'Saber 1974; Caatinga's limits *sensu* Silva et al. 2017). The Caatinga has a complex phytophysognomy, characterized mainly by xerophytic vegetation (Cole 1960; Ab'Saber 1998), although it also has enclaves of tropical rainforest and elements of cerrado vegetation (in high altitude areas called "brejos") (Ab'Saber 1974, 1977; Velloso et al. 2002; Guedes et al. 2020). Due to its heterogeneity, the Caatinga is divided into nine ecoregions (Silva et al. 2017). The climate is generally characterized by a prolonged dry season, with high temperatures (Reis 1976; Prado 2003) and irregular rainfall within and among years (Andrade-Lima 1981).

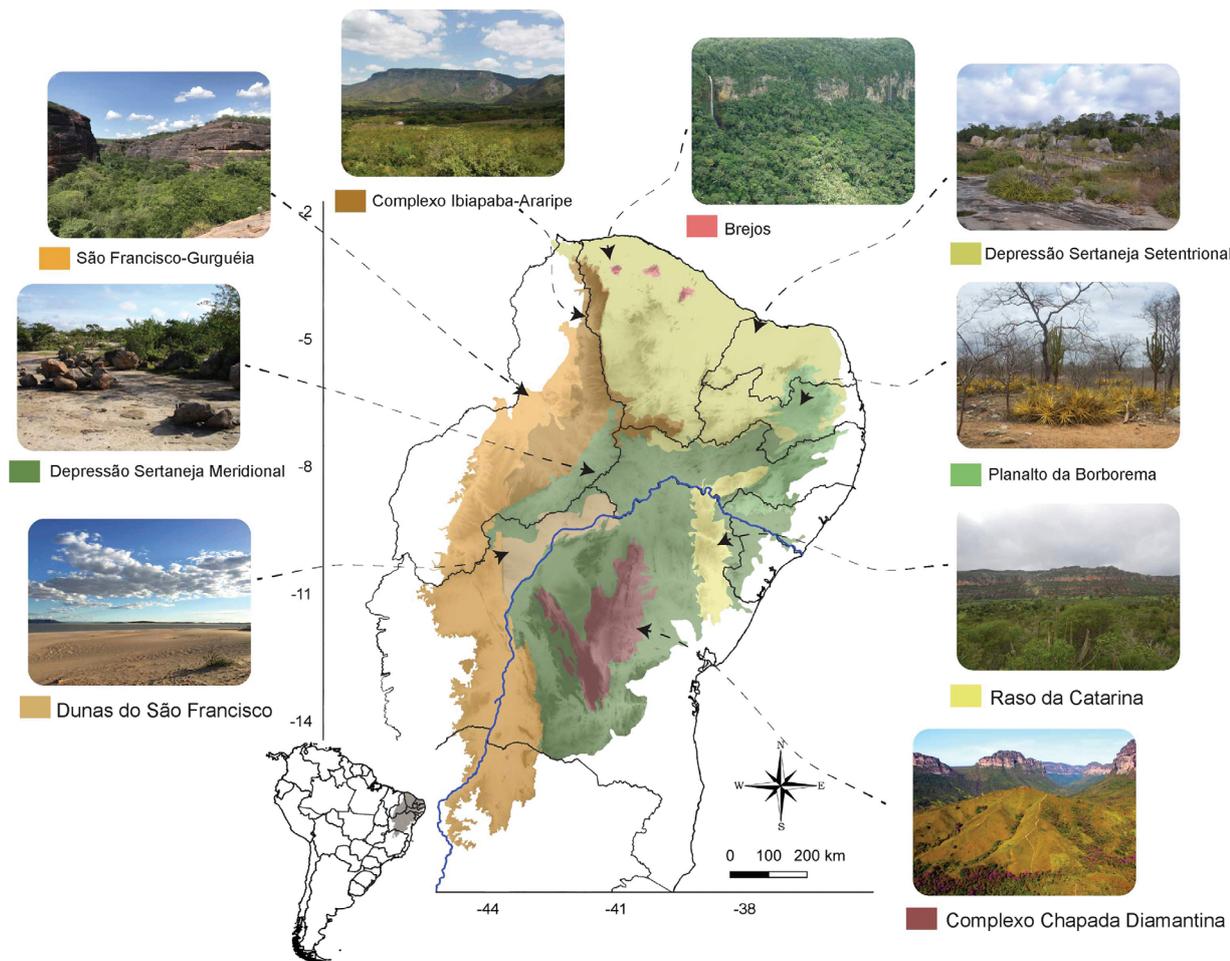


Figure 1. Caatinga map showing the geographic location and coverage of the study area, northeast of Brazil and phytophysiognomies of the Caatinga ecoregions (following Silva et al. 2017). São Francisco River (blue line). Photo credits: Brejo de Altitude do PARNA Ubajara, Ceará state, photo by Daniel Loebmann; Chapada Diamantina, municipality of Palmeiras, Bahia state, photo by Daniela Coelho; Depressão Sertaneja Setentrional, municipality of Cabaceiras, Paraíba state, photo by Thaís Guedes; Dunas do Rio São Francisco, Bahia State, photo by Leonardo Ribeiro; São Francisco-Gurguéia, Piauí State, photo by Daniel Mesquita; Ibiapaba – Araripe, municipality of Ubajara, Ceará State, photo by Daniel Loebmann; Planalto da Borborema, municipality of Pocinhos, Paraíba State, photo by Edilson Guedes; Raso da Catarina, photo by Tiago Azevedo.

Data source

We compiled a database using primary data obtained from biological collections and fieldwork conducted in the Caatinga, complemented with data from public databases and literature. We examined lizard specimens in the following biological collections: Coleção Herpetológica da Universidade Federal de Sergipe, Museu de História Natural da Universidade Federal de Alagoas, Coleção Herpetológica da Universidade Federal da Paraíba, Museu de Zoologia da Universidade de São Paulo, Museu Nacional da Universidade Federal do Rio de Janeiro, Coleção Herpetológica da Universidade Federal do Ceará, Coleção Herpetológica da Universidade de Brasília. Additionally, curators provided good quality data on lizard occurrences in the Caatinga for the following biological collections: Museu de Zoologia da Universidade Federal da Bahia, Museu de Zoologia da Universidade Estadual de Feira de Santana, Museu de Zoologia da Universidade Federal de Viçosa, Laboratório de Herpetologia da Universidade Federal de Campina Grande, Museu de Biolo-

gia Professor Melo Leitão do Instituto Nacional da Mata Atlântica and Coleção Biológica do Instituto Federal de Pedro II. Field data came from 18 surveys conducted in 19 municipalities (six states) within the Caatinga range: Paulo Afonso (Bahia State); district of Daniel de Queiroz in Quixadá, Santa Quitéria, São Gonçalo do Amarante, and district Várzea da Conceição in Cedro (Ceará State); Areia (Paraíba State); Arcoverde, Araripina, Trindade, and Serra Talhada (Pernambuco State); Paulistana, Pavussu, Rio Grande do Piauí, Redenção do Gurguéia, Pedro II, and São Francisco de Assis do Piauí (Piauí State); and Canindé do São Francisco, Poço Redondo, and Nossa Senhora da Glória (Sergipe State). We complement our database by including data from Museu de Zoologia da Universidade Estadual de Campinas accessed through Sistema de Informações Distribuído para Coleções Biológicas (Species Link: <http://splink.cria.org.br>), and by including several published papers (taxonomic, surveys, ecological and evolutionary studies) that provided the location of collection and vouchered specimens (e.g., Delfim et al. 2006; Garda et al. 2012; Cavalcanti et al.

2014; Recoder et al. 2014; Lanna et al. 2018). The list of acronyms and field numbers is presented in Appendix S1 and the list of literature compilation is presented in Appendix S2, both in the Supplementary Material.

We georeferenced the location information associated with specimens deposited in scientific collections and those obtained from the literature. For the fieldwork data, we obtained the coordinates of the collection site. We followed Guedes et al. (2014b) to obtain coordinates from gazetteers, scientific publications, or direct inspection of layers (e.g., conservation units, municipalities) in mapping software. We used the municipalities' centroids only when we could not retrieve accurate information about the specimen collection location. We included in our database all species that had at least one record of occurrence within the Caatinga's limits (Silva et al. 2017). We follow Guedes et al. (2014b) and Nogueira et al. (2011) regarding definition of endemism, which considers endemic species those with evolutionary and biogeographic affinities closely tied to the Caatinga, despite occurring marginally outside the Caatinga cartographical limits. To better diagnose endemic species, information from the literature was used, together with species occurrence data, present in ecotone regions and outside the Caatinga's limits (e.g., Centeno et al. 2014; Arias et al. 2018).

Mapping and environmental bioclimatic profile

We produced distribution maps and calculated the extent of occurrence (EOO) of each species. The EOO was calculated using the minimum convex polygon (MCP) method, which consists of drawing a polygon containing all records of occurrence of a species and whose internal angles do not exceed 180° (IUCN 2012). For species with few disjunct records, we calculated the EOO using a 10 km radius buffer around the point of occurrence (IUCN 2012; Guedes et al. 2014b). We consider species with EOO less than 20,000 km² as restricted distribution and species with EOO greater than 20,000 km² were considered to have a wide distribution in the Caatinga (IUCN 2012).

We used elevation range, mean annual temperature, and mean annual precipitation to characterize the environmental profile for each lizard species. For this, we downloaded the variables "Annual Mean Temperature" (BIO 1), Annual Precipitation (BIO 12), and "Altitude" from the WorldClim database (<https://www.worldclim.org>; Fick and Hijmans 2017) and extracted the environmental data via interpolation with each occurrence point of each lizard species. Based on altitude parameters, the species were considered to occur in low altitudes when recorded in elevations equal or below 300 m above the sea level, medium altitude from 301–600 m a.s.l., or high altitude when up to 601 m a.s.l.

We produced a taxonomic richness pattern map containing the number of species in the Caatinga municipalities. We also prepared a sampling map containing the number of lizard occurrences in the Caatinga municipali-

ties. We used QGIS software version 3.10 (QGIS Development Team 2020) to produce the distribution, richness, and sampling gap maps, and to obtain the data to calculate the EOO and environmental bioclimatic profile. Additionally, we present bar charts containing information on frequency of occurrence of species according to their EOO, species richness and endemism by state and ecoregion.

Results

We assembled a database with 20,538 lizard occurrences within the Caatinga, of which 5,817 (28.4%) are primary data from biological collections and fieldwork (Appendix S1 in Supplementary Material), and 14,721 (71.6%) are secondary data from the literature (Appendix S2).

Taxonomic richness

We recorded 93 species of lizards from 13 families distributed in the Caatinga (Table 1). The most speciose family was Gymnophthalmidae (29 species, 31.2% of the total), followed by Tropiduridae (19 species, 20.4%), Teiidae (10 species, 10.8%), Mabuyidae (seven species, 7.5%), Gekkonidae (six species, 6.5%), Phyllodactylidae (six species, 6.5%), Leiosauridae (five species, 5.4%), Diploglossidae (three species, 3.2%), Dactyloidae (two species, 2.2%), Polychrotidae (two species, 2.2%), Sphaerodactylidae (two species, 2.2%), Hoplocercidae (one species, 1.1%), and Iguanidae (one species, 1.1%). We provide new and detailed distribution and ecological data for all lizard species recorded in the Caatinga. We identified 49 endemic species, corresponding to 52.7% of the total (Table 1).

Forty-one species (44%) of lizards show restricted distribution (EOO < 20,000 km²), and 52 species (56%) present wide distributions (EOO < 21,000 km²). Twelve species (*Ameiva ameiva*, *Ameivula ocellifera*, *Brasiliscincus heathi*, *Coleodactylus meridionalis*, *Gymnodactylus geckoides*, *Hemidactylus mabouia*, *Iguana iguana*, *Micrablepharus maximiliani*, *Phyllopezus pollicaris*, *Tropidurus hispidus*, *T. semitaeniatus* and *Vanzosaura multi-scutata*) occur throughout the whole Caatinga area (see Appendix S3 and S4).

We recorded lizards in 373 municipalities (Fig. 2A; Appendix S5); 300 of these (80.4%) had between one and 10 species, 61 (16.4%) had between 11 and 20 species, and 12 (3.2%) had between 21 and 30 species. We recorded no lizard species in 867 municipalities of the Caatinga (70%), which correspond to an area of 53% of the Caatinga. The municipality of Crateús, in the state of Ceará (in the Depressão Sertaneja Setentrional ecoregion), showed the highest species richness (30 species). One hundred and fourteen municipalities (31%) showed a single species each.

The Caatinga ecoregions had between 25 and 59 lizard species (Appendix S6). The richest ecoregion was the

Table 1. Lizards from the Caatinga. Summarized data about distribution, ecology, and conservation. Caatinga ecoregions (Silva et al. 2017) – B: Brejos, CCD: Complexo Chapada Diamantina, CIA: Complexo Ibiapaba-Araripe, DSM: Depressão Sertaneja Meridional, DSS: Depressão Sertaneja Setentrional, DSF: Dunas do São Francisco, PB: Planalto da Borborema, RC: Raso da Catarina, SFG: São Francisco – Gurgueia. Distribution Patterns – WD: widespread (EOO greater than 20,000 km², see Material and Methods for details), R: restricted (EOO less than 20,000 km²). Habitat – O: open areas; F: forested areas; Preferred habitat type: AT: ant hills and termite mounds, B: bromeliads, G: general, LL: leaf litter, P: psammophilous, A: anthropic; S: saxicolous and TB: trees and bushes; Activity – D: diurnal, N: nocturnal and C: crepuscular. Conservation status (IUCN 2021; ICMBio 2018) – Critically Endangered (CR), Data Deficient (DD), Endangered (EN), Least Concern (LC), Near Threatened (NT), Not Evaluated (NE) and Vulnerable (VU). Caatinga endemic species **.

Taxa	Caatinga Ecoregions	Distribution Pattern	Habitat	Preferred habitat type	Activity	Conservation status (IUCN/ICMBio)
Dactyloidae						
<i>Norops brasiliensis</i> (Vanzolini & Williams, 1970)	CIA, SFG	R	O	TB	D	LC, LC
<i>Norops fuscoauratus</i> (D'Orbigny, 1837 in Duméril & Bibron, 1837)	B, CIA, DSM, DSS, PB	WD	F	TB	D	LC, LC
Diploglossidae						
<i>Diploglossus lessonae</i> Peracca, 1890	B, CCD, CIA, DSM, DSS, PB, RC	WD	O	LL	D	LC, LC
<i>Ophiodes striatus</i> (Spix, 1825)	CCD, CIA, SFG	WD	O	LL	D	LC, DD
<i>Ophiodes</i> sp. 2	CIA, DSM, PB	WD	O		D	NE, NE
Gekkonidae						
<i>Hemidactylus agrius</i> * Vanzolini, 1978	CIA, DSM, DSS, PB	WD	O, F	G	N	LC, LC
<i>Hemidactylus brasiliensis</i> (Amaral, 1935)	CCD, CIA, DSF, DSM, DSS, PB, RC, SFG	WD	O, F	G	N/C	LC, LC
<i>Hemidactylus mabouia</i> (Moreau de Jonnés, 1818)	all ecoregions	WD	O, F	G/A	N	NE, NE
<i>Lygodactylus kluzei</i> (Smith, Martin & Swain, 1977)	CCD, CIA, DSF, DSM, DSS, PB, RC, SFG	WD	O, F	TB	D	LC, LC
<i>Lygodactylus</i> sp. 1*	DSM	R	O		D	NE, NE
<i>Lygodactylus</i> sp. 2*	DSM	R	O		D	NE, NE
Gymnophthalmidae						
<i>Acratosauro mentalis</i> * (Amaral, 1933)	CCD, DSM, DSS, PB, RC, SFG	WD	O	LL	D	LC, LC
<i>Acratosauro spinosa</i> * Rodrigues, Cassimiro, Freitas & Silva, 2009	CCD	R	O	LL	D	NE, DD
<i>Anotosauro collaris</i> * Amaral, 1933	CCD	R	O	LL	D	LC, DD
<i>Anotosauro vanzolinia</i> * Dixon, 1974	DSM, DSS, PB, RC	WD	F	LL	D	LC, LC
<i>Calyptommatus confusio</i> * Rodrigues, Zaher & Curcio, 2001	CIA, SFG	R	O	P	N	LC, LC
<i>Calyptommatus frontalis</i> * Recoder, Marques-Souza, Silva-Soares, Ramiro, Castro & Rodrigues, 2022	SFG	R	O	P	N	NE, NE
<i>Calyptommatus leiopleps</i> * Rodrigues, 1991	DSF, DSM	R	O	P	N	NE, EN
<i>Calyptommatus nicterus</i> * Rodrigues, 1991	DSF, DSM, SFG	R	O	P	N	NE, EN
<i>Calyptommatus sinebrachiatus</i> * Rodrigues, 1991	DSM, SFG	R	O	P	N	NE, EN
<i>Calyptommatus</i> sp. 1*	DSF	R	O	P	N	NE, NE

Taxa	Caatinga Ecoregions	Distribution Pattern	Habitat	Preferred habitat type	Activity	Conservation status (IUCN/ICMBio)
<i>Calyptommatus</i> sp. 2*	DSF	R	O	P	N	NE, NE
<i>Cercosaura olivacea</i> (Gray, 1845)	CCD, CIA, DSF, DSM, DSS, PB, SFG	WD	O	?	D	NE, NE
<i>Colobosaura modesta</i> (Reinhardt & Luetken, 1862)	CIA, DSM, DSS, SFG	WD	O	LL	D	NE, LC
<i>Colobosauroides carvalhoi</i> * Soares & Caramaschi, 1998	CIA, DSM, SFG	WD	F	LL	D	NE, DD
<i>Colobosauroides cearensis</i> * Cunha, Lima-Verde & Lima, 1991	B, CIA, DSS,	WD	F	LL	D	LC, LC
<i>Dryadosaura nordestina</i> Rodrigues, Freire, Pellegrino & Sites, 2005	DSM, DSS, PB	WD	F	LL	D	LC, LC
<i>Heterodactylus septentrionalis</i> * Rodrigues, Freitas & Silva, 2009	CCD	R	LL	LL	D	NE, EN
<i>Leposoma baturitensis</i> * Rodrigues & Borges, 1997	B, CIA, DSS, PB	WD	F	LL	D	NE, EN
<i>Leposoma scincoides</i> Spix, 1825	CCD	R	LL	LL	D	LC, LC
<i>Micrablepharus maximiliani</i> (Reinhardt & Luetken, 1862)	all ecoregions	WD	O	LL	D	LC, LC
<i>Nothobachia ablephara</i> * Rodrigues, 1984	CIA, DSF, DSM	WD	O	P	D/N	LC, LC
<i>Placosoma limaverdorum</i> * Borges-Nojosa, Caramaschi & Rodrigues, 2016	B	R	F	LL	D	NE, NE
<i>Procellosaurinus erythrocerus</i> * Rodrigues, 1991	CIA, DSF, DSM, SFG	WD	O	P	D	LC, LC
<i>Procellosaurinus tetradactylus</i> * Rodrigues, 1991	DSF	R	O	P	D	NE, EN
<i>Psilops mucigenis</i> * Rodrigues, Recoder, Teixeira Jr., Roscito, Guerrero, Nunes, Freitas, Fernandes, Bocchiglieri, Dal Vecchio, Leite, Nogueira, Damasceno, Pellegrino, Argôlo & Amaro, 2017	CCD	R	O	P	D	NE, NE
<i>Psilops paeminosus</i> * (Rodrigues, 1991)	CCD, DSF, DSM, RC, SFG	WD	O	P	D	VU, NT
<i>Scriptosaura catimbaui</i> * Rodrigues & Santos, 2008	RC	R	O	P	D	LC, LC
<i>Stenolepis ridleyi</i> Boulenger, 1887	B, CIA, DSS, PB, RC	WD	F	LL	D	LC, LC
<i>Vanzosaura multiscutata</i> * (Amaral, 1933)	all ecoregions	WD	O	LLP	D	LC, LC
Hoplocercidae						
<i>Hoplocercus spinosus</i> Fitzinger, 1843	DSF, SFG	R	O	AT	D/N	NE, LC
Iguanidae						
<i>Iguana iguana</i> (Linnaeus, 1758)	all ecoregions	WD	O, F	TB	D	LC, LC
Leiosauridae						
<i>Eryalius bibronii</i> Boulenger, 1885	B, CCD, CIA, DSM, DSS, PB, RC, SFG	WD	O, F	G	D	LC, LC
<i>Eryalius bilineatus</i> (Duméril & Bibron, 1837)	DSM	R	F	G	D	LC, LC
<i>Eryalius catenatus</i> (Wied, 1821)	CCD, DSM, PB	WD	F	G	D	LC, LC
<i>Eryalius erythrocerus</i> * Rodrigues, Freitas, Silva & Bertolotto, 2006	CCD	R	F	G	D	NE, CR
<i>Eryalius pictus</i> (Schinz, 1822)	DSM, SFG	R	F	G	D	LC, LC
Phyllodactylidae						
<i>Gymnodactylus geckooides</i> Spix, 1825	all ecoregions	WD	O, F	G	N/C	LC, LC
<i>Gymnodactylus vanzolini</i> * Cassimiro & Rodrigues, 2009	CCD	R	O	G	N	NE, DD

Taxa	Caatinga Ecoregions	Distribution Pattern	Habitat	Preferred habitat type	Activity	Conservation status (IUCN/ICMBio)
<i>Phyllopezus diamantino</i> * Dubeux, Gonçalves, Palmeira, Nunes, Cassimiro, Gamble, Werneck, Rodrigues & Mott, 2022	CCD	R		S/TB	N	NE, NE
<i>Phyllopezus periosus</i> * Rodrigues, 1986	CIA, DSM, DSS, PB, RC	WD	O	S	N	LC, LC
<i>Phyllopezus pollicaris</i> (Spix, 1825)	all ecoregions	WD	O, F	G/A	N	LC, LC
<i>Phyllopezus selmae</i> * Dubeux, Gonçalves, Palmeira, Nunes, Cassimiro, Gamble, Werneck, Rodrigues & Mott, 2022	DSM, PB	R		S/TB	N	NE, NE
Polychroftidae						
<i>Polychrus acutirostris</i> Spix, 1825	B, CCD, CIA, DSM, DSS, PB, RC, SFG	WD	O	TB	D	LC, LC
<i>Polychrus marmoratus</i> (Linnaeus, 1758)	B, CIA, DSS, PB	WD	F	TB	D	LC, LC
Mabuyidae						
<i>Aspronema</i> aff. <i>dorsivittatum</i>	CCD	R	O	ER	D	LC, LC
<i>Brasiliscincus heathi</i> (Schmidt & Inger, 1951)	all ecoregions	WD	O	WD	D	LC, LC
<i>Copeoglossum arajara</i> * (Rebouças-Spieker, 1981)	CIA, DSS, SFG	WD	O	OD	D	LC, LC
<i>Copeoglossum nigropunctatum</i> (Spix, 1825)	B, CCD, CIA, DSS, PB, RC, SFG	WD	F	FC	D	LC, LC
<i>Notomabuya frenata</i> (Cope, 1862)	CIA, SFG	WD	O, F	LL/P/TB	D	LC, LC
<i>Psychosaura agnosticha</i> (Rodrigues, 2000)	DSM, DSS, PB, RC	WD	F	R	D	LC, LC
<i>Psychosaura macrorhyncha</i> (Hogs, 1947)	CCD, DSM, DSS, PB, RC	WD	F	R	D	LC, LC
Sphaerodactylidae						
<i>Coleodactylus meridionalis</i> (Boulenger, 1888)	all ecoregions	WD	F	R	D	LC, LC
<i>Gonatodes humeralis</i> (Guichenot, 1855)	DSS	R	F	G	D	LC, LC
Teiidae						
<i>Ameiva ameiva</i> (Linnaeus, 1758)	all ecoregions	WD	O	G	D	LC, LC
<i>Ameivula confusoniba</i> * (Arias, Carvalho, Rodrigues & Zaher, 2011)	SFG	R	O	G	D	LC, LC
<i>Ameivula nigrigula</i> * (Arias, Carvalho, Rodrigues & Zaher, 2011)	CCD, DSM, RC, SFG	WD	F	G	D	NE, DD
<i>Ameivula ocellifera</i> (Spix, 1825)	all ecoregions	WD	O	G	D	LC, LC
<i>Ameivula pyrrhogularis</i> (Silva & Avila-Pires, 2013)	CIA, DSM, DSS, SFG	WD	O	G	D	LC, LC
<i>Glaucomastix cyanura</i> * (Arias, Carvalho, Rodrigues & Zaher, 2011)	CCD	R	O	G	D	NE, DD
<i>Glaucomastix venetacauda</i> * (Arias, Carvalho, Rodrigues & Zaher, 2011)	CIA, SFG	R	O	G	D	LC, LC
<i>Kentropyx calcarata</i> Spix, 1825	B, CIA, DSM, DSS, PB	WD	F	G	D	LC, LC
<i>Sahvator merianae</i> Duméril & Bibron, 1839	B, CCD, CIA, DSM, DSS, PB, RC, SFG	WD	O	G	D	LC, LC
<i>Tupinambis teguixin</i> (Linnaeus, 1758)	DSM, DSS	WD	O, F	G	D	LC, LC

Taxa	Caatinga Ecoregions	Distribution Pattern	Habitat	Preferred habitat type	Activity	Conservation status (IUCN/ICMBio)
Tropiduridae						
<i>Eurolophosaurus amathites</i> * (Rodrigues, 1984)	DSM, DSF	R	O	P	D	DD, EN
<i>Eurolophosaurus dharvicatus</i> * (Rodrigues, 1986)	DSF	R	O	P	D	LC, LC
<i>Eurolophosaurus</i> aff. <i>divaricatus</i> *	DSF	R	O	P	D	NE, NE
<i>Eurolophosaurus</i> sp.*	CCD, DSM	R	O	P	D	NE, NE
<i>Stenocercus squarrosus</i> Nogueira & Rodrigues, 2006	CIA, SFG	R	O	P	D	LC, LC
<i>Strobilurus torquatus</i> Wiegmann, 1834	B, CIA, DSM, DSS, PB	WD	F	TB	D	LC, LC
<i>Tropidurus cocorobensis</i> * Rodrigues, 1987	CCD, DSM, DSF, RC	WD	O	P	D	LC, LC
<i>Tropidurus erythrocephalus</i> * Rodrigues, 1987	CCD, DSM, DSS	R	O	S	D	NT, VU
<i>Tropidurus etheridgei</i> Cei, 1982	DSM, SFG	WD	O	S	D	LC, LC
<i>Tropidurus helenae</i> * (Manzani & Abe, 1990)	CIA, DSM, SFG	R	O	S	D	LC, LC
<i>Tropidurus hispidus</i> (Spix, 1825)	all ecoregions	WD	O	G	D	LC, LC
<i>Tropidurus jaguaribanus</i> * Passos, Lima & Borges-Nojosa, 2011	CIA, DSM, DSS	R	O	S	D	NE, NT
<i>Tropidurus montanus</i> Rodrigues, 1987	DSM, SFG	WD	O	G	D	LC, LC
<i>Tropidurus mucujensis</i> * Rodrigues, 1987	CCD, DSM	R	O	S	D	NE DD
<i>Tropidurus oreadicus</i> Rodrigues, 1987	CCD, CIA, DSM, DSS, SFG	WD	O	A/S	D	LC, LC
<i>Tropidurus pinima</i> * (Rodrigues, 1984)	DSM, DSF	WD	O	S	D	LC, LC
<i>Tropidurus psammonastes</i> * Rodrigues, Kasahara & Yonenaga-Yasuda, 1988	DSF, SFG	R	O	P	D	DD, EN
<i>Tropidurus semitaeniatus</i> * (Spix, 1825)	all ecoregions	WD	O	S	D	LC, LC
<i>Tropidurus sertanejo</i> * Carvalho, Sena, Peloso, Machado, Montesinos, Silva, Campbell & Rodrigues, 2016	DSM, SFG	R	O	G	D	NE, NE

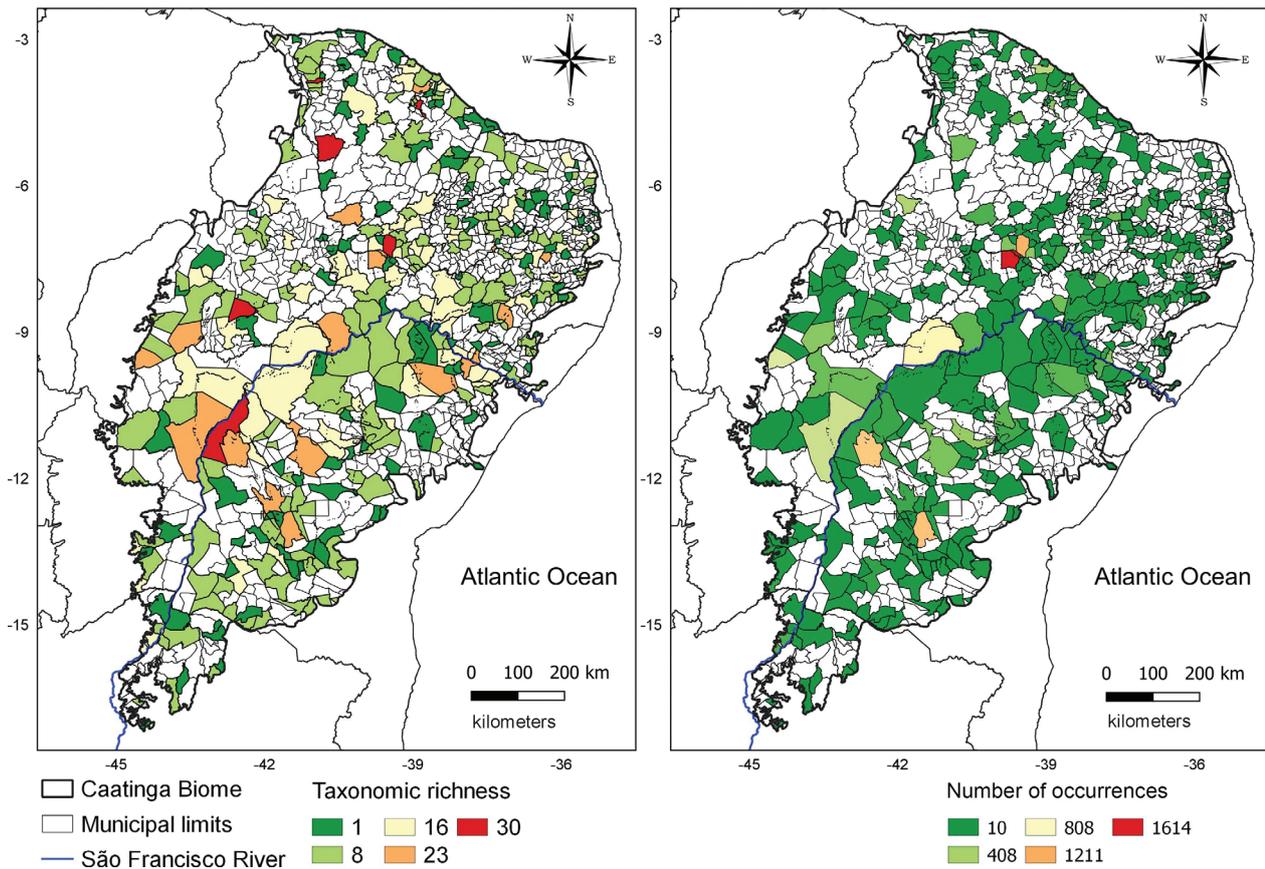


Figure 2. Map showing the taxonomic richness and sampling gaps of lizards along all municipalities of the Caatinga. **A** Taxonomic richness. **B** Number of occurrences.

Depressão Sertaneja Meridional (59 species, 62.3% of the total), followed by the Complexo Ibiapaba-Araripe, and São Francisco/Gurguéia (both with 45 species, 48.4%), Complexo da Chapada Diamantina, and Depressão Sertaneja Setentrional (both with 41 species, 44.1%), Planalto da Borborema (36 species, 38.7%), Dunas do São Francisco (31 species, 33.3%), Raso da Catarina (29 species, 31.2%), and Brejos (25 species, 26.9%). The most species-rich state was Bahia (74 species, 79.6%), followed by Ceará (45 species, 48.4%), Pernambuco (43 species, 46.2%), Piauí (41 species, 44.1%), Paraíba (32 species, 34.4%), Alagoas (30 species, 32.3%), Rio Grande do Norte (27 species, 29%), Sergipe (25 species, 26.9%), and Minas Gerais (18 species, 19.4%) (Appendix S7).

The Caatinga ecoregions also exhibited a high number of endemic species, ranging from five to 26 lizard species (Appendix S6). The most endemism-rich ecoregion was the Depressão Sertaneja Meridional (26 species, 53.1%), followed by the Complexo da Chapada Diamantina, Dunas do São Francisco, and São Francisco/Gurguéia (all with 17 species each, 34.7%), Complexo Ibiapaba-Araripe (14 species, 28.6%), Depressão Sertaneja Setentrional (10 species, 20.4%), Raso da Catarina (nine species, 18.4%), Planalto da Borborema (eight species, 16.3%), and Brejos (five species, 10.2%). The number of endemic species per state was higher in Bahia (37 species, 75.5%), followed by Piauí (16 species, 32.7%), Pernambuco (13 species, 26.5%), Ceará (12 species, 24.5%), Alagoas (eight species, 16.3%), Paraíba and Sergipe (all with

seven species each, 14.3%), Rio Grande do Norte (six species, 12.2%), and Minas Gerais (four species, 8.2%) (Appendix S7).

Still regarding the degree of endemism of lizards in the Caatinga, the “Dunas do São Francisco” are noteworthy for their high rate of endemism, with 17 endemic species (54.8% of the total number of lizards in the ecoregion). However, other ecoregions also have a high rate of endemics, such as the Depressão Sertaneja Meridional (44%), Complexo da Chapada Diamantina (41.5%), and São Francisco/Gurguéia (37.8%). All ecoregions had an endemism rate greater than or equal to 20%. The state of Bahia exhibits the highest high rate of endemism (50% of the total number of lizards in the ecoregion). Despite the low sampling and lower species richness, states with territory largely located within the Caatinga are also remarkable for presenting a considerable endemism level, such as states of Piauí (39%), Pernambuco (30.2%), and Sergipe (28%).

We obtained lizard occurrence data for only 47% (521,183 km²) of the Caatinga area (Fig. 2B; Appendix S5). Of the 1,240 municipalities in the Caatinga, 867 (70%) had no record of lizards, and 373 (30%) had at least one record. The municipality of Exú (area = 1,494 km²), in the state of Pernambuco, had 1,615 records of lizards. The municipalities of Mucugê and Gentio do Ouro (state of Bahia) and Crato (state of Ceará) (municipalities areas summed = 7,266 km²) had between 1,000 and 1,200 occurrences of lizards. In Bahia, the municipality of Casa Nova (area = 9,657 km²) had 853 occurrences of lizards.

We found that 371 municipalities had less than 600 records of lizards; of these, 73 municipalities had only one occurrence record.

Species Account

Dactyloidae Fitzinger, 1843 (two species)

Norops brasiliensis (Vanzolini & Williams, 1970)

Figs 3.1 and 13

Type locality. Barra do Tapirapés, state of Mato Grosso, Brazil.

Distribution. In the Caatinga it is registered in the states of Ceará and Piauí. It shows restricted distribution in the Caatinga and occurs along two ecoregions (Table 1; Appendix S3). It occurs in low to high elevation areas (181–919 m a.s.l.), with annual mean temperature 21 to 27°C, and average annual rainfall between 673 and 1,123 mm.

Ecological notes. Semiarboreal and diurnal. Found in seasonally dry forests and gallery forests and adjacent habitats, where it is mainly found in leaf litter and tree trunks (Vanzolini and Williams 1970; Mesquita et al. 2015). Diet based mainly on arthropods, being Araneae, Orthoptera and Formicidae the most representative items (Mesquita et al. 2015). Oviparous, the females lay one egg at a time (Mesquita et al. 2015).

Norops fuscoauratus (D’Orbigny, 1837 in Duméril & Bibron, 1837)

Figs 3.2 and 13

Type locality. Rio Mamoré, between Loreto and the confluence of Rio Sara, Moxos province, Bolivia.

Distribution. In the Caatinga it is registered in the states of Bahia, Ceará and Pernambuco. It is widespread in the Caatinga and occurs along five ecoregions (Table 1; Appendix S3). It occurs in low to high elevation areas (128–919 m a.s.l.), with annual mean temperature 21 to 26°C, and average annual rainfall between 566 and 1,580 mm.

Ecological notes. Arboreal and diurnal (Ávila-Pires 1995; Vitt et al. 2008). It inhabits forested environments in the Caatinga (Castro et al. 2019) and prefers more preserved environments with shade (Vitt et al. 2003). Diet based mainly on arthropods, being Orthoptera, Araneae and Hemiptera the most representative items (Vitt et al. 2003). Oviparous, the female usually lays two eggs at a time (but see Campos 2016 for details).

Diploglossidae Cope, 1865 (three species)

Diploglossus lessonae Peracca, 1890

Figs 3.3 and 13

Type locality. Brazil.

Distribution. In the Caatinga it is registered in the states of Alagoas, Bahia, Ceará, Paraíba, Pernambuco, Rio Grande do Norte, and Sergipe. It is widespread in the Caatinga and occurs along seven ecoregions (Table 1; Appendix S3). It occurs in low to high elevation areas (29–1,004 m a.s.l.), with annual mean temperature 21 to 27°C, and average annual rainfall between 412 and 1,479 mm.

Ecological notes. Semifossorial and diurnal (Vanzolini et al. 1980). It inhabits arboreal and bush caatinga habits where it is associated with leaf litter, fallen logs and rock crevices (Vanzolini et al. 1980; Vitt 1995; Passos et al. 2011). Diet based mainly on arthropods being Araneae, Blattodea and Coleoptera the most important items (Vitt 1985; Passos et al. 2011; Caldas et al. 2016). Oviparous, the female usually lays 5–7 eggs at a time (Vitt 1992).

Ophiodes striatus (Spix, 1825)

Figs 3.4 and 13

Type locality. state of Rio de Janeiro, Brasil.

Distribution. In the Caatinga it is registered in the states of Bahia, Ceará, and Minas Gerais. It is widespread in the Caatinga and occurs along three ecoregions (Table 1; Appendix S3). It occurs in medium to high elevation areas (480–872 m a.s.l.), with annual mean temperature 21 to 24°C, and average annual rainfall between 690 and 1,402 mm.

Ecological notes. Fossorial and diurnal (Colli et al. 2002; Novelli et al. 2012; Linares and Eterovick 2013). It inhabits areas of relictual humid forest and areas of campos rupestres vegetation (Loebmann and Haddad 2010; Magalhães et al. 2015). Diet based mainly on arthropods, being Blattodea, Araneae, and Orthoptera the most representative items. Oviparous, the female usually lays 3–10 eggs at a time (Barros and Teixeira 2007).

Ophiodes sp. 2 (*sensu* Borges-Martins, 1998)

Fig. 13

Distribution. In the Caatinga it is registered in the states of Bahia, Ceará, and Pernambuco. It is widespread in the Caatinga and occurs along three ecoregions (Table 1; Appendix S3). It occurs in low to high elevation areas (27–



Figure 3. Lizards recorded in the Caatinga region. **3.1** *Norops brasiliensis*; **3.2** *Norops fuscoauratus*; **3.3** *Diploglossus lessonae*; **3.4** *Ophiodes striatus*; **3.5** *Hemidactylus agrius*; **3.6** *Hemidactylus brasilianus*; **3.7** *Hemidactylus mabouia*; and **3.8** *Lygodactylus klugei*. Photograph credits: Mauro Teixeira (3.1), Marco A. Freitas (3.2), Daniel Mesquita (3.5, 3.7), Adrian Garda (3.3, 3.4, 3.6, 3.8)

855 m a.s.l.), with annual mean temperature 22 to 26°C, and average annual rainfall between 617 and 1,403 mm.

Ecological notes. Fossorial and diurnal (Colli et al. 2002; Novelli et al. 2012; Linares and Eterovick 2013). It inhabits high-altitude marsh areas, always found on forest edges (Borges-Nojosa and Caramaschi 2003; Borges-Nojosa and Cascon 2005). Diet based mainly on arthropods, no information about the preferred items on the diet of this species is known. Oviparous, no detailed data is known about the number of eggs laid by the species, but it could be similar to other *Ophiodes* species (Barros and Teixeira 2007; Montechiaro et al. 2011).

Gekkonidae Gray, 1825 (six species)

Hemidactylus agrius Vanzolini, 1978

Figs 3.5 and 13

Type locality. Valença, state of Piauí, Brazil.

Distribution. Caatinga endemic species. It is registered in the states of Bahia, Ceará, Paraíba, Pernambuco, Piauí, and Rio Grande do Norte. It is widespread in the Caatinga and occurs along four ecoregions (Table 1; Appendix S3). It occurs in low to high elevation areas (5–919 m a.s.l.), with annual mean temperature 21 to 28°C, and average annual rainfall between 492 and 1,402 mm. We highlight the possibility that records made for the Caatinga present identification errors and confusion with *H. mabouia*.

Ecological notes. Terrestrial and nocturnal (Vanzolini et al. 1980). It inhabits rocky outcrop areas, arboreal-shrubby vegetation and shrubby vegetation, having a great variety of microhabitats (Andrade et al. 2020). Diet based mainly on arthropods, being insect larvae, Blattodea and Araneae the most representative items (Andrade et al. 2020). Oviparous, the female usually lays 1–2 eggs at a time (Bezerra et al. 2011).

Hemidactylus brasiliensis (Amaral, 1935)

Figs 3.6 and 13

Type locality: Rio Pandeiros, state of Minas Gerais, Brazil.

Distribution. In the Caatinga it is registered in the states of Alagoas, Bahia, Ceará, Paraíba, Pernambuco, Piauí, Rio Grande do Norte, and Sergipe. It is widespread in the Caatinga and occurs along eight ecoregions (Table 1; Appendix S3). It occurs in low to high elevation areas (34–1,085 m a.s.l.), with annual mean temperature 20 to 27°C, and average annual rainfall between 374 and 1,479 mm.

Ecological notes. Terrestrial and nocturnal/crepuscular (Vanzolini et al. 1980; Rodrigues 2003; Menezes et al. 2013). It occurs in open and forested habitats along the Caatinga, where it is commonly associated with areas with rock formations and fallen trunks, dry cactuses, but also observed in bromeliads (Rocha and Rodrigues 2005; Andrade et al. 2013; FRD pers. obs.). Diet based mainly on arthropods, being Diplopoda, Gryllotalpidae (Mole cricket) and Isoptera are the most representative items (Mesquita et al. 2006; Menezes et al. 2013). Oviparous, no detailed data is known about the number of eggs laid by the species, but it could be similar to other *Hemidactylus* (Vitt 1992; Bezerra et al. 2011).

Hemidactylus mabouia (Moreau de Jonnés, 1818)

Figs 3.7 and 13

Type locality Antilles, restricted to St. Vincent Island, Lesser Antilles, by Stejneger (1904).

Distribution. In the Caatinga it is recorded in the states of Alagoas, Bahia, Ceará, Minas Gerais, Paraíba, Pernambuco, Piauí, Rio Grande do Norte, and Sergipe. It is widespread in the Caatinga and occurs along all ecoregions (Table 1; Appendix S3). Distributed in low to high elevation areas (18–1,085 m a.s.l.), annual mean temperature 20 to 27°C, and average annual rainfall between 412 and 1,573 mm.

Commentary. In South America, *H. mabouia* is considered an invasive species that was originally introduced either carried by ships used to transport slaves in the 19th century (Goeldi 1902; Vanzolini 1968) or via “natural rafts” (i.e., logs or masses of floating vegetation) (Kluge 1969). Diet based mainly on arthropods, being Araneae, Coleoptera and Formicidae the most representative items (Albuquerque et al. 2013), also with records of cannibalism (Bonfiglio et al. 2006). Oviparous, the female usually lays two eggs at a time (Vitt 1992).

Lygodactylus klugei (Smith, Martin & Swain, 1977)

Figs 3.8 and 13

Type locality. Carnaubeira, state of Pernambuco, Brazil.

Distribution. In the Caatinga it is registered in the states of Alagoas, Bahia, Ceará, Paraíba, Pernambuco, Piauí, Rio Grande do Norte, and Sergipe. It is widespread in the Caatinga and occurs along eight ecoregions (Table 1; Appendix S3). It occurs in low to high elevation areas (43–1,105 m a.s.l.), with annual mean temperature 21 to 28°C, and average annual rainfall between 374 and 1,186 mm.

Ecological notes. Arboreal and diurnal (Vanzolini et al. 1980; Vitt 1995). It inhabits areas with rock formations, dense shrubby vegetation and open formation, being restricted to arboreal microhabitats (Vitt 1995; Galdino et al. 2011; Andrade et al. 2013). Distributed throughout the Brazilian Caatinga (Vitt 1995). Diet based mainly on arthropods, being Diptera, Coleoptera, and Araneae the most representative items (Vitt 1995). Oviparous, the female usually lays two eggs at a time (Vitt 1992).

Lygodactylus sp. 1 (*sensu* Lanna et al., 2018)

Fig. 13

Distribution. Caatinga endemic species. It is recorded only in the state of Bahia. It shows restricted distribution in the Caatinga and occurs along one ecoregion (Table 1; Appendix S3). It occurs in high elevation areas (1,105 m a.s.l.), with annual mean temperature of 21°C, and average annual rainfall of 774 mm.

Ecological notes. Arboreal and diurnal (Vanzolini et al. 1980; Lanna et al. 2018). It is restricted to semiarboreal/bush vegetation in the Quaternary sand dunes of the São Francisco River (Lanna et al. 2018). Diet based mainly on arthropods, no information about the preferred items on the diet of this species is known. Oviparous, no detailed data is known about the number of eggs laid by the species, but it could be similar to other *Lygodactylus* species (Vitt 1992, 1995).

Lygodactylus sp. 2 (*sensu* Lanna et al., 2018)

Fig. 13

Distribution. Caatinga endemic species. It is recorded only in the state of Bahia. It shows restricted distribution in the Caatinga and occurs along one ecoregion (Table 1; Appendix S3). It occurs in high elevation areas (720 m a.s.l.), with annual mean temperature of 22°C, and average annual rainfall of 750 mm.

Ecological notes. Arboreal and diurnal (Vanzolini et al. 1980; Lanna et al. 2018). It is known only for the municipality of Condeúba, southwestern of the state of Bahia, in areas with rock formations, dense shrubby vegetation and open formation, being restricted to arboreal microhabitats, an environment similar to other *Lygodactylus* of the Caatinga, although at higher altitudes (Vitt 1995; Galdino et al. 2011; Andrade et al. 2013). Diet based mainly on arthropods, no information about the preferred items on the diet of this species is known. Oviparous, no detailed data is known about the number of eggs laid by the species, but it could be similar to other *Lygodactylus* species (Vitt 1992, 1995).

Gymnophthalmidae Fitzinger, 1826 (29 species)

Acratosaura mentalis (Amaral, 1933)

Figs 4.1 and 14

Type locality. Villa Nova, municipality of Senhor do Bonfim, state of Bahia, Brazil.

Distribution. Caatinga endemic species. It is registered in the states of Alagoas, Bahia, Ceará, Minas Gerais, Paraíba, Pernambuco, Piauí, Rio Grande do Norte, and Sergipe. It is widespread in the Caatinga and occur along six ecoregions (Table 1; Appendix S3). It occurs in low to high elevation areas (122–1,085 m a.s.l.), with annual mean temperature 20 to 26°C, and average annual rainfall between 412 and 1,042 mm.

Ecological notes. Fossorial and diurnal (Rodrigues 2003). It is associated with area with shrub vegetation on a sandy soil along the Caatinga (Brito et al. 2012). It is also known to occur in semi-arid Caatinga areas with arboreal vegetation and disturbed areas (FRD pers. obs.). Specimens have already been collected buried in the litter between the rocky extrusions and under a piece of trunk (Delfim and Freire 2007). Diet based mainly on arthropods, being Scorpionida, Orthoptera, and insect larvae the most representative items (Costa 2015). Oviparous, no detailed data is known about the number of eggs laid by the species, but it could be similar to other species of the Iphisiini tribe (Mesquita and Colli 2010).

Acratosaura spinosa Rodrigues, Cassimiro, Freitas & Silva, 2009

Figs 4.2 and 14

Type locality. Caraíbas Farm, municipality of Mucugê, Serra do Sincorá, Serra do Espinhaço, state of Bahia, Brazil.

Distribution. Caatinga endemic species. It is recorded only in the state of Bahia. It shows restricted distribution in the Caatinga and occurs along one ecoregion (Table 1; Appendix S3). Distributed in high elevation areas (1,025–1,176 m a.s.l.), with annual mean temperature 19 to 20°C, and average annual rainfall between 917 and 996 mm.

Ecological notes. Fossorial and diurnal (Rodrigues et al. 2009a). It was observed under rocks and on a road in a disturbed area of rupestrian fields of the Diamantina Plateau (Rodrigues et al. 2009a). Diet based mainly on arthropods, no information about the preferred items on the diet of this species is known. Oviparous, no detailed data is known about the number of eggs laid by the species, but it could be similar to others of the Iphisiini tribe (Mesquita and Colli 2010; Costa 2015).

Anotosaura collaris Amaral, 1933

Figs 4.3 and 14

Type locality. Villa Nova, municipality of Senhor do Bonfim, state of Bahia, Brazil.

Distribution. Caatinga endemic species. It is recorded only in the state of Bahia. It shows restricted distribution in the Caatinga and occurs along one ecoregion (Table 1; Appendix S3). Distributed in medium to high elevation areas (468–637 m a.s.l.), with annual mean temperature 22 to 24°C, and average annual rainfall between 762 and 901 mm.

Ecological notes. Fossorial or semifossorial and diurnal (Rodrigues et al. 2013). It is observed in relatively open habitats, in the Caatinga, under leaf litter or small rocks of forested areas of isolated mountaintops in clayey soils (Rodrigues et al. 2013). Diet based mainly on arthropods, no information about the preferred items on the diet of this species is known. Oviparous, no detailed data is known about the number of eggs laid by the species, but it could be similar to other *Anotosaura* species (Oliveira et al. 2018).

Anotosaura vanzolinia Dixon, 1974

Figs 4.4 and 14

Type locality. Agrestina, state of Pernambuco, Brazil.

Distribution. Caatinga endemic species. It is registered in the states of Alagoas, Bahia, Ceará, Paraíba, Pernambuco, Piauí, and Rio Grande do Norte. It is widespread in the Caatinga and occurs along four ecoregions (Table 1; Appendix S3). Distributed in low to high elevation areas (43–883 m a.s.l.), with annual mean temperature 21 to 27°C, and average annual rainfall between 412 and 1,073 mm.

Ecological notes. Fossorial and diurnal. It occurs in different habitats, with prevalence in microhabitats with leaf litter and earthy soil near rocky outcrops (Oliveira and Pessanha 2013). Diet based mainly on arthropods, being Formicidae, Isoptera and Coleoptera the most representative items. Oviparous, the female usually lays two eggs at a time (Oliveira et al. 2018).

Calyptommatus confusionibus Rodrigues, Zaher & Curcio, 2001

Figs 4.5 and 14

Type locality. Toca da Cabocla, Serra Grande, Parque Nacional da Serra das Confusões, state of Piauí, Brazil.

Distribution. Caatinga endemic species. It is recorded only in the state of Piauí. It shows restricted distribution

in the Caatinga and occurs along two ecoregions (Table 1; Appendix S3). Distributed in low to medium elevation areas (259–596 m a.s.l.), with annual mean temperature 25 to 27°C, and average annual rainfall between 702 and 831 mm.

Ecological notes. Fossorial and nocturnal (Rodrigues et al. 2001; Rodrigues 2003). It is associated with sandy soil patches along the Caatinga (Rodrigues et al. 2001). Diet based mainly on arthropods, no information about the preferred items on the diet of this species is known. Oviparous, no detailed data is known about the number of eggs laid by the species, but it could be similar to other *Calyptommatus* species (Rodrigues 1991a).

Calyptommatus frontalis Recoder, Marques-Souza, Silva-Soares, Ramiro, Castro & Rodrigues, 2022

Figs 4.6 and 14

Type locality. Lameirão, Buritirama, state of Bahia, Brazil.

Distribution. Caatinga endemic species. It is recorded only in the state of Bahia. It shows restricted distribution in the Caatinga and occurs along one ecoregion (Table 1; Appendix S3). Distributed in medium elevation areas (503–600 m a.s.l.), with annual mean temperature 24°C, and average annual rainfall between 942 and 953 mm.

Ecological notes. Fossorial and nocturnal (Recoder et al. 2022). Recorded to occur in a sandstone plateau, characterized by white sandy soils, on the east side of Serra do Estreito. The vegetation is a short xeromorphic caatinga vegetation with sparse trees, shrubs, cacti and clumps of bromeliads with scattered spaces of bare sand. Individuals were found buried in sand under leaf litter in shaded microhabitats (Recoder et al. 2022). Diet based mainly on arthropods, no information about the preferred items on the diet of this species is known. Oviparous, no detailed data is known about the number of eggs laid by the species, but it could be similar to other *Calyptommatus* species (Rodrigues 1991a).

Calyptommatus leiolepis Rodrigues, 1991

Figs 4.7 and 14

Type locality. Ibiraba, state of Bahia, Brazil

Distribution. Caatinga endemic species. It is recorded only in the states of Bahia and Pernambuco. It shows restricted distribution in the Caatinga and occurs along two ecoregions (Table 1; Appendix S3). Distributed in medium to high elevation areas (315–643 m a.s.l.), with annual mean temperature 23 to 26°C, and average annual rainfall between 528 and 849 mm.



Figure 4. Lizards recorded in the Caatinga region. **4.1** *Acratosaura mentalis*; **4.2** *Acratosaura spinosa*; **4.3** *Anotosaura collaris*; **4.4** *Anotosaura vanzolinia*; **4.5** *Calyptommatus confusionibus*; **4.6** *Calyptommatus frontalis*; **4.7** *Calyptommatus leiolepis*; and **4.8** *Calyptommatus nicterus*. Photograph credits: Marco A. Freitas (4.2, 4.7, 4.8), Miguel T. Rodrigues (4.6), Mauro Teixeira (4.3), Adrian Garda (4.1, 4.4, 4.5).

Ecological notes. Fossorial and nocturnal (Rodrigues 1991a; Rocha and Rodrigues 2005; Siedschlag et al. 2010). It is associated with sandy soil patches along right and left São Francisco riverbanks in the arboreal and herbaceous vegetation of the Caatinga (Rodrigues 1991a, 1996b). Diet based mainly on arthropods, being insect larvae, Isoptera and Coleoptera the most representative items (Rodrigues 1991a; Rocha and Rodrigues 2005). Oviparous, the female usually lays two eggs at a time (Rodrigues 1991a).

Calyptommatus nicterus Rodrigues, 1991

Figs 4.8 and 14

Type locality. Capim Verde, state of Bahia, Brazil.

Distribution. Caatinga endemic species. It is recorded only in of Bahia. It shows restricted distribution in the Caatinga and occurs along three ecoregions (Table 1; Appendix S3). Distributed in medium elevation areas (399–446 m a.s.l.), with annual mean temperature 25 to 26°C, and average annual rainfall between 674 and 970 mm.

Ecological notes. Fossorial and nocturnal (Rodrigues 1991a; Rocha and Rodrigues 2005; Siedschlag et al. 2010). It is associated with sandy soil patches along the Caatinga (Rodrigues 1991a). Diet based mainly on arthropods, being Tenebrionidae the most representative item (Rodrigues 1991a). Oviparous, the female usually lays two eggs at a time (Rodrigues 1991a).

Calyptommatus sinebrachiatus Rodrigues, 1991

Figs 5.1 and 14

Type locality. Santo Inácio, state of Bahia, Brazil.

Distribution. Caatinga endemic species. It is registered in the states of Bahia and Piauí. It shows restricted distribution in the Caatinga and occurs along two ecoregions (Table 1; Appendix S3). Distributed in medium to high elevation areas (405–896 m a.s.l.), with annual mean temperature 22 to 26°C, and average annual rainfall between 622 and 831 mm.

Ecological notes. Fossorial and nocturnal (Rodrigues 1991a, Rocha and Rodrigues 2005, Siedschlag et al. 2010). It is associated with sandy soil patches along the Caatinga (Rodrigues 1991a). Diet based mainly on arthropods, being Tenebrionidae the most representative item (Rodrigues 1991a). Oviparous, the female usually lays two eggs at a time (Rodrigues 1991a).

Calyptommatus sp. 1 (*sensu* Recoder et al., 2022)

Fig. 14

Distribution. Caatinga endemic lineage. It is recorded only in the state of Bahia. It shows restricted distribution in the Caatinga and occurs along one ecoregion (Table 1; Appendix S3). Distributed in medium elevation areas (407 m a.s.l.), with annual mean temperature 25°C, and average annual rainfall between 727 mm.

Ecological notes. Fossorial and nocturnal (Recoder et al. 2022). It inhabits patches of sandy soil in the Quaternary sand dunes of the São Francisco River (Recoder et al. 2022). *Calyptommatus* sp. 1 “Lagoa do Fábio” was recovered as sister clade of *C. confusionibus*. Diet based mainly on arthropods, no information about the preferred items on the diet of this species is known. Oviparous, no detailed data is known about the number of eggs laid by the species, but it could be similar to other *Calyptommatus* species (Rodrigues 1991a).

Calyptommatus sp. 2 (*sensu* Recoder et al., 2022)

Fig. 14

Distribution. Caatinga endemic lineage. It is recorded only in the state of Bahia. It shows restricted distribution in the Caatinga and occurs along one ecoregion (Table 1; Appendix S3). Distributed in low to medium elevation areas (462 m a.s.l.), with annual mean temperature 25°C, and average annual rainfall between 901 mm.

Ecological notes. Fossorial and nocturnal (Recoder et al. 2022). It inhabits patches of sandy soil in the Quaternary sand dunes of the São Francisco River (Recoder et al. 2022).

Calyptommatus sp. 2 “Barra” were retrieved nested within *C. leirolepis* with strong support for the external node, but with weak support for internal relationships among clades. Both have a narrow parapatric distribution on the Xique-Xique dune field (Recoder et al. 2022).

Diet based mainly on arthropods, no information about the preferred items on the diet of this species is known. Oviparous, no detailed data is known about the number of eggs laid by the species, but it could be similar to other *Calyptommatus* species (Rodrigues 1991a).

Cercosaura olivacea Gray, 1845

Figs 5.2 and 14

Type locality. State of Pernambuco, Brazil.

Distribution. In the Caatinga it is registered in the states of Alagoas, Bahia, Ceará, Paraíba, and Rio Grande do



Figure 5. Lizards recorded in the Caatinga region. **5.1** *Calyptommatus sinebrachiatus*; **5.2** *Cercosaura olivacea*; **5.3** *Colobosaura modesta*; **5.4** *Colobosauroides carvalhoi*; **5.5** *Colobosauroides cearensis*; **5.6** *Dryadosaura nordestina*; **5.7** *Heterodactylus septentrionalis* and **5.8** *Leposoma baturitensis*. Photograph credits: Ricardo Marques (5.1), Mauro Teixeira (5.4), Daniel Mesquita (5.3), Kássio Araújo (5.5), Marco A. Freitas (5.7), Adrian Garda (5.2, 5.6).

Norte. It is widespread in the Caatinga and occurs along seven ecoregions (Table 1; Appendix S3). Distributed in low to high elevation areas (36–909 m a.s.l.), with annual mean temperature 21 to 26°C, and average annual rainfall between 420 and 1,548 mm.

Ecological notes. Fossorial and both diurnal and nocturnal (DOM pers. obs.). It is found in enclaves of open areas and in the brejos nordestinos (Borges-Nojosa and Caramaschi 2003), more precisely on the edge or inside forests close to watercourses (Recoder and Nogueira 2007; Macedo et al. 2008). Diet based mainly on arthropods, no information about the preferred items on the diet of this species is known. Oviparous, no detailed data is known about the number of eggs laid by the species, but it could be similar to other *Cercosaura* (Balestrin et al. 2010; Cossovich et al. 2011; Sturaro et al. 2018).

Colobosaura modesta (Reinhardt & Lütken, 1862)

Figs 5.3 and 15

Type locality. Morro da Garça, municipality of Curvelo, state of Minas Gerais, Brazil.

Distribution. In the Caatinga it is registered in the states of Bahia, Ceará and Piauí. It is widespread in the Caatinga and occurs along four ecoregions (Table 1; Appendix S3). Distributed in low to high elevation areas (29–919 m a.s.l.), with annual mean temperature 21 to 27°C, and average annual rainfall between 702 and 1,413 mm.

Ecological notes. Fossorial and diurnal (Benozzati and Rodrigues 2003; Mesquita et al. 2006). It inhabits dry forest and savannah enclaves in the Caatinga (Freire et al. 2012). Diet based mainly on arthropods, being Araneae, Orthoptera and Blattaria the most representative items (Mesquita et al. 2006; Torelli et al. 2017). Oviparous, the female usually lays two eggs at a time (Mesquita and Colli 2010).

Colobosauroides carvalhoi Soares & Caramaschi, 1998

Figs 5.4 and 15

Type locality. Barreiras, state of Bahia, Brazil.

Distribution. Caatinga endemic species. It is registered in the states of Bahia, Ceará and Piauí. It is widespread in the Caatinga and occurs along three ecoregions (Table 1; Appendix S3). Distributed in low to high elevation areas (259–724 m a.s.l.), with annual mean temperature 22 to 27°C, and average annual rainfall between 702 and 1,402 mm.

Ecological notes. Fossorial and diurnal (Soares and Caramaschi 1998). It can be found in savannah areas (forest-

ed hillside areas where moisture is retained), surrounded by caatinga areas and in a Cerrado-Caatinga transition areas (Soares and Caramaschi 1998; Magalhães-Júnior et al. 2017). Diet based mainly on arthropods, being Isoptera, Orthoptera and Blattaria the most representative items (Mesquita et al. 2006; Cavalcanti et al. in press). Oviparous, no detailed data is known about the number of eggs laid by the species, but it could be similar to other *Colobosauroides* (Silva Neta et al. 2019).

Colobosauroides cearensis Cunha, Lima-Verde & Lima, 1991

Figs 5.5 and 15

Type locality. Sítio Lorena, municipality of Mulungu, Serra de Baturité, state of Ceará, Brazil.

Distribution. Caatinga endemic species. It is registered in the states of Ceará, Paraíba, and Piauí. It is widespread in the Caatinga and occurs along three ecoregions (Table 1; Appendix S3). Distributed in low to high elevation areas (18–855 m a.s.l.), with annual mean temperature 22 to 28°C, and average annual rainfall between 760 and 1,573 mm.

Ecological notes. Fossorial and diurnal. In habits shaded microhabitats in the Caatinga and prefers microenvironments with leaf litter and minimal direct exposure to sunlight (Borges-Nojosa and Caramaschi 2003; Rodrigues 2003; Silva Neta et al. 2019). Diet based mainly on arthropods, being Hymenoptera, Isoptera and Insect larvae the most representative items. Oviparous, the female usually lays two eggs at a time (Silva Neta et al. 2019).

Dryadosaura nordestina Rodrigues, Freire, Pellegrino & Sites, 2005

Figs 5.6 and 15

Type locality. João Pessoa, state of Paraíba, Brazil.

Distribution. In the Caatinga it is registered in the states of Bahia, Paraíba, Pernambuco, and Rio Grande do Norte. It is widespread in the Caatinga and occurs along three ecoregions (Table 1; Appendix S3). Distributed in low to high elevation areas (34–739 m a.s.l.), with annual mean temperature 21 to 26°C, and average annual rainfall between 542 and 1,479 mm.

Ecological notes. Fossorial and diurnal (Rodrigues et al. 2005). Occurring in areas of semideciduous forest (Mesquita et al. 2018), dry forest (FRD pers. obs.) and tabuleiros with dry vegetation and in remnants of Atlantic Forest in the Northeast in small forest fragments, influenced by the forest edge effect (Garda et al. 2014). Diet based mainly on arthropods, being Formicidae, insect

larvae and Araneae the most representative items. Oviparous, the female usually lays two eggs at a time (Garda et al. 2014).

***Heterodactylus septentrionalis* Rodrigues, Freitas & Silva, 2009**

Figs 5.7 and 15

Type locality. Fazenda Caraíbas, municipality of Mucugê, Serra do Espinhaço, state of Bahia, Brazil.

Distribution. Caatinga endemic species. It is recorded only in the state of Bahia. It shows restricted distribution in the Caatinga and occurs along one ecoregion (Table 1; Appendix S3). Distributed in high elevation areas (1,084–1,091 m a.s.l.), with annual mean temperature of 20°C, and average annual rainfall between 904 and 1,013 mm.

Ecological notes. Fossorial and diurnal (Rodrigues et al. 2009b). It inhabits cold climate areas, associated with high altitudes and mountainous areas in eastern Brazil (Rodrigues et al. 2009b). Diet based mainly on arthropods, no information about the preferred items on the diet of this species is known. Oviparous, no detailed data is known about the number of eggs laid by the species, but it could be similar to other *Heterodactylus* species (Morton et al. 2012).

***Leposoma baturitensis* Rodrigues & Borges, 1997**

Figs 5.8 and 15

Type locality. Sítio Barbosa, municipality of Pacoti, Serra de Baturité, state of Ceará, Brazil.

Distribution. Caatinga endemic species. It is registered in the states of Alagoas and Ceará. It is widespread in the Caatinga and occurs along four ecoregions (Table 1; Appendix S3). Distributed in low to high elevation areas (142–839 m a.s.l.), with annual mean temperature 20 to 26°C, and average annual rainfall between 778 and 1,580 mm.

Ecological notes. Fossorial and diurnal (Teixeira and Fonseca 2003). It inhabits high altitude areas inside Caatinga, and it can be found in disturbed areas in the spaces between the roots of banana trees (Borges-Nojosa 2007), and in primary and secondary forests (Rodrigues and Borges 1997; Roberto and Albano 2012). Diet based mainly on arthropods, no information about the preferred items on the diet of this species is known (Teixeira and Fonseca 2003). Oviparous, the female usually lays two eggs at a time (Roberto and Albano 2012).

***Leposoma scincoides* Spix, 1825**

Fig. 15

Type locality. Banks of Rio Amazon, Brazil.

Distribution. In the Caatinga it is recorded only in the state of Bahia. It shows restricted distribution in the Caatinga and occurs along one ecoregion (Table 1; Appendix S3). Distributed in high elevation areas (822–926 m a.s.l.), with annual mean temperature 20 to 21°C, and average annual rainfall between 806 and 908 mm.

Ecological notes. Fossorial and diurnal (Teixeira and Fonseca 2003). It inhabits high altitude areas with forested vegetation inside Caatinga (Damasceno et al. 2020). Diet based mainly on arthropods, being Isoptera, Araneae and Collembola the most representative items. Oviparous, the female usually lays two eggs at a time (Teixeira and Fonseca 2003).

***Micrablepharus maximiliani* (Reinhardt & Lütken, 1862)**

Figs 6.1 and 15

Type locality. Municipality of Maruim, state of Sergipe, Brazil.

Distribution. In the Caatinga it is registered in the states of Alagoas, Bahia, Ceará, Paraíba, Pernambuco, Piauí, Rio Grande do Norte, and Sergipe. It is widespread in the Caatinga and occurs along all ecoregions (Table 1; Appendix S3). Distributed in low to high elevation areas (17–1,008 m a.s.l.), with annual mean temperature 20 to 28°C, and average annual rainfall between 532 and 1,573 mm.

Ecological notes. Terrestrial and diurnal (Rodrigues 1996a). It is found mainly in open areas, sandy soils and among litter, but also inside termite mounds, among scattered grasses or herbaceous beach vegetation, and in rocky outcrops (Freire 1996; Rodrigues 1996a, 2003; Mesquita et al. 2006; Silva et al. 2006; Couto-Ferreira et al. 2011). Diet based mainly on arthropods, being Orthoptera, Homoptera and Araneae the most representative items (Vitt 1991; Dal Vechio et al. 2014). Oviparous, the female usually lays two eggs at a time (Mesquita and Colli 2010; Dal Vechio et al. 2014).

***Nothobachia ablephara* Rodrigues, 1984**

Figs 6.2 and 15

Type locality. São Raimundo Nonato, state of Piauí, Brazil (corrected to Sal, state of Piauí, Brazil, 09°11'S, 42°03'W).

Distribution. Caatinga endemic species. It is recorded in the states of Bahia, Pernambuco and Piauí. It is widespread in the Caatinga and occurs along three ecoregions (Table 1; Appendix S3). Distributed in low to high elevation areas (259–643 m a.s.l.), with annual mean temperature 24 to 27°C, and average annual rainfall between 528 and 861 mm.

Ecological notes. Fossorial and both diurnal and nocturnal (Rodrigues 2003). It can be found in patches of sand soil in the arboreal and herbaceous vegetation in the Caatinga (Rodrigues 1984). Diet based mainly on arthropods, being Isoptera, insect larvae and Araneae the most representative items (Rocha and Rodrigues 2005; Santos et al. 2012). Oviparous, the female usually lays two eggs at a time (Ramiro et al. 2017).

***Placosoma limaverdorum* Borges-Nojosa, Caramaschi & Rodrigues, 2016**

Fig. 15

Type locality. Olho d'Água dos Tangarás farm, Maciço de Baturité, municipality of Pacoti, state of Ceará, Brazil.

Distribution. Caatinga endemic species. It is recorded only in the state of Ceará. It shows restricted distribution in the Caatinga and occurs along one ecoregion (Table 1; Appendix S3). Distributed in low to high elevation areas (142–839 m a.s.l.), with annual mean temperature 21 to 26°C, and average annual rainfall between 1,089 and 1,628 mm.

Ecological notes. Fossorial and diurnal (Borges-Nojosa et al. 2016). Found mainly in areas of brejos nordestinos (Borges-Nojosa et al. 2016). Most specimens were found in litter from primary and secondary vegetation, or in banana plantations, but it can also be found in tree trunks (Lima 2005; Borges-Nojosa et al. 2016). Diet based mainly on arthropods, no information about the preferred items on the diet of this species is known (Marques et al. 2009). Oviparous, no detailed data is known about the number of eggs laid by the species, but it could be similar to other *Placosoma* species (Uzzell 1959).

***Procellosaurinus erythrocerus* Rodrigues, 1991**

Figs 6.3 and 15

Type locality. Ibiraba, state of Bahia, Brazil.

Distribution. Caatinga endemic species. It is registered in the states of Bahia, Pernambuco, and Piauí. It is widespread in the Caatinga and occurs along four ecoregions (Table 1; Appendix S3). Distributed in low to high elevation areas (259–643 m a.s.l.), with annual mean tempera-

ture 24 to 27°C, and average annual rainfall between 528 and 940 mm.

Ecological notes. Fossorial and diurnal (Rodrigues 1991c; Rocha and Rodrigues 2005). It inhabits sand soil patches and dunes, much typical on both sides of the São Francisco River (Rodrigues 1991c; Delfim et al. 2011). Diet based mainly on arthropods, being Araneae, Thysanura, and Orthoptera the most representative items (Rocha and Rodrigues 2005). Oviparous, no detailed data is known about the number of eggs laid by the species, but it could be similar to other *Procellosaurinus* species (Ramiro et al. 2017).

***Procellosaurinus tetradactylus* Rodrigues, 1991**

Figs 6.4 and 15

Type locality. Alagoado, state of Bahia, Brazil.

Distribution. Caatinga endemic species. It is recorded only in the state of Bahia. It shows restricted distribution in the Caatinga and occurs along one ecoregion (Table 1; Appendix S3). Distributed in medium elevation areas (405–447 m a.s.l.), with annual mean temperature of 26°C, and average annual rainfall between 572 and 726 mm.

Ecological notes. Fossorial and diurnal (Rodrigues 1991c; 1996b, Rocha and Rodrigues 2005). It inhabits patches of sandy soil and dunes on the left bank of the São Francisco River (Rodrigues 1991c). Diet based mainly on arthropods, no information about the preferred items on the diet of this species is known (Rocha and Rodrigues 2005). Oviparous, the female usually lays two eggs at a time (Ramiro et al. 2017).

***Psilops mucugensis* Rodrigues, Recoder, Teixeira Jr., Roscito, Guerrero, Nunes, Freitas, Fernandes, Bocchiglieri, Dal Vechio, Leite, Nogueira, Damasceno, Pellegrino, Argôlo & Amaro, 2017**

Figs 6.5 and 16

Type locality. Três Irmãos Farm, municipality of Mucugê, Serra do Espinhaço (Diamantina Plateau), state of Bahia, Brazil.

Distribution. Caatinga endemic species. It is recorded only in the state of Bahia. It shows restricted distribution in the Caatinga and occurs along one ecoregion (Table 1; Appendix S3). Distributed in medium to high elevation areas (587–1,085 m a.s.l.), with annual mean temperature 20 to 24°C, and average annual rainfall between 662 and 917 mm.



Figure 6. Lizards recorded in the Caatinga region. **6.1** *Micrablepharus maximiliani*; **6.2** *Nothobachia ablephara*; **6.3** *Procellosaurinus erythrocerus*; **6.4** *Procellosaurinus tetradactylus*; **6.5** *Psilops mucugensis*; **6.6** *Psilops paeminus*; **6.7** *Scriptosaura catimbau*, and **6.8** *Stenolepis ridleyi*. Photograph credits: Mauro Teixeira (6.2, 6.4, 6.6), Marco A. Freitas (6.8), Adrian Garda (6.1, 6.3, 6.5, 6.7).

Ecological notes. Fossorial and diurnal (Rodrigues 1991b). It has a strict association with sandy soils. It was recorded in open areas with a sandy quartzite soil in the municipality of Miguel Calmon, in open semideciduous forest in the municipality of Morro do Chapéu, in a plateau covered by lower semideciduous vegetation in Mucugê, and in rupestrian fields in Palmeiras (Magalhães et al. 2015; Rodrigues et al. 2017). Diet based mainly on arthropods, no information about the preferred items on the diet of this species is known, but it could be similar to other *Psilops* (Costa 2015). Oviparous, no detailed data is known about the number of eggs laid by the species, but it could be similar to other Gymnophthalmidae (Mesquita and Colli 2010; Dal Vechio et al. 2014; Ramiro et al. 2017).

Psilops paeminus (Rodrigues, 1991)

Figs 6.6 and 16

Type locality. Santo Inácio, state of Bahia, Brazil.

Distribution. Caatinga endemic species. It is registered in the states of Bahia, Minas Gerais, and Sergipe. It is widespread in the Caatinga and occurs along five ecoregions (Table 1; Appendix S3). Distributed in low to high elevation areas (271–916 m a.s.l.), with annual mean temperature 21 to 26°C, and average annual rainfall between 470 and 980 mm.

Ecological notes. Fossorial and diurnal (Rodrigues 1991b). Recorded in sandy soil litter, associated with undergrowth, in clusters of vegetation (Rodrigues 1991b) such as cacti and bromeliads (Delfim et al. 2006). Diet based mainly on arthropods, being Araneae, Blattodea and Hemiptera the most representative items (Costa 2015). Oviparous, no detailed data is known about the number of eggs laid by the species, but it could be similar to other Gymnophthalmidae (Mesquita and Colli 2010; Dal Vechio et al. 2014; Ramiro et al. 2017).

Scriptosaura catimbau Rodrigues & Santos, 2008

Figs 6.7 and 16

Type locality. Porto Seguro Farm, municipality of Buíque, Parque Nacional do Catimbau, state of Pernambuco, Brazil.

Distribution. Caatinga endemic species. It is recorded only in the state of Pernambuco. It shows restricted distribution in the Caatinga and occurs along one ecoregion (Table 1; Appendix S3). Distributed in high elevation areas (705–869 m a.s.l.), with annual mean temperature 21 to 22°C, and average annual rainfall between 609 and 869 mm

Ecological notes. Fossorial and diurnal (Rodrigues and Santos 2008; Bars-Closel et al. 2018). It is adapted for sandy soils between litter around vegetation thickets. Found buried in the sand some fields below the surface (Rodrigues and Santos 2008). Diet based mainly on arthropods, no information about the preferred items on the diet of this species is known. Oviparous, no detailed data is known about the number of eggs laid by the species, but it could be similar to others of the Gymnophthalmini tribe (Rodrigues 1991a; Rocha and Rodrigues 2005; Santos et al. 2012; Ramiro et al. 2017).

Stenolepis ridleyi Boulenger, 1887

Figs 6.8 and 16

Type locality. Igarassu forest (also referred to as Iguarassu), state of Pernambuco, Brazil.

Distribution. In the Caatinga it is registered in the states of Ceará, Paraíba, and Pernambuco. It is widespread in the Caatinga and occurs along five ecoregions (Table 1; Appendix S3). Distributed in low to high elevation areas (128–855 m a.s.l.), with annual mean temperature 21 to 26°C, and average annual rainfall between 532 and 1,467 mm.

Ecological notes. Fossorial and diurnal. It occurs in isolated forest remnants in the semi-arid Northeast, associated with high-altitude marshes and mountainous areas (Borges-Nojosa and Caramaschi 2003; Rodrigues et al. 2007; Roberto and Loebmann 2016). Diet based mainly on arthropods, no information about the preferred items on the diet of this species is known. Oviparous, no detailed data is known about the number of eggs laid by the species, but it could be similar to others of the Iphisiini tribe (Mesquita and Colli 2010; Costa 2015).

Vanzosaura multiscutata (Amaral, 1933)

Figs 7.1 and 16

Type locality. Senhor do Bonfim, state of Bahia, Brazil.

Distribution. Caatinga endemic species. It is registered in the states of Alagoas, Bahia, Ceará, Minas Gerais, Paraíba, Pernambuco, Piauí, Rio Grande do Norte, and Sergipe. It is widespread in the Caatinga and occurs along all ecoregions (Table 1; Appendix S3). Distributed in low to high elevation areas (5–1,008 m a.s.l.), with annual mean temperature 20 to 28°C, and average annual rainfall between 374 and 1,400 mm.

Ecological notes. Fossorial and diurnal (Vanzolini et al. 1980; Vitt 1995). They are found in different vegetation environments, related to litter in different types of soil (Delfim and Freire 2007; Recoder et al. 2014; Caldas et

al. 2016; Freitas et al. 2019). Diet based mainly on arthropods, being Araneae, insect larvae, Orthoptera and Hemiptera the most representative items (Vitt 1995; Mesquita et al. 2006; Recoder et al. 2014). Oviparous, the female usually lays two eggs at a time (Vitt 1992; Moraes 1993).

Hoplocercidae Frost & Etheridge, 1989 (one species)

Hoplocercus spinosus Fitzinger, 1843

Figs 7.2 and 16

Type locality. America and Brazil.

Distribution. In the Caatinga it is registered in the states of Bahia and Piauí. It shows restricted distribution in the Caatinga and occurs along two ecoregions (Table 1; Appendix S3). Distributed in medium to high elevation areas (448–643 m a.s.l.), with annual mean temperature 24 to 25°C, and average annual rainfall between 827 and 1,029 mm.

Ecological notes. Terrestrial and both diurnal and nocturnal (Ávila-Pires 1995). Found in arboreal caatinga of the Parque Nacional Serra das Confusões (Torres-Carvajal et al. 2011). Diet based mainly on arthropods, being Blattodea, Coleoptera and Araneae the most representative items (Ávila-Pires 1995). Oviparous no detailed data is known about the number of eggs laid by the species.

Iguanidae Oppel, 1811 (one species)

Iguana iguana (Linnaeus, 1758)

Figs 7.3 and 16

Type locality. “Indiis”, restricted by Hoogmoed (1973) to the confluence of the Cottica River and the Perica Creek, Suriname.

Distribution. In the Caatinga it is registered in the states of Alagoas, Bahia, Ceará, Minas Gerais, Paraíba, Pernambuco, Piauí, Rio Grande do Norte, and Sergipe. It is widespread in the Caatinga and occurs along all ecoregions (Table 1; Appendix S3). Distributed in low to high elevation areas (5–919 m a.s.l.), with annual mean temperature 21 to 28°C, and average annual rainfall between 412 and 1,592 mm.

Ecological notes. Arboreal and diurnal (Vanzolini et al. 1980). It occurs widely in the Caatinga, being found mainly in riparian forests (Vanzolini et al. 1980; Freitas and Silva 2007). Diet is based mainly on vegetables

(leaves, shoots, flowers, fruits, and occasionally seeds) (Vanzolini et al. 1980; van Marken Lichtenbelt 1993; Kaplan 2014). Oviparous, on female the clutch size is varied in different populations, in Pantanal the clutch size range is 12–19 eggs (Campos 2004) and in Amazonia is 20–33 eggs (Haller and Rodrigues 2005).

Leiosauridae Frost, Etheridge, Janies & Titus, 2001 (five species)

Enyalius bibronii Boulenger, 1885

Figs 7.4 and 16

Type locality. State of Bahia, Brazil.

Distribution. In the Caatinga it is registered in the states of Alagoas, Bahia, Ceará, Minas Gerais, Paraíba, Pernambuco, Piauí, and Rio Grande do Norte. It is widespread in the Caatinga and occurs along eight ecoregions (Table 1; Appendix S3). Distributed in low to high elevation areas (23–1,006 m a.s.l.), with annual mean temperature 20 to 28°C, and average annual rainfall between 495 and 1,580 mm.

Ecological notes. Semiarboreal and diurnal (Rodrigues et al. 2014). It is typical of forest enclaves in arid environments of the Caatinga and scattered patches of the semi-arid (Jackson 1978; Rodrigues et al. 2006). Diet based mainly on arthropods, being Coleoptera, Orthoptera and Hemiptera the most representative items (Costa 2015). Oviparous, the female usually lays 7–10 eggs at a time (Lagares 2019).

Enyalius bilineatus (Duméril & Bibron, 1837)

Fig. 16

Type locality. “Brésil” [= Brazil].

Distribution. In the Caatinga it is recorded only in the state of Bahia. It shows restricted distribution in the Caatinga and occurs along one ecoregion (Table 1; Appendix S3). Distributed in high elevation areas (1,441 m a.s.l.), annual mean temperature 18°C, and average annual rainfall 1,118 mm.

Ecological notes. Semiarboreal and diurnal (Rodrigues et al. 2014). In the Caatinga it occurs in an area that mix of campos rupestres and cerrado vegetation, living in leaf litter under shrubs (Sales et al. 2015). Diet based mainly on arthropods, being Hymenoptera, Orthoptera and Blattodea the most representative items (Teixeira et al. 2005). Oviparous, the female usually lays 2–6 eggs at a time (Teixeira et al. 2005).

Enyalius catenatus (Wied, 1821)

Figs 7.5 and 16

Type locality. Cabeça do Boi, Bahia, Brazil (fide Etheridge 1968) [= Jequié, Bahia]; “sertao (= interior) of Bahia” (fide Jackson 1978).

Distribution. In the Caatinga it is registered in the states of Alagoas, Bahia and Pernambuco. It is widespread in the Caatinga and occurs along three ecoregions (Table 1; Appendix S3). Distributed in low to high elevation areas (96–1,006 m a.s.l.), annual mean temperature 20 to 24°C, and average annual rainfall between 635 and 1,398 mm.

Ecological notes. Semiarboreal and diurnal (Rodrigues et al. 2014). It occurs in humid forest enclaves of the Caatinga, with shaded environments and abundant litter (Arzabe et al. 2005) Diet based mainly on arthropods, being Isoptera, insect larvae and Hymenoptera the most representative items (Cruz et al. 2018). Oviparous, no detailed data is known about the number of eggs laid by the species, but it could be similar to other *Enyalius* (Migliore et al. 2014).

Enyalius erythroceus Rodrigues, Freitas, Silva & Bertolotto, 2006

Figs 7.6 and 16

Type locality. Fazenda Caraíbas, municipality of Mucugê, Serra do Espinhaço (Chapada Diamantina), state of Bahia, Brazil.

Distribution. Caatinga endemic species. It is recorded only in the state of Bahia. It shows restricted distribution in the Caatinga and occurs along one ecoregion (Table 1; Appendix S3). Distributed in high elevation areas (1,085–1,091 m a.s.l.), with annual mean temperature 20°C, and average annual rainfall between 904 and 917 mm.

Ecological notes. Semiarboreal and diurnal (Rodrigues et al. 2006, 2014). It is known from an area of semideciduous forest, locally called the “carrasco”, which is characterized by the abundance of Myrtaceae, and gallery forest along the river valleys (Rodrigues et al. 2006). Diet based mainly on arthropods, no information about the preferred items on the diet of this species is known (Cruz et al. 2018). Oviparous, no detailed data is known about the number of eggs laid by the species, but it could be similar to other *Enyalius* (Migliore et al. 2014).

Enyalius pictus (Schinz, 1822)

Figs 7.7 and 16

Type locality. Mucuri and Lago d’Arara, state of Bahia, Brazil.

Distribution. It is recorded only in the states of Bahia and Minas Gerais. It shows restricted distribution in the Caatinga and occurs along two ecoregions (Table 1; Appendix S3). Distributed in medium to high elevation areas (475–916 m a.s.l.), with annual mean temperature 21 to 24°C, and average annual rainfall between 804 and 910 mm.

Ecological notes. Semiarboreal and diurnal (Rodrigues et al. 2014). It inhabits regions of rupestrian fields and cerrados in the states of Minas Gerais and Bahia (Freitas and Silva 2007). Diet based mainly on arthropods, no information about the preferred items on the diet of this species is known (Cruz et al. 2018). Oviparous, no detailed data is known about the number of eggs laid by the species, but it could be similar to other *Enyalius* (Migliore et al. 2014).

Phyllodactylidae Gamble, Bauer, Greenbaum & Jackman, 2008 (six species)

Gymnodactylus geckoides Spix, 1825

Figs 7.8 and 17

Type locality. State of Bahia, Brasil.

Distribution. In the Caatinga it is registered in the states of Alagoas, Bahia, Ceará, Paraíba, Pernambuco, Piauí, Rio Grande do Norte, and Sergipe. It is widespread in the Caatinga and occurs along all ecoregions (Table 1; Appendix S3). Distributed in low to high elevation areas (34–1,006 m a.s.l.), with annual mean temperature 20 to 28°C, and average annual rainfall between 374 and 1,479 mm.

Ecological notes. Terrestrial and crepuscular/nocturnal (Vanzolini et al. 1981; Vitt 1995; Andrade et al. 2013; TBG and FRD pers. obs.). It is occurring in all kinds of caatinga vegetation, in open and forest environments in litter, trunks and rocky outcrops beyond coastal restinga (Vanzolini et al. 1980; Vanzolini 2004). Diet based mainly on arthropods, being Isoptera and Formicidae the most representative items (Colli et al. 2003). Oviparous, the female usually lays one egg at a time (Vitt 1992; Souza-Oliveira et al. 2017).

Gymnodactylus vanzolinii Casimiro & Rodrigues, 2009

Figs 8.1 and 17

Type locality. Municipality of Mucugê, Serra do Sincorá, Chapada Diamantina, state of Bahia, Brazil.

Distribution. Caatinga endemic species. It is recorded only in the state of Bahia. It shows restricted distribution in the Caatinga and occurs along one ecoregion (Table 1;

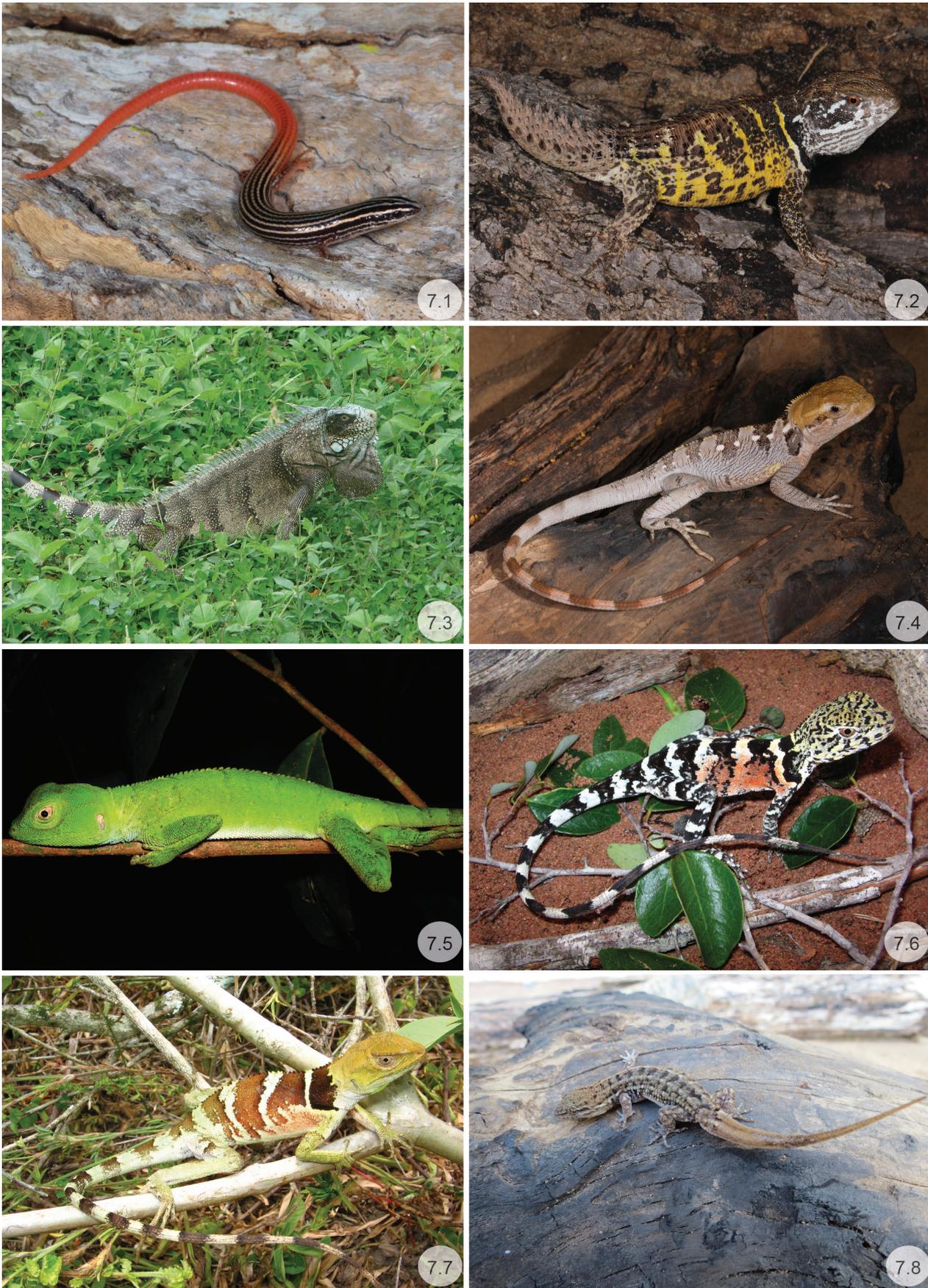


Figure 7. Lizards recorded in the Caatinga region. 7.1 *Vanzosaura multiscutata*; 7.2 *Hoplocercus spinosus*; 7.3 *Iguana iguana*; 7.4 *Enyalius bibronii*; 7.5 *Enyalius catenatus*; 7.6 *Enyalius erythroceneus*; 7.7 *Enyalius pictus*, and 7.8 *Gymnodactylus geckoides*. Photograph credits: Daniel Mesquita (7.3, 7.8), Marco A. Freitas (7.5, 7.6, 7.7), Adrian Garda (7.1, 7.2, 7.4).

Appendix S3). Distributed in high elevation areas (1,085–1,091 m a.s.l.), with annual mean temperature 20°C, and average annual rainfall between 904 and 917 mm.

Ecological notes. Terrestrial and nocturnal (Cassimiro and Rodrigues 2009; Freitas et al. 2012). It has been associated with rupestrian fields, found in rocky outcrop crevices, dominated by pioneer vegetation (Cassimiro and Rodrigues 2009; Silva Júnior 2010). Diet based mainly on arthropods, no information about the preferred items on the diet of this species is known (Cruz et al. 2018). Oviparous, no detailed data is known about the number of eggs laid by the species, but it could be similar to other *Gymnodactylus* (Vitt 1992; Souza-Oliveira et al. 2017).

***Phyllopezus diamantino* Dubeux, Gonçalves, Palmeira, Nunes, Cassimiro, Gamble, Werneck, Rodrigues & Mott, 2022**

Figs 8.2 and 17

Type locality. Municipality of Mucugê, Serra do Sincorá, Chapada Diamantina, state of Bahia, Brazil.

Distribution. Caatinga endemic species. It is recorded only in the state of Bahia. It shows restricted distribution in the Caatinga and occurs along one ecoregion (Table 1; Appendix S3). Distributed in high elevation areas (935–1,010 m a.s.l.), with annual mean temperature 20°C, and average annual rainfall of 996 mm.

Ecological notes. Terrestrial and nocturnal. The species is known only from the mountains of Serra do Sincorá, occurring in areas of campos rupestres vegetation. Observed specimens on rocky outcrops and in tree and shrub trunks (Dubeux et al. 2022). Diet based mainly on arthropods, no information about the preferred items on the diet of this species is known (Albuquerque et al. 2013; Palmeira et al. 2021). Oviparous, no detailed data is known about the number of eggs laid by the species, but it could be similar to other *Phyllopezus* (Mesquita and Colli 2010; Lima et al. 2011).

***Phyllopezus periosus* Rodrigues, 1986**

Figs 8.3 and 17

Type locality. Bravo Farm, municipality of Cabaceiras, state of Paraíba, Brazil.

Distribution. Caatinga endemic species. It is registered in the states of Alagoas, Ceará, Paraíba, Pernambuco, Rio Grande do Norte, and Sergipe. It is widespread in the Caatinga and occurs along five ecoregions (Table 1; Appendix S3). Distributed in low to high elevation areas (54–869 m a.s.l.), with annual mean temperature 21 to 28°C, and average annual rainfall between 412 and 1,475 mm.

Ecological notes. Saxicolous and nocturnal. It has ambush foraging habits, associated with rock formations, with emphasis on the use of cracks in rocks and bare rock (Vanzolini 1953; Rodrigues 1986a; Vitt 1995; Freire et al. 2000; Passos et al. 2013b). Diet based mainly on arthropods, being Coleoptera, Hymenoptera, and Blattodea the most representative items (Palmeira et al. 2021). Oviparous, the female usually lays eight eggs at a time (Lima et al. 2011).

***Phyllopezus pollicaris* (Spix, 1825)**

Figs 8.4 and 17

Type locality. Sylvis interioris Bahiae campestribus, according Vanzolini (1968) state of Bahia, Brazil.

Distribution. In the Caatinga it is registered in the states of Alagoas, Bahia, Ceará, Minas Gerais, Paraíba, Pernambuco, Piauí, Rio Grande do Norte, and Sergipe. It is widespread in the Caatinga and occurs along all ecoregions (Table 1; Appendix S3). Distributed in low to high elevation areas (70–1,450 m a.s.l.), with annual mean temperature 18 to 28°C, and average annual rainfall between 374 and 1,532 mm.

Ecological notes. Semi-arboreal and nocturnal. It is found both in open formations and in forested areas along the Caatinga (Vanzolini et al. 1980; Ávila-Pires 1995). Diet based mainly on arthropods, being Coleoptera, Hymenoptera and Araneae the most representative items (Albuquerque et al. 2013). Oviparous, the female usually lays two eggs at a time (Vitt 1992; Mesquita and Colli 2010).

***Phyllopezus selmae* Dubeux, Gonçalves, Palmeira, Nunes, Cassimiro, Gamble, Werneck, Rodrigues & Mott, 2022**

Figs 8.5 and 17

Type locality. Municipality of Boca da Mata, Cariri da Prensa Farm, state of Alagoas, Brazil.

Distribution. Caatinga endemic species. It is recorded only in the state of Alagoas. It shows restricted distribution in the Caatinga and occurs along two ecoregions (Table 1; Appendix S3). Distributed in low to high elevation areas (68–780 m a.s.l.), with annual mean temperature 21 to 24°C, and average annual rainfall of 861 and 1382 mm.

Ecological notes. Terrestrial and nocturnal. The species is found in rocky outcrops and trees. Were mainly observed active in the early evening when foraging in forested sites near rivers with rocky bed (Dubeux et al. 2022). Diet based mainly on arthropods, no information about the preferred items on the diet of this species is known (Albuquerque et al. 2013; Palmeira et al. 2021).



Figure 8. Lizards recorded in the Caatinga region. **8.1** *Gymnodactylus vanzolinii*; **8.2** *Phyllopezus diamantino*; **8.3** *Phyllopezus periosus*; **8.4** *Phyllopezus pollicaris*; **8.5** *Phyllopezus selmae*; **8.6** *Polychrus acutirostris*; **8.7** *Polychrus marmoratus*, and **8.8** *Brasiliscincus heathi*. Photograph credits: Mauro Teixeira (8.1), José Cassimiro (8.2), Fagner Delfim (8.3), Daniel Mesquita (8.7), Marcos Dubeux (8.5), Adrian Garda (8.4, 8.6, 8.8).

Oviparous, no detailed data is known about the number of eggs laid by the species, but it could be similar to other *Phyllorhynchus* (Mesquita and Colli 2010; Lima et al. 2011).

Polychrotidae Frost & Etheridge, 1989 (two species)

***Polychrus acutirostris* Spix, 1825**

Figs 8.6 and 17

Type locality. State of Bahia, Brazil.

Distribution. In the Caatinga it is registered in the states of Alagoas, Bahia, Ceará, Minas Gerais, Paraíba, Pernambuco, Piauí, Rio Grande do Norte, and Sergipe. It is widespread in the Caatinga and occurs along eight ecoregions (Table 1; Appendix S3). Distributed in low to high elevation areas (34–1,085 m a.s.l.), with annual mean temperature 20 to 27°C, and average annual rainfall between 412 and 1,532 mm.

Ecological notes. Arboreal and diurnal (Vanzolini et al. 1980). It inhabits arboreal savannas with open vegetation and different types of vegetation in the high and low altitude caatinga, mainly found in branches of trees and shrubs (Ávila-Pires 1995; Vitt 1995; Rodrigues 1996b; 2003; Mesquita et al. 2018). Diet based mainly on arthropods, being Orthoptera and Coleoptera the most representative items, in addition to plant material (Garda et al. 2012). Oviparous, the female usually lays 7–31 eggs at a time (Vitt 1992; Garda et al. 2012).

***Polychrus marmoratus* (Linnaeus, 1758)**

Figs 8.7 and 17

Type locality. “Hispania”, restricted by Hoogmoed (1973) to the vicinity of Paramaribo, Suriname.

Distribution. In the Caatinga it is registered in the states of Ceará, Paraíba, Pernambuco, and Rio Grande do Norte. It is widespread in the Caatinga and occurs along four ecoregions (Table 1; Appendix S3). Distributed in low to high elevation areas (81–855 m a.s.l.), with annual mean temperature 22 to 27°C, and average annual rainfall between 778 and 1,413 mm.

Ecological notes. Arboreal and diurnal. Occurring in the caatinga associated with tropical forests relics (Vanzolini 1983; Ávila-Pires 1995; Loebmann and Haddad 2010). Diet based mainly on arthropods with a variety of insects and spiders, in addition to plant material (Vanzolini 1983; Ávila-Pires 1995). Oviparous, the female usually lays 8–10 eggs at a time (Rand 1982).

Mabuyidae Mittleman, 1952 (seven species)

Aspronema aff. dorsivittatum

Fig. 17

Type locality. Paraguay.

Distribution. In the Caatinga it is recorded only in the state of Bahia. It shows restricted distribution in the Caatinga and occurs along one ecoregion (Table 1; Appendix S3). Distributed in high elevation areas (787–872 m a.s.l.), with annual mean temperature 21 to 22°C, and average annual rainfall between 690 and 813 mm.

Ecological notes. Terrestrial and diurnal (Vrcibradic et al. 2004). It has been associated with rupestrian fields, found in rocky outcrop crevices reported by Freitas and Silva (2007). Diet based mainly on arthropods, no information about the preferred items on the diet of this species is known (Vrcibradic et al. 2004). Viviparous, no detailed data on the number of embryos of the species per clutch are known, but it could be similar to other *Aspronema* (Vrcibradic et al. 2011).

***Brasiliscincus heathi* (Schmidt & Inger, 1951)**

Figs 8.8 and 17

Type locality. Fortaleza, state of Ceará, Brazil.

Distribution. In the Caatinga it is registered in the states of Alagoas, Bahia, Ceará, Paraíba, Pernambuco, Piauí, Rio Grande do Norte, and Sergipe. It is widespread in the Caatinga and occurs along all ecoregions (Table 1; Appendix S3). Distributed in low to high elevation areas (5–1,085 m a.s.l.), with annual mean temperature 20 to 28°C, and average annual rainfall between 450 and 1,413 mm.

Ecological notes. Terrestrial and diurnal (Vanzolini et al. 1980). It inhabits open landscapes in herbaceous caatinga vegetation (Vanzolini et al. 1980). Diet based mainly on arthropods, being Orthoptera, insect larvae, Homoptera and Isoptera the most representative items (Mesquita et al. 2006; Ferreira et al. 2017). Viviparous, the female usually with clutch of 1–6 embryos (Vitt and Blackburn 1983).

***Copeoglossum arajara* (Rebouças-Spieker, 1981)**

Figs 9.1 and 17

Type locality. Arajara, state of Ceará, Brazil.

Distribution. Caatinga endemic species. It is registered in the states of Ceará, Pernambuco, and Piauí. It is widespread in the Caatinga and occurs along three ecoregions (Table 1; Appendix S3). Distributed in low to high elevation areas (23–927 m a.s.l.), with annual mean temperature 21 to 28°C, and average annual rainfall between 523 and 1,413 mm.

Ecological notes. Terrestrial and diurnal. It is recorded in a narrow transitional area, on the edges of the forest and open areas, in different mesic environments (Ribeiro et al. 2008; Roberto and Loebmann 2010; Roberto et al. 2010). Diet based mainly on arthropods, being Isoptera the most representative item. Viviparous, the female usually with clutch of 2–9 embryos (Ribeiro et al. 2015).

Copeoglossum nigropunctatum (Spix, 1825)

Figs 9.2 and 17

Type locality. Ecág, Brazil.

Distribution. In the Caatinga it is registered in the states of Alagoas, Bahia, Ceará, Paraíba, Pernambuco and Piauí. It is widespread in the Caatinga and occurs along seven ecoregions (Table 1; Appendix S3). Distributed in low to high elevation areas (80–872 m a.s.l.), with annual mean temperature 21 to 27°C, and average annual rainfall between 447 and 1,467 mm.

Ecological notes. Terrestrial and diurnal. Lives in leaf litter and tree trunks in open areas and forest (Vitt and Blackburn 1991; Ávila-Pires 1995; Borges-Nojosa and Caramaschi 2003). In the Caatinga it can be found in dense arboreal vegetation with some shrubby elements in compact sandy soil (Cavalcanti et al. 2014). Diet based mainly on arthropods, being Isoptera, Araneae and Homoptera the most representative items (Vitt et al. 1997a; Mesquita et al. 2006). Viviparous, the female usually with clutch of 2–9 embryos (Vitt and Blackburn 1991).

Notomabuya frenata (Cope, 1862)

Figs 9.3 and 18

Type locality. Río Paraguay valley, Paraguay.

Distribution. In the Caatinga it is registered in the states of Ceará, Minas Gerais, and Piauí. It is widespread in the Caatinga and occurs along two ecoregions (Table 1; Appendix S3). Distributed in medium to high elevation areas (475–919 m a.s.l.), with annual mean temperature 21 to 24°C, and average annual rainfall between 813 and 1,090 mm.

Ecological notes. Terrestrial and diurnal. It is reported to occur in open environments, on rocks and forest edges, and in some urban areas (Vrcibradic and Rocha 1998a,

Cruz et al. 2014). Diet based mainly on arthropods, being Isoptera, Orthoptera and Araneae the most representative items (Vrcibradic and Rocha 1998a), also with a record of cannibalism (Vrcibradic and Rocha 1996). Viviparous, the female usually with clutch of 2–8 embryos (Vrcibradic and Rocha 1998b).

Psychosaura agmosticha (Rodrigues, 2000)

Figs 9.4 and 18

Type locality. Xingó, state of Alagoas, Brazil.

Distribution. In the Caatinga it is registered in the states of Alagoas, Ceará, Paraíba, Pernambuco, Rio Grande do Norte, and Sergipe. It is widespread in the Caatinga and occurs along four ecoregions (Table 1; Appendix S3). Distributed in low to high elevation areas (80–869 m a.s.l.), with annual mean temperature 21 to 27°C, and average annual rainfall between 412 and 932 mm.

Ecological notes. Terrestrial and diurnal. It is found in Caatinga areas where there is predominance of bromeliads (Rodrigues 2000). Despite occurring in many locations in the Caatinga and in different phytophysiognomies, the distribution pattern is relictual, due to the availability of its microhabitat (bromelias) (Rodrigues 2003; Magalhães et al. 2014). Diet based mainly on arthropods, being Blattodea and Araneae the most representative items (Jorge 2019). Viviparous, the female usually with clutch of 1–4 embryos (Stevaux 1993).

Psychosaura macrorhyncha (Hoge, 1946)

Figs 9.5 and 18

Type locality. Ilha da Queimada Grande, Brazil.

Distribution. In the Caatinga it is registered in the states of Alagoas, Bahia, Paraíba, Pernambuco, Rio Grande do Norte, and Sergipe. It is widespread in the Caatinga and occurs along five ecoregions (Table 1; Appendix S3). Distributed in low to high elevation areas (34–1,006 m a.s.l.), with annual mean temperature 20 to 26°C, and average annual rainfall between 483 and 1,479 mm.

Ecological notes. Terrestrial and diurnal. They in a great variety of habitats, including open and forested areas inside Caatinga; under litter, rocks, shrubs and are generally associated with bromeliads (Vrcibradic and Rocha 1995; Dias and Lira-da-Silva 1998; Rodrigues 2003). Diet based mainly on arthropods, being Araneae, Blattodea and Hymenoptera the most representative items (Vrcibradic and Rocha 1995; Dias and Lira-da-Silva 1998), also being recorded occasionally preying on frogs (Vrcibradic and Rocha 1995). Viviparous, the female usually with clutch of 1–6 embryos (Vrcibradic and Rocha 2011).

Sphaerodactylidae Underwood, 1954 (two species)

***Coleodactylus meridionalis* (Boulenger, 1888)**

Figs 9.6 and 18

Type locality. Igarassu, state of Pernambuco, Brazil.

Distribution. In the Caatinga it is registered in the states of Alagoas, Bahia, Ceará, Paraíba, Pernambuco, Piauí, Rio Grande do Norte, and Sergipe. It is widespread in the Caatinga and occurs along all ecoregions (Table 1; Appendix S3). Distributed in low to high elevation areas (5–934 m a.s.l.), with annual mean temperature 21 to 28°C, and average annual rainfall between 532 and 660 mm.

Ecological notes. Terrestrial and diurnal. It is found in leaf litter of the arboreal Caatinga, with moist soil (Carvalho et al. 2005; Capistrano and Freire 2008; da Silva et al. 2015). Diet based mainly on arthropods, being Orthoptera, Isopoda and Araneae the most representative items (Dias et al. 2003; da Silva et al. 2015). Oviparous, the female usually lays one egg at a time (Vanzolini et al. 1980; Mesquita and Colli 2010).

***Gonatodes humeralis* (Guichenot, 1855)**

Figs 9.7 and 18

Type locality. Rio Ucayali, Mission de Sarayacu, Peru.

Distribution. In the Caatinga it is recorded only in the state of Ceará. It shows restricted distribution in the Caatinga and occurs along one ecoregion (Table 1; Appendix S3). Distributed in low elevation areas (27–38 m a.s.l.), with annual mean temperature of 27°C, and average annual rainfall between 1139 and 1,367 mm.

Ecological notes. Semi-arboreal and diurnal (Oliveira et al. 2021). It inhabits areas of forest fragments, along the coastal landscape, with vegetation with a predominance of trees and shrubs. Occurring predominantly on tree trunks, living or dead (Oliveira et al. 2021). Diet based mainly on arthropods, being Araneae, Coleoptera and Orthoptera the most representative items (Oliveira et al. 2021). Oviparous, the female usually lays one egg at a time (Vitt et al. 1997b).

Teiidae Gray, 1827 (ten species)

***Ameiva ameiva* (Linnaeus, 1758)**

Figs 9.8 and 18

Type locality. America, restricted by Hoogmoed (1973) to the confluence of the Cottica River and the Perica Creek, Suriname.

Distribution. In the Caatinga it is registered in the states of Alagoas, Bahia, Ceará, Minas Gerais, Paraíba, Pernambuco, Piauí, Rio Grande do Norte, and Sergipe. It is widespread in the Caatinga and occurs along all ecoregions (Table 1; Appendix S3). Distributed in low to high elevation areas (5–1,105 m a.s.l.), with annual mean temperature 20 to 28°C, and average annual rainfall between 374 and 1,573 mm.

Ecological notes. Terrestrial and diurnal (Vanzolini et al. 1980). It is widely distributed in open areas in South America (Vanzolini et al. 1980). Diet based mainly on arthropods, being Isoptera, insect larvae and Coleoptera the most representative items (Vitt and Colli 1994). Oviparous, the female usually lays 1–9 eggs at a time (Vitt 1992).

***Ameivula confusioniba* (Arias, Carvalho, Rodrigues & Zaher, 2011)**

Figs 10.1 and 18

Type locality. Toca da Cabocla, municipality of Caracol, Parque Nacional da Serra das Confusões, state of Piauí, Brazil.

Distribution. Caatinga endemic species. It is recorded only in the state of Piauí. It shows restricted distribution in the Caatinga and occurs along one ecoregion (Table 1; Appendix S3). Distributed in medium elevation areas (310–596 m a.s.l.), with annual mean temperature 25 to 26°C, and average annual rainfall between 827 and 940 mm.

Ecological notes. Terrestrial and diurnal. It is seen foraging among tufts of Caatinga on white sand soils. Eventually found crossing rocky areas (Arias et al. 2011a, 2011b). Diet based mainly on arthropods, no information about the preferred items on the diet of this species is known. Oviparous, no detailed data is known about the number of eggs laid by the species, but it could be similar to other *Ameivula* (Mesquita and Colli 2003; Sales and Freire 2016).



Figure 9. Lizards recorded in the Caatinga region. **9.1** *Copeoglossum arajara*; **9.2** *Copeoglossum nigropunctatum*; **9.3** *Notomabuya frenata*; **9.4** *Psychosaura agmosticha*; **9.5** *Psychosaura macrorhyncha*; **9.6** *Coleodactylus meridionalis*; **9.7** *Gonatodes humeralis*, and **9.8** *Ameiva ameiva*. Photograph credits: Samuel Ribeiro (9.1), Daniel Mesquita (9.4, 9.7), Fagner Delfim (9.3), Adrian Garda (9.2, 9.5, 9.6, 9.8).

Ameivula nigrigula (Arias, Carvalho, Rodrigues & Zaher, 2011)

Figs 10.2 and 18

Type locality. Santo Inácio, state of Bahia, Brazil.

Distribution. Caatinga endemic species. It is registered in the states of Bahia, Minas Gerais, and Sergipe. It is widespread in the Caatinga and occurs along four ecoregions (Table 1; Appendix S3). Distributed in low to high elevation areas (218–1,085 m a.s.l.), with annual mean temperature 20 to 25°C, and average annual rainfall between 492 and 980 mm.

Ecological notes. Terrestrial and diurnal (Arias et al. 2011a). The microhabitat most used by juveniles and adults was leaf litter under bush, followed by leaf litter under herbaceous vegetation. Diet based mainly on arthropods, being Isoptera, Araneae, and Coleoptera the most representative items (Xavier et al. 2019), also with record of cannibalism (Oliveira et al. 2017). Oviparous, no detailed data is known about the number of eggs laid by the species, but it could be similar to other *Ameivula* (Mesquita and Colli 2003; Sales and Freire 2016).

Ameivula ocellifera (Spix, 1825)

Figs 10.3 and 18

Type locality. State of Bahia, Brazil.

Distribution. In the Caatinga it is registered in the states of Alagoas, Bahia, Ceará, Minas Gerais, Paraíba, Pernambuco, Piauí, Rio Grande do Norte, and Sergipe. It is widespread in the Caatinga and occurs along all ecoregions (Table 1; Appendix S3). Distributed in low to high elevation areas (5–1,196 m a.s.l.), with annual mean temperature 20 to 28°C, and average annual rainfall between 374 and 1,573 mm.

Ecological notes. Terrestrial and diurnal (Vanzolini et al. 1980). It can be found in all kind of open vegetation landscapes in the Caatinga (Rocha and Siqueira 2008). Diet based mainly on arthropods, being Isoptera, Insect larvae, and Orthoptera the most representative items (Mesquita and Colli 2003). Oviparous, the female usually lays 1–5 eggs at a time (Mesquita and Colli 2003; Sales and Freire 2016).

Ameivula pyrrhogularis (Silva & Ávila-Pires, 2013)

Figs 10.4 and 18

Type locality. Fazenda Bonito, municipality of Castelo do Piauí, state of Piauí, Brazil.

Distribution. In the Caatinga it is registered in the states of Bahia, Ceará, Pernambuco, and Piauí. It is widespread in the Caatinga and with annual mean temperature 20 to 28°C along four ecoregions (Table 1; Appendix S3). Distributed in low to high elevation areas (53–840 m a.s.l.), with annual mean temperature 22 to 27°C, and average annual rainfall between 528 and 1,198 mm.

Ecological notes. Terrestrial and diurnal. It can be found in a variety of habitats like pasture even in rocky areas, open cerrado, in sandy or rocky soils, around boulders, on forest edges, being also common around human habitation (Silva and Ávila-Pires 2013). Diet based mainly on arthropods, being Isoptera, Coleoptera, and Lepidoptera the most representative items (Silva et al. 2019). Oviparous, no detailed data is known about the number of eggs laid by the species, but it could be similar to other *Ameivula* (Mesquita and Colli 2003; Sales and Freire 2016).

Glaucomastix cyanura (Arias, Carvalho, Rodrigues & Zaher, 2011)

Figs 10.5 and 18

Type locality. Morro do Chapéu, state of Bahia, Brazil.

Distribution. Caatinga endemic species. It is recorded only in the state of Bahia. It shows restricted distribution in the Caatinga and with annual mean temperature 20 to 28°C along one ecoregion (Table 1; Appendix S3). Distributed in medium to high elevation areas (482–1,006 m a.s.l.), with annual mean temperature 20 to 25°C, and annual average annual rainfall between 707 and 751 mm.

Ecological notes. Terrestrial and diurnal. Occurring in campos rupestres on white sand soils, observed foraging in the leaf litter and sand near rocky outcrops (Arias et al. 2011a; Pinto-Silva and Silva-Soares 2018). Diet based mainly on arthropods, no information about the preferred items on the diet of this species is known, but it could be similar to other *Glaucomastix* (Cavalcanti et al. in press). Oviparous, no detailed data is known about the number of eggs laid by the species, but it could be similar to other *Ameivula* (Mesquita and Colli 2003; Sales and Freire 2016; Xavier et al. 2019).

Glaucomastix venetacauda (Arias, Carvalho, Rodrigues & Zaher, 2011)

Figs 10.6 and 18

Type locality. Olho D'água da Santa, municipality of Caracol, Parque Nacional da Serra das Confusões, state of Piauí, Brazil.

Distribution. Caatinga endemic species. It is recorded only in the state of Piauí. It shows restricted distribution



Figure 10. Lizards recorded in the Caatinga region. **10.1** *Ameivula confusioniba*; **10.2** *Ameivula nigrigula*; **10.3** *Ameivula ocellifera*; **10.4** *Ameivula pyrrhogularis*; **10.5** *Glaucmastix cyanura*; **10.6** *Glaucmastix venetacauda*; **10.7** *Kentropyx calcarata*, and **10.8** *Salvator merianae*. Photograph credits: Adrian Garda (10.1, 10.3, 10.6, 10.7), Daniel Mesquita (10.2), Davi Pantoja (10.4), Ricardo Marques (10.5), Fagner Delfim (10.8).

in the Caatinga and with annual mean temperature 20 to 28°C along two ecoregions (Table 1; Appendix S3). Distributed in low to medium elevation areas (259–583 m a.s.l.), with annual mean temperature 25 to 27°C, and average annual rainfall between 702 and 1,029 mm.

Ecological notes. Terrestrial and diurnal. It can be found in areas with sandy soils with sandstone outcrops of the Parque Nacional Serra das Confusões. They often took refuge under rocks, fallen logs, piles of rubble or small holes in the ground along the caatinga vegetation (Arias et al. 2011b). Diet based mainly on arthropods, being Pseudoscorpiones and Isoptera the most representative items (Cavalcanti et al. in press). Oviparous, no detailed data is known about the number of eggs laid by the species, but it could be similar to other *Ameivula* (Mesquita and Colli 2003; Sales and Freire 2016; Xavier et al. 2019).

Kentropyx calcarata Spix, 1825

Figs 10.7 and 19

Type locality. Rio Itapecuru, state of Maranhão, Brazil.

Distribution. In the Caatinga it is registered in the states of Bahia, Ceará, Paraíba, Pernambuco and Piauí. It is widespread in the Caatinga and with annual mean temperature 20 to 28°C along five ecoregions (Table 1; Appendix S3). Distributed in low to medium elevation areas (80–489 m a.s.l.), with annual mean temperature 23 to 26°C, and average annual rainfall between 500 and 1,327 mm.

Ecological notes. Terrestrial and diurnal. It can be found in forested and open areas typical of savannas (Gallagher and Dixon 1992; Harvey et al. 2012). It was recorded in a mangrove area in the Delta do Parnaíba in the state of Piauí (Roberto et al. 2012; Araújo et al. 2020) and in “brejos nordestinos” in the middle of the Caatinga of the Serra de Baturité (Borges-Nojosa and Caramaschi 2003). Diet based mainly on arthropods, being Araneae and Orthoptera the most representative items (Franzini et al. 2019). Oviparous, the female usually lays 3–11 eggs at a time (Werneck et al. 2009; Filadelfo et al. 2013).

Salvator merianae Duméril & Bibron, 1839

Figs 10.8 and 19

Type locality. Cayenne, French Guiana; Brazil; Montevideo, Uruguay.

Distribution. In the Caatinga it is registered in the states of Alagoas, Bahia, Ceará, Paraíba, Pernambuco, Piauí, Rio Grande do Norte, and Sergipe. It is widespread in the Caatinga and with annual mean temperature 20 to 28°C along eight ecoregions (Table 1; Appendix S3). Distributed in low to high elevation areas (5–919 m a.s.l.), with

annual mean temperature 21 to 28°C, and annual average annual rainfall between 412 and 1,573 mm.

Ecological notes. Terrestrial and diurnal. It is found in all kind of open vegetation landscapes inside Caatinga (Barbosa et al. 2018; Castro et al. 2019). Diet is omnivorous, generalist eating invertebrates (e.g., Araneae, Orthoptera, and Blattaria), small vertebrates (e.g., anuros, snakes, and Muridae), eggs, carrion, and fruits (e.g., Arecaceae and Moraceae) (Kiefer and Sazima 2002; Castro and Galletti 2004; Silva and Hillesheim 2004; Oliveira-Santos and Leuchtenberger 2009). Oviparous, the female usually lays 20–50 eggs at a time (Yanosky and Mercolli 1991; Naretto et al. 2015).

Tupinambis teguixin (Linnaeus, 1758)

Figs 11.1 and 19

Type locality. “Indiis”, restricted by Presch (1973) to Paramaribo, Suriname.

Distribution. In the Caatinga it is registered in the states of Bahia, Ceará, and Piauí. It is widespread in the Caatinga and with annual mean temperature 20 to 28°C along two ecoregions (Table 1; Appendix S3). Distributed in low to medium elevation areas (5–405 m a.s.l.), with annual mean temperature 26 to 28°C, and annual average annual rainfall between 726 and 1,311 mm.

Ecological notes. Terrestrial and diurnal. Occurs in sandy soil and riparian vegetation with deciduous and thorny shrubs in a semiarid climate (Passos et al. 2013a). Diet is omnivorous, generalist eating invertebrates (e.g., Gastropoda, Araneae and Coleoptera), small vertebrates (e.g., anuros, serpentes, and pisces), eggs, carrion, and fruits and plants (e.g., vegetal matter and Pindó) (Vanzolini et al. 1980; Mercolli and Yanosky 1994). Oviparous, the female usually lays 13–29 eggs at a time (Vanzolini et al. 1980).

Tropiduridae Bell, 1843 in Darwin, 1843 (19 species)

Eurolophosaurus amathites (Rodrigues, 1984)

Figs 11.2 and 19

Type locality. Santo Inácio, state of Bahia, Brazil.

Distribution. Caatinga endemic species. It is recorded only in the state of Bahia. It shows restricted distribution in the Caatinga and with annual mean temperature 20 to 28°C along two ecoregions (Table 1; Appendix S3). Distributed in low to medium elevation areas (405–587 m a.s.l.), with annual mean temperature 24 to

26°C, and annual average annual rainfall between 572 and 745 mm.

Ecological notes. Terrestrial and diurnal. It occurs in the sand dunes of the São Francisco River. The microhabitat used by this species is the leaf litter under shrubs and vegetation with a height of less than 2 m (Xavier et al. 2021). With the human presence, it seeks shelter amidst vegetation (Rodrigues 1986b). Diet based mainly on arthropods, being Hymenoptera, Blattodea, and plant leaves the most representative items. Oviparous, the female usually lays two eggs at a time (Xavier et al. 2021).

Eurolophosaurus divaricatus (Rodrigues, 1986)

Figs 11.3 and 19

Type locality. Arraial do Paulista, state of Bahia, Brazil.

Distribution. Caatinga endemic species. It is recorded only in the state of Bahia. It shows restricted distribution in the Caatinga and with annual mean temperature 20 to 28°C along one ecoregion (Table 1; Appendix S3). Distributed in medium elevation areas (400–484 m a.s.l.), with annual mean temperature 26°C, and average annual rainfall between 572 and 732 mm.

Ecological notes. Terrestrial and diurnal. It normally occurs in open areas of sandy environments and habitats (Rocha and Rodrigues 2005). Diet based mainly on arthropods and flowers, being Formicidae and Coleoptera the most representative items (Rocha and Rodrigues 2005). Oviparous, no detailed data is known about the number of eggs laid by the species, but it could be similar to other *Eurolophosaurus* (Galdino et al. 2003; Xavier et al. 2021).

Eurolophosaurus aff. *divaricatus* (sensu Rodrigues et al., 2006)

Fig. 19

Distribution. Caatinga endemic species. It is recorded only in the state of Bahia. It shows restricted distribution in the Caatinga and with annual mean temperature 20 to 28°C along one ecoregion (Table 1; Appendix S3). Distributed in medium elevation areas (447–484 m a.s.l.), with annual mean temperature of 26°C, and average annual rainfall between 572 and 578 mm.

Ecological notes. Terrestrial and diurnal. According to Rodrigues et al. (2006), it is a species of the genus *Eurolophosaurus* that occurs in the dune field of Casa Nova, left bank of the São Francisco River and advanced as *E. divaricatus*. It is a non-elevated species, aff to *E. divaricatus*, under description (Freitas and Silva 2007). Diet based mainly on arthropods, no information about the

preferred items on the diet of this species is known. Oviparous, no detailed data is known about the number of eggs laid by the species, but it could be similar to other *Eurolophosaurus* (Galdino et al. 2003; Rocha and Rodrigues 2005; Xavier et al. 2021).

Eurolophosaurus sp.

Fig. 19

Distribution. Caatinga endemic species. It is recorded only in the state of Bahia. It shows restricted distribution in the Caatinga and with annual mean temperature 20 to 28°C along two ecoregions (Table 1; Appendix S3). Distributed in high elevation areas (634–1,391 m a.s.l.), with annual mean temperature 19 to 23°C, and average annual rainfall between 638 and 1,019 mm.

Ecological notes. Terrestrial and diurnal. It is a species of *Eurolophosaurus* related to *Eurolophosaurus nanuzae* (Rodrigues et al. 2006). Occurring in areas of white sandy soils covered by an open cerrado like vegetation, mixed with that of campos rupestres (Rodrigues et al. 2006). Diet based mainly on arthropods, no information about the preferred items on the diet of this species is known. Oviparous, no detailed data is known about the number of eggs laid by the species, but it could be similar to other *Eurolophosaurus* (Galdino et al. 2003; Rocha and Rodrigues 2005; Xavier et al. 2021).

Stenocercus squarrosus Nogueira & Rodrigues, 2006

Figs 11.4 and 19

Type locality. Chapada dos Gerais, a sandstone plateau in Parque Nacional Serra das Confusões, state of Piauí, Brazil.

Distribution. In the Caatinga it is registered in the states of Ceará and Piauí. It shows restricted distribution in the Caatinga and with annual mean temperature 20 to 28°C along two ecoregions (Table 1; Appendix S3). Distributed in low to high elevation areas (259–919 m a.s.l.), with annual mean temperature 21 to 27°C, and annual average annual rainfall between 702 and 1,074 mm.

Ecological notes. Terrestrial and diurnal. This species is recorded in isolated elevated plateaus Ceará (Floresta Nacional do Araripe-Apodi) with adjacent in low elevation areas close to the Cerrado in the state of Piauí (Ribeiro et al. 2009; Delfim 2012; Ribeiro et al. 2012). Diet based mainly on arthropods, being Araneae, Formidae, Coleoptera and Pseudoescorpiones the most representative items (Cavalcanti et al. unpublished data). Oviparous, no detailed data is known about the number of eggs laid by the species, but it could be similar to other *Stenocercus* (Rodrigues et al. 1989; Torres-Carvajal 2007).

Strobilurus torquatus Wiegmann, 1834

Figs 11.5 and 19

Type locality. Brazil.

Distribution. In the Caatinga it is registered in the states of Alagoas, Bahia, Ceará, Pernambuco, and Sergipe. It is widespread in the Caatinga and with annual mean temperature 20 to 28°C along five ecoregions (Table 1; Appendix S3). Distributed in low to medium elevation areas (83–598 m a.s.l.), with annual mean temperature 22 to 26°C, and average annual rainfall between 566 and 1,398 mm.

Ecological notes. Arboreal and diurnal. It is considered a forest-dwelling heliophilic lizard, in the Caatinga it is found in isolated enclaves of semi-arid tropical forest, under tree trunks at different levels of the forest (Borges-Nojosa and Caramaschi 2003; Rodrigues et al. 2013). Diet based mainly on arthropods, being Formicidae the most representative item, but also Coleoptera and Hemiptera (Rodrigues et al. 1989). Oviparous, the female usually lays 1–3 eggs at a time (Rodrigues et al. 1989; Torres-Carvajal 2007).

Tropidurus cocorobensis Rodrigues, 1987

Figs 11.6 and 19

Type locality. Cocorobó, state of Bahia, Brazil.

Distribution. Caatinga endemic species. It is registered in the states of Alagoas, Bahia, Pernambuco, and Sergipe. It is widespread in the Caatinga and with annual mean temperature 20 to 28°C along four ecoregions (Table 1; Appendix S3). Distributed in low to high elevation areas (30–1,116 m a.s.l.), with annual mean temperature 19 to 26°C, and average annual rainfall between 447 and 1,452 mm.

Ecological notes. Terrestrial and diurnal. It is a psammophilic species occurring in sandy soils, with relictual distribution in semi-arid environments along the Caatinga (Rodrigues 1987, 2003). Diet based mainly on arthropods, being Formicidae, Orthoptera, and Araneae the most representative items (Costa 2015), having the first report of saurophagy in the species, where a microendemic and threatened gymnophthalmid lizard (*S. catimbau*) was the prey (Oliveira and Nunes 2020). Oviparous, no detailed data is known about the number of eggs laid by the species, but it could be similar to other *Tropidurus* (Vitt 1991; Ávila et al. 2008).

Tropidurus erythrocephalus Rodrigues, 1987

Figs 11.7 and 19

Type locality. Morro do Chapéu, state of Bahia, Brazil.

Distribution. Caatinga endemic species. It is recorded only in the state of Bahia. It shows restricted distribution in the Caatinga and with annual mean temperature 20 to 28°C along three ecoregions (Table 1; Appendix S3). Distributed in medium to high elevation areas (399–1,154 m a.s.l.), with annual mean temperature 19 to 26°C, and average annual rainfall between 586 and 810 mm.

Ecological notes. Terrestrial and diurnal. It occurs in campos rupestres, with a record in Santo Inácio (Rodrigues 1987; Carvalho 2013). Diet based mainly on arthropods, no information about the preferred items on the diet of this species is known. Oviparous, no detailed data is known about the number of eggs laid by the species, but it could be similar to other *Tropidurus* (Vitt 1991; Ávila et al. 2008).

Tropidurus etheridgei Cei, 1982

Figs 11.8 and 19

Type locality. Mina Claveros, province of Córdoba, Argentina.

Distribution. In the Caatinga it is registered in the states of Bahia and Minas Gerais. It is widespread in the Caatinga and with annual mean temperature 20 to 28°C along two ecoregions (Table 1; Appendix S3). Distributed in medium to high elevation areas (475–973 m a.s.l.), with annual mean temperature 20 to 24°C, and average annual rainfall between 708 and 935 mm.

Ecological notes. Terrestrial and diurnal. It occupies a general dry habitat including tree trunks and sandy soils (Cruz et al. 1998; Vitt 1991). Diet based mainly on arthropods, being Formicidae, Araneae and also plant material the most representative items. Oviparous, the female usually lays 2–7 eggs at a time (Vitt 1991; Ávila et al. 2008).

Tropidurus helenae (Manzani & Abe, 1990)

Figs 12.1 and 20

Type locality. Toca de Cima dos Pilões, municipality of São Raimundo Nonato, state of Piauí, Brazil.

Distribution. Caatinga endemic species. It is recorded only in the state of Piauí. It shows restricted distribution in the Caatinga and with annual mean temperature 20 to 28°C along three ecoregions (Table 1; Appendix S3). Distributed in low to medium elevation areas (259–387 m a.s.l.), with annual mean temperature 26 to 27°C, and average annual rainfall between 702 and 849 mm.

Ecological notes. Terrestrial and diurnal. It is a saxicolous species specializing in rocky areas with crevices (Passos et al. 2011a; Pelegrin et al. 2017). It is found in



Figure 11. Lizards recorded in the Caatinga region. **11.1** *Tupinambis teguixin*; **11.2** *Eurolophosaurus amathites*; **11.3** *Eurolophosaurus divaricatus*; **11.4** *Stenocercus squarrosus*; **11.5** *Strobilurus torquatus*; **11.6** *Tropidurus cocorobensis*; **11.7** *Tropidurus erythrocephalus*, and **11.8** *Tropidurus etheridgei*. Photograph credits: Daniel Mesquita (11.1, 11.4), Marco A. Freitas (11.2, 11.3, 11.5, 11.7, 11.8), Adrian Garda (11.6).

limestone and sandstone formations and is occasionally found on the ground or in tree trunks (Manzani and Abe 1990). Diet based mainly on arthropods, being Isoptera, Araneae, and Coleoptera the most representative items (Pelegrin et al. 2017). Oviparous, no detailed data is known about the number of eggs laid by the species, but it could be similar to other *Tropidurus* (Vitt 1991; Ávila et al. 2008).

Tropidurus hispidus (Spix, 1825)

Figs 12.2 and 20

Type locality. Bahia, restricted by Vanzolini (1981) to Salvador, state of Bahia, Brazil.

Distribution. In the Caatinga it is registered in the states of Alagoas, Bahia, Ceará, Minas Gerais, Paraíba, Pernambuco, Piauí, Rio Grande do Norte, and Sergipe. It is widespread in the Caatinga and with annual mean temperature 20 to 28°C along all ecoregions (Table 1; Appendix S3). Distributed in low to high elevation areas (5–1,450 m a.s.l.), with annual mean temperature 18 to 28°C, and average annual rainfall between 374 and 1,580 mm.

Ecological notes. Terrestrial and diurnal. It inhabits usually open-areas, and shows great spatial niche plasticity using a wide variety of substrates, being found on rocky surfaces, forest edges, trunks of trees, sandy soils, fences and walls of human constructions, among others (Vitt 1983; Rocha and Bergallo 1990; Vitt et al. 1997c; Van Sluys et al. 2004; Rodrigues 1987; Carvalho et al. 2005). Diet based mainly on arthropods, being Orthoptera, Formicidae and also plant material the most representative items (Vitt 1995; Van Sluys et al. 2004; Pelegrin et al. 2017), but also with a record of cannibalism (Sales et al. 2011) and other vertebrates (Guedes et al. 2017). Oviparous, the female usually lays 6–13 eggs at a time (Ribeiro et al. 2008a, 2008b; Ribeiro and Freire 2011).

Tropidurus jaguaribanus Passos, Lima & Borges-Nojosa 2011

Figs 12.3 and 20

Type locality. São João do Jaguaribe, state of Ceará, Brazil.

Distribution. Caatinga endemic species. It is recorded only in the states of Ceará and Piauí. It shows restricted distribution in the Caatinga and with annual mean temperature 20 to 28°C along three ecoregions (Table 1; Appendix S3). Distributed in low to medium elevation areas (51–582 m a.s.l.), with annual mean temperature 25 to 28°C, and average annual rainfall between 630 and 822 mm.

Ecological notes. Terrestrial and diurnal. It inhabits regions with fractured granitic rocky outcrops, surrounded by hypoxerophytic caatinga in the state of Ceará (Passos et al. 2011a). Diet based mainly on arthropods, being Coleoptera and Formicidae the most representative items (Alcantara et al. 2018). Oviparous, the female usually lays two eggs at a time (Passos et al. 2013c).

Tropidurus montanus Rodrigues, 1987

Figs 12.4 and 20

Type locality. Serra do Cipó, state of Minas Gerais, Brazil.

Distribution. In the Caatinga it is registered in the states of Bahia and Minas Gerais. It is widespread in the Caatinga and with annual mean temperature 20 to 28°C along two ecoregions (Table 1; Appendix S3). Distributed in medium to high elevation areas (591–1,450 m a.s.l.), with annual mean temperature 18 to 25°C, and average annual rainfall between 638 and 1,060 mm.

Ecological notes. Terrestrial and diurnal. Occurring in desert regions and xeric thickets, with rocky outcrops, sandy soils in grassy fields, in shrubs and walls (Rodrigues 1987; Van Sluys et al. 2004; Carvalho 2013). Diet based mainly on arthropods, being Formicidae, Coleoptera and Isoptera the most representative items (Van Sluys et al. 2004). Oviparous, the female usually lays 1–6 eggs at a time (Van Sluys et al. 2002).

Tropidurus mucujensis Rodrigues, 1987

Figs 12.5 and 20

Type locality. Mucugê, state of Bahia, Brazil.

Distribution. Caatinga endemic species. It is recorded only in the state of Bahia. It shows restricted distribution in the Caatinga and with annual mean temperature 20 to 28°C along two ecoregions (Table 1; Appendix S3). Distributed in high elevation areas (926–1,683 m a.s.l.), with annual mean temperature 17 to 21°C, and average annual rainfall between 759 and 1,118 mm.

Ecological notes. Terrestrial and diurnal. It inhabits rupes-trian grassland habitat above 900 meters of elevation (Rodrigues 1987; Carvalho 2013). Diet based mainly on arthropods, no information about the preferred items on the diet of this species is known. Oviparous, no detailed data is known about the number of eggs laid by the species, but it could be similar to other *Tropidurus* (Rodrigues 1987; Martelotte et al. 2010).



Figure 12. Lizards recorded in the Caatinga region. **12.1** *Tropidurus helenae*; **12.2** *Tropidurus hispidus*; **12.3** *Tropidurus jaguaribanus*; **12.4** *Tropidurus montanus*; **12.5** *Tropidurus mucujensis*; **12.6** *Tropidurus oreadicus*; **12.7** *Tropidurus pinima* and **12.8** *Tropidurus semitaeniatus*. Photograph credits: Daniel Mesquita (12.1, 12.6, 12.8), Adrian Garda (12.2), Daniel Passos (12.3, 12.4, 12.7), Marco A. Freitas (12.5).

Tropidurus oreadicus Rodrigues, 1987

Figs 12.6 and 20

Type locality. Burity, state of Minas Gerais, Brazil.

Distribution. In the Caatinga it is registered in the states of Bahia, Minas Gerais, Pernambuco, and Piauí. It is widespread in the Caatinga and with annual mean temperature 20 to 28°C along five ecoregions (Table 1; Appendix S3). Distributed in low to high elevation areas (222–926 m a.s.l.), with annual mean temperature 21 to 27°C, and average annual rainfall between 700 and 1,050 mm.

Ecological notes. Terrestrial and diurnal. Occurring in rocky open areas, shelters on the grounds and termite nests (Colli et al. 1992). It uses crevices for refuge in rocks, reducing the risk of predation and overheating (Faria and Araujo 2004). Diet based mainly on arthropods, being Formicidae and Isoptera the most representative items (Faria and Araujo 2004). Oviparous, the female usually lays 2–6 eggs at a time (Faria and Araujo 2004).

Tropidurus pinima (Rodrigues, 1984)

Figs 12.7 and 20

Type locality. Santo Inácio, state of Bahia, Brazil.

Distribution. Caatinga endemic species. It is recorded in the states of Bahia and Pernambuco. It is widespread in the Caatinga and with annual mean temperature 20 to 28°C along two ecoregions (Table 1; Appendix S3). Distributed in medium to high elevation areas (404–1,154 m a.s.l.), with annual mean temperature 20 to 26°C, and average annual rainfall between 528 and 842 mm.

Ecological notes. Terrestrial and diurnal. It is a saxicolous lizard that occurs along open areas in the Caatinga (Rodrigues 1996b). Diet based mainly on arthropods, being Hymenoptera and also Plant material the most representative items (Xavier and Dias 2017). Oviparous, the female usually lays two eggs at a time (Xavier and Dias 2017).

Tropidurus psammonastes Rodrigues, Kasahara & Yonenaga-Yasuda, 1988

Fig. 20

Type locality. Arraial do Paulista, municipality of Xique-Xique, state of Bahia, Brazil.

Distribution. Caatinga endemic species. It is recorded only in the state of Bahia. It shows restricted distribution in the Caatinga and with annual mean temperature 20 to 28°C along two ecoregions (Table 1; Appendix S3). Distributed in medium to high elevation areas (400–652 m

a.s.l.), with annual mean temperature 24 to 26°C, and average annual rainfall between 674 and 964 mm.

Ecological notes. Terrestrial and diurnal. Found mainly in dunes on the left bank of the São Francisco River, which are characterized by sparse vegetation, with a space of bare sand between the vegetation clumps (Rodrigues et al. 1988). The species prefers shaded and protected sites (Rocha and Rodrigues 2005), it can be seen in bare sand or moving through bushes and, when chased, hides in small holes at the base of clumps of vegetation (Rodrigues et al. 1988). Diet based mainly on arthropods, being Formicidae, insect larvae and also plant material the most representative item (Lima and Rocha 2006). Oviparous, no detailed data is known about the number of eggs laid by the species, but it could be similar to other *Tropidurus* (Rodrigues 1987; Faria and Araujo 2004).

Tropidurus semitaeniatus (Spix, 1825)

Figs 12.8 and 20

Type locality. "... in campis montosis Sincura provinciae Bahiae".

Distribution. Caatinga endemic species. It is registered in the states of Alagoas, Bahia, Ceará, Paraíba, Pernambuco, Piauí, Rio Grande do Norte, and Sergipe. It is widespread in the Caatinga and with annual mean temperature 20 to 28°C along all ecoregions (Table 1; Appendix S3). Distributed in low to high elevation areas (38–1,683 m a.s.l.), with annual mean temperature 17 to 28°C, and average annual rainfall between 429 and 1,417 mm.

Ecological notes. Terrestrial and diurnal. It has a saxicolous habit and it is distributed in the rocky habitats in open areas of the Caatinga. Diet based mainly on arthropods, being Isoptera, Formicidae, Hemiptera, insect larvae, and plant material the most representative items (Vanzolini et al. 1980; Ribeiro and Freire 2011; Gomes et al. 2015), acting in pollination and seed dispersal (Gomes et al. 2014; Ribeiro et al. 2008a). Oviparous, the female usually lays 1–3 eggs at a time (Vitt 1992; Ribeiro et al. 2012).

Tropidurus sertanejo Carvalho, Sena, Peloso, Machado, Montesinos, Silva, Campbell & Rodrigues, 2016

Fig. 20

Type locality. Reserva Particular do Patrimônio Natural Fazenda Pé da Serra, Serra do Arame, municipality of Ibotirama, State of Bahia, Brazil.

Distribution. Caatinga endemic species. It is recorded only in the state of Bahia. It shows restricted distribution

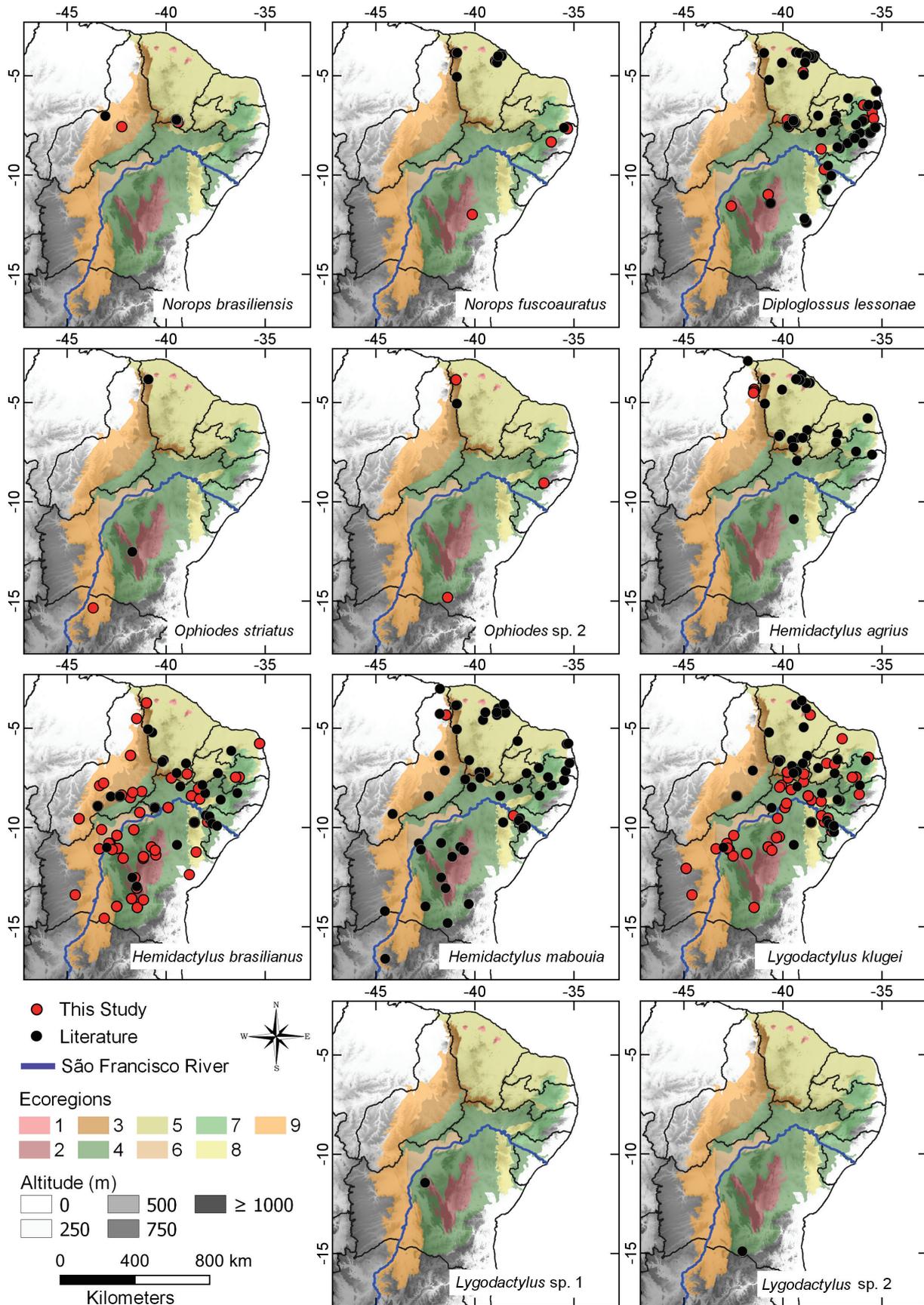


Figure 13. Map showing the geographic distribution records and extent of occurrence of the lizards in the Caatinga region: *Norops brasiliensis*, *Norops fuscoauratus*, *Diploglossus lessonae*, *Ophiodes striatus*, *Ophiodes* sp. 2, *Hemidactylus agrius*, *Hemidactylus brasiliensis*, *Hemidactylus mabouia*, *Lygodactylus klugei*, *Lygodactylus* sp. 1, *Lygodactylus* sp. 2. Red circles represent data occurrence data produced in this study; Black circles represent data from literature. Ecoregions: 1: Brejos; 2: Complexo da Chapada Diamantina; 3: Complexo Ibiapaba – Araripe; 4: Depressão Sertaneja Meridional; 5: Depressão Sertaneja Setentrional; 6: Dunas do São Francisco; 7: Planalto da Borborema; 8: Raso Catarina and 9: São Francisco/Gurguéia.

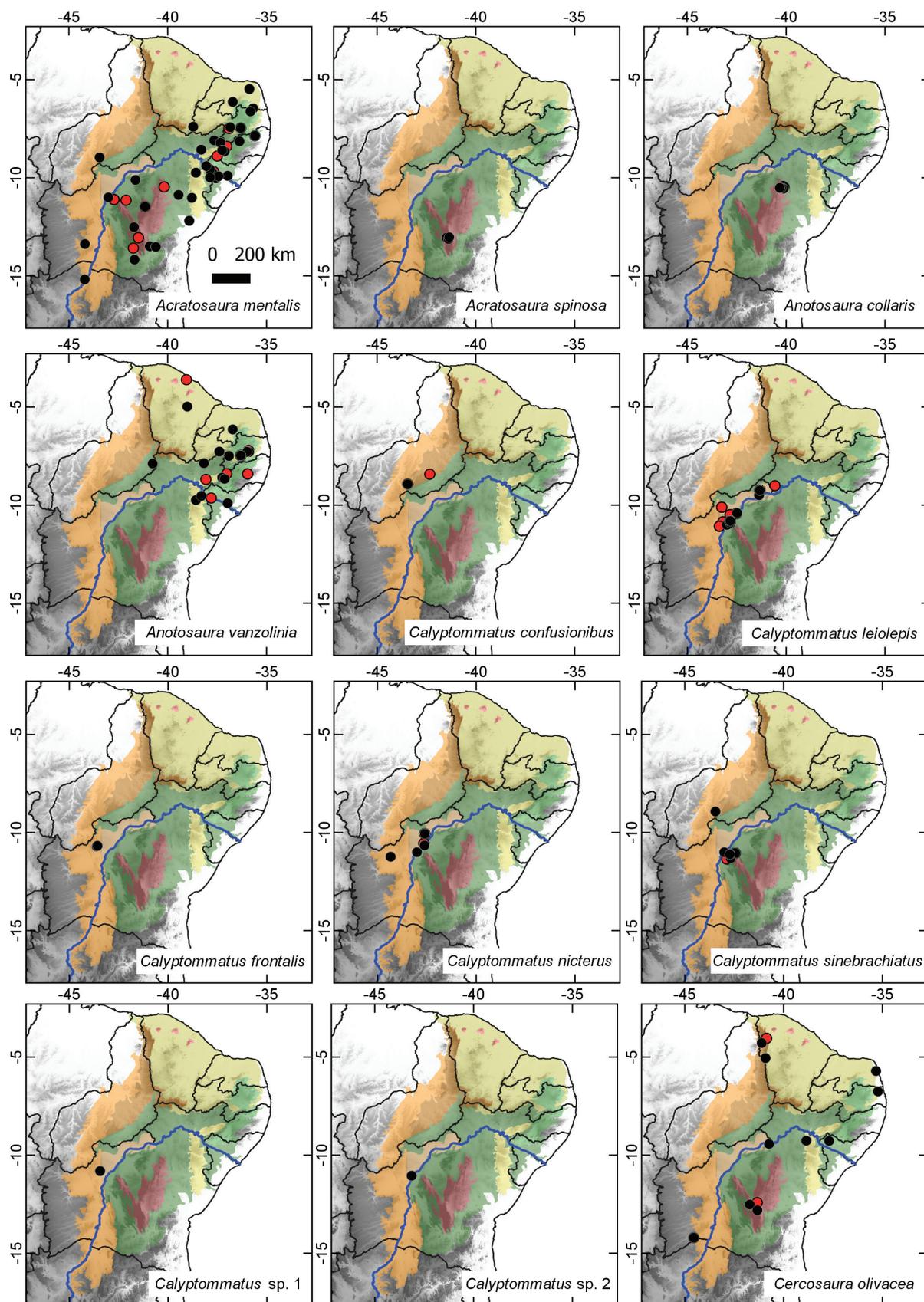


Figure 14. Map showing the geographic distribution records and extent of occurrence of the lizards in the Caatinga region: *Acratosaura mentalis*, *Acratosaura spinosa*, *Anotosaura collaris*, *Anotosaura vanzolinia*, *Calyptommatus confusionibus*, *Calyptommatus leiolepis*, *Calyptommatus frontalis*, *Calyptommatus nicterus*, *Calyptommatus sinebrachiatus*, *Calyptommatus* sp. 1, *Calyptommatus* sp. 2, *Cercosaura olivacea*. Red circles represent data occurrence data produced in this study; Black circles represent data from literature. Ecoregions: 1: Brejos; 2: Complexo da Chapada Diamantina; 3: Complexo Ibiapaba – Araripe; 4: Depressão Sertaneja Meridional; 5: Depressão Sertaneja Setentrional; 6: Dunas do São Francisco; 7: Planalto da Borborema; 8: Raso Catarina and 9: São Francisco/Gurguéia.

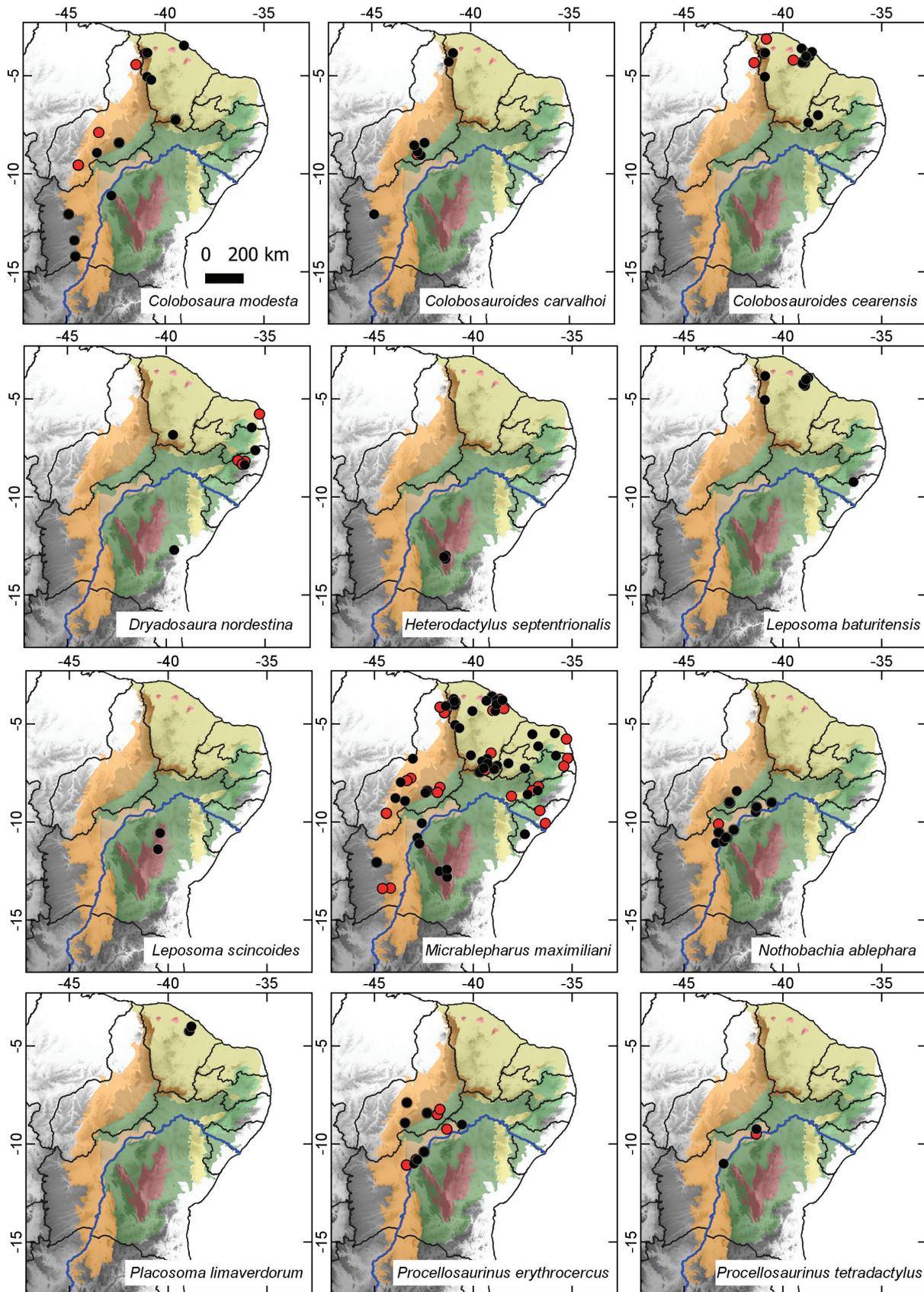


Figure 15. Map showing the geographic distribution records and extent of occurrence of the lizards in the Caatinga region: *Colobosaura modesta*, *Colobosauroides carvalhoi*, *Colobosauroides cearensis*, *Dryadosaura nordestina*, *Heterodactylus septentrionalis*, *Leposoma baturitensis*, *Leposoma scincoides*, *Micrablepharus maximiliani*, *Nothobachia ablephara*, *Placosoma limaverdorum*, *Procellosaurinus erythrocerus*, *Procellosaurinus tetradactylus*. Red circles represent data occurrence data produced in this study; Black circles represent data from literature. Ecoregions: 1: Brejos; 2: Complexo da Chapada Diamantina; 3: Complexo Ibiapaba – Araripe; 4: Depressão Sertaneja Meridional; 5: Depressão Sertaneja Setentrional; 6: Dunas do São Francisco; 7: Planalto da Borborema; 8: Raso Catarina and 9: São Francisco/Gurguéia.

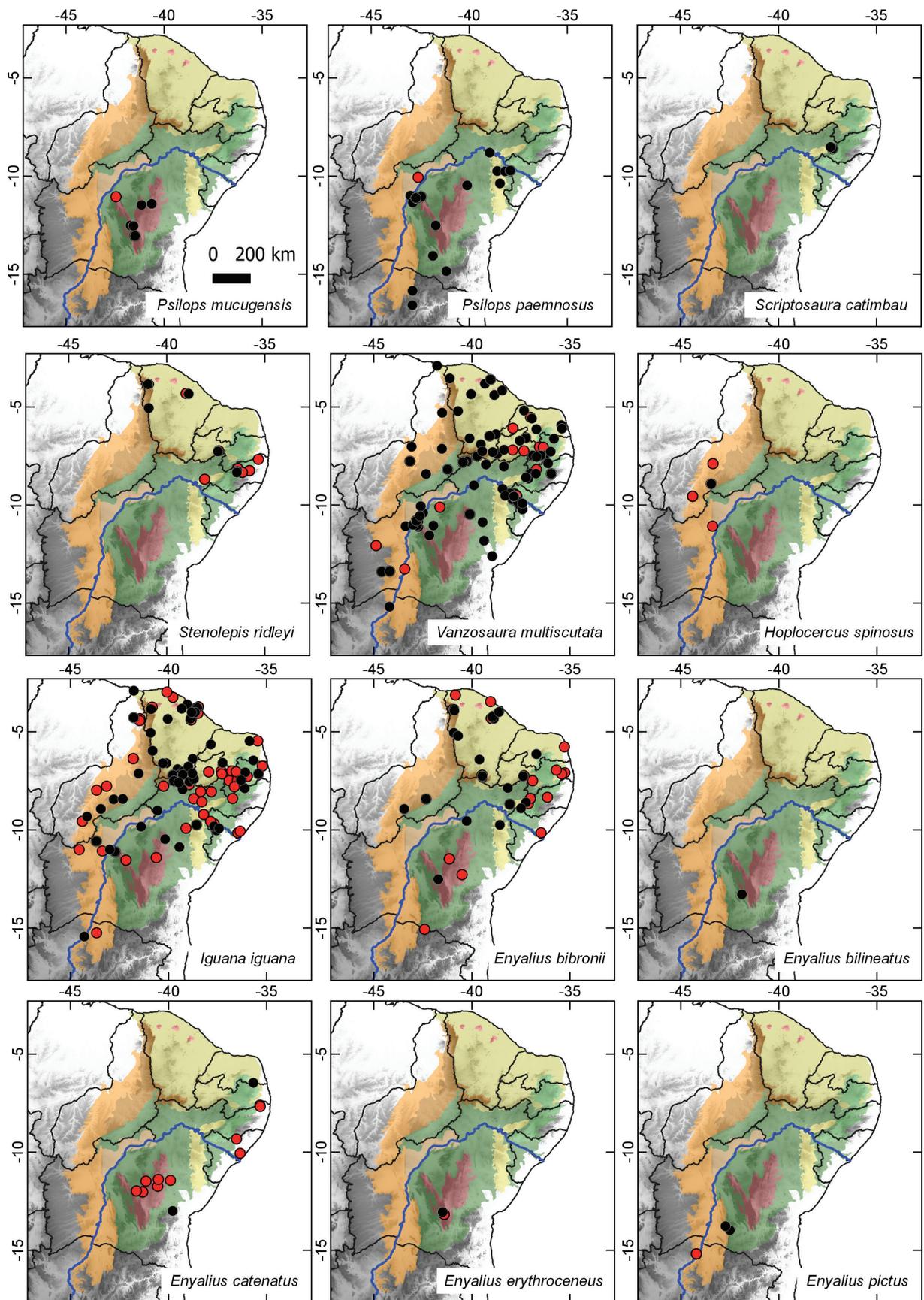


Figure 16. Map showing the geographic distribution records and extent of occurrence of the lizards in the Caatinga region: *Psilops mucugensis*, *Psilops paeminosus*, *Scriptosaura catimbau*, *Stenolepis ridleyi*, *Vanzosaura multiscutata*, *Hoplocercus spinosus*, *Iguana iguana*, *Enyalius bibronii*, *Enyalius bilineatus*, *Enyalius catenatus*, *Enyalius erythroceus*, *Enyalius pictus*. Red circles represent data occurrence data produced in this study; Black circles represent data from literature. Ecoregions: 1: Brejos; 2: Complexo da Chapada Diamantina; 3: Complexo Ibiapaba – Araripe; 4: Depressão Sertaneja Meridional; 5: Depressão Sertaneja Setentrional; 6: Dunas do São Francisco; 7: Planalto da Borborema; 8: Raso Catarina and 9: São Francisco/Gurguéia.

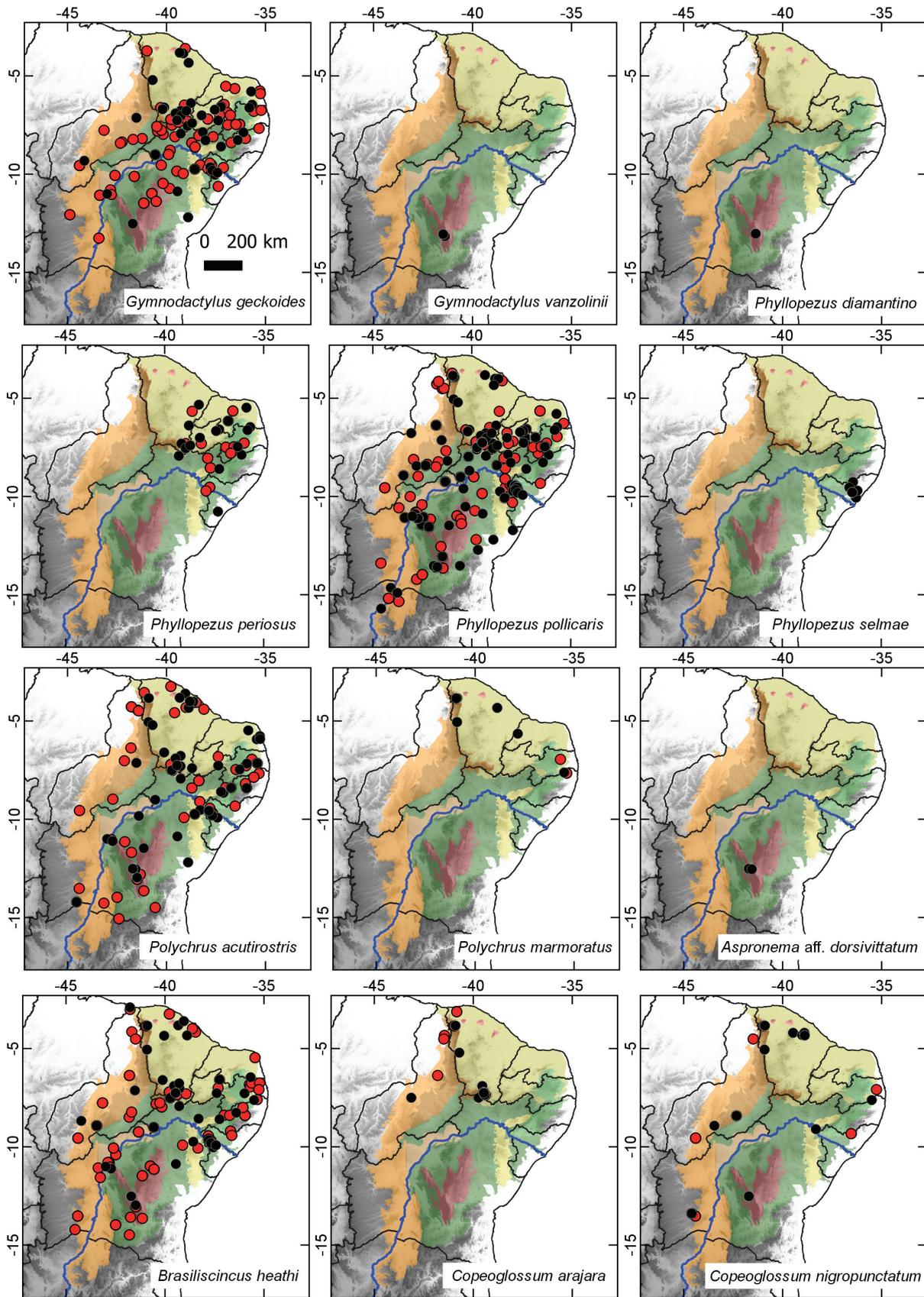


Figure 17. Map showing the geographic distribution records and extent of occurrence of the lizards in the Caatinga region: *Gymnodactylus geckoides*, *Gymnodactylus vanzolinii*, *Phyllopezus diamantino*, *Phyllopezus periosus*, *Phyllopezus pollicaris*, *Phyllopezus selmae*, *Polychrus acutirostris*, *Polychrus marmoratus*, *Aspronema aff. dorsivittatum*, *Brasiliscincus heathi*, *Copeoglossum arajara*, *Copeoglossum nigropunctatum*. Red circles represent data occurrence data produced in this study; Black circles represent data from literature. Ecorregions: 1: Brejos; 2: Complexo da Chapada Diamantina; 3: Complexo Ibiapaba – Araripe; 4: Depressão Sertaneja Meridional; 5: Depressão Sertaneja Setentrional; 6: Dunas do São Francisco; 7: Planalto da Borborema; 8: Raso Catarina and 9: São Francisco/Gurguéia.

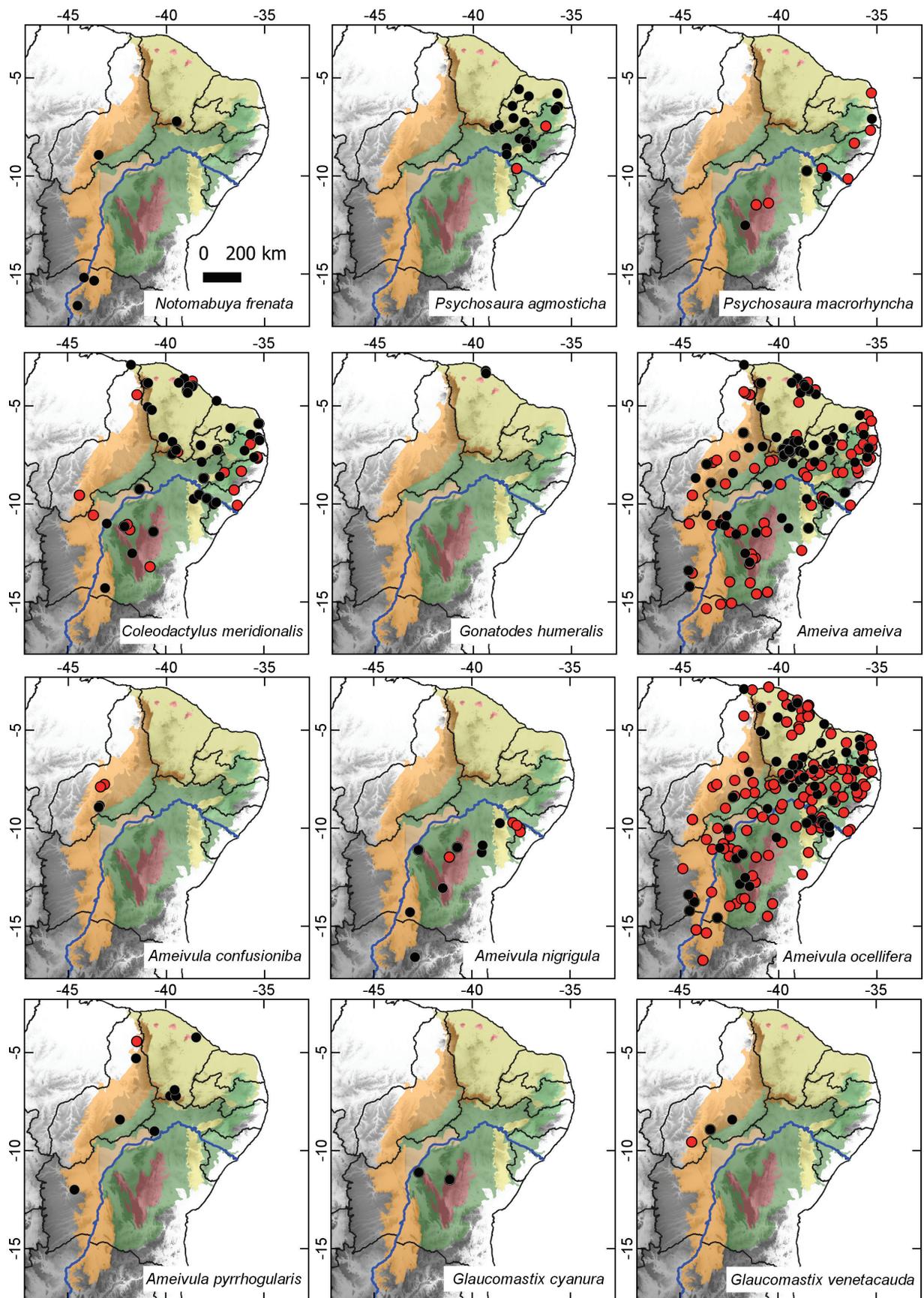


Figure 18. Map showing the geographic distribution records and extent of occurrence of the lizards in the Caatinga region: *Notomabuya frenata*, *Psychosaura agmosticha*, *Psychosaura macrorhyncha*, *Coleodactylus meridionalis*, *Gonatodes humeralis*, *Ameiva ameiva*, *Ameivula confusioniba*, *Ameivula nigrigula*, *Ameivula ocellifera*, *Ameivula pyrrhogularis*, *Glaucomastix cyanura*, *Glaucomastix venetacauda*. Red circles represent data occurrence data produced in this study; Black circles represent data from literature. Ecorregions: 1: Brejos; 2: Complexo da Chapada Diamantina; 3: Complexo Ibiapaba – Araripe; 4: Depressão Sertaneja Meridional; 5: Depressão Sertaneja Setentrional; 6: Dunas do São Francisco; 7: Planalto da Borborema; 8: Raso Catarina and 9: São Francisco/Gurguéia.

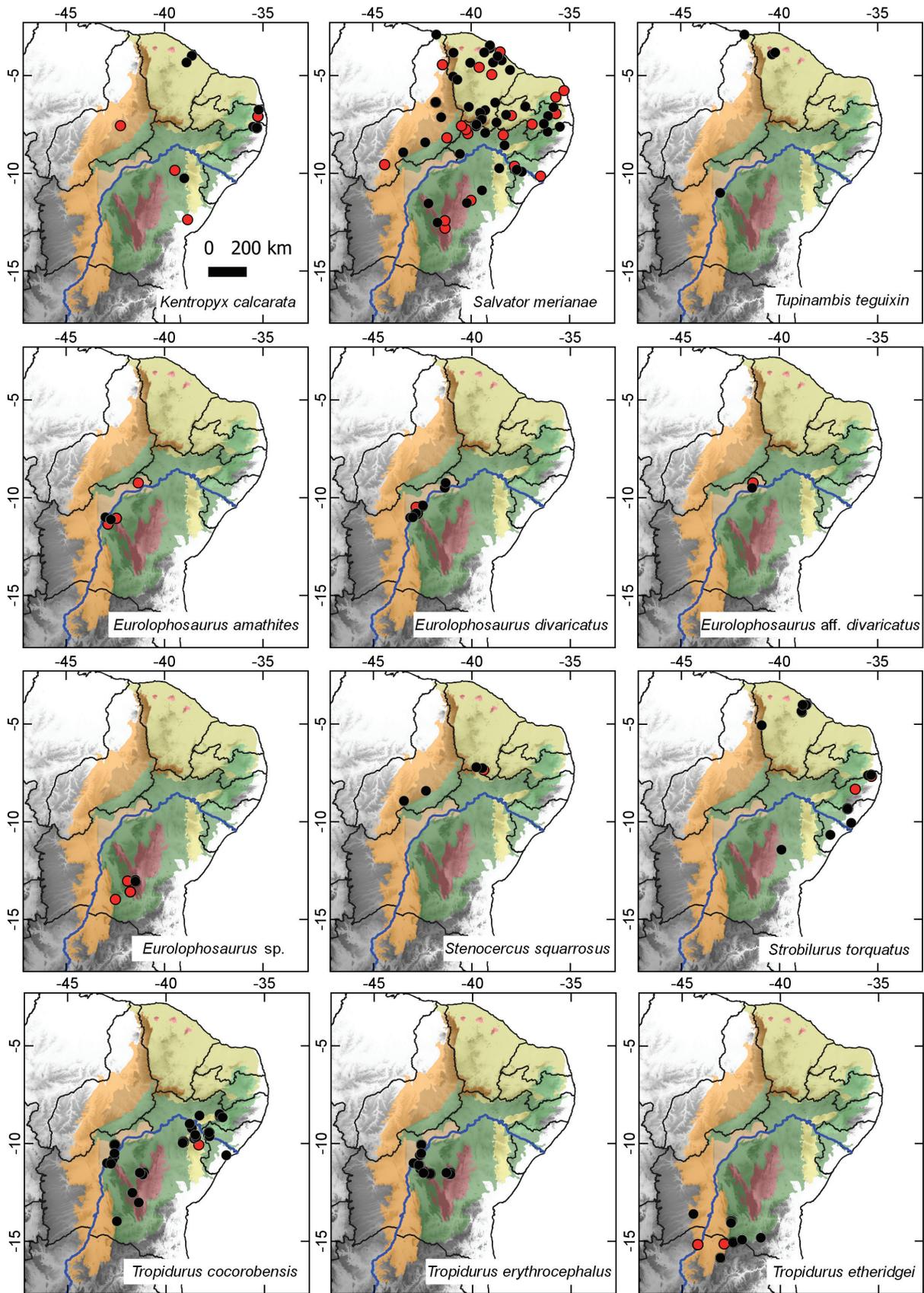


Figure 19. Map showing the geographic distribution records and extent of occurrence of the lizards in the Caatinga region: *Kentropyx calcarata*, *Salvator merianae*, *Tupinambis teguixin*, *Eurolophosaurus amathites*, *Eurolophosaurus divaricatus*, *Eurolophosaurus aff. divaricatus*, *Eurolophosaurus sp.*, *Stenocercus squarrosus*, *Strobilurus torquatus*, *Tropidurus cocorobensis*, *Tropidurus erythrocephalus*, *Tropidurus etheridgei*. Red circles represent data occurrence data produced in this study; Black circles represent data from literature. Ecoregions: 1: Brejos; 2: Complexo da Chapada Diamantina; 3: Complexo Ibiapaba – Araripe; 4: Depressão Sertaneja Meridional; 5: Depressão Sertaneja Setentrional; 6: Dunas do São Francisco; 7: Planalto da Borborema; 8: Raso Catarina and 9: São Francisco/Gurguéia.

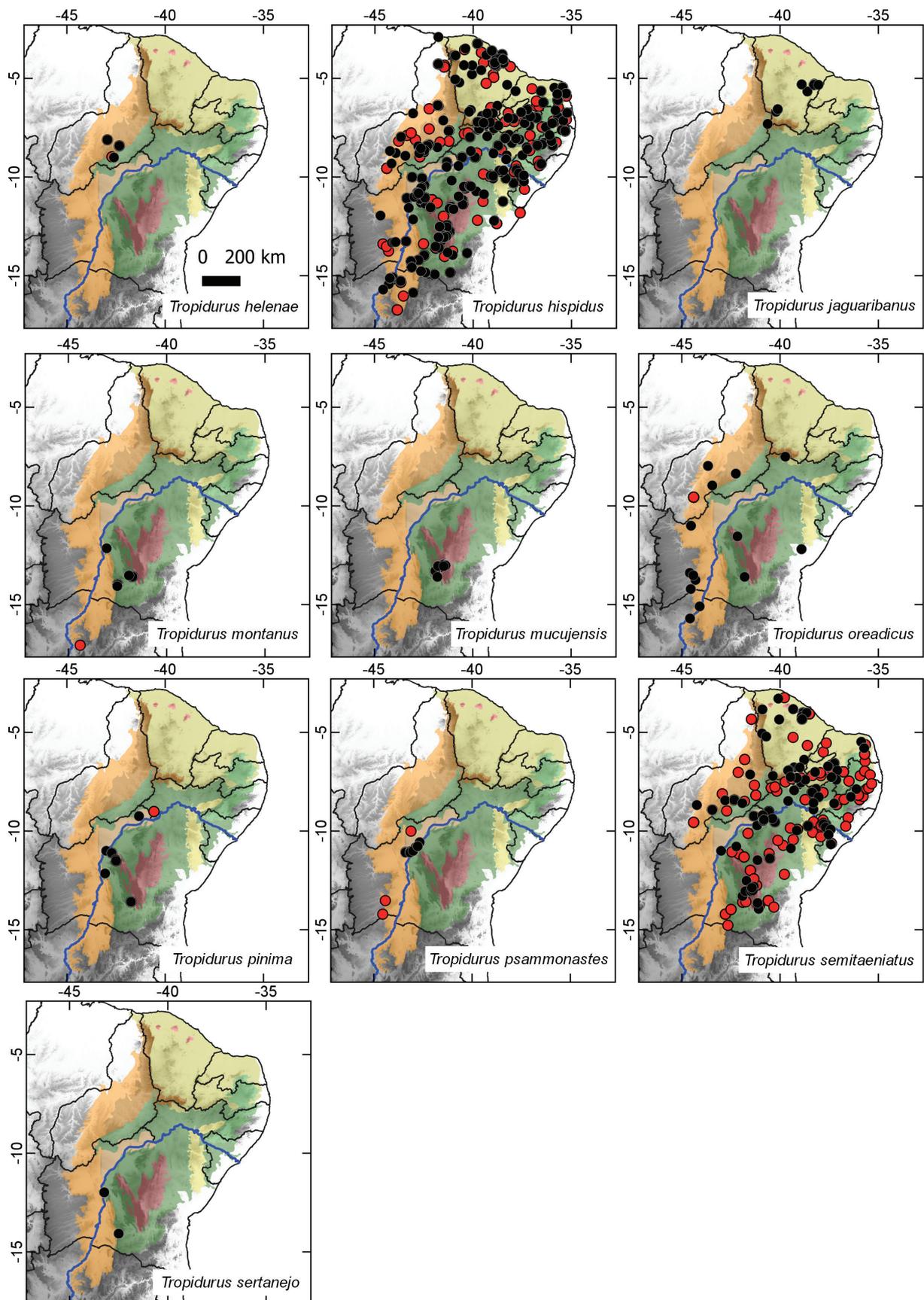


Figure 20. Map showing the geographic distribution records and extent of occurrence of the lizards in the Caatinga region: *Tropidurus helenae*, *Tropidurus hispidus*, *Tropidurus jaguaribanus*, *Tropidurus montanus*, *Tropidurus mucujensis*, *Tropidurus oreadicus*, *Tropidurus pinima*, *Tropidurus psammonastes*, *Tropidurus semitaeniatus*, *Tropidurus sertanejo*. Red circles represent data occurrence data produced in this study; Black circles represent data from literature. Ecoregions: 1: Brejos; 2: Complexo da Chapada Diamantina; 3: Complexo Ibiapaba – Araripe; 4: Depressão Sertaneja Meridional; 5: Depressão Sertaneja Setentrional; 6: Dunas do São Francisco; 7: Planalto da Borborema; 8: Raso Catarina and 9: São Francisco/Gurguéia.

in the Caatinga and occur along two ecoregions (Table 1; Appendix S3). Distributed in medium to high elevation areas (480–856 m a.s.l.), with annual mean temperature 21 to 25°C, and average annual rainfall between 819 and 865 mm.

Ecological notes. Terrestrial and diurnal. It has been observed among rocks on sandy trails covered by dry forests and caatinga vegetation (Carvalho et al. 2016). Diet based mainly on arthropods, no information about the preferred items on the diet of this species is known. Oviparous, no detailed data is known about the number of eggs laid by the species, but it could be similar to other *Tropidurus* (Rodrigues 1987).

Discussion

Our study updates the list of Caatinga lizards, their endemism status, and also presents detailed distribution maps, environmental bioclimatic profiles, and species range data for all lizards. Moreover, we present patterns of taxonomic richness using occurrence data and quantify sampling gaps using the most comprehensive database for Caatinga lizards up to date. Thus, although lizards are the most studied group of reptiles in the Caatinga, the information synthesized herein and now available, has an unprecedented format. We show that 93 species have at least one record within Caatinga limits, updating the occurrence of thirteen new species in relation to the most current species synthesis (*Ameivula pyrrhogularis*, *Calyptommatus frontalis*, *Calyptommatus* sp. 1 and 2, *Enyalius bilineatus*, *Gonatodes humeralis*, *Lygodactylus* sp. 1 and 2, *Leposoma scincoides*, *Notomabuya frenata*, *Ophiodes* sp. 2, *Phyllopezus diamantino*, *Phyllopezus selmae*, and *Tropidurus oreadicus*), and revise and add eleven species to the list of endemics (*Acratosaura mentalis*, *Calyptommatus frontalis*, *Calyptommatus* sp. 1 and 2, *Copeoglossum arajara*, *Hemidactylus agrius*, *Lygodactylus* sp. 1 and 2, *Phyllopezus diamantino*, *Phyllopezus selmae*, and *Tropidurus semitaeniatus*), which now totals 49 endemic lizards. The maps presented here are the most up-to-date for each species, containing new occurrences even for species previously described or known to occur in the Caatinga.

The number of endemic lizards has increased in the last decade due to the description of several species, such as *Ameivula confusioniba* and *A. nigrigula* (Arias, Carvalho, Rodrigues & Zaher 2011); *Calyptommatus frontalis* Recoder, Marques-Souza, Silva-Soares, Ramiro, Castro & Rodrigues, 2022; *Glaucomastix cyanura* and *G. venetacauda* (Arias, Carvalho, Rodrigues & Zaher 2011); *Phyllopezus diamantino* Dubeux, Gonçalves, Palmeira, Nunes, Cassimiro, Gamble, Werneck, Rodrigues & Mott, 2022; *Phyllopezus selmae* Dubeux, Gonçalves, Palmeira, Nunes, Cassimiro, Gamble, Werneck, Rodrigues & Mott, 2022; *Placosoma limaverdorum* Borges-Nojosa, Caramaschi & Rodrigues 2016; *Psilops mucugensis* Ro-

drigues, Recoder, Teixeira Jr., Roscito, Guerrero, Nunes, Freitas, Fernandes, Bocchiglieri, Dal Vechio, Leite, Nogueira, Damasceno, Pellegrino, Argôlo & Amaro 2017; *Tropidurus jaguaribanus* Passos, Lima & Borges-Nojosa 2011; and *T. sertanejo* Carvalho, Sena, Peloso, Machado, Montesinos, Silva, Campbell & Rodrigues 2016. The currently known distribution of some species under description suggests that they are also endemic to the Caatinga, such as *Aspronema* aff. *dorsivittatum* (Freitas and Silva 2007), *Calyptommatus* sp. 1 and *Calyptommatus* sp. 2 (Recoder et al. 2022), *Lygodactylus* sp. 1 and *Lygodactylus* sp. 2 (Lanna et al. 2018), *Eurolophosaurus* aff. *divaricatus* (Freitas and Silva 2007), and *Eurolophosaurus* sp. (Rodrigues et al. 2006). These findings show that the Caatinga is an endemism-rich region.

The advances presented here were only possible after producing a database combining records from biological collections, unpublished field data, and records from the scientific literature incorporated after a careful and extensive search following principles of data quality (Chapman 2005; Guedes et al. 2018). The lizard distribution data provided here can be used in broader analyses of biodiversity syntheses (e.g., Roll et al. 2017), studies testing biogeographic hypotheses (e.g., Werneck et al. 2015; Mesquita et al. 2017), investigations of climate change impacts (e.g., Oliveira et al. 2012), and planning of conservation strategies for the region (e.g., Rodrigues 2005).

Our analysis of the taxonomic richness pattern was performed using occurrence points, thus diverging from the synthesis presented by Mesquita et al. (2017), which used the potential distribution of species. Despite the different analytical methodologies, species richness patterns are relatively similar, also highlighting the Depressão Sertaneja Setentrional, Planalto da Borborema (states of Rio Grande do Norte and Paraíba), Dunas do São Francisco (central-western Bahia) and Serra de Baturité (state of Ceará). We also highlight the high taxonomic richness of regions within the Depressão Sertaneja Meridional and Complexo da Chapada Diamantina (central Bahia), Complexo Ibiapaba-Araripe (central western Ceará on the border with Piauí), between the Planalto da Borborema and Raso da Catarina (the portion between the states of Bahia, Pernambuco, and Sergipe), and areas of the Serra da Capivara and Serra das Confusões National Parks (southern portion of Piauí).

Our distribution database also allowed us to quantify the coverage area of sampling regarding our spatial knowledge of the Caatinga lizards. Our data indicate the existence of records of at least one species in 373 municipalities, corresponding to an area of 521,183 km² (47% of the Caatinga). Our sample shows an advance three times greater than the first synthesis of knowledge for the Caatinga, which had occurrence records for 112 municipalities and data collected primarily in one museum, the MZUSP (Rodrigues 2003). We detected an extensive knowledge gap (591,517 km², 53% of the Caatinga) that should be prioritized in future surveys. The sampling gaps identified in western Caatinga (in contact with the Cerrado) and high elevation areas (Morro do Chapéu and Chapada Diamantina, both in Bahia state) coincide with the top

5% and top 10% areas considered great for discoveries of new vertebrate species, especially reptiles (Moura and Jetz 2021).

The database is also not homogeneous in the number of records per taxon. Some species showed high numbers of occurrence records, for example, *Tropidurus hispidus* (5,218 records, the most recorded species), *Ameivula ocellifera* (1,626 records, the second most recorded species), and *Polychrus acutirostris* (1,200 records). Other species showed few records, probably because they are rare, threatened, narrowly distributed, and poorly represented in biological collections (Rodrigues 2003), for example *Heterodactylus septentrionalis* (four records), *Calypotommatus confusionibus* (14 records), and *Placosoma limaverdorum* (16 records). It is also worth mentioning that species with fossorial habits are difficult to sample and most of the times are collected by using passive collection methods (e.g. pitfall traps). We obtained records for 30 species fossorial lizards in this study, with the addition of five species from the previous synthesis (Mesquita et al. 2017).

The advance in knowledge about Caatinga lizards, in each new syntheses published, legitimizes the crucial importance of taxonomic, distribution, and herpetological surveys studies in the region. In one of the first syntheses, Vanzolini et al. (1980) listed 18 species of lizards for the Caatinga, with data collection concentrated on the municipality of Exú, state of Pernambuco (which explains the extensive sampling we identified for this municipality). Rodrigues (2003) identified 47 species of lizards from eight families sampled in 112 municipalities in the Caatinga. The most recent synthesis identified 79 species of lizards from 13 families (Mesquita et al. 2017). The description of new lizard species for the Caatinga has grown exponentially; 47 species have been described in the last 71 years (1950–2021), and about one species has been described annually in the last 20 years (Appendix S8).

The EOO shows that almost half of lizard species (44%) are narrowly distributed in the Caatinga (Appendix S4). For example, 15 endemics have less than 20 records each, 30 occur in only one state, and 19 occur in a single ecoregion. The rare microteiid *Acratosaura spinosa* has only three records, and its EOO is only 66 km². *Enyalius erythroceneus* has seven known records (all in the type locality). *Eurolophosaurus* aff. *divaricatus* has four records and an EOO of 309 km², obtained through a 10 km buffer. This taxon may be threatened even though it is in the process of taxonomic description. The restricted distribution pattern within the Caatinga is also observed in other herpetofaunal groups from the region, such as snakes (*Apostolepis arenaria*, *A. gaboi*; Guedes et al. 2014b) and amphibians (*Sphaenorhynchus bromelicola*; Camardelli and Napoli 2012). This similarity demonstrates the faunal significance of the region, high levels of endemism, and biological importance in a conservation context.

Sixty-two species of Caatinga lizards have been assessed for their conservation status globally (IUCN 2021) and 78 nationally (ICMBio 2018) (Table 1). Fifteen species have not been assessed by IUCN (2021) or ICMBio

(2018). Moreover, it should be noted that two states in the Caatinga have regional red lists of threatened species. Twenty-three species of Caatinga lizards have been assessed in Bahia and 37 species in Pernambuco (SEMA 2017; SEMAS 2017). In the global list of threatened species, only *Psilops paeminus* appears in a threat category (vulnerable; IUCN 2021). In the Brazilian Red list, ten species of Caatinga lizards appear in some threat category, as follows: *Tropidurus erythrocephalus* as vulnerable; *Eurolophosaurus amathites*, *T. psammonastes*, *Calypotommatus leiolepis*, *C. nicterus*, *C. sinebrachiatus*, *Heterodactylus septentrionalis*, *Leposoma baturitensis*, and *Procellosaurinus tetradactylus* as endangered; and *Enyalius erythroceneus* as critically endangered (ICMBio 2018). All these threatened species are covered by the National Plan for Conservation of the Threatened Herpetofauna of the Northeast Brazil (Plano de Ação Nacional para Conservação da Herpetofauna do Nordeste, PAN; MMA 354 of 25 July 2019).

Most lizards from Caatinga have terrestrial habits (45 species, 48% of the total; Table 1), followed by fossorial (31 spp., 33%) and semiarboreal (eight spp., 9%) habits. Most Caatinga lizards are strictly diurnal (74 spp., 80%); only three species (3%; *Cercosaura olivacea*, *Notobachia ablephara* and *Hoplocercus spinosus*) are diurnal/nocturnal. Moreover, most lizards in the Caatinga feed primarily on invertebrates (60 spp., 65%) feeding mostly Araneae, Coleoptera, Isoptera and Orthoptera; Most species (45 species, 48%) are known to be oviparous. Our results corroborate the same ecological pattern described for the Caatinga lizards by Vanzolini et al. (1980), Rodrigues (2003), and Mesquita et al. (2017). For 29 species (31%) we do not know detailed information about diet and 41 species (44%) we do not have detailed data for reproduction. The paucity of autecology data for several species (e.g., *Acratosaura spinosa*; *Heterodactylus septentrionalis* and *Scriptosaura catimbau*) reinforces the need for natural history studies in this group.

Conclusions

As knowledge of Caatinga's biodiversity advances, its biological relevance in the Neotropics is better understood. Regarding herpetofauna, the high species richness and endemism are notorious and irrefutable, not only concentrated in specific regions (e.g., Brejos or Dunas do Rio São Francisco ecoregions), but also in large areas along the Caatinga where some species seem to have evolved. Nevertheless, the extensive sampling gap observed for lizards, which possibly also occurs in other groups of organisms, prevents a more precise understanding of the biological potential of the Caatinga.

The data presented here are a detailed synthesis of knowledge about the lizards of the Caatinga. These data are also an important product for planning lizard conservation actions accurately and for safeguarding the biological potential of the Caatinga, acting as an important step

towards the production of a substantiated knowledge of the region's lizard fauna. Moreover, our results point areas that deserve attention to research in order to advance our knowledge about Caatinga lizards: (i) we identify priority areas to concentrate lizard surveys, (ii) we indicate species that lack ecological data, mainly endemic species. Finally, our database will enable a continuous update of the occurrence database of Caatinga lizards, especially of poorly recorded species and poorly known areas.

Declaration of competing interests

The authors have declared that no competing interests exists.

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Supplementary material 1

Appendices S1–S8

Authors: Uchôa LR, Delfim FR, Mesquita, DO, Colli GR, Garda AA, Guedes TB (2022)

Data type: .docx

Explanation note: **Appendix S1.** Voucher specimens of lizards of the Caatinga, organized by families and species in alphabetical order, and with its respective municipalities of occurrence. Acronyms – CHUNB: Coleção Herpetológica da Universidade de Brasília; CHUFPB: Coleção Herpetológica da Universidade Federal da Paraíba; CHUFS: Coleção Herpetológica da Universidade Federal de Sergipe; Coleção Herpetológica da Universidade Federal do Ceará; MUFAL: Museu de História Natural da Universidade Federal de Alagoas; MZUSP: Museu de Zoologia da Universidade de São Paulo; MNRJ: Museu Nacional da Universidade Federal do Rio de Janeiro; UFC: Universidade Federal do Ceará; MZUFBA: Museu de Zoologia da Universidade Federal da Bahia; MZUFV: Museu de Zoologia da Universidade Federal de Viçosa; MZUEFS: Museu de Zoologia da Universidade Estadual de Feira de Santana; ZUEC-REP: Coleção de Répteis do Museu de Zoologia da Universidade Estadual de Campinas; CBPII: Coleção Biológica do Instituto Federal do IFPI Pedro II; MBML: Museu de Biologia Professor Melo Leitão do Instituto Nacional da Mata Atlântica; LHUFCG: Laboratório de Herpetologia da Universidade Federal de Campina Grande. Field Number – GRCOLLI: Guarino Rinaldi Colli; AAGARDA: Adrian Garda; FRD: Fagner Ribeiro Delfim; ACF: Ana Cecília Falcão. — **Appendix S2.** Literature compilation used to obtain complementary data of lizard's occurrences of the Caatinga. — **Appendix S3.** Range size of each species of lizards of the Caatinga region. The range size was calculated by Minimum Polygon Convex method (MCP) or buffer (see Material and Methods) organized by families and species in alphabetical order. — **Appendix S4.** Histogram representing the frequency of occurrence of species according to their Extent of Occurrence (EOO), calculated via MCP. — **Appendix S5.**

Number of species and occurrences of lizards of the Caatinga organized by municipality. — **Appendix S6.** Species richness and endemism detected in the Caatinga ecoregions, Northeast Brazil. The numbers above bars show the percentage of Caatinga species detected in each ecoregion. Abbreviations: B: Brejos; CCD: Complexo da Chapada Diamantina; CIA: Complexo Ibiapaba – Araripe; DSM: Depressão Sertaneja Meridional; DSS: Depressão Sertaneja Setentrional; DSF: Dunas do São Francisco; PB: Planalto da Borborema; RC: Raso Catarina and SFG: São Francisco/Gurguéia. — **Appendix S7.** Species richness and endemism detected in the states that make up the Caatinga, Northeast Brazil. The numbers above the bars show the richness of species detected in each state. Abbreviations: AL: Alagoas; BA: Bahia; CE: Ceará; MG: Minas Gerais; PB: Paraíba; PE: Pernambuco; PI: Piauí; RN: Rio Grande do Norte and SE: Sergipe. — **Appendix S8.** Progression of the growth history of descriptions of new lizard species in the Caatinga. distances based on the 16S gene among all *Occidozyga* samples used in this study.

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