

Composition, distribution patterns, and conservation priority areas for the herpetofauna of the state of Ceará, northeastern Brazil

IGOR JOVENTINO ROBERTO¹ & DANIEL LOEBMANN²

¹⁾ Universidade Federal do Amazonas, Departamento de Ciências Biológicas, Pós-graduação em Zoologia, Av. Gen. Rodrigo Octávio Jordão Ramos, 3000, 69077-000 Manaus, AM, Brazil

²⁾ Universidade Federal do Rio Grande, Instituto de Ciências Biológicas, Laboratório de Vertebrados. Av. Itália, Km 8, 96203-900 Rio Grande, RS, Brazil

Corresponding author: IGOR JOVENTINO ROBERTO, e-mail: igorjoventino@yahoo.com.br

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Abstract. We provide an updated list of amphibians and reptiles of the state of Ceará, northeastern Brazil, with information on species distribution patterns and conservation priority areas. Data compilation based on information available in the literature, scientific collections, as well as original data resulted in a species list of 57 amphibians and 126 reptiles. The species *Lygophis paucidens* is recorded for the first time from Ceará. The herpetofauna of this state is predominantly typical of open areas (Cerrado and Caatinga biomes). However, species of Atlantic and Amazon Forests are also found, especially in higher-altitude areas covered by relict moist forests. Endemic species are also found in Ceará, some of them are still undescribed. These relict moist forests are phytoecological areas with high species richness of both amphibians and reptiles. Analysis of Key Biodiversity Areas indicated that the herpetofauna of Ceará has six endemic amphibian and six endemic reptile species, as well potentially threatened continental species, most of them are not found in protected areas. Our results suggest that the moist forests of Serra de Maranguape and Serra de Baturité should be made protected areas in order to protect their endemic herpetofauna. Finally, we strongly recommend the immediate creation of a Red List of threatened species of Ceará as a framework for conservation programmes focused on species at risk of extinction.

Key words. Amphibians, reptiles, biogeography, Caatinga biome, endemism.

Introduction

The Caatinga is an ecosystem unique to Brazil and home to a large number of endemic species, some of which are threatened with extinction (RODRIGUES 2003, LOEBMANN & HADDAD 2010). This domain has been severely degraded since the 16th century (COIMBRA-FILHO & CÂMARA 1996), with the natural vegetation having been replaced with large areas used for agriculture and livestock farming, resulting in the loss of habitats for indigenous wildlife (CÂMARA 1992). From a conservation perspective, the Caatinga is currently the least known Brazilian domain (LEWINSOHN & PRADO 2002), and its herpetofauna has received focal attention only recently (e.g., VIEIRA et al. 2007, VIEIRA et al. 2008, LOEBMANN & HADDAD 2010, CAMARDELLI & NAPOLI 2012, RIBEIRO et al. 2012, GARDA et al. 2013, CAVALCANTI et al. 2014, GUEDES et al. 2014a,b, PEDROSA et al. 2014, MAGALHÃES et al. 2015).

The state of Ceará is predominantly composed of arid environments that harbour a herpetofauna typical of open areas, especially the Caatinga domain (LOEBMANN & HADDAD 2010). However, in some regions, transitional ar-

eas form a mosaic of phytophysiognomies such as patches of Cerrado and tropical moist forests (LIMA et al. 2000). This complexity of landscapes has been associated with increased species diversity (see BORGES-NOJOSA 2007, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, GUEDES et al. 2014a, b, RIBEIRO et al. 2015).

The first checklist of the herpetofauna of Ceará was based on specimens collected by the naturalist Francisco Dias da Rocha that recorded 19 species of amphibians and 78 reptiles (ROCHA 1948). An updated list was published 40 years later based on specimens deposited in the Herpetological Collection of the Federal University of Ceará, with 34 species of amphibians and 68 species of reptiles (LIMA-VERDE & CASCON 1990). Since then, regional lists of species have been published, increasing the knowledge on the herpetofauna of Ceará (e.g., BORGES-NOJOSA 2007, BORGES-NOJOSA et al. 2010, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, BORGES-LEITE et al. 2014, RIBEIRO et al. 2015, SANTANA et al. 2015).

Herein, we compile data available from the literature, scientific collections, and original data in order to identify the possible main dispersion routes that have led to the

current species distribution and identify priority areas for the conservation of the herpetofauna of Ceará. This study differs from previous ones in that we present a detailed and updated list of the herpetofauna of Ceará and provide a framework for conservation planning. In addition, we identify habitat requirements and classify species according to their habitat-specificity.

Materials and methods

Study area

Located in northeastern Brazil (coordinates $03^{\circ}46'30''$ and $07^{\circ}52'15''$ S, $37^{\circ}14'54''$ and $41^{\circ}24'55''$ W [DMS]), the state of Ceará covers an area of 148,016 km². According to Köppen's classification (see PEEL et al. 2007), the climate in the state varies from tropical savanna (Aw) to hot semi-arid (BSh). Temperatures are warm throughout the year, with means ranging from 26 to 29°C and 5°C of thermal amplitude. There are two well-defined seasons, a rainy season from January through May and a dry season from June through December. In the coastal zone, average precipitation ranges from 900 to 1,000 mm per year, decreasing to 700 mm in semi-arid regions. In the mountainous areas, however, accumulated rainfall can be more than 1,500 mm per annum (LIMA et al. 2000).

Ceará is composed of three main geomorphologic formations: 1) Cenozoic sedimentary deposits including the formation of barriers, palaeodunes, colluviums, beach sediments, and mudslides the coast; 2) palaeomesozoic sedimentary plateaus in Chapada do Araripe, Chapada do Apodi, Planalto da Ibiapaba, and Serra Grande; and 3) shields and residual massifs/plateaus formed by the Sertaneja depressions and mountain ranges (LIMA et al. 2000). An extensive and continuous area of rocky outcrops reaching altitudes of 500 m is known as the Sertaneja depression. It is located in the peripheral range of the sedimentary plateaus or between them and the residual massifs/plateaus, covering approximately 70% of the state. Finally, several mountain ranges from 500 to 1,100 m in altitude characterize the residual massifs/plateaus (LIMA et al. 2000).

Ceará is entirely located within the Caatinga biome (*sensu* AB'SÁBER 1973) and its main phytophysiognomies are coastal vegetation complexes, formed by patches of savannas, shrubby vegetation along the shoreline, dune vegetation, mangroves, and areas of mesic forest; Caatinga *sensu stricto* along the Sertaneja depression; relict moist forests on sedimentary formations in the Serra de Baturité, Serra de Maranguape Serra da Aratanha, and Serra da Uruburetama; humid forests on crystalline formations in the Chapada do Araripe and on the Planalto da Ibiapaba; Cerrado and Cerradão in the southern regions of the Chapada do Araripe to the northwestern Planalto da Ibiapaba and coastal zones; and dry forests of arboreal Caatinga (FIGUEIREDO 1997, LIMA et al. 2000, MORO et al. in press).

Data analysis

We examined specimens from the main representative herpetological collections in Brazil to elaborate the list of the herpetofauna of Ceará as follows: Célio F. B. Haddad (CFBH) amphibian collection, São Paulo State University Rio Claro Campus, São Paulo, Brazil; snake collection of the Butantan Institute (IBSP) and reference collection of the Butantan Institute (CRIB), São Paulo, São Paulo, Brazil; herpetological collection of the Rio Grande Federal University (CHFURG), Rio Grande, Rio Grande do Sul, Brazil; herpetological collection of the University of Brasília (CHUNB), Brasília, Distrito Federal, Brazil; Natural History Museum of the Campinas State University (ZUEC), Campinas, São Paulo, Brazil; herpetological collection of the National Museum (MNRJ), Rio de Janeiro, Rio de Janeiro, Brazil; and herpetological collection of the Cariri Regional University (URCA-H), Crato, Ceará, Brazil. To complement the list of species, we included data available from the literature as well as original data obtained during field trips to different regions of the state between 2005 and 2013 (Supplementary files S3 and S4).

To identify patterns of species distribution in the state, we plotted all available species records from the municipality and micro-region levels (according to IPECE 2007). Subsequently, we divided the state into phytoecological units (adapted from FIGUEIREDO 1997, modified by MORO et al. in press), and identified nine of them as follows: CC – Caatinga on crystalline formations; CE – Cerrado and Cerradão; CS – Caatinga on sedimentary formations; CVC – coastal vegetation complex; DFC – dry forest on crystalline formations; DFS – dry forest on sedimentary formations; HFC – humid forest on crystalline formations; HFS – humid forest on sedimentary formations; PGF – palm gallery forests. We created geographic distribution maps for all species associated with the phytoecological units (modified from MORO et al. in press).

The conservation status and level of protection of each species was evaluated according to the concept of Key Biodiversity Areas (KBA) based on vulnerability and irreplaceability (see EKEN et al. 2004) at regional level (KNIGHT et al. 2007). Areas were considered KBAs when at least one viable population with a restricted range (i.e., species with vulnerability indices 1 or 2) or endemic species was present in the state. Although they are considered threatened species, the five species of marine turtles that are found on the shores of Ceará were not considered in the distributional analysis.

Patterns of species distribution, rarity, and vulnerability indices were analysed and the presence of threatened species in protected areas was verified (Conservation Units of Integral Protection – SNUC 2007). Based on these results, conservation needs were identified for the individual regions and species, indicating where the most restricted-range species as well as endemic ones occurred, and whether they existed within protected areas or not (protected species or gap species) (EKEN et al. 2004, RODRIGUES 2004).

Taxonomic arrangements follow FROST (2015) for amphibians, PYRON et al. (2013) for Squamata, with the exception of the snake families Dipsadidae, Viperidae, and Typhlopidae that follow GRAZZIOTIN et al. (2012), CARRASCO et al. (2012), and HEDGES et al. (2012), respectively. Taxonomy for non-squamate reptiles follow the Brazilian Society of Herpetology (COSTA & BÉRNILS 2014).

Results

Species composition

The amphibians found in Ceará were represented by 57 species of two orders (55 Anura and 2 Gymnophiona), eleven families (Bufonidae, Craugastoridae, Eleutherodactylidae, Hylidae, Leptodactylidae, Microhylidae, Odontophryidae, Pipidae, Ranidae, Siphonopidae, and Typhlonectidae), and 22 genera (Table 1). Hylidae and Leptodactylidae were the most richly represented families with 33% ($N = 19$) and 31% of the species ($N = 18$), respectively.

Regarding reptiles, 126 species were recorded, representing three orders (10 Testudines, 2 Crocodylia, and 114 Squamata [seven amphisbaenians, 41 lizards, and 66 snakes]), 28 families, and 83 genera (Table 2). The two snake families with the most species were Dipsadidae with 33 species (26%) and Colubridae with 15 species (12%). One species was recorded for the first time, *Lygophis paucidens*, in the coastal vegetation complex on the western shores of Ceará.

The Supplementary tables S1 and S2 present detailed information regarding the municipalities where amphibian and reptiles species were recorded in Ceará.

Species composition and richness in phytoecological units

For amphibians, the species richness was highest in the phytoecological units DFS (dry forest on sedimentary formations) ($N = 35$; 62%) and HFC (humid forest on crystalline formations) ($N = 32$; 57%), which represent most of the dry forest corridor from the Chapada do Araripe to the Planalto da Ibiapaba and the highland marshes of the Serras de Baturité, Maranguape, and Aratanha. Species richness was also high in the coastal vegetation complex ($N = 29$; 52%), followed by HFS (humid forest on sedimentary formations) ($N = 27$; 48%) (Table 1, Supplementary figures 1–3), which corresponds to the slopes of the Chapada do Araripe and higher-altitude areas of the Planalto da Ibiapaba. *Adelophryne maranguapensis*, *Dendropsophus* sp. (aff. *decipiens*), *Scinax* sp. (aff. *hayii*), *Rhinella casconi*, *R. hoogmoedi*, *Proceratophrys renalis*, and *Leptodactylus natalensis* were restricted to HFC (humid forest on crystalline formations). The amphibian species with the most restricted geographic ranges were *Adelophryne maranguapensis*, endemic to the Serra de Maranguape mountain range; *Proceratophrys renalis*, restricted to the Serra de Maranguape and Serra da Aratanha mountains; *Rhinella hoogmoedi*, *Rhinella casconi*, *Leptodactylus na-*

talensis, *Scinax* sp. (aff. *hayii*), only occurring in the Serra de Baturité mountains. *Pristimantis* sp. and *Adelophryne baturitensis* were the most widespread taxa in humid forests, occurring in the Serras de Baturité, Maranguape, Aratanha, and on the Planalto da Ibiapaba. *Pseudopaludicola jaredi* was exclusive to the Cerrado vegetation on rocky outcrops of the Serra das Flores, in the northern portion of the Planalto da Ibiapaba, in northwestern Ceará. *Chthonerpeton arii* is currently known only from shrubby Caatinga in the municipality of Limoeiro do Norte in the lower Jaguaribe region.

For reptiles, species richness was greatest in the phytoecological unit HMS ($N = 72$; 57.6% of the species) (Table 2, Supplementary figures 4–10). Other phytoecological units with substantial species richness were DFS and CVC ($N = 68$; 54.4% of the species), CS ($N = 62$; 49.6%), and HFC ($N = 60$; 48%). The reptile species with the most restricted geographic ranges were *Mesoclemmys perplexa* found only in the Cerrado (CE) at high altitudes (above 600 m) in rocky bottoms of streams and ponds on the Planalto da Ibiapaba; and *Gonatodes humeralis* with a distribution restricted to the coastal vegetation complex in a small fragmented dry forest along the coast of the municipality of Trairi.

Amphisbaena sp., *Placosoma* sp., *Anolis fuscoauratus*, *Strobilurus torquatus*, *Kentropyx calcarata*, *Lachesis muta*, and *Chironius carinatus* were restricted to HFC, whereas *Amphisbaena anomala*, *Anilius scytale*, *Bothrops* sp. (gr. *atrox*), *Coronelaps lepidus*, *Chironius exoletus*, *Liophylops cf. ternetzi*, *Micrurus lemniscatus ditius*, *Ophiodes* sp. (aff. *striatus*), *Trilepida brasiliensis*, and *Xenopholis undulatus* were restricted to HFS.

Conservation status, protection levels, and KBA areas for the conservation of the herpetofauna in Ceará

The majority of the amphibians of Ceará are classified as 'least concern' (LC) by the IUCN (2015) (63.6%; $N = 35$). Only *Adelophryne baturitensis* and *A. maranguapensis*, classified as vulnerable (VU) and endangered (EN), respectively, are considered threatened species. Currently, *Chthonerpeton arii* and *Phyllomedusa nordestina* have the status of 'data deficient'. Sixteen species (29%) of the amphibians of Ceará were not assessed by the IUCN (2015) and therefore have no conservation status.

Following the Ministério do Meio Ambiente (2014), the statuses of the amphibians of Ceará are as follows: 70.4% 'least concern' ($N = 38$), 26% not evaluated ($N = 14$), 1.8% 'vulnerable' (*Adelophryne maranguapensis*), and 1.8% 'data deficient' (*Chthonerpeton arii*).

The analysis of KBAs based on vulnerability and irreplaceability revealed KBA areas within the state with viable populations of six threatened and/or endemic amphibian species (Table 3): *Adelophryne maranguapensis*, *A. baturitensis*, *Dendropsophus* sp. (aff. *decipiens*), *Scinax* sp. (aff. *hayii*), *Rhinella casconi*, and *Pristimantis* sp. (Supplementary figure 11). The KBAs for amphibians in Ceará are composed of higher-altitudinal areas with relict moist forests

The herpetofauna of the state of Ceará, northeastern Brazil

Table 1. Updated list of amphibians native to the state of Ceará, northeastern Brazil. Voucher – reference specimen deposited in a scientific collection. IUCN status – Species threat status according to the IUCN (2015) and MINISTÉRIO DO MEIO AMBIENTE (2014). Environment observed: CVC – coastal vegetation complex; CE – Cerrado and Cerradão; CC – Caatinga on crystalline formations; DFC – dry forest on crystalline formations; HFC – humid forest on crystalline formations; CS – Caatinga on sedimentary formations; DFS – dry forest on sedimentary formations; HFS – humid forest on sedimentary formations; PGF – palm gallery forest; O – ocean.

Taxon	Voucher	Endemic	IUCN Status	MMA, 2014	Phytoecological Units								
					CC	CS	DFC	DFS	CVC	CE	HFC	HFS	PGF
Class Amphibia GRAY, 1825													
Order Anura FISCHER VON WALDHEIM, 1813													
Family Eleutherodactylidae LUTZ, 1954													
Subfamily Phyzelaphryninae HEDGES, DUELLMAN & HEINICKE, 2008													
<i>Adelophryne baturitensis</i> HOOGMOED, BORGES & CASCON, 1994	CFBH 20469	Yes	VU	LC							X	X	
<i>Adelophryne maranguapensis</i> HOOGMOED, BORGES & CASCON, 1994	CFBH 20468	Yes	EN	VU							X		
Family Craugastoridae HEDGES, DUELLMAN & HEINICKE, 2008													
Subfamily Ceuthomantinae HEINICKE, DUELLMAN, TRUEB, MEANS, MACCULLOCH & HEDGES, 2009													
<i>Pristimantis</i> sp.	MNRJ 55884	Yes	NE	NE			X	X			X	X	
Family Hylidae RAFINESQUE, 1815													
Subfamily Phylomedusinae GÜNTHER, 1858													
<i>Phylomedusa nordestina</i> CARAMASCHI, 2006	MNRJ 36645	No	DD	LC	X	X	X	X	X	X	X	X	X
Subfamily Hylinae RAFINESQUE, 1815													
<i>Corythomantis greeningi</i> BOULENGER, 1896	CFBH 20450	No	LC	LC	X	X	X	X		X	X	X	X
<i>Dendropsophus minusculus</i> RIVERO, 1971	CFBH 15883	No	LC	LC						X	X	X	X
<i>Dendropsophus</i> sp. (aff. <i>decipiens</i>)	CFBH 24536	Yes	NE	NE							X		
<i>Dendropsophus minutus</i> (PETERS, 1872)	CFBH 15852	No	LC	LC		X	X	X		X	X	X	X
<i>Dendropsophus nanus</i> (BOULENGER, 1889)	CFBH 15587	No	LC	LC	X	X			X	X			
<i>Dendropsophus rubicundulus</i> (REINHARDT & LÜTKEN, 1862)	CFBH 23464	No	LC	LC						X			
<i>Dendropsophus soaresi</i> (CARAMASCHI & JIM, 1983)	CFBH 15864	No	LC	LC	X	X	X	X	X	X	X	X	X
<i>Hypsiboas multifasciatus</i> (GÜNTHER, 1859)	MNRJ 55345	No	LC	LC			X					X	
<i>Hypsiboas raniceps</i> COPE, 1862	CFBH 15998	No	LC	LC	X	X	X	X	X	X	X	X	X
<i>Scinax fuscomarginatus</i> (A. LUTZ, 1925)	CFBH 19386	No	LC	LC			X	X					
<i>Scinax pachycrus</i> (MIRANDA-RIBEIRO, 1937)	*	No	LC	LC		X							X
<i>Scinax nebulosus</i> (SPIX, 1824)	CFBH 25433	No	LC	LC					X	X			X
<i>Scinax</i> sp. (gr. <i>ruber</i>)	CFBH 15876	No	NE	NE		X			X	X			
<i>Scinax</i> sp. (aff. <i>hayii</i>)		Yes	NE	NE							X		
<i>Scinax x-signatus</i> (SPIX, 1824)	CFBH 15874	No	LC	LC	X	X	X	X	X	X	X	X	X
<i>Trachycephalus atlas</i> BOKERMANN, 1966	MNRJ 55562	No	LC	LC			X						
<i>Trachycephalus typhonius</i> (LINNAEUS, 1758)	CFBH 20419	No	LC	LC		X	X	X		X	X		
Family Leptodactylidae WERNER, 1896													
Subfamily Leiuperinae BONAPARTE, 1850													
<i>Physalaemus albifrons</i> (SPIX, 1824)	MNRJ 14940	No	LC	LC	X	X	X	X	X	X			X
<i>Physalaemus cicada</i> BOKERMANN, 1966	MNRJ 24060	No	LC	LC		X			X				
<i>Physalaemus cuvieri</i> FITZINGER, 1826	CFBH 16136	No	LC	LC	X	X	X	X	X	X	X	X	X
<i>Pleurodema diplolister</i> (PETERS, 1870)	CFBH 16143	No	LC	LC	X	X	X	X	X	X	X		X
<i>Pseudopaludicola mystacalis</i> (COPE, 1887)	CFBH 20298	No	LC	LC		X			X	X			X
<i>Pseudopaludicola pocoto</i> MAGALHÃES, LOEBMANN, KOKUBUM, HADDAD & GARDA, 2014	CFBH 20285	No	NE	NE	X	X			X	X	X		
<i>Pseudopaludicola jaredi</i> ANDRADE, MAGALHÃES, NUNES-DE-ALMEIDA, VEIGA-MENONCELLO, SANTANA, GARDA, LOEBMANN, RECCO-PIMENTEL, GIARETTA & TOLEDO, 2016	CFBH 20288	No	NE	NE							X		

Taxon	Voucher	Endemic	IUCN Status	MMA, 2014		Phytoecological Units							
				CC	CS	DFC	DFS	CVC	CE	HFC	HFS	PGF	
Subfamily Leptodactylinae WERNER, 1896													
<i>Adenomera cf. juikitam</i>	CFBH 15898	No	NE	NE		X	X	X		X	X		
<i>Adenomera hylaedactyla</i> (COPE, 1868)	CFBH 15887	No	NE	NE			X						
<i>Leptodactylus caatingae</i> HEYER & JUNCÁ, 2003	NMA 921	No	LC	LC				X					
<i>Leptodactylus fuscus</i> (SCHNEIDER, 1799)	CFBH 16122	No	LC	LC	X	X	X	X	X	X	X	X	X
<i>Leptodactylus macrosternum</i> MIRANDA-RIBEIRO, 1926	CFBH 16121	No	LC	LC	X	X	X	X	X	X	X	X	X
<i>Leptodactylus mystaceus</i> (SPIX, 1824)	CFBH 16101	No	LC	LC			X	X	X		X	X	
<i>Leptodactylus</i> sp. (aff. <i>syphax</i>)	CFBH 20398	No	NE	NE		X	X			X	X	X	
<i>Leptodactylus natalensis</i> LUTZ, 1930	MNRJ 55885	No	LC	LC							X		
<i>Leptodactylus pustulatus</i> (PETERS, 1870)	UFC A4076	No	LC	LC			X	X			X		
<i>Leptodactylus troglodytes</i> LUTZ, 1926	CFBH 16133	No	LC	LC	X	X	X	X	X	X	X	X	X
<i>Leptodactylus vastus</i> (LUTZ, 1930)	CFBH 23445	No	LC	LC	X	X	X	X	X	X	X	X	X
<i>Leptodactylus</i> cf. <i>furnarius</i> SAZIMA & BOKERMANN, 1978	MNRJ 27533	No	NE	NE							X		
Family Odontophrynidae LYNCH, 1969													
<i>Odontophrynus carvalhoi</i> SAVAGE & CEI, 1965	CFBH 20301	No	LC	LC							X	X	
<i>Proceratophrys caramaschii</i> CRUZ, NUNES & JUNCÁ, 2012	MNRJ 16592	No	NE	NE						X		X	
<i>Proceratophrys cristiceps</i> (MÜLLER, 1883)	AAGARDA 10219	No	LC	LC	X					X			
<i>Proceratophrys aridus</i> CRUZ, NUNES & JUNCÁ, 2012	MNRJ 55782	No	NE	NE	X	X					X		
<i>Proceratophrys renalis</i> (MIRANDA-RIBEIRO, 1920)	CFBH 24528	No	NE									X	
Family Bufonidae GRAY, 1825													
<i>Rhinella granulosa</i> (SPIX, 1824)	CFBH 16106	No	LC	LC	X	X	X	X	X	X	X	X	X
<i>Rhinella jimi</i> (STEVAUX, 2002)	CFBH 16007	No	LC	LC	X	X	X	X	X	X	X	X	X
<i>Rhinella hoogmoedi</i> CARAMASCHI & POMBAL, 2006	CFBH 20319	No	LC	LC							X		
<i>Rhinella casconi</i> Roberto, BRITO & THOMÉ, 2014	CFBH 28175	Yes	NE	NE							X		
Family Microhylidae GÜNTHER, 1858 (1843)													
Subfamily Gastrophryninae FITZINGER, 1843													
<i>Dermatonotus muelleri</i> (BOETTGER, 1885)	CFBH 16104	No	LC	LC	X	X	X	X	X	X	X	X	X
<i>Elachistocleis piauiensis</i> CARAMASCHI & JIM, 1983	CHBEZ 1028	No	LC	LC		X		X					
<i>Elachistocleis cesarri</i> (MIRANDA-RIBEIRO, 1920)	MNRJ 55891	No	NE	LC			X		X				
Family Pipidae GRAY, 1825													
<i>Pipa carvalhoi</i> (MIRANDA-RIBEIRO, 1937)	URCA H-1177	No	LC	LC			X					X	
<i>Pipa pipa</i> (LINNAEUS, 1758)	MNRJ 55444	No	LC	LC					X			X	
Family Ranidae BATSCHE, 1796													
<i>Lithobates catesbeianus</i> (SHAW, 1802)	*			LC	LC					X			
Order Gymnophiona MÜLLER, 1832													
Family Siphonopidae BONAPARTE, 1850													
<i>Siphonops</i> sp. (aff. <i>paulensis</i>)	CFBH 16135	No	NE	NE			X				X	X	
Family Typhlonectidae TAYLOR, 1968													
<i>Chthonerpeton arii</i> CASCON & LIMA-VERDE, 1994	UFC A1503	Yes	DD	DD	X								

including the Serras de Baturité, Maranguape, Aratanha, and the Planalto da Ibiapaba.

Regarding the presence of threatened species in Conservation Units of Integral Protection, 71.4% of the species ($N = 5$) have no records in protected areas (gap species). *Adelophryne baturitensis* and *Pristimantis* sp. occur in the Ubajara National Park and are threatened species with populations in this type of conservation unit (Supplementary figure 12).

Most reptiles of Ceará (81%; $N = 101$) were not assessed by the IUCN (2015), but only 13.2% are classified as of least concern ($N = 16$). Among the reptiles recorded in the state, all

marine turtles are considered threatened taxa, with a status of either 'vulnerable' (*Lepidochelys olivacea*), 'endangered' (*Caretta caretta* and *Chelonia mydas*), or 'critically endangered' (*Eretmochelys imbricata* and *Dermochelys coriacea*). According to the Ministério do Meio Ambiente (2014), for marine turtles of Brazil the only differences to the classification of the IUCN (2015) is that *Lepidochelys olivacea* is listed as 'endangered' and *Chelonia mydas* as 'vulnerable'. Also, the snake *Atractus ronniei* and the lizard *Leposoma baturitensis* are classified as 'endangered' (Ministério do Meio Ambiente 2014), and *Amerotyphlops paucisquamus* as 'vulnerable'.

The herpetofauna of the state of Ceará, northeastern Brazil

Table 2. Updated list of reptiles from the state of Ceará, northeastern Brazil. Voucher – reference specimen deposited in a scientific collection. IUCN status – Species threat status according to the IUCN (2015) and MINISTÉRIO DO MEIO AMBIENTE (2014). Environment observed: CVC – coastal vegetation complex; CE – Cerrado and Cerradão; CC – Caatinga on crystalline formations; DFC – dry forest on crystalline formations; HFC – humid forest crystalline formations; CS – Caatinga on sedimentary formations; DFS – dry forest on sedimentary formations; HFS – humid forest on sedimentary formations; PGF – palm gallery forest; O – ocean.

Taxon	Voucher	Endemic	IUCN Status	MMA status	Phytoecological Units									
					CC	CS	DFC	DFS	CVC	CE	HFC	HFS	PGF	O
Class Reptilia LAURENTI, 1768														
Order Testudines LINNAEUS, 1758														
Suborder Cryptodira COPE, 1868														
Family Cheloniidae OPEL, 1811														
<i>Caretta caretta</i> (LINNAEUS, 1758)	*	No	EN	EN										X
<i>Chelonia mydas</i> (LINNAEUS, 1758)	*	No	EN	VU										X
<i>Eretmochelys imbricata</i> (LINNAEUS, 1766)	*	No	CR	CR										X
<i>Lepidochelys olivacea</i> (ESCHSCHOLTZ, 1829)	*	No	VU	EN										X
Family Dermochelyidae FITZINGER, 1843														
<i>Dermochelys coriacea</i> (LINNAEUS, 1766)	*	No	CR	CR										X
Family Testudinidae BATSCHE, 1788														
<i>Chelonoides carbonaria</i> (SPIX, 1824)	*	No	LC											
Family Kinosternidae BAUR, 1893														
<i>Kinosternon scorpioides</i> (LINNAEUS, 1766)	ZUEC 3377	No	NE		X	X	X	X	X	X	X	X	X	X
Suborder Pleurodira COPE, 1864														
Family Chelidae GRAY, 1825														
<i>Mesoclemmys perplexa</i> BOUR & ZAHER, 2005	CRIB 289	No	NE											X
<i>Mesoclemmys tuberculata</i> (LÜDERWALDT, 1926)	CRIB 618	No	NE		X	X	X	X	X	X	X			X
<i>Phrynops</i> sp. (aff. <i>geoffroanus</i>) (SCHWEIGER, 1812)	URCA H-1221	No	NE		X	X	X	X	X	X	X			X
Order Crocodylia GMELIN, 1789														
Family Alligatoridae CUVIER, 1807														
<i>Caiman crocodilus</i> (LINNAEUS, 1758)	CHUFC C 044	No	LC				X							X
<i>Paleosuchus palpebrosus</i> (CUVIER, 1807)	CHUFC C 045	No	LC					X						X
Order Squamata OPPEL, 1811														
Suborder Amphisbaenia GRAY, 1844														
Family Amphisbaenidae GRAY, 1825														
<i>Amphisbaena alba</i> LINNAEUS, 1758	CRIB 484	No	LC		X	X	X	X	X	X	X	X	X	X
<i>Amphisbaena fuliginosa</i> LINNAEUS, 1758	MUZUSP 7059	No	NE											?
<i>Amphisbaena pretrei</i> DUMÉRIL & BIBRON, 1839	ZUEC 3379	No	LC				X		X	X	X			X
<i>Amphisbaena vermicularis</i> WAGLER, 1824	CRIB 487	No	NE		X	X	X	X	X	X	X	X	X	X
<i>Amphisbaena anomala</i> (BARBOUR, 1914)	CRIB 288	No	NE											X
<i>Amphisbaena</i> sp.	MZUSP 87775	Yes	NE											X
<i>Amphisbaena polystega</i> (DUMÉRIL, 1851)	CRIB 489	No	LC		X	X	X	X	X	X	X	X	X	X
Infraorder Iguania COPE, 1864														
Pleurodonta COPE, 1864														
Family Iguanidae OPPEL, 1811														
<i>Iguana iguana</i> (LINNAEUS, 1758)	CHUNB 57364	No	NE		X	X	X	X	X	X	X	X	X	X
Family Dactyloidea FITZINGER, 1843														
<i>Anolis fuscoauratus</i> (D'ORBIGNY, 1837)	UFRGS 4946	No	NE											X
<i>Anolis brasiliensis</i> (VANZOLINI & WILLIAMS, 1970)	URCA H-3889	No	NE											X
Family Polychrotidae FITZINGER, 1843														
<i>Polychrus acutirostris</i> SPIX, 1825	CRIB 612	No	NE		X	X	X	X	X	X	X			X
<i>Polychrus marmoratus</i> (LINNAEUS, 1758)	CHUNB 57381	No	NE											X

Taxon	Voucher	Endemic	IUCN Status	MMA status	Phytoecological Units													
					CC	CS	DFC	DFS	CVC	CE	HFC	HFS	PGF	O				
Family Leiosauridae FROST, ETHERIDGE, JANIES, & TITUS, 2001																		
Subfamily Enyaliinae FROST, ETHERIDGE, JANIES, & TITUS, 2001																		
<i>Enyalius bibronii</i> BOULENGER, 1885	CHUNB 57375	No	LC		X	X	X			X	X	X						
Family Tropiduridae BELL, 1843																		
<i>Strobilurus torquatus</i> WIEGMANN, 1834	MZUSP 87856	No	NE										X	X				
<i>Tropidurus hispidus</i> (SPIX, 1825)	UFRGS 4952	No	NE		X	X	X	X	X	X	X	X	X	X				
<i>Tropidurus semitaeniatus</i> (SPIX, 1825)	UFRGS 4951	No	LC		X	X	X	X	X	X	X	X	X	X				
<i>Tropidurus jaguaribanus</i> PASSOS, LIMA & BORGES-NOJOSA, 2011	URCA H-1775	No	NE		X	X	X	X										
<i>Stenocercus squarrosus</i> NOGUEIRA & RODRIGUES, 2006	URCA H-009	No	NE					X										
Infraorder Gekkota CUVIER, 1817																		
Family Gekkonidae GRAY, 1825																		
<i>Hemidactylus brasiliensis</i> (AMARAL, 1935)	URCA H-1795	No	NE		X	X	X	X	X	X	X			X				
<i>Hemidactylus agrius</i> Vanzolini, 1978	UFRGS 4953	No	NE		X	X	X	X	X	X				X				
<i>Hemidactylus mabouia</i> (MOREAU DE JONNÈS, 1818)	CHUNB 57374	No	NE							X				X				
<i>Lygodactylus klugei</i> (SMITH, MARTIN & SWAIN, 1977)	URCA H-1448	No	NE		X	X	X	X	X	X								
Family Phyllodactylidae GAMBLE, BAUER, GREENBAUM & JACKMAN, 2008																		
<i>Gymnodactylus geckoides</i> SPIX, 1825	URCA H-1091	No	NE		X	X	X	X										
<i>Phyllopezus pollicaris</i> (SPIX, 1825)	URCA H-848	No	NE		X	X	X	X	X	X			X	X				
<i>Phyllopezus periosus</i> RODRIGUES, 1987	CHUNB 56576	No	NE		X	X												
Family Sphaerodactylidae UNDERWOOD, 1954																		
<i>Coleodactylus merionalis</i> (BOULENGER, 1888)	URCA H-363	No	NE				X	X	X				X	X				
<i>Gonatodes humeralis</i> (GUICHENOT, 1855)	URCA H-6389	No	NE							X								
Infraorder Teiiformata VIDAL & HEDGES, 2005																		
Family Gymnophthalmidae MERREM, 1820																		
Subfamily Gymnophthalminae MERREM, 1820																		
Tribe Gymnophthalmini MERREM, 1820																		
<i>Micrablepharus maximiliani</i> (REINHARDT & LUTKER, 1862)	URCA H-161	No	NE		X	X	X	X	X	X				X				
<i>Vanzosaura multiscutata</i> (AMARAL, 1933)	URCA H-177	No	NE		X	X	X	X	X	X				X				
Tribe Iphisiini Rodrigues, CASSIMIRO, PAVAN, CURCIO, VERDADE & PELLEGRINO, 2009																		
<i>Acratosaura mentalis</i> (AMARAL, 1933)	Not available		NE				X											
<i>Colobosaura modesta</i> (REINHARDT & LÜTKEN, 1862)	URCA H-159	No	NE			X		X		X								
<i>Stenolepis ridleyi</i> BOULENGER, 1887	UFC L2183	No	NE										X	X				
Subfamily Cercosaurinae GRAY, 1838																		
Tribe Cercosaurini GRAY, 1838																		
<i>Cercosaura ocellata</i> WAGLER, 1830	UFC L2140	No	NE						X					X				
<i>Placosoma</i> sp.	URCA H-3410	Yes	NE								X							
Tribe Eubleopodini FITZINGER, 1843																		
<i>Colobosauroides cearensis</i> CUNHA, LIMA-VERDE & LIMA, 1991	URCA H-2313	No	NE				X	X	X				X	X				
<i>Leposoma baturitensis</i> RODRIGUES & BORGES, 1997	MZUSP 79378	Yes	NE	EN									X	X				
Family Teiidae GRAY, 1827																		
Subfamily Teiinae MERREM, 1820																		
<i>Ameiva ameiva</i> (LINNAEUS, 1758)	MZUSP 52046	No	NE		X	X	X	X	X	X	X	X	X	X				

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Taxon	Voucher	Endemic	IUCN Status	MMA status	Phytoecological Units									
					CC	CS	DFC	DFS	CVC	CE	HFC	HFS	PGF	O
<i>Cnemidophorus ocellifer</i> (SPIX, 1825)	URCA H-239	No	NE		X	X	X	X	X	X	X	X	X	X
<i>Kentropyx calcarata</i> SPIX, 1825	UFC L2180	No	NE									X		
Subfamily Tupinambinae DAUDIN, 1820														
<i>Tupinambis merianae</i> (DUMÉRIL & BIBRON, 1839)	URCA H-010	No	LC		X	X	X	X	X	X	X	X	X	X
<i>Tupinambis teguixin</i> (LINNAEUS, 1758)	UFC L4847	No	LC			X								
Scinciformata VIDAL & HEDGES, 2005														
Family Scincidae GRAY, 1825														
Subfamily Lygosominae MITTELMAN, 1952														
<i>Mabuya arajara</i> REBOUÇAS-SPIEKER, 1981	URCA H-2043	No	NE			X			X		X		X	
<i>Mabuya nigropunctata</i> (SPIX, 1825)	URCA H-2322	No	NE											
<i>Mabuya heathi</i> SCHMIDT & INGER, 1951	URCA H-174	No	NE		X	X	X	X	X	X	X	X	X	X
<i>Mabuya frenata</i> (COPE, 1862)	URCA H-2058	No	NE								X			
<i>Mabuya agmosticha</i> RODRIGUES, 2000	UFPE 101	No	NE				X							
Infraorder Anguimorpha FÜRBRINGER, 1900														
Family Diploglossidae COPE, 1864														
<i>Diploglossus lessonae</i> PERACCA, 1890	URCA H-243	No	LC			X	X				X	X		
<i>Ophioodes</i> sp. (aff. <i>striatus</i>)	URCA H-2321	No	NE										X	
Suborder Serpentes LINNAEUS, 1758														
Infraorder Scolecophidia COPE, 1864														
Family Anomalepididae TAYLOR, 1939														
<i>Liophylops cf. ternetzi</i> (BOULENGER, 1896)	IBSP 76856	No	NE										X	
Family Leptotyphlopidae STEINEGER, 1891														
Subfamily Epictinae ADALSTEINSSON, BRANCH, TRAPE, VITT & HEDGES, 2009														
Tribe Epictini ADALSTEINSSON, BRANCH, TRAPE, VITT & HEDGES, 2009														
<i>Trilepida brasiliensis</i> (LAURENT, 1949)	ZUEC 3380	No	NE										X	
<i>Epictia borapeliotes</i> (VANZOLINI, 1996)	IBSP 76987	No	NE		X	X	X					X		
Family Typhlopidae JAN, 1863														
<i>Amerotyphlops</i> sp. (aff. <i>amoipira</i>)	UFC 2935	?	NE	NE						X				
<i>Amerotyphlops brongersmianus</i> (VANZOLINI, 1976)	IBSP 76365	No	NE					X	X				X	
<i>Ameropyhlops paucisquamus</i> (DIXON & HENDRICKS, 1979)	IBSP 76985	No	NE	VU							X			
Alethinopidae HOFFSTETTER, 1955														
Afrophidida VIDAL, DELMAS & HEDGES, 2007														
Henophidida HOFFSTETTER, 1939														
Family Boidae GRAY, 1825														
Subfamily Boinae GRAY, 1825														
<i>Boa constrictor constrictor</i> LINNAEUS, 1758	IBSP 77053	No	NE		X	X	X	X	X	X	X	X	X	X
<i>Corallus hortulanus</i> (LINNAEUS, 1758)	IBSP 77056	No	NE		X	X	X	X	X	X				
<i>Epicrates assisi</i> MACHADO, 1945	IBSP 77062	No	NE		X	X	X	X	X	X	X	X	X	X
<i>Eunectes murinus</i> (LINNAEUS, 1758)	CHUFC 3054	No	NE						X					
Infraorder Caenophidia HOFFSTETTER, 1939														
Family Viperidae LAURENTI, 1768														
Subfamily Crotalinae OPPEL, 1811														
<i>Bothrops</i> sp. (aff. <i>atrox</i>)	IBSP 77064	Yes	NE										X	
<i>Bothrops lutzi</i> MIRANDA-RIBEIRO, 1915	ZUEC 3373	No	LC					X						
<i>Bothrops erythromelas</i> AMARAL, 1923	IBSP 50892	No	LC		X	X	X	X	X	X				X
<i>Crotalus durissus</i> LINNAEUS, 1758	IBSP 1468	No	LC		X	X	X	X	X	X				X
<i>Lachesis muta</i> (LINNAEUS, 1766)	IBSP 56222	No	NE								X			
Family Elapidae BOIE, 1827														
Subfamily Elapinae BOIE, 1827														
<i>Micrurus</i> sp. (aff. <i>ibiboboca</i>)	IBSP 76849	No	NE		X	X	X	X	X	X	X	X	X	X
<i>Micrurus lemniscatus ditius</i> BURGER, 1955	IBSP 77096	No	NE									X		
<i>Micrurus lemniscatus lemniscatus</i> BURGER, 1955	IBSP 77079	No	NE						X	X	X			

Taxon	Voucher	Endemic	IUCN Status	MMA status	Phytoecological Units									
					CC	CS	DFC	DFS	CVC	CE	HFC	HFS	PGF	O
Family Colubridae OPPEL, 1811														
<i>Chironius bicarinatus</i> (WIED, 1820)	IBSP 77076	No	NE								X	X		
<i>Chironius carinatus</i> (LINNAEUS, 1758)	MZUSP 3633	No	NE								X			
<i>Chironius exoletus</i> (LINNAEUS, 1758)	CHUFC 1590	No	NE									X		
<i>Chironius flavolineatus</i> (BOETTGER, 1885)	IBSP 77058	No	NE						X		X		X	
<i>Drymarchon corais corais</i> (BOIE, 1827)	IBSP 77237	No	NE		X	X	X	X	X	X	X	X	X	X
<i>Drymoluber dichrous</i> (PETERS, 1863)	IBSP 77074	No	NE									X	X	
<i>Drymoluber brasili</i> (GOMES, 1918)	MZUSP 5329	No	NE						X	X				
<i>Leptophis ahaetulla</i> (LINNAEUS, 1758)	MZUSP 5321	No	NE		X	X	X	X	X	X	X	X	X	X
<i>Mastigodryas boddarti boddarti</i> (SENTZEN, 1796)	IBSP 77234	No	NE						X				X	
<i>Mastigodryas bifossatus</i> (RADDI, 1820)	IBSP 20010	No	NE		X	X	X	X	X		X	X	X	
<i>Oxybelis aeneus</i> (WAGLER, 1824)	IBSP 19992	No	NE		X	X	X	X	X	X	X	X	X	X
<i>Spilotes sulphureus sulphureus</i> (WAGLER, 1824)	IBSP 77504	No	NE								X	X		
<i>Spilotes pullatus</i> (LINNAEUS, 1758)	IBSP 77503	No	NE		X	X	X	X	X	X	X	X	X	X
<i>Tantilla melanocephala</i> (LINNAEUS, 1758)	IBSP 76841	No	NE		X	X	X	X	X	X	X	X	X	X
Family Dipsadidae BONAPARTE, 1838														
Subfamily Dipsadinae BONAPARTE, 1838														
Tribe Dipsadini BONAPARTE, 1838														
<i>Atractus ronnie PASSOS, FERNANDES & BORGES-NOJOSA, 2007</i>	MNRJ 17326	Yes	NE	EN								X	X	
<i>Sibon nebulatus</i> (LINNAEUS, 1758)	IBSP 76848	No	NE							X		X	X	
<i>Sibynomorphus mikani</i> (SCHLEGEL, 1837)	URCA H-3481	No	NE							X		X		
Tribe Imantodini MYERS, 2011														
<i>Imantodes cenchoa cenchoa</i> (LINNAEUS, 1758)	IBSP 77072	No	NE									X	X	
<i>Leptodeira annulata pulchriceps</i> (DUELLMAN, 1958)	IBSP 77054	No	NE		X	X	X	X	X	X	X	X	X	
Subfamily Xenodontinae BONAPARTE, 1845														
Tribe Elapomorphini JAN, 1862														
<i>Apostolepis cearensis</i> GOMES, 1915	IBSP 20385	No	NE		X	X	X	X	X	X	X	X	X	X
<i>Apostolepis</i> sp. (gr. <i>nigrolineata</i>)	ZUEC 3384	Yes	NE								X	X		
<i>Coronelaps lepidus</i> LEMA & HOFSTADLER DEIQUES, 2010	Not available	No	NE										X	
Tribe Pseudoboini BAILEY, 1967														
<i>Boiruna sertaneja</i> ZAHER, 1996	IBSP 77514	No	NE		X	X	X	X	X	X	X	X	X	X
<i>Oxyrhopus melanogenys orientalis</i> CUNHA & NASCIMENTO, 1983	IBSP 76842	No	LC								X	X		
<i>Oxyrhopus trigeminus</i> DUMÉRIL, BIBRON & DUMÉRIL, 1854	IBSP 76853	No	NE		X	X	X	X	X	X	X	X	X	X
<i>Pseudoboa nigra</i> (DUMÉRIL, BIBRON & DUMÉRIL, 1854)	IBSP 77052	No	NE		X	X	X	X	X	X	X	X	X	X
<i>Siphlophis compressus</i> (DAUDIN, 1803)	IBSP 20295	No	LC						X					
Tribe Hydropsini DOWLING, 1975														
<i>Helicops angulatus</i> (LINNAEUS, 1758)	URCA H-006	No	NE							X				X
<i>Helicops leopardinus</i> (SCHLEGEL, 1837)	IBSP 20024	No	NE		X	X	X	X	X					X
Tribe Xenodontini BONAPARTE, 1845														
<i>Erythrolamprus miliaris</i> (LINNAEUS, 1758)	MPEG 17694	No	NE			X								
<i>Erythrolamprus poecilogyrus schotti</i> (SCHLEGEL, 1837)	IBSP 77099	No	NE		X	X	X	X	X	X	X	X	X	X
<i>Erythrolamprus reginae semilineata</i> (WAGLER, 1824)	IBSP 77051	No	NE									X	X	
<i>Erythrolamprus taeniogaster</i> (JAN, 1863)	IBSP 76850	No	NE		X			X	X					
<i>Erythrolamprus viridis</i> (GÜNTHER, 1862)	IBSP 77108	No	LC		X	X	X	X	X	X	X	X	X	X
<i>Erythrolamprus mossoroensis</i> (HOGE & LIMA-VERDE, 1972)	IBSP 52952	No	NE		X	X	X	X	X					X
<i>Lygophis dilepis</i> COPE, 1862	IBSP 20134	No	LC		X	X	X	X	X	X	X	X	X	X

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Taxon	Voucher	Endemic	IUCN Status	MMA status	Phytoecological Units									
					CC	CS	DFC	DFS	CVC	CE	HFC	HFS	PGF	O
<i>Lygophis paucidens</i> (HOGE, 1953)	URCA H-5706	No	NE						X					
<i>Xenodon merremii</i> (WAGLER, 1824)	IBSP 77066	No	NE		X	X	X	X	X	X	X	X	X	X
Tribe Philodryadini COPE, 1886														
<i>Philodryas nattereri</i> STEINDACHNER, 1870	IBSP 20252	No	NE		X	X	X	X	X	X	X	X	X	X
<i>Philodryas olfersii herbeus</i> (WIED, 1825)	IBSP 20638	No	NE		X	X	X	X	X	X	X	X	X	X
Tribe Psomophini ZAHER, GRAZZIOTIN, CADLE, MURPHY, MOURA-LEITE & BONATTO, 2009														
<i>Psomophis joberti</i> (SAUVAGE, 1884)	IBSP 20019	No	NE		X	X	X	X	X	X				X
Tribe Echinantherini ZAHER, GRAZZIOTIN, CADLE, MURPHY, MOURA-LEITE & BONATTO, 2009														
<i>Taeniophallus affinis</i> (GÜNTHER, 1858)	IBSP 76363	No	LC								X	X		
<i>Taeniophallus occipitalis</i> (JAN, 1863)	IBSP 76852	No	NE						X	X	X	X	X	X
Tribe Trachymenini BAILEY, 1967														
<i>Thamnodynastes</i> sp.	IBSP 77507	No	NE		X	X	X	X	X	X				X
<i>Thamnodynastes almae</i> FRANCO & FERREIRA, 2003	IBSP 76969	No	NE			X		X						
<i>Thamnodynastes sertanejo</i> BAILEY, THOMAS & SILVA-JR, 2005	IBSP 76971	No	NE		X	X		X	X					
Xenodontinae Incertae sedis														
<i>Xenopholis undulatus</i> (JENSEN, 1900)	IBSP 76832	No	NE											X
Amerophidia VIDAL, DELMAS & HEDGES, 2007														
Family Aniilidae STEJNEGER, 1907														
<i>Anilius scytale</i> (LINNAEUS, 1758)	IBSP 20013	No	NE											X

Table 3. Key Biodiversity Areas (KBA) for amphibians of Ceará showing gap and protected species.

Species	Distribution (KBA)	Conservation Unit	GAP species	Covered species
<i>Dendropsophus</i> sp. (aff. <i>decipiens</i>)	Serra de Baturité, Aratana e Maranguape			X
<i>Scinax</i> sp. (aff. <i>hayii</i>)	Serra de Baturité			X
<i>Rhinella casconii</i>	Serra de Baturité			X
<i>Adelophryne baturitensis</i>	Serras de Baturité, Aratana e Maranguape, Ibiapaba	Ubajara's National Park		X
<i>Adelophryne maranguapensis</i>	Serras de Maranguape			X
<i>Pristimantis</i> sp.	Serras de Baturité, Uruburetama, Aratana e Maranguape, Ibiapaba.	Ubajara's National Park		X

Table 4. Key Biodiversity Areas (KBA) for reptiles of Ceará showing the gap and protected species.

Species	Distribution (KBA)	Conservation Unit	GAP species	Covered species
<i>Amphisbaena</i> sp.	Serras de Maranguape and Baturité			X
<i>Amerotyphlops paucisquamus</i>	Caucaia			X
<i>Apostolepis</i> sp. (gr. <i>nigrolineata</i>)	Serras de Maranguape, Baturité and Ibiapaba	Ubajara's National Park		X
<i>Atractus ronnie</i>	Serras de Baturité, Ibiapaba, and Chapada do Araripe	Ubajara's National Park		X
<i>Bothrops</i> sp (aff. <i>atrox</i>)	Planalto da Ibiapaba, Chapada do Araripe	Ubajara's National Park		X
<i>Leposoma baturitensis</i>	Serras de Maranguape, Aratana, Baturité and Ibiapaba	Ubajara's National Park		X
<i>Placosoma</i> sp.	Serra de Maranguape and Baturité			X

According to our irreplaceability and vulnerability analysis, KBAs within the state have viable populations of seven endemic and potentially threatened reptiles: *Bothrops* sp. (gr. *atrox*), *Placosoma* sp., *Leposoma baturitensis*, *Atractus ronnie*, *Amphisbaena* sp., *Apostolepis* sp. (gr. *nigrolineata*), and *Amerotyphlops paucisquamus* (Table 4, Supplementary figure 13). Similar to the KBAs observed for amphibians, those for reptiles in Ceará are higher-altitude areas with relict moist forests including the Serra de Baturité, Serra de Maranguape, Serra da Aratanga, Planalto da Ibiapaba, and Chapada do Araripe, and the coastal forests of the municipality of Caucaia, where *A. paucisquamus* was found. Among reptile species, *Placosoma* sp., *Amerotyphlops paucisquamus*, and *Amphisbaena* sp. have no records in protect areas whereas *Apostolepis* sp (gr. *nigrolineata*), *Atractus ronnie*, *Bothrops* sp. (gr. *atrox*), and *Leposoma baturitensis* are found in the Ubajara National Park (Table 4, Supplementary figure 12). Although marine turtles were not included in our analysis (see details in the Materials and methods section), it is important to mention that the Jericoacoara National Park is a conservation area in the coastal zone that can be used temporally by all marine turtles.

Discussion

Species composition and richness

The current list of the herpetofauna of Ceará nearly doubles the number of species previously reported by LIMA-VERDE & CASCON (1990). The increase in the number of surveys in the most diverse areas of the state, i.e., Serra de Baturité with 30 amphibian and 55 reptile species (BORGES-NOJOSA 2007); the most diverse Planalto da Ibiapaba, with 38 amphibian and 80 reptile species (LOEBMANN & HADDAD 2010); and the Chapada do Araripe with 31 amphibian and 78 reptile species (RIBEIRO et al. 2012), has substantially improved our knowledge of the herpetofauna of Ceará and provided several new species records. However, further surveys especially in the highland marshes of the Serras de Maranguape, Aratanga, and Baturité, and the Caatinga of the Jaguaribe and Araripe regions in Ceará are still needed and may further increase the number of species found in this state.

It is important to emphasize that some species were not included in the present list because of incorrect identification. These species are *Rhinella schneideri* (in BORGES-NOJOSA & CASCON 2005, BORGES-NOJOSA 2007), *Leptodactylus labyrinthicus* (in BORGES-NOJOSA 2007), *Pseustes poecilonotus* (in GOMES 1918), and *Leptodactylus latrans* (in CHAVES et al. 2012). Correct identifications for these species are *Rhinella jimi*, *Leptodactylus vastus*, *Spilotes sulphureus*, and *Leptodactylus macrosternum*, respectively. In addition, *Amphisbaena fuliginosa* was considered a historical record of dubious credibility, and further studies are needed to confirm its occurrence in Ceará. The record of *Erythrolamprus miliaris* from the municipality of Iguatu (GUEDES et al. 2014b) requires clarification. These authors described the distribution of this species in the Caatinga biome based on the localities and/or examination of the same material

described by DIXON (1983) as "*Liophis miliaris mossoroensis*" in the municipalities of Barreiras, Bahia, and Quebrangulo, Alagoas. Although we included this species record for Ceará, an integrative taxonomic revision of the *Liophis miliaris* complex is needed to clarify its distribution.

Oxyrhopus melanogenys orientalis, referred to by GUEDES et al. (2014b) as *Oxyrhopus* sp. or *O. aff. melanogenys*, is restricted to humid forests on crystalline formations (Maciço de Baturité) and humid forests on sedimentary formations (Planalto da Ibiapaba at altitudes above 700 m [LOEBMANN & ROBERTO 2009]). The records reported by GUEDES et al. (2014b) for the municipalities of Sobral and Santana do Acaraú, in low-altitude areas with xerophytic vegetation, seem dubious in that they do not agree with the habitat normally occupied by this species. Therefore, they were not included in our study (see Supplementary table S2). Additionally, records from the Chapada do Araripe (RIBEIRO et al. 2012) referred in fact to a variant of *Oxyrhopus trigeminus* (I. J. ROBERTO pers. comm.). Populations referred to as *Cnemidophorus pyrrhogularis* from the Chapada do Araripe (see RIBEIRO et al. 2015) were subsequently re-identified as *C. ocellifer* by OLIVEIRA et al. (2015). The record of *Amerotyphlops reticulatus* from the municipality of Limoeiro do Norte (DIXON & HENDRICKS 1979) seems inaccurate. This species is found in the Amazon Forest and was believed to occur in the Caatinga (GUEDES et al. 2014b) based on this specimen without examination by these authors. SILVA (2010) analysed this specimen (IB 20336) and concluded that it was not representative of *A. reticulatus*, restricting the species' distribution to the northern regions of the Amazon Basin. The record of *Amerotyphlops* aff. *amoipira* from the municipality of São Gonçalo do Amarante in the coastal vegetation complex (BORGES-LEITE et al. 2014) warrants further examination. The recent record of *A. paucisquamus* from the municipality of Caucaia (GRABOSKI et al. 2015), in the same environment as São Gonçalo do Amarante, suggests that the specimen of *A. aff. amoipira* may be *A. paucisquamus*.

Some amphibian species, such as *Adenomera* cf. *juikitam*, *Adenomera hylaedactyla*, referred to as *Adenomera* aff. *hylaedactyla* (e.g., BORGES-LEITE et al. 2015), *Leptodactylus macrosternum*, and *Siphonops* sp. (aff. *paulensis*) still need an integrative taxonomic revision to fix their taxonomic status. The species *Adenomera* cf. *juikitam* was identified by FOUCET et al. (2014) as *Adenomera* sp. I, a clade originating from the Amazon region that dispersed throughout the Cerrado biome 18 Mya. This species occurs in the Cerrado and Caatinga of Ceará, Piauí, Maranhão, and Tocantins. Based on preliminary bioacoustic analyses, this Ceará species is closely related to *Adenomera juikitam* (T. R. CARVALHO pers. comm.). Since FOUCET et al. (2014) did not analyse tissues of *A. juikitam*, we have here maintained the name *Adenomera* cf. *juikitam* for the populations of the highland marshes of Ceará until a taxonomic revision is conducted. Likewise, *Adenomera hylaedactyla* has a wider distribution from eastern French Guyana throughout the Brazilian Amazon region, central Brazil, and the Atlantic Forest in northeastern Brazil, and a highly

diverse genetic structure among the different populations, possibly forming a species complex (FOUQUET et al. 2014). Therefore, until further taxonomic studies on the *Adenomera hylaedactyla* clade will be conducted, we will refer to the species found in Serra da Ibiapaba and on the west coast of Ceará as *Adenomera hylaedactyla*.

Although DE SÁ et al. (2015) included *L. macrosternum* only based on its type locality in the state of Bahia, they did not assign a valid name to the populations in the Caatinga biome. Thus, we maintain the name *L. macrosternum* for the Caatinga populations until a taxonomic review of the *L. latrans* group will be conducted, in line with other authors (see RIBEIRO et al. 2015, SANTANA et al. 2015). The populations identified as *Proceratophrys cristiceps* from the municipalities of Crateús, Pacajus, and Jaguaribe (see BORGES-NOJOSA & CASCON 2005, BORGES-NOJOSA et al. 2010, SANTANA et al. 2015) were not examined either, and therefore we maintain this species on the list until a taxonomic review of this material and that from other localities within the Caatinga biome will be carried out.

Biogeographic distribution patterns in phytoecological units

Species typical of the Cerrado Domain in Ceará are found in the northwestern regions, from the Planalto da Ibiapaba mountain range to the west coast and in the Chapada do Araripe Plateau in southern Ceará. One possible route that explains this distribution would be through the Cerrados of the state of Piauí. The corridor of mesic habitats through the littoral of Ceará, part of the coastal vegetation complex, with dry forests and patches of savanna, seems to be an important dispersal route for some species in Ceará, both for species typical of Cerrado and the Amazon Forest, and occasionally connecting to the Atlantic Forest. For example, the snake *Sibon nebulata*, a species from the Amazon Forest, was recorded from moist and dry forests of the Planalto da Ibiapaba, the dry forests on the western coast of Ceará (municipality of Trairi), and the Serra de Baturité mountain range, suggesting a dispersal route to the Atlantic Forest. This may also be the case in the snake *Lygophis paucidens* that has populations living in the transitional areas between Cerrado and Caatinga in the state of Piauí and on to the coast of Ceará. WERNECK et al. (2012) investigated the historical distribution of the Cerrado biome during Quaternary climatic fluctuations and found evidence of two savanna corridors, one connecting elements of the fauna of the Andes with central Brazil and a more recent one connecting the savannas of the northern Amazon with the Cerrado along the Atlantic coast. Their results corroborate the distribution patterns of the Cerrado herpetofauna in Ceará.

The strong influence of Cerrado on the herpetofauna of Ceará has been previously reported by LOEBMANN & HADDAD (2010). Our study supports their findings and may explain the presence of several Atlantic Forest species in the Caatinga as mentioned by BORGES-NOJOSA & CARAMASCHI (2003) and BORGES-NOJOSA (2007).

In addition to the presence of Atlantic Forest herpetofaunal elements, many species from the Amazon Forest, were also found. A dispersal route for these species might have opened up when highland marshes formed during the Quaternary, according to the Pleistocene Refuge Theory (HAFFER 1969, VANZOLINI 1981). This connection hypothesis is strongly supported by the presence of genera such as *Adelophryne*, *Gonatodes*, *Leposoma*, *Polychrus*, *Lachesis*, *Sibon*, and *Pristimantis*. However, the time of divergence of *Adelophryne* species of the Amazon Forest from the *Adelophryne* in the northern Atlantic Forest, including *A. baturitensis* and *A. maranguapensis*, was approximately 23–16 Mya, during the Miocene (FOUQUET et al. 2012).

The highland marshes of Ceará, along with the Pernambuco Endemism Centre, are considered part of the northern portion of the Brazilian Atlantic Forest (SILVA & CASTELETTI 2003). However, recent studies have shown that the species distribution patterns of these areas are more closely related to the Amazon Forest than to the Atlantic Forest (SANTOS et al. 2007, CANEDO & HADDAD 2012).

Regardless of the influence of the Amazon and Atlantic Forests on the composition of the herpetofauna of Ceará, most species typical of moist forests, e.g., *Atractus ronnie*, *Amphisbaena* sp., *Rhinella casconi*, *Dendropsophus* sp. (aff. *decipiens*), *Placosoma* sp., *Leposoma baturitensis*, *Bothrops* sp. (aff. *atrox*) are endemic to the highland marshes of Ceará, especially in the Serra de Baturité, Serra de Maranguape, Serra da Aratanha, and on the Planalto da Ibiapaba. The isolation period of these mountain forest refugia led to a vicariate speciation, evidencing a past connection to both Neotropical rainforests of Brazil. In addition to the high level of endemism of the herpetofauna in the highland marshes of Ceará, our results also suggest low similarities with Atlantic Forest elements of the Pernambuco Endemism Center (PRANCE 1982, 1987, SILVA & CASTELETTI 2003) and other highland marshes of northeastern Brazil. SANTOS et al. (2007), based on the biogeographical relationships between the tropical forests of northeastern Brazil, the Amazon, and southern Atlantic Forest, suggested that these Caatinga forest enclaves do not represent a single biogeographical entity and Baturité would form a distinctive biogeographical unit that is more closely related to the Amazon Forest and the Pernambuco centre of endemism. Therefore, we believe that areas at higher altitudes in the Serras do Aratanha, Maranguape, Baturité, and on the Planalto da Ibiapaba constitute an independent endemism centre. These areas characterize the Ceará Endemism Centre, which is composed of moist forest species originating from ancestors in the Amazon and Atlantic forests. In conclusion, our findings suggest that the herpetofauna of Ceará was formed mainly by dispersal events, including species typical of forests and open areas that alternated in their invasions several times following glacial/warm periods. However, some species recorded from the state underwent a process of vicariate speciation, especially the ones that are associated with relict moist forests at higher-altitude areas.

Conservation of the Herpetofauna of Ceará

Two amphibian species of Ceará are classified as ‘threatened’ (IUCN 2015). However, some considerations should be discussed regarding the conservation status of *Adelophryne baturitensis*. This species has been assigned the status of ‘vulnerable’ because of its restricted distribution, e.g., less than 20,000 km², occurring only in Serra de Baturité (SILVANO & BORGES-NOJOSA 2004). Its currently known distribution range is wider than previously reported, and it has also been recorded from the relict moist forests of the Planalto da Ibiapaba, the Serra de Aratana, and the Serra de Maranguape (LOEBMANN & HADDAD 2010, FOUCET ET AL. 2012, CASCON ET AL. 2014). Another issue is the potential decline of the population at the type locality (Serra de Baturité) (ETEROVICK ET AL. 2005). This assessment is highly speculative, because information on the biology of this species was very scarce at that time. Recently, it was reported as being one of the most abundant species in the moist forests of the Planalto da Ibiapaba, including the Ubajara National Park (LOEBMANN & HADDAD 2010), as well as in other areas where it has been found. Additionally, the threat level for *A. baturitensis* has been decreased to a status of ‘least concern’ in the Brazilian Red List (HADDAD ET AL. 2013, MINISTÉRIO DO MEIO AMBIENTE 2014). Therefore, we believed that *A. baturitensis* is not threatened worldwide and its conservation status needs to be reviewed.

On the other hand, several endemic undescribed species of Ceará may be threatened, especially due their restricted ranges that are mostly small and cover less than 20,000 km². Among these species are *Adelophryne maranguapensis*, *Bothrops* sp. (aff. *atrox*), *Rhinella casconi*, *Dendropsophus* sp. (aff. *decipiens*), *Placosoma* sp., *Scinax* sp. (aff. *hayii*), and *Apostolepis* sp. (gr. *nigrolineata*). Based on our findings, most of these must be considered gap species and thus do not occur in any protected area of Ceará. These species inhabit the Serra de Baturité and/or Serra de Maranguape, which are both considered priority areas for biodiversity conservation (MINISTÉRIO DO MEIO AMBIENTE 2007) and of extreme importance for amphibian and snake conservation in the Caatinga Biome and semiarid regions of Brazil (CAMARDELLI & NAPOLI 2012, GUEDES ET AL. 2014a). These areas suffer from high rates of deforestation, especially for banana plantations and human settlements (LIMA & CASCON 2008). Illegal collection of and trade in bromeliads in the Serra de Maranguape is another serious threat for *A. maranguapensis* (LIMA & CASCON 2008), because of its specialized reproductive mode of oviposition in bromeliads and the direct development of their eggs (CASSIANO-LIMA ET AL. 2011).

The lack of an IUCN conservation assessment for the majority of reptiles that occur in Ceará is a conservation issue discussed by BÖHM ET AL. (2013). These authors estimate that only 35% of reptile species of the world have been assessed by the IUCN and Latin America is one of the largest geographical gaps regarding species assessed. While this is beginning to be addressed now, obtaining data on popula-

tion sizes and possible declines at regional and global levels still remain major obstacles to determining accurate conservation statuses for reptiles, which in most of the cases are based only on distribution range sizes (BÖHM ET AL. 2013).

According to the Ministério do Meio Ambiente (2014), only *Atractus ronnie* (‘endangered’), *Amerotyphlops paucisquamis* (‘vulnerable’), and *Leposoma baturitensis* (‘endangered’) are threatened squamates in Ceará. While *A. ronnie* and *L. baturitensis* have wide geographic distributions in the state and occur at least in three mountain formations (BORGES-NOJOSA & CARAMASCHI 2003, LOEBMANN ET AL. 2009, ROBERTO & ALBANO 2012), the amphibian *A. maranguapensis* is considered ‘vulnerable’, inhabiting only the Serra de Maranguape and a range of less than 5000 km². These examples illustrate how misleading this classification can be, especially because all species lack data regarding their population sizes and signs of decline.

Our results emphasize the need to create conservation units in the Serra de Maranguape, on the slopes of the Chapada do Araripe, and in the Serra de Baturité to protect their endemic herpetofauna.

One important issue is the need to describe the endemic and possible threatened herpetofauna of Ceará. A total of 66.6% of the endemic reptile species and 50% of the endemic amphibians have not been described (I. J. ROBERTO pers. comm.) and consequently are overlooked in conservation efforts.

Finally, the present study emphasizes the relevance and urgency to create a red list of species of Ceará, as has been done for other states in southern Brazil (e.g., BERGALLO ET AL. 2000, FONTANA ET AL. 2003, MIKICH & BÉRNILS 2004, PASSAMANI & LUCENA 2007, SÃO PAULO 2008). Additionally, species conservation statuses in this regional context should follow IUCN criteria for better comparison (GÄRDENFORS ET AL. 2001). This information will provide a framework for the development of strategies for the conservation of the herpetofauna of Ceará.

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Supplementary material

Additional information is available in the online version of this article at <http://www.salamandra-journal.com>

2 Supplementary tables, 2 Supplementary files, 13 Supplementary figures

Table S1. Details of the amphibian species distribution.

Table S2. Details of the reptile species distribution.

Supplementary file S3. Analyzed specimens of amphibians.

Supplementary file S4. Analyzed specimens of reptiles.

Supplementary table S1. Details of the amphibian species distribution in the state of Ceará, with its respective municipalities, and bibliographic source. (*): records from this study.

Taxon	Municipalities	References
1 <i>Adelophryne baturitensis</i>	Guaramiranga, Pacoti, Ibiapina, Maranguape, Pacatuba, Tianguá, Ubajara, Viçosa do Ceará.	HOOGMOED et al. 1994, LOEBMANN & HADDAD 2010, FOUQUET et al. 2012, CASCON et al. 2014.
2 <i>Adelophryne maranguapensis</i>	Maranguape.	HOOGMOED et al. 1994, FOUQUET et al. 2012.
3 <i>Pristimantis</i> sp.	Aratuba, Granja, Guaramiranga, Maranguape, Mulungu, Pacatuba, Pacoti, Tianguá, Urubure-tama.	BORGES-NOJOSA 2007, LOEBMANN & HADDAD 2010, CASCON et al. 2014.
4 <i>Phyllomedusa nordestina</i>	Barbalha, Caucaia, Crateús, Guaraciaba do Norte, Guaramiranga, Icapuí, Jaguaribe, Jati, Maranguape, Milagres, Missão Velha, Morada Nova, Mulungu, Nova Olinda, Nova Russas, Pacajus, Pacoti, Santana do Cariri, São Gonçalo do Amarante, Tianguá, Trairi, Ubajara.	CARAMASCHI 2006, BORGES-NOJOSA et al. 2010, LOEBMANN & HADDAD 2010, LOEBMANN & MAI 2008, RIBEIRO et al. 2012, BORGES-LEITE et al. 2014, RIBEIRO et al. 2015, SANTANA et al. 2015, *.
5 <i>Corythomantis greeningi</i>	Barbalha, Caucaia, Crateús, Crato, Jaguaribe, Jati, Ubajara, Maranguape, Milagres, Missão Ve-lha, Mulungu, Nova Olinda, Pacatuba, Santana do Cariri, Ubajara, Viçosa do Ceará.	BORGES-NOJOSA & CASCON 2005, BORGES-NOJOSA 2007, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, RIBEIRO et al. 2015, SANTANA et al. 2015, *.
6 <i>Dendropsophus minusculus</i>	Caucaia, Crateús, Fortaleza, Guaraciaba do Norte, Guaramiranga, Pacajus, Pacatuba, Pacoti, 2010, CASCON et al. 2014, BORGES-LEITE et al. 2014, São Gonçalo do Amarante, Trairi, Ubajara, Uru-ZINA et al. 2014, *.	BORGES-NOJOSA et al. 2010, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, RIBEIRO et al. 2015, *.
7 <i>Dendropsophus</i> sp. (aff. <i>decipiens</i>)	Guaramiranga, Maranguape, Pacatuba.	BORGES-NOJOSA 2007, *.
8 <i>Dendropsophus minutus</i>	Barbalha, Crateús, Crato, Jati, Morada Nova, Nova Olinda, Pacoti, Santana do Cariri, Tian-guá, Ubajara.	BORGES-NOJOSA 2007, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, RIBEIRO et al. 2015, *.
9 <i>Dendropsophus nanus</i>	Barbalha, Caucaia, Crateús, Crato, Guaraciaba do Norte, Ibiapina, Jaguaribe, Milagres, Missão Velha, Morada Nova, Nova Olinda, Pacajus, Santana do Cariri, São Gonçalo do Amarante, Viçosa do Ceará.	SCHUBART 1942, BORGES-NOJOSA et al. 2010, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, BORGES-LEITE et al. 2014, RIBEIRO et al. 2015, SANTANA et al. 2015, *.
10 <i>Dendropsophus rubicundulus</i>	Viçosa do Ceará, Morada Nova.	LOEBMANN & HADDAD 2010, *.
11 <i>Dendropsophus soaresi</i>	Barbalha, Caucaia, Crateús, Crato, Fortaleza, Guaramiranga, Jati, Milagres, Missão Velha, Mu-lungu, Tianguá, Trairi, Ubajara, Viçosa do Ceará.	LUTZ 1973, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, RIBEIRO et al. 2015, *.
12 <i>Hypsiboas multifasciatus</i>	Granja, Guaraciaba do Norte, Viçosa do Ceará.	LOEBMANN et al. 2007, *.
13 <i>Hypsiboas raniceps</i>	Aratuba, Barbalha, Beberibe, Caucaia, Crateús, Crato, Fortaleza, Guaramiranga, Jaguaribe, Jati, Maranguape, Milagres, Missão Velha, Mulungu, Nova Olinda, Pacajus, Santana do Cariri, São Gonçalo do Amarante, Ubajara.	SCHUBART 1942, LUTZ 1973, BORGES-NOJOSA & CASCON 2005, BORGES-NOJOSA 2007, BORGES-NOJOSA et al. 2010, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, BORGES-LEITE et al. 2014, RIBEIRO et al. 2015, SANTANA et al. 2015, *.
14 <i>Scinax fuscomarginatus</i>	Caucaia, São Gonçalo do Amarante, Viçosa do Ceará.	LEITE JR. et al. 2008, BORGES-LEITE et al. 2014, *.
15 <i>Scinax pachycrus</i>	Milagres.	LIMA-VERDE & CASCON 1990, *.
16 <i>Scinax nebulosus</i>	Caucaia, Ibiapina, São Gonçalo do Amarante, Tianguá, Trairi, Ubajara.	LOEBMANN & HADDAD 2010, *.
17 <i>Scinax</i> sp. (gr. <i>ruber</i>)	Crato, Viçosa do Ceará, Caucaia.	LOEBMANN & HADDAD 2010, *.
18 <i>Scinax</i> sp. (aff. <i>hayii</i>)	Guaramiranga, Pacoti.	*
19 <i>Scinax x-signatus</i>	Ariape, Barbalha, Beberibe, Caucaia, Crateús, Crato, Fortaleza, Guaramiranga, Iguatu, Jagua-ribe, Jati, Maranguape, Milagres, Missão Velha, Mulungu, Nova Olinda, Pacajus, Pacoti, Santana do Cariri, São Gonçalo do Amarante, Tianguá, Ubajara, Viçosa do Ceará.	SCHUBART 1942, LUTZ 1973, BORGES-NOJOSA & CASCON 2005, BORGES-NOJOSA 2007, BORGES-NOJOSA et al. 2010, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, BORGES-LEITE et al. 2014, RIBEIRO et al. 2015, SANTANA et al. 2015, *.

Taxon	Municipalities	References
20 <i>Trachycephalus atlas</i>	Jati.	ROBERTO et al. 2011.
21 <i>Trachycephalus typhonius</i>	Caucaia, Guaramiranga, Horizonte, Maranguape, Mulungu, Pacoti, Ubajara, Viçosa do Ceará.	BORGES-NOJOSA 2007, LOEBMANN & HADDAD 2010, *.
22 <i>Physalaemus albifrons</i>	Araripe, Barbalha, Brejo Santo, Caucaia, Crato, Fortaleza, Jaguaribe, Jati, Milagres, Missão Velha, Morada Nova, Nova Olinda, Nova Russas, Pacajus, Santana do Cariri, Santa Quitéria, São Gonçalo do Amarante, Trairi, Viçosa do Ceará.	NASCIMENTO et al. 2005, LOEBMANN & MAI 2008, BORGES-NOJOSA et al. 2010, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, BORGES-LEITE et al. 2014, RIBEIRO et al. 2015, SANTANA et al. 2015, *.
23 <i>Physalaemus cicada</i>	Acopiara, Aiuba, Barro, Brejo Santo, Crato, Crateús, Farias Brito, Jaguaribe, Missão Velha, Nova Russas, Santana do Cariri, Santa Quitéria, Várzea Alegre.	NASCIMENTO et al. 2005, LOEBMANN & MAI 2008, RIBEIRO et al. 2012, DA SILVA et al. 2013, RIBEIRO et al. 2015, SANTANA et al. 2015.
24 <i>Physalaemus cuvieri</i>	Araripe, Barbalha, Caucaia, Crateús, Crato, Guaramiranga, Jaguaribe, Jati, Maranguape, Milagres, Missão Velha, Mulungu, Nova Olinda, Pacajus, Pacatuba, Pacoti, Santana do Cariri, São Gonçalo do Amarante, Tianguá, Ubajara.	BORGES-NOJOSA & CASCON 2005, BORGES-NOJOSA 2007, BORGES-NOJOSA et al. 2010, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, BORGES-LEITE et al. 2014, SANTANA et al. 2015, *.
25 <i>Pleurodema diplolister</i>	Beberibe, Caucaia, Crateús, Crato, Jaguaribe, Lagoinha, Milagres, Missão Velha, Nova Russas, Paraipaba, Santana do Cariri, São Gonçalo do Amarante, Trairi, Viçosa do Ceará.	BORGES-NOJOSA & CASCON 2005, BORGES-NOJOSA et al. 2010, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, RIBEIRO et al. 2015, SANTANA et al. 2015, *.
26 <i>Pseudopaludicola mystacalis</i>	Barbalha, Caucaia, Crateús, Crato, Itapipoca, Milagres, Missão Velha, Paraipaba, São Gonçalo do Amarante, Ubajara, Viçosa do Ceará.	LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, PAN-SONATO et al. 2014, RIBEIRO et al. 2015, *.
27 <i>Pseudopaludicola pocoto</i>	Barbalha, Fortaleza, Jaguaribe, Jati, Limoeiro do Norte, Missão Velha, Morada Nova, Nova Russas, Pacatuba, Santa Quitéria.	LOEBMANN & HADDAD 2010, MAGALHÃES et al. 2014, RIBEIRO et al. 2015, SANTANA et al. 2015, *.
28 <i>Pseudopaludicola jaredi</i>	Viçosa do Ceará.	LOEBMANN & HADDAD 2010, ANDRADE et al. 2016.
29 <i>Adenomera cf. juikitam</i>	Barbalha, Crateús, Crato, Guaramiranga, Maranguape, Pacatuba, Pacoti, Santana do Cariri, Tianguá, Ubajara, Uruburetama, Viçosa do Ceará.	LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, RIBEIRO et al. 2015, *.
30 <i>Adenomera hylaedactyla</i>	São Gonçalo do Amarante, Viçosa do Ceará.	LOEBMANN & HADDAD 2010, BORGES-LEITE et al. 2014, BORGES-LEITE et al. 2015, *.
31 <i>Leptodactylus caatingae</i>	Brejo Santo.	VIEIRA et al. 2012.
32 <i>Leptodactylus fuscus</i>	Barbalha, Caucaia, Crateús, Crato, Granja, Ibiapina, Jaguaribe, Jati, Jijoca, Milagres, Missão Velha, Nova Russas, Pacajus, Paracuru, Santana do Cariri, São Gonçalo do Amarante, Viçosa do Ceará.	LOEBMANN & MAI 2008, BORGES-NOJOSA et al. 2010, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, BORGES-LEITE et al. 2014, RIBEIRO et al. 2015, SANDO et al. 2015, *.
33 <i>Leptodactylus macrosternum</i>	Barbalha, Caucaia, Crateús, Crato, Fortaleza, Guaramiranga, Itapipoca, Jaguaribe, Jati, Maranguape, Milagres, Missão Velha, Nova Olinda, Pacajus, Quixadá, Santana do Cariri, São Gonçalo do Amarante, Ubajara.	SCHUBART 1942, SCHMIDT & INGER 1951, BORGES-NOJOSA & CASCON 2005, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, CASTRO et al. 2013, BORGES-LEITE et al. 2014, RIBEIRO et al. 2015, SANTANA et al. 2015, *.
34 <i>Leptodactylus mystaceus</i>	Barbalha, Caucaia, Crato, Guaramiranga, Ibiapina, Mulungu, Nova Olinda, Pacajus, Pacatuba, Santana do Cariri, São Gonçalo do Amarante, Tianguá, Ubajara, Uruburetama, Viçosa do Ceará.	BORGES-NOJOSA 2007, BORGES-NOJOSA et al. 2010, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, BORGES-LEITE et al. 2014, RIBEIRO et al. 2015, *.
35 <i>Leptodactylus</i> sp. (aff. <i>syphax</i>)	Crateús, Milagres, Pacatuba, Pacoti, Ubajara, Uruburetama, Viçosa do Ceará.	LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, *.
36 <i>Leptodactylus natalensis</i>	Guaramiranga.	BORGES-NOJOSA 2007.
37 <i>Leptodactylus pustulatus</i>	Caucaia, Fortaleza, Guaramiranga, Pacajus, São Gonçalo do Amarante.	BORGES-NOJOSA 2007, BORGES-NOJOSA et al. 2010, CASTRO et al. 2013, *.

Taxon	Municipalities	References
38 <i>Leptodactylus troglodytes</i>	Araripe, Barbalha, Caucaia, Crateús, Crato, Ibiapina, Jaguaribe, Jati, Maranguape, Milagres, Missão Velha, Nova Olinda, Pacajus, Pacatuba, Santana do Cariri, São Gonçalo do Amarante, Ubajara, Viçosa do Ceará.	BORGES-NOJOSA 2007, BORGES-NOJOSA et al. 2010, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, BORGES-LEITE et al. 2014, RIBEIRO et al. 2015, SANTANA et al. 2015, *.
39 <i>Leptodactylus vastus</i>	Araripe, Barbalha, Caucaia, Crateús, Crato, Fortaleza, Guaramiranga, Jaguaribe, Jardim, Jati, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, Maranguape, Milagres, Missão Velha, Mulungu, BORGES-LEITE et al. 2014, RIBEIRO et al. 2015, *. Nova Olinda, Santana do Cariri, São Gonçalo do Amarante, Ubajara, Uruburetama, Viçosa do Ceará.	SCHUBART 1942, HEYER 2005, BORGES-NOJOSA 2007,
40 <i>Leptodactylus cf. furnarius</i>	Pacoti, São Benedito.	BORGES-NOJOSA 2007, *.
41 <i>Odontophrynus carvalhoi</i>	Guaramiranga, Ibiapina, Pacoti, Ubajara.	BORGES-NOJOSA 2007, LOEBMANN & HADDAD 2010.
42 <i>Proceratophrys caramaschii</i>	Aquiraz, Caucaia, Fortaleza, Ibiapina, Mulungu, Pacoti, Paracuru, Paraipaba, São Gonçalo do Amarante, Tianguá, Ubajara, Viçosa do Ceará.	LOEBMANN & HADDAD 2010, CRUZ et al. 2012, BORGES-LEITE et al. 2014, NUNES et al. 2015, *.
43 <i>Proceratophrys aridus</i>	Barbalha, Crato, Jati, Milagres, Missão Velha, Nova Olinda, Santana do Cariri.	CRUZ et al. 2012, RIBEIRO et al. 2012, *.
44 <i>Proceratophrys cristiceps</i>	Crateús, Jaguaribe, Pacajus.	BORGES-NOJOSA & CASCON, 2005, BORGES-NOJOSA et al. 2010, RIBEIRO et al. 2015, SANTANA et al. 2015.
45 <i>Proceratophrys renalis</i>	Maranguape, Pacatuba.	PRADO & POMBAL 2008.
46 <i>Rhinella granulosa</i>	Barbalha, Caucaia, Crateús, Crato, Fortaleza, Jaguaribe, Jati, Maranguape, Milagres, Missão Velha, Mulungu, Nova Olinda, Pacajus, Pacoti, Santana do Cariri, São Gonçalo do Amarante, Sobral, Viçosa do Ceará.	SCHUBART 1942, SCHMIDT & INGER 1951, BORGES-NOJOSA & CASCON 2005, NARVAES & RODRIGUES 2009, BORGES-NOJOSA et al. 2010, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, BORGES-LEITE et al. 2014, RIBEIRO et al. 2015, SANTANA et al. 2015, *.
47 <i>Rhinella jimi</i>	Barbalha, Caucaia, Crateús, Crato, Fortaleza, Jaguaribe, Jati, Maranguape, Milagres, Missão Velha, Mulungu, Nova Olinda, Pacajus, Pacatuba, Paraipaba, Pacoti, São Gonçalo do Amarante, Santana do Cariri, Sobral, Ubajara, Viçosa do Ceará.	BORGES-NOJOSA et al. 2010, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, BORGES-LEITE et al. 2014, RIBEIRO et al. 2015, SANTANA et al. 2015, *.
48 <i>Rhinella hoogmoedi</i>	Guaramiranga, Pacoti.	CARAMASCHI & POMBAL JR 2006.
49 <i>Rhinella casconii</i>	Guaramiranga, Pacoti.	BALDISSERA JR. et al. 2004, ROBERTO et al. 2014b.
50 <i>Dermatonotus muelleri</i>	Barbalha, Caucaia, Crateús, Crato, Jaguaribe, Milagres, Missão Velha, Mulungu, Nova Olinda, Pacajus, Pacoti, Paraipaba, Santana do Cariri, São Gonçalo do Amarante, Ubajara, Viçosa do Ceará.	BORGES-NOJOSA 2007, BORGES-NOJOSA et al. 2010, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, BORGES-LEITE et al. 2014, RIBEIRO et al. 2015, SANTANA et al. 2015, *.
51 <i>Elachistocleis piauiensis</i>	Jaguaribe, Milagres, Missão Velha, Mombaça, Nova Russas, Viçosa do Ceará.	SANTOS et al. 2005, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2015, SANTANA et al. 2015, *.
52 <i>Elachistocleis cesarii</i>	Caucaia, São Gonçalo do Amarante.	CARAMASCHI 2010, BORGES-LEITE et al. 2014.
53 <i>Pipa carvalhoi</i>	Barbalha, Crato, Jardim, Milagres.	SCHUBART 1942, RIBEIRO et al. 2012, RIBEIRO et al. 2015.
54 <i>Pipa pipa</i>	Fortaleza.	*
55 <i>Lithobates catesbeianus</i>	Fortaleza.	BOTH et al. 2011.
56 <i>Siphonops sp. (aff. paulensis)</i>	Brejo Santo, Crato, Crateús, Guaramiranga, Ibiapina, Maranguape, Mulungu, Ubajara.	BORGES-NOJOSA 2007, LOEBMANN & HADDAD 2010, GOGLIATH et al. 2015, DA SILVA et al. 2015, *.
57 <i>Chthonerpeton arii</i>	Limoeiro do Norte.	CASCON & LIMA-VERDE 1994.

Supplementary table S2. Details of the reptile species distribution in the state of Ceará, with respective municipalities, and bibliographic source. (*): records from this study.

Taxon	Municipalities	References
1 <i>Caretta caretta</i>	Not available	ROCHA 1948.
2 <i>Chelonia mydas</i>	Not available	ROCHA 1948.
3 <i>Eretmochelys imbricata</i>	Not available	ROCHA 1948.
4 <i>Lepidochelys olivacea</i>	Not available	ROCHA 1948.
5 <i>Dermochelys coriacea</i>	Not available	ROCHA 1948.
6 <i>Chelonoides carbonaria</i>	Not available	ROCHA 1948, *.
7 <i>Kinosternon scorpioides</i>	Caucaia, Crato, Fortaleza, Milagres, Nova Olinda, Pacatuba, Sobral, Ubajara.	ROCHA 1948, RIBEIRO et al. 2015, *.
8 <i>Mesoclemmys perplexa</i>	Granja, Viçosa do Ceará.	LOEBMANN 2008b, *.
9 <i>Mesoclemmys tuberculata</i>	Caucaia, Crato, Fortaleza, Icó, Jati, Pacajus, Pacatuba, Quixadá, São Gonçalo do Amarante, Viçosa do Ceará.	LUEDERWALDT 1926, BOUR & PAULER 1987, BORGES-NOJOSA et al. 2010, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, BORGES-LEITE et al. 2014, RIBEIRO et al. 2015, *.
10 <i>Phrynops geoffroanus</i>	Caucaia, Crato, Fortaleza, Milagres.	LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, RIBEIRO et al. 2015, *.
11 <i>Caiman crocodilus</i>	Caucaia, Crateús, Trairi.	BORGES-NOJOSA & CASCON 2005, *.
12 <i>Paleosuchus palpebrosus</i>	Crateús, São Benedito, Itapipoca.	LIMA et al. 2011a, *.
13 <i>Amphisbaena alba</i>	Barbalha, Caucaia, Crateús, Crato, Guaramiranga, Ibiapina, Maranguape, Milagres, Morada Nova, Pacatuba, São Benedito, Tianguá, Trairi, Ubajara.	BORGES-NOJOSA & CARAMASCHI 2003, BORGES-NOJOSA & CASCON 2005, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, RIBEIRO et al. 2015, *.
14 <i>Amphisbaena fuliginosa</i>	?	VANZOLINI 1951.
15 <i>Amphisbaena pretrei</i>	Barbalha, Crato, Ibiapina, Paraipaba, São Gonçalo do Amarante, Trairi.	VANZOLINI 1981, BORGES-NOJOSA & CARAMASCHI 2003, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, *.
16 <i>Amphisbaena vermicularis</i>	Araripe, Brejo Santo, Caucaia, Crato, Ibiapina, Maranguape, Nova Olinda, Paracuru, Paraipaba, São Benedito, São Gonçalo do Amarante, Trairi, Ubajara, Viçosa do Ceará.	BORGES-NOJOSA & CARAMASCHI 2003, BORGES-NOJOSA et al. 2010, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, BORGES-LEITE et al. 2014, RIBEIRO et al. 2015, *.
17 <i>Amphisbaena anomala</i>	Crateús, Ibiapina, São Benedito, Ubajara.	BORGES-NOJOSA & CARAMASCHI 2003, LOEBMANN & HADDAD 2010, *.
18 <i>Amphisbaena</i> sp.	Maranguape, Mulungu, Pacoti.	BORGES-NOJOSA & CARAMASCHI 2003.
19 <i>Amphisbaena polystega</i>	Barbalha, Caucaia, Crato, Ibiapina, Pacatuba, Paracuru, Paraipaba, São Benedito, São Gonçalo do Amarante, Tianguá, Trairi, Ubajara.	VANZOLINI 1981, BORGES-NOJOSA & CARAMASCHI 2003, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, *.
20 <i>Iguana iguana</i>	Barbalha, Caucaia, Crateús, Crato, Frecheirinha, Jati, Milagres, Missão Velha, Mulungu, Nova Olinda, Pacatuba, Santana do Cariri, São Gonçalo do Amarante.	BORGES-NOJOSA & CARAMASCHI 2003, BORGES-NOJOSA & CASCON 2005, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, BORGES-LEITE et al. 2014, RIBEIRO et al. 2015, *.
21 <i>Anolis fuscoauratus</i>	Guaramiranga, Ibiapina, Maranguape, Mulungu, Pacatuba, Pacoti, São Benedito, Tianguá, Ubajara.	BORGES-NOJOSA & CARAMASCHI 2003, LOEBMANN & HADDAD 2010, *.
22 <i>Anolis brasiliensis</i>	Barbalha, Crato, Nova Olinda.	VANZOLINI 1981, RIBEIRO et al. 2012, RIBEIRO et al. 2015.
23 <i>Polychrus acutirostris</i>	Barbalha, Caucaia, Crateús, Crato, Fortaleza, Ibiapina, Maranguape, Missão Velha, Mulungu, Nova Olinda, Pacatuba, Paracuru, Santana do Cariri, São Gonçalo do Amarante, Ubajara, Viçosa do Ceará.	VANZOLINI 1981, BORGES-NOJOSA & CARAMASCHI 2003, BORGES-NOJOSA et al. 2010, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, BORGES-LEITE et al. 2014, RIBEIRO et al. 2015, *.
24 <i>Polychrus marmoratus</i>	Guaramiranga, Ibiapina, Mulungu, Pacatuba, Pacoti, São Benedito, Ubajara.	BORGES-NOJOSA & CARAMASCHI 2003, LOEBMANN & HADDAD 2010, *.

Taxon	Municipalities	References
25 <i>Enyalius bibronii</i>	Araripe, Barbalha, Crateús, Crato, Granja, Guaramiranga, Ibiapaba, Mulungu, Pacatuba, Pacoti, Santana do Cariri, Ubajara.	BORGES-NOJOSA & CARAMASCHI 2003, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, RIBEIRO et al. 2015, *.
26 <i>Strobilurus torquatus</i>	Guaramiranga, Ibiapina, Maranguape, Pacatuba.	BORGES-NOJOSA & CARAMASCHI 2003.
27 <i>Tropidurus hispidus</i>	Araripe, Barbalha, Caucaia, Crateús, Crato, Fortaleza, Guaramiranga, Ibiapina, Itapipoca, Jati, Maranguape, Meruoca, Milagres, Mulungu, Pacajus, Pacoti, Paraipaba, Quixadá, São Benedito, São Gonçalo do Amarante, Tian-	VANZOLINI 1981, BORGES-NOJOSA & CARAMASCHI 2003, BORGES-NOJOSA et al. 2010, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, BORGES-LEITE et al. 2014, *.
28 <i>Tropidurus semitaeniatus</i>	guá, Trairi, Ubajara, Viçosa do Ceará.	VANZOLINI 1981, BORGES-NOJOSA & CARAMASCHI 2003, BORGES-NOJOSA et al. 2010, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, BORGES-LEITE et al. 2014, *.
29 <i>Tropidurus jaguaribanus</i>	Aiuaba, Banabuiú, Jaguaribara. Quixadá, São João do Jaguaribe.	PASSOS et al. 2011, ROBERTO et al. 2013, *.
30 <i>Stenocercus squarrosus</i>	Araripe, Santana do Cariri.	RIBEIRO et al. 2009, RIBEIRO et al. 2015.
31 <i>Hemidactylus brasiliensis</i>	Araripe, Aiuaba, Crateús, Crato, Ibiapina, Milagres, Misão Velha, Santana do Cariri, Ubajara.	BORGES-NOJOSA & CARAMASCHI 2003, BORGES-NOJOSA & CASCON 2005, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, RIBEIRO et al. 2015, *.
32 <i>Hemidactylus agrius</i>	Barbalha, Crateús, Crato, Ibiapina, Itaitinga, Maranguape, Pacatuba, Paraipaba, Pentecoste, São Gonçalo do Amarante, Ubajara, Viçosa do Ceará.	VANZOLINI 1978, BORGES-NOJOSA & CARAMASCHI 2003, BORGES-NOJOSA & CASCON 2005, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, BORGES-LEITE et al. 2014, PASSOS et al. 2015, RIBEIRO et al. 2015, *.
33 <i>Hemidactylus mabouia</i>	Barbalha, Beberibe, Crateús, Crato, Fortaleza, Guaramiranga, Ibiapina, Itaitinga, Maranguape, Missão Velha, Mulungu, Pacajus, Pacoti, Palmácia, Santana do Cariri, São Gonçalo do Amarante, Tianguá, Ubajara.	VANZOLINI 1978, BORGES-NOJOSA & CARAMASCHI 2003, BORGES-NOJOSA & CASCON 2005, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, BORGES-LEITE et al. 2014, RIBEIRO et al. 2015, *.
34 <i>Lygodactylus klugei</i>	Barbalha, Crateús, Crato, Fortaleza, Icapuí, Jati, Maranguape, Milagres, Misão Velha, São Gonçalo do Amarante, Juazeiro do Norte.	BORGES-NOJOSA & CARAMASCHI 2003, BORGES-NOJOSA & CASCON 2005, RIBEIRO et al. 2012, BORGES-LEITE et al. 2014, RIBEIRO et al. 2015, *.
35 <i>Gymnodactylus geckoides</i>	Araripe, Barbalha, Caucaia, Crateús, Crato, Jati, Milagres, Missão Velha, Mulungu.	VANZOLINI 1981, BORGES-NOJOSA & CARAMASCHI 2003, BORGES-NOJOSA & CASCON 2005, BORGES-NOJOSA et al. 2010, RIBEIRO et al. 2012, RIBEIRO et al. 2015, *.
36 <i>Phyllopezus pollicaris</i>	Barbalha, Crateús, Crato, Ibiapina, Jaguaribara, Jati, Maranguape, Milagres, Missão Velha, Mulungu, Nova Olinda, Pacatuba, Santana do Cariri, São Benedito, Tian-	VANZOLINI 1981, BORGES-NOJOSA & CARAMASCHI 2003, BORGES-NOJOSA & CASCON 2005, RIBEIRO et al. 2012, RIBEIRO et al. 2015, *.
37 <i>Phyllopezus periosus</i>	guá, Ubajara, Viçosa do Ceará.	
38 <i>Coleodactylus merionalis</i>	Brejo Santo, Mauriti, Milagres, Missão Velha, Icó, Jaguaribara, São João do Jaguaripe.	ROBERTO & BRITO 2004, LIMA et al. 2011b, RIBEIRO et al. 2015, DA SILVA-NETA et al 2015.
39 <i>Gonatodes humeralis</i>	Barbalha, Caucaia, Crateús, Crato, Guaramiranga, Icapuí, Maranguape, Nova Olinda, Pacajus, Pacatuba, Pacoti, Paraipaba, Santana do Cariri, São Gonçalo do Amarante, Tianguá, Trairi, Ubajara, Uruburetama.	VANZOLINI 1981, BORGES-NOJOSA & CARAMASCHI 2003, BORGES-NOJOSA & CASCON 2005, BORGES-NOJOSA et al. 2010, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, BORGES-LEITE et al. 2014, RIBEIRO et al. 2015, *.
40 <i>Micrablepharus maximiliani</i>	Trairi.	ROBERTO et al. 2014a.
	Barbalha, Caucaia, Crateús, Crato, Ibiapina, Jati, Milagres, Mulungu, Pacajus, Pacoti, Paraipaba, Santana do Cariri, São Gonçalo do Amarante, Tianguá, Trairi, Ubajara, Viçosa do Ceará.	VANZOLINI 1981, BORGES-NOJOSA & CARAMASCHI 2003, BORGES-NOJOSA & CASCON 2005, BORGES-NOJOSA et al. 2010, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, BORGES-LEITE et al. 2014, RIBEIRO et al. 2015, *.

Taxon	Municipalities	References
41 <i>Vanzosaura multiscutata</i>	Araripe, Caucaia, Crato, Jati, Milagres, Missão Velha, Nova Olinda, Pacajus, Paraipaba, Santana do Cariri, São Gonçalo do Amarante, Trairi, Viçosa do Ceará.	BORGES-NOJOSA & CARAMASCHI 2003, BORGES-NOJOSA & CASCON 2005, BORGES-NOJOSA et al. 2010, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, BORGES-LEITE et al. 2014, RIBEIRO et al. 2015, *.
42 <i>Acratosaura mentalis</i>	Mauriti.	BRITO et al. 2012.
43 <i>Colobosaura modesta</i>	Barbalha, Crateús, Crato, Ubajara.	BORGES-NOJOSA & CASCON 2005, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, RIBEIRO et al. 2015.
44 <i>Stenolepis ridleyi</i>	Aratuba, Guaramiranga, Mulungu, São Benedito.	BORGES-NOJOSA & CARAMASCHI 2003.
45 <i>Cercosaura ocellata</i>	São Benedito.	BORGES-NOJOSA & CARAMASCHI 2003.
46 <i>Placosoma sp.</i>	Maranguape, Pacoti.	BORGES-NOJOSA & CARAMASCHI 2003.
47 <i>Colobosauroides cearensis</i>	Aratuba, Fortaleza, Granja, Guaramiranga, Maranguape, Mulungu, Pacatuba, Pacoti, Paraipaba, São Gonçalo do Amarante, Trairi, Ubajara.	CUNHA et al. 1991, BORGES-NOJOSA & CARAMASCHI 2003, LOEBMANN & HADDAD 2010, BORGES-LEITE et al. 2014, *.
48 <i>Leposoma baturitensis</i>	Guaramiranga, Maranguape, Pacoti, Pacatuba, São Benedito, Ubajara.	RODRIGUES & BORGES 1997, BORGES-NOJOSA & CARAMASCHI 2003, ROBERTO & ALBANO 2012.
49 <i>Ameiva ameiva</i>	Araripe, Barbalha, Caucaia, Crateús, Crato, Fortaleza, Guaramiranga, Ibiapina, Jati, Maranguape, Milagres, Mu- lungu, Pacajus, Pacatuba, Pacoti, Paraipaba, São Benedito, São Gonçalo do Amarante, Tianguá, Trairi, Ubajara.	BORGES-NOJOSA & CARAMASCHI 2003, BORGES-NOJOSA & CASCON 2005, BORGES-NOJOSA et al. 2010, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, BORGES-LEITE et al. 2014, RIBEIRO et al. 2015, *.
50 <i>Cnemidophorus ocellifer</i>	Caucaia, Crateús, Crato, Fortaleza, Ibiapina, Icapuí, Jati, Milagres, Missão Velha, Nova Olinda, Pacajus, Paracuru, Paraipaba, Quixadá, Santana do Cariri, São Benedito, São Gonçalo do Amarante, Trairi, Ubajara.	BORGES-NOJOSA & CARAMASCHI 2003, BORGES-NOJOSA & CASCON 2005, BORGES-NOJOSA et al. 2010, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, BORGES-LEITE et al. 2014, RIBEIRO et al. 2015, *.
51 <i>Kentropyx calcarata</i>	Pacoti.	BORGES-NOJOSA & CARAMASCHI 2003.
52 <i>Tupinambis merianae</i>	Barbalha, Caucaia, Crateús, Crato, Guaramiranga, Jati, Milagres, Mulungu, Nova Olinda, Pacajus, São Gonçalo do Amarante, Trairi, Ubajara.	BORGES-NOJOSA & CARAMASCHI 2003, BORGES-NOJOSA & CASCON 2005, BORGES-NOJOSA et al. 2010, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, BORGES-LEITE et al. 2014, RIBEIRO et al. 2015, *.
53 <i>Tupinambis teguixin</i>	Chaval, Groaíras.	PASSOS et al. 2013, *.
54 <i>Mabuya arajara</i>	Barbalha, Crateús, Crato, Granja, Missão Velha, Nova Olinda, Santana do Cariri, Ubajara.	REBOUÇAS-SPIEKER 1991, ROBERTO & LOEBMANN 2010, RIBEIRO et al. 2012, RIBEIRO et al. 2015.
55 <i>Mabuya nigropunctata</i>	Guaramiranga, Mulungu, Pacoti, Ubajara.	BORGES-NOJOSA & CARAMASCHI 2003, LOEBMANN & HADDAD 2010.
56 <i>Mabuya heathi</i>	Araripe, Barbalha, Baturité, Caucaia, Crato, Fortaleza, Ibiapina, Jati, Milagres, Missão Velha, Mulungu, Nova Olinda, Pacajus, Paraipaba, Santana do Cariri, São Benedito, São Gonçalo do Amarante, Trairi, Ubajara.	SCHMIDT & INGER 1951, Vanzolini 1981, BORGES-NOJOSA & CARAMASCHI 2003, BORGES-NOJOSA et al. 2010, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, BORGES-LEITE et al. 2014, RIBEIRO et al. 2015, *.
57 <i>Mabuya frenata</i>	Barbalha, Crato, Santana do Cariri.	RIBEIRO et al. 2012, RIBEIRO et al. 2015.
58 <i>Mabuya agmosticha</i>	Brejo Santo, Mauriti, Milagres.	MAGALHÃES Jr. et al. 2014.
59 <i>Diploglossus lessonae</i>	Barbalha, Crato, Guaramiranga, Maracanaú, Maranguape, Nova Olinda, Pacatuba, Pacoti.	VANZOLINI 1981, BORGES-NOJOSA & CARAMASCHI 2003, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, RIBEIRO et al. 2015.
60 <i>Ophiodes sp. (aff. striatus)</i>	Crato, Ibiapina, São Benedito, Tianguá, Ubajara.	BORGES-NOJOSA & CARAMASCHI 2003, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012.
61 <i>Liopholops cf. ternetzi</i>	Ubajara.	LOEBMANN 2009c.
62 <i>Amerotyphlops brongersmianus</i>	Caucaia, Trairi, Ubajara.	LOEBMANN 2008c, *.

Taxon	Municipalities	References
63 <i>Amerotyphlops</i> sp. (aff. <i>amoipira</i>)	Caucaia.	BORGES-LEITE et al. 2014.
64 <i>Amerotyphlops</i> <i>paucisquamus</i>	Caucaia.	GRABOSKI et al. 2015.
65 <i>Trilepida brasiliensis</i>	Crato, Ubajara, Viçosa do Ceará	BORGES-NOJOSA et al. 2009, LOEBMANN & HADDAD 2010.
66 <i>Epictia borapeliotes</i>	Aratuba, Limoeiro do Norte, Maranguape, Mulungu, Santana do Cariri, Várzea Alegre.	LIMA-VERDE 1976, ROBERTO & VEIGA 2009, RIBEIRO et al. 2012, RIBEIRO et al. 2015, *.
67 <i>Boa constrictor</i> <i>constrictor</i>	Barbalha, Caucaia, Crato, Fortaleza, Iguatu, Itapipoca, Jaguaribe Jati, Limoeiro do Norte, Maranguape, Milagres, Mulungu, Nova Olinda, Paracuru, Pentecoste, São Gonçalo do Amarante, Ubajara.	LIMA-VERDE 1976, BORGES-NOJOSA 2007, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, MESQUITA et al. 2013, BORGES-LEITE et al. 2014, GUEDES et al. 2014b, RIBEIRO et al. 2015, *.
68 <i>Corallus hortulanus</i>	Barbalha, Coreaú, Crato, Jardim, Jati, Limoeiro do Norte, Milagres, Missão Velha, Quixeramobim, Santana do Cariri, Tianguá, Ubajara.	LIMA-VERDE 1976, GUEDES et al. 2014b, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, RIBEIRO et al. 2015, *.
69 <i>Epicrates assisi</i>	Caucaia, Caririaçú, Crato, Fortaleza, Frecheirinha, Icó, Itapipoca, Limoeiro do Norte, Maracanaú, Maranguape, Milagres, Morada Nova, Nova Olinda, Pacatuba, Pacoti, Pentecoste, Santana do Cariri, São Gonçalo do Amarante, Tianguá, Ubajara.	AMARAL 1954, LIMA-VERDE 1976, BORGES-NOJOSA 2007, PASSOS & FERNANDES 2008, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, MESQUITA et al. 2013, BORGES-LEITE et al. 2014, GUEDES et al. 2014b, RIBEIRO et al. 2015, *.
70 <i>Eunectes murinus</i>	Aquiraz.	MENDONÇA et al. 2009.
71 <i>Bothrops</i> sp. (aff. <i>atrox</i>)	Araripe, Barbalha, Crato, Ibiapina, Nova Olinda, Santana do Cariri, São Benedito, Ubajara, Viçosa do Ceará.	PORTO & TEIXEIRA, 1995, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2014, GUEDES et al. 2014b, RIBEIRO et al. 2015.
72 <i>Bothrops lutzi</i>	Crateús, Ubajara, Tianguá.	BORGES-NOJOSA & CASCON 2005, LOEBMANN, 2009d, GUEDES et al. 2014b.
73 <i>Bothrops erythromelas</i>	Aquiraz, Baturité, Crateús, Crato, Fortaleza, Icapuí, Icó, Independência, Jaguaribara, Limoeiro do Norte, Milagres, Missão Velha, Pacatuba, Quixadá, Quixeramobim, Santana do Cariri, Solonópole, Viçosa do Ceará.	BORGES-NOJOSA 2005, BORGES-NOJOSA 2007, RIBEIRO et al. 2012, GUEDES et al. 2014b, RIBEIRO et al. 2015, *.
74 <i>Crotalus durissus</i>	Boa Viagem, Crateús, Fortaleza, Jaguaribe, Limoeiro do Norte, Mulungu, Pentecoste, Quixadá, Quixeramobim, São Luis do Curu, Solonópole, Viçosa do Ceará.	LIMA-VERDE 1976, BORGES-NOJOSA & CASCON 2005, BORGES-NOJOSA 2007, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, MESQUITA et al. 2013, GUEDES et al. 2014b, *,
75 <i>Lachesis muta</i>	Guaramiranga, Pacoti.	ROCHA 1948, BORGES-NOJOSA & LIMA-VERDE 1999.
76 <i>Micrurus</i> sp. (aff. <i>ibiboboca</i>)	Aquiraz, Aracioba, Barbalha, Baturité, Beberibe, Caucaia, Crateús, Crato, Eusébio, Fortaleza, Itaitinga, Itapipoca, Limoeiro do Norte, Maranguape, Milagres, Missão Velha, Mulungu, Pacoti, Paracuru, Pentecoste, Quixelô, Quixeramobim, Santana do Cariri, São Gonçalo do Amarante, São Benedito, Tauá, Tianguá, Trairi, Ubajara, Umirim.	LIMA-VERDE 1976, VANZOLINI 1981, BORGES-NOJOSA & CASCON 2005, BORGES-NOJOSA 2007, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, MESQUITA et al. 2013, BORGES-LEITE et al. 2014, GUEDES et al. 2014b, RIBEIRO et al. 2015, *.
77 <i>Micrurus lemniscatus</i> <i>dutius</i>	Ubajara.	LOEBMANN & HADDAD 2010.
78 <i>Micrurus lemniscatus</i> <i>lemniscatus</i>	Crato, Fortaleza, Guaramiranga, Icó, Tianguá, Ubajara, Viçosa do Ceará.	LOEBMANN 2009a, GUEDES et al. 2014b, RIBEIRO et al. 2015.
79 <i>Chironius bicarinatus</i>	Guaramiranga, Ibiapina, Maranguape, Pacoti, Tianguá, Ubajara.	DIXON et al. 1993, LOEBMANN & HADDAD 2010, GUEDES et al. 2014b.
80 <i>Chironius carinatus</i>	Baturité.	GUEDES et al. 2014b.
81 <i>Chironius exoletus</i>	Ubajara.	GUEDES et al. 2014b.
82 <i>Chironius flavolineatus</i>	Barbalha, Crato, Granja, Ibicutinga, Ubajara, Viçosa do Ceará.	DIXON et al. 1993, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, GUEDES et al. 2014b, *.

Taxon	Municipalities	References
83 <i>Drymarchon corais corais</i>	Amontada, Beberibe, Fortaleza, Guaramiranga, Justiniano Serpa, Mulungu, Pacoti, São Gonçalo do Amarante, São Luis do Curu, Ubajara, Viçosa do Ceará.	BORGES-NOJOSA 2007, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, BORGES-LEITE et al. 2014, GUEDES et al. 2014b,*.
84 <i>Drymoluber dichrous</i>	Crato, Maranguape, Pacatuba, Pacoti, Ubajara.	BORGES-NOJOSA 2007, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, GUEDES et al. 2014b.
85 <i>Drymoluber brasili</i>	Barbalha, Beberibe, Milagres.	LEHR et al. 2009, RIBEIRO et al. 2012, RIBEIRO et al. 2015.
86 <i>Leptophis ahaetulla</i>	Aquiraz, Baturité, Caucaia, Crato, Croatá, Fortaleza, Guaiuba, Icó, Iguatu, Itaitinga, Itapipoca, Jati, Justiniano Serpa, Limoeiro do Norte, Maranguape, Milagres, Mora- da Nova, Mulungu, Pacajus, Pacoti, Paraipaba, Pentecos- te, São Gonçalo do Amarante, Trairi, Ubajara, Viçosa do Ceará.	LIMA-VERDE 1976, BORGES-NOJOSA 2007, LOEBMANN & HADDAD 2010, RIBEIRO ET AL. 2012, MESQUITA et al. 2013, GUEDES et al. 2014b, *.
87 <i>Mastigodryas boddaerti boddaerti</i>	Ibiapina, Ipu, Tianguá, Ubajara.	NASCIMENTO & LIMA-VERDE 1989; GUEDES et al. 2014b.
88 <i>Mastigodryas bifossatus</i>	Cascavel, Caucaia, Chorozinho, Fortaleza, Guaramiranga, Vanzolini 1981, MESQUITA et al. 2013, Horizonte, Maracanaú, Maranguape, Mulungu, Pacoti, Pente- coste, Quixadá, São Gonçalo do Amarante, Ubajara.	GUEDES et al. 2014b, *.
89 <i>Oxybelis aeneus</i>	Amontada, Barbalha, Baturité, Beberibe, Caucaia, Crate- ús, Crato, Fortaleza, Icó, Ipú, Itapipoca, Jaguaribara, Jus- tiniano Serpa, Limoeiro do Norte, Maranguape, Milagres, 2010, RIBEIRO et al. 2012, MESQUITA et al. Missão Velha, Mulungu, Nova Olinda, Pacajús, Pacatuba, 2013, BORGES-LEITE et al. 2014, GUEDES et Pacoti, Pente- coste, Quixeramobim, Santana do Cariri, São Gonçalo do Amarante, São Luis do Curu, Senador Pompeu, Trairi, Ubajara, Viçosa do Ceará.	LIMA-VERDE 1976, Vanzolini 1981, BORG- ES-NOJOSA 2007, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, BORGES-LEITE et al. 2014, GUEDES et al. 2014b, RIBEIRO et al. 2015, *.
90 <i>Spilotes sulphureus sulphureus</i>	Fortaleza, Pacoti, Tianguá, Ubajara.	BORGES-NOJOSA et al. 2006, GUEDES et al. 2014b.
91 <i>Spilotes pullatus</i>	Barbalha, Baturité, Caucaia, Crato, Guaramiranga, Limoeiro do Norte, Maranguape, Pacatuba, Pacoti, São Gonçalo do Amarante, Ubajara, Viçosa do Ceará.	LIMA-VERDE 1976, BORGES-NOJOSA 2007, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, BORGES-LEITE et al. 2014, GUEDES et al. 2014b, RIBEIRO et al. 2015, *.
92 <i>Tantilla melanocephala</i>	Araripe, Barbalha, Cascavel, Crato, Guaramiranga, Ibia- pina, Ipú, Jijoca, Maracanaú, Milagres, Pacoti, Paracuru, Paraipaba, Pente- coste, São Gonçalo do Amarante, Trairi, Ubajara, Viçosa do Ceará.	BORGES-NOJOSA 2007, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, MESQUITA et al. 2013, BORGES-LEITE et al. 2014, GUEDES et al. 2014b, RIBEIRO et al. 2015, *.
93 <i>Atractus ronnie</i>	Baturité, Crato, Guaramiranga, Mulungu, Pacoti, Tian- guá.	PASSOS et al. 2007, LOEBMANN et al. 2009.
94 <i>Sibon nebulatus nebulatus</i>	Guaramiranga, Ibiapina, Maranguape, Pacatuba, Pacoti, São Benedito, Tianguá, Trairi, Ubajara.	NASCIMENTO & LIMA-VERDE 1989, BORG- ES-NOJOSA 2007, GUEDES et al. 2014b, *.
95 <i>Sibynomorphus mikani</i>	Barbalha, Crato.	VANZOLINI 1981, RIBEIRO et al. 2012.
96 <i>Imantodes cenchoa cenchoa</i>	Crato, Guaramiranga, Maranguape, Pacatuba, Pacoti, Ubajara.	NASCIMENTO & LIMA-VERDE 1989, LOE- BMANN & HADDAD 2010, GUEDES et al. 2014b, *.
97 <i>Leptodeira annulata pulchriceps</i>	Aracoíaba, Barbalha, Boa Viagem, Caucaia, Crateús, Crato, Fortaleza, Guaiuba, Ibiapina, Icó, Iguatu, Independência, Ipú, Ipueiras, Itapipoca, Itapajé, Itapiuna, Jati, Juazeiro do Norte, Jucás, Limoeiro do Norte, Maranguape, Milagres, Mombaça, Morada Nova, Mulungu, Pacatuba, Pacoti, Pente- coste, Quixeramobim, Redenção, Santana do Cariri, Santa Quitéria, São Gonçalo do Amarante, São Luis do Curu, Tianguá, Ubajara, Varjota, Viçosa do Ceará.	LIMA-VERDE 1976, BORGES-NOJOSA 2007, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, MESQUITA et al. 2013, GUEDES et al. 2014b, RIBEIRO et al. 2015, *.
98 <i>Apostolepis cearensis</i>	Araripe, Aquiraz, Aracoíaba, Barbalha, Beberibe, Crateús, FERRAREZZI et al. 2005, BORGES-NOJOSA Crato, Fortaleza, Icapuí, Icó, Jijoca, Juazeiro do Norte, Li- 2007, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, MESQUITA et al. 2013, moeiro do Norte, Maranguape, Milagres, Pacoti, Paracu- ru, Pente- coste, Quixadá, São Benedito, Tianguá, Ubajara, GUEDES et al. 2014b, RIBEIRO et al. 2015, *. Viçosa. do Ceará.	

Taxon	Municipalities	References
99 <i>Apostolepis</i> sp. (gr. <i>nigrolineata</i>)	Guaramiranga, Ibiapina, Maranguape, Pacoti, São Benedito, Ubajara, Viçosa do Ceará.	NASCIMENTO & LIMA-VERDE 1989, LEMA & RENNER 1998, LEMA & HOFSTADLER DEIQUES 2010, LOEBMANN & HADDAD 2010.
100 <i>Boiruna sertaneja</i>	Brejo Santo, Caucaia, Crateus, Crato, Icapuí, Icó, Limoeiro do Norte, Paraipaba, Pentecoste, Quixelô, Reriutaba, São Luiz do Curu, Ubajara.	LIMA-VERDE 1976, ZAHER 1996, BORGES-NOJOSA et al. 2010, RIBEIRO et al. 2012, MESQUITA et al. 2013, GUEDES et al. 2014b, *.
101 <i>Coronelaps lepidus</i>	Crato.	LEMA & HOFSTADLER DEIQUES, 2010.
102 <i>Oxyrhopus melanogenys</i> <i>orientalis</i>	Guaramiranga, Ibiapina, Pacoti, Ubajara.	LOEBMANN & ROBERTO 2009, GUEDES et al. 2014b.
103 <i>Oxyrhopus trigeminus</i>	Aracati, Araripe, Barbalha, Caucaia, Crateús, Crato, Fortaleza, Guaramiranga, Ibiapina, Icó, Independência, Ipu, Ipueiras, Itapajé, Itapipoca, Jardim, Jati, Juazeiro do Norte, Justiniano Serpa, Lavras da Mangabeira, Limoeiro do Norte, Maranguape, Mauriti, Milagres, Missão Velha, Mombaça, Mulungu, Pacoti, Pentecoste, Quixadá, Quixeramobim, Santana do Cariri, São Benedito, São Gonçalo do Amarante, São Luís do Curu, Sobral, Trairi, Ubajara, Viçosa do Ceará.	LIMA-VERDE 1976, BORGES-NOJOSA & CASCON 2005, BORGES-NOJOSA 2007, BORGES-NOJOSA et al. 2010, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, MESQUITA et al. 2013, BORGES-LEITE et al. 2014, GUEDES et al. 2014b, RIBEIRO et al. 2015, *.
104 <i>Pseudoboa nigra</i>	Caucaia, Crato, Fortaleza, Icó, Guaramiranga, Ipu, Itapajé, Jati, Limoeiro do Norte, Maranguape, Milagres, Missão Velha, Nova Olinda, Pacatuba, Pentecoste, Quixeramobim, Redenção, Santa Quitéria, São Gonçalo do Amarante, Senador Pompeu, Tamboril, Tianguá, Trairi, Ubajara, Varjota, Viçosa do Ceará.	LIMA-VERDE 1976, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, MESQUITA et al. 2013, BORGES-LEITE et al. 2014, GUEDES et al. 2014b, RIBEIRO et al. 2015, *.
105 <i>Helicops angulatus</i>	Aquiraz, Crato, Juazeiro do Norte.	BORGES-NOJOSA et al. 2008, ROBERTO et al. 2009b.
106 <i>Helicops leopardinus</i>	Aquiraz, Caucaia, Coreaú, Crateús, Crato, Fortaleza, Pentecoste, Quixadá, Santa Quitéria, São Gonçalo do Amarante.	BORGES-LEITE et al. 2014, GUEDES et al. 2014b, *.
107 <i>Erythrolamprus miliaris</i>	Iguatu.	GUEDES et al. 2014b.
108 <i>Erythrolamprus poecilogyrus schotti</i>	Aquiraz, Aracioba, Barbalha, Boa Viagem, Canindé, Caraíva, Caucaia, Crateús, Crato, Fortaleza, Frecheirinha, General Sampaio, Icó, Iguatá, Independência, Itapipoca, Itapiúna, Jaguaripe, Juazeiro do Norte, Justiniano Serpa, Limoeiro do Norte, Maracanaú, Maranguape, Messejana, Milagres, Mombaça, Monsenhor Tabosa, Mulungu, Pacajás, Pacatuba, Pentecoste, Quixadá, Quixeramobim, Santa Fé, Santa Quitéria, Santana do Acaraú, São Gonçalo do Amarante, Sobral, Solonópole, Taíba, Ubajara, Viçosa do Ceará.	LIMA-VERDE 1976, Vanzolini 1981, BORGES-NOJOSA 2007, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, MESQUITA et al. 2013, GUEDES et al. 2014b, *.
109 <i>Erythrolamprus reginae</i> <i>semilineata</i>	Barbalha, Baturité, Crateús, Crato, Fortaleza, Guaramiranga, Ibiapina, Ipú, Limoeiro do Norte, Maranguape, Mulungu, Pacatuba, Pacoti, Palmácia, São Benedito, Tianguá, Ubajara.	VANZOLINI 1981, BORGES-NOJOSA, 2007, LOEBMANN & HADDAD 2010.
110 <i>Erythrolamprus taeniogaster</i>	Barbalha, Crato, Ibiapina, Milagres, São Gonçalo do Amarante, São Benedito, Ubajara.	FERNANDES et al. 2002, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, GUEDES et al. 2014b.
111 <i>Erythrolamprus viridis</i>	Araripe, Boa Viagem, Catunda, Caucaia, Crato, Limoeiro do Norte, Maranguape, Milagres, Mulungu, Pacajás, Pacoti, Pentecoste, Quixeramobim, Russas, São Gonçalo do Amarante, Sobral, Viçosa do Ceará.	LIMA-VERDE 1976, BORGES-NOJOSA 2007, LOEBMANN & HADDAD 2010, RIBEIRO et al. 2012, MESQUITA et al. 2013, GUEDES et al. 2014b, RIBEIRO et al. 2015, *.
112 <i>Erythrolamprus mossoroensis</i>	Boa Viagem, Crato, Fortaleza, Jaguaripe, Limoeiro do Norte, Pentecoste, Quixelô, Russas, Várzea Alegre.	HOGUE & LIMA-VERDE 1973, LIMA-VERDE 1976, DIXON, 1983, MESQUITA et al. 2013, RIBEIRO et al. 2012, GUEDES et al. 2014b.

Taxon	Municipalities	References
113 <i>Lygophis dilepis</i>	Aurora, Barbalha, Beberibe, Canindé, Cariús, Caucaia, Crato, Fortaleza, Guaiuba, Icó, Iguatu, Itapipoca, Juazeiro do Norte, Justiniano Serpa, Limoeiro do Norte, Maracanaú, Maranguape, Marco, Mauriti, Milagres, Missão Velha, Pacajús, Pacatuba, Pentecoste, Quixelô, Quixeramobim, Russas, São Gonçalo do Amarante, Sobral, Trairi.	LIMA-VERDE 1976, Vanzolini 1981, LEMA 1989, Borges-Nojosa 2007, Loebmann & Haddad 2010, Ribeiro et al. 2012, Mesquita et al. 2013, Guedes et al. 2014b, Ribeiro et al. 2015, *.
114 <i>Lygophis paucidens</i>		*
115 <i>Xenodon merremii</i>	Aquiraz, Aracoiaba, Barbalha, Baturité, Beberibe, Cascavel, Caucaia, Crateús, Crato, Fortaleza, Guaiuba, Guaramiranga, Horizonte, Ibiapina, Icapuí, Icó, Itapipoca, Itatira, Juazeiro do Norte, Justiniano Serpa, Lavras da Mangabeira, Maranguape, Meruoca, Milagres, Mombaça, Monsenhor Tabosa, Mulungu, Pacajús, Pacatuba, Pacoti, Paracuru, Paraipaba, Pentecoste, Quixadá, Santana do Cariri, São Gonçalo do Amarante, Tianguá, Trairi, Ubajara, Viçosa do Ceará.	Vanzolini 198, Ferreira 1997, Borges-Nojosa 2007, Loebmann & Haddad 2010, Ribeiro et al. 2012, Mesquita et al. 2013, Guedes et al. 2014b, *.
116 <i>Philodryas nattereri</i>	Araripe, Barbalha, Baturité, Beberibe, Boa Viagem, Cidade, Caucaia, Cedro, Crateús, Crato, Fortaleza, Guaiuba, Icó, Itapipoca, Itatira, Jati, Jijoca, Justiniano Serpa, Limoeiro do Norte, Maranguape, Milagres, Missão Velha, Nova Olinda, Pacajús, Paraipaba, Pentecoste, Quixadá, Quixeramobim, Santana do Cariri, Santa Quitéria, São Gonçalo do Amarante, São Luís do Curu, Sobral, Trairi, Ubajara.	LIMA-VERDE 1976, Borges-Nojosa & Cascon 2005, Loebmann & Haddad 2010, Ribeiro et al. 2012, Mesquita et al. 2013, Borges-Leite et al. 2014, Guedes et al. 2014b, Ribeiro et al. 2015, *.
117 <i>Philodryas olfersii herbeus</i>	Barbalha, Baturité, Beberibe, Cariús, Caucaia, Crateús, Crato, Fortaleza, Guaiuba, Guaramiranga, Horizonte, Icapuí, Icó, Ipú, Itapipoca, Jati, Juazeiro do Norte, Limoeiro do Norte, Maranguape, Missão Velha, Mombaça, Mulungu, Pacatuba, Pacoti, Paraipaba, Pentecoste, Quixadá, Redenção, Santana do Cariri, São Benedito, São Gonçalo do Amarante, Sobral, Trairi, Ubajara, Viçosa do Ceará.	LIMA-VERDE 1976, Vanzolini 1981, Borges-Nojosa 2007, Loebmann & Haddad 2010, Mesquita et al. 2013, Ribeiro et al. 2012, Mesquita et al. 2013, Borges-Leite et al. 2014, Guedes et al. 2014b, Ribeiro et al. 2015, *.
118 <i>Psomophis joberti</i>	Aquiraz, Barbalha, Caucaia, Crato, Fortaleza, Itapipoca, Juazeiro do Norte, Limoeiro do Norte, Pentecoste, São Gonçalo do Amarante, Trairi, Viçosa do Ceará, Ubajara.	LIMA-VERDE 1976, Vanzolini 1981, Loebmann & Haddad 2010, Ribeiro et al. 2012, Mesquita et al. 2013, Guedes et al. 2014b, *.
119 <i>Taeniophallus affinis</i>	Pacatuba, Ubajara.	Loebmann 2008a, Guedes et al. 2014b.
120 <i>Taeniophallus occipitalis</i>	Crato, Fortaleza, Horizonte, Meruoca, Mulungu, Pacoti, São Gonçalo do Amarante, Tianguá, Ubajara, Viçosa do Ceará.	Borges-Nojosa 2007, Loebmann & Haddad 2010, Ribeiro et al. 2012, Guedes et al. 2014b, *.
121 <i>Thamnodynastes</i> sp.	Araripe, Canindé, Crateús, Crato, Fortaleza, Icapuí, Independência, Itapipoca, Jardim, Jati, Limoeiro do Norte, Mauriti, Milagres, Missão Velha, Pacoti, Pentecoste, Tabuleiro do Norte, Ubajara.	LIMA-VERDE 1976, Borges-Nojosa 2007, Loebmann & Haddad 2010, Ribeiro et al. 2012, Coelho et al. 2013, Mesquita et al. 2013, Guedes et al. 2014b, Ribeiro et al. 2015, *.
122 <i>Thamnodynastes almae</i>	Jardim, Milagres.	Roberto et al. 2009c, Ribeiro et al. 2015.
123 <i>Thamnodynastes sertanejo</i>	Jati, Santana do Cariri, São Gonçalo do Amarante, Aquiraz.	Roberto et al. 2009a, Ribeiro et al. 2015, *.
124 <i>Xenopholis undulatus</i>	Tianguá, Ubajara.	Guedes et al. 2014, Loebmann 2009b, Guedes et al. 2014b.
125 <i>Anilius scytale</i>	Crato.	Silva Jr. et al. 2001.
126 <i>Siphlophis compressus</i>	Fortaleza.	Guedes et al. 2011.

Supplementary file S3

Specimens of amphibians analyzed in this study, with its respective municipalities of occurrence and voucher numbers

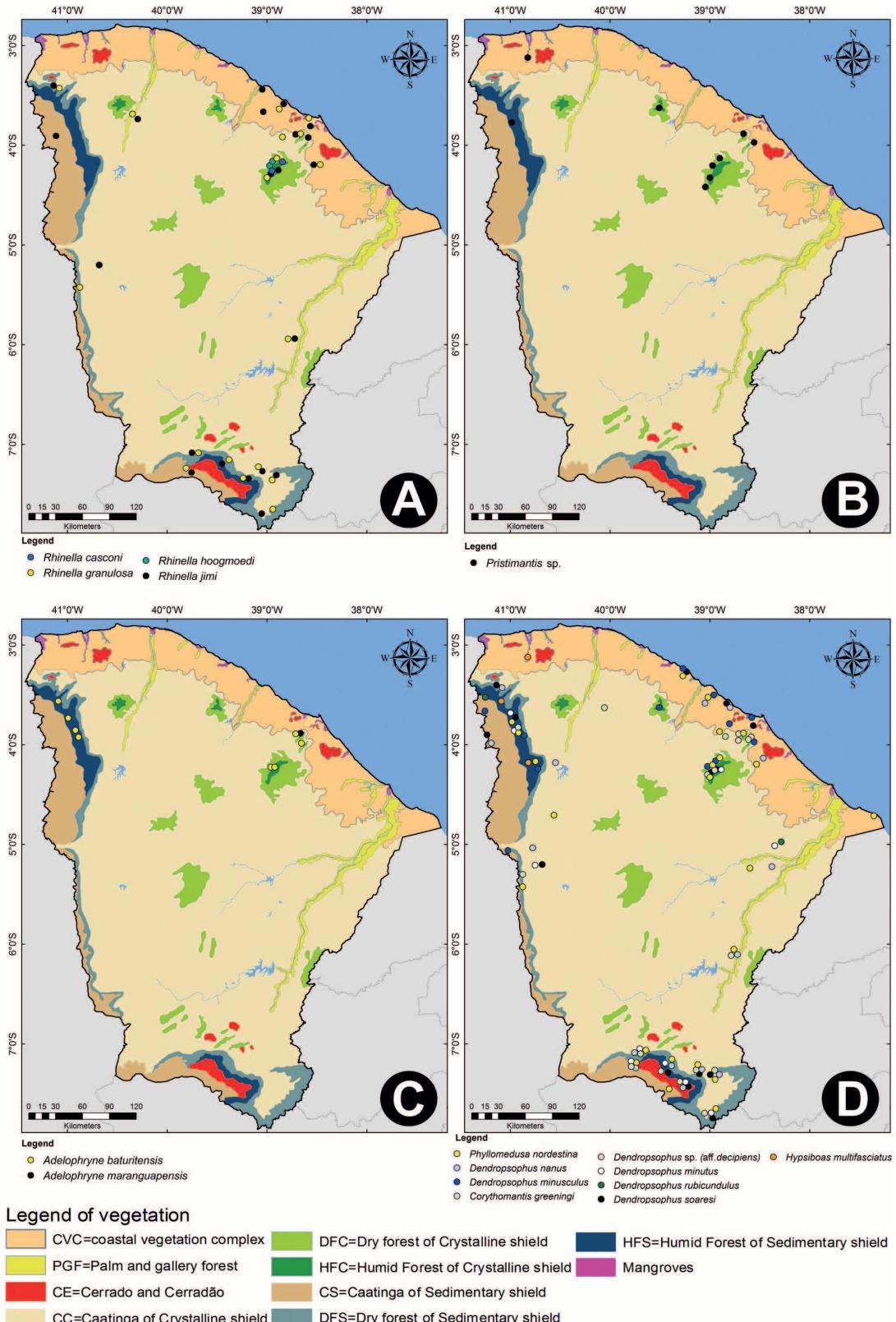
Adelophryne baturitensis: GUARAMIRANGA: CFBH 20469 – 20476; PACOTI: CHFURG 2145; VIÇOSA DO CEARÁ: CFBH 20431-20432; UBAJARA: CFBH 20433-20434; TIANGUÁ: CFBH 24554-24560; *Adelophryne maranguapensis*: MARANGUAPE: CFBH 20468, 24515; *Adenomera cf. juikitam*: TIANGUÁ: URCA-H 9272-9276; VIÇOSA DO CEARÁ: UFC 4548; *Adenomera hylaedactyla*: VIÇOSA DO CEARÁ: CFBH 20456-20458; *Chthonerpeton ariet*: LIMOEIRO DO NORTE: UFC 1503; *Corythomantis greeningi*: JATI: MNRJ 55984; MARANGUAPE: CFBH: 24529; MILAGRES: MNRJ 55336; PACATUBA: MNRJ 55553-55559; UBAJARA: CFBH 24550; VIÇOSA DO CEARÁ: UFC 4542; *Dendropsophus minusculus*: CAUCAIA: MNRJ 55897-55898; GUARACIABA DO NORTE: CHFURG 2111-2116; GUARAMIRANGA: CHFURG 2191-2196; PACATUBA: MNRJ 55895-55898; URUBURETAMA: CFBH: 23434; *Dendropsophus minutus*: UBAJARA: CFBH 15852; *Dendropsophus nanus*: CRATEÚS: MNRJ 55520-55521; GUARACIABA DO NORTE: CHFURG 2176; JATI: MNRJ 55541-55544; MORADA NOVA: MNRJ 55545-55546; *Dendropsophus soaresi*: CRATEÚS: MNRJ 55540; TIANGUÁ: CFBH 23749-23750; UBAJARA: CFBH 15869-15873; VIÇOSA DO CEARÁ: CFBH 19296-19302; *Dendropsophus sp. (aff. decipiens)*: GUARAMIRANGA: CFBH 23428; MARANGUAPE: CFBH 24536; *Dendropsophus rubicundulus*: MORADA NOVA: MNRJ 56003; *Dermatonotus muelleri*: MILAGRES: MNRJ 55338-55341; VIÇOSA DO CEARÁ: CFBH 16104-16105; *Elachistocleis cesarii*: CAUCAIA: MNRJ 55891; *Elachistocleis piauiensis*: VIÇOSA DO CEARÁ: CFBH 20451-20455; *Hypsiboas multifasciatus*: GRANJA: MNRJ 55435; UBAJARA: CFBH 16147-16149; *Hypsiboas raniceps*: ARATUBA: MNRJ 42945; CAUCAIA: UFC 4073; MARANGUAPE: UFC 2712; MULUNGU: MNRJ 42944; UBAJARA: CFBH 15998-16001; *Leptodactylus fuscus*: GRANJA: CFBH 16122-16123; IBIAPINA: CFBH 16134; JATI: MNRJ 55524; JIJOCA: MNRJ 10244; MILAGRES: MNRJ 55930; PARACURU: URCA-H 5587; *Leptodactylus macrosternum*: CAUCAIA: UFC 4072, URCA-H 5859; JATI: MNRJ 55530; UBAJARA: CFBH 16121; *Leptodactylus mystaceus*: IBIAPINA: UFC 4100; MULUNGU: UFC 4099; PACATUBA: MNRJ 55527; SÃO GONÇALO DO AMARANTE: URCA-H 6404; TIANGUÁ: UFC 4102; UBAJARA: CFBH 16101, 16117; VIÇOSA DO CEARÁ: CFBH 16103; *Leptodactylus natalensis*: GUARAMIRANGA: MNRJ 55885-55886; *Leptodactylus pustulatus*: CAUCAIA: UFC 4076; GUARAMIRANGA: CFBH 23426-23434; *Leptodactylus sp. (aff. syphax)*: MILAGRES: MNRJ 71655; PACATUBA: MNRJ 55333; UBAJARA: CFBH 20398, 23753-23754; VIÇOSA DO CEARÁ: CFBH 23751-23752; *Leptodactylus troglodytes*: CAUCAIA: UFC 4075; MILAGRES: MNRJ 55770; SÃO GONÇALO DO AMARANTE: URCA-H 5799; VIÇOSA DO CEARÁ: CFBH 16133; *Leptodactylus vastus*: CAUCAIA: URCA-H 5866; JATI: MNRJ 55892; *Odontophrynus carvalhoi*: GUARAMIRANGA: CFBH 23412-23416; UBAJARA: CFBH: 20415, 20301-20302; *Phyllomedusa nordestina*: CAUCAIA: UFC 4074; BARBALHA: UFC 2898; CRATO: MNRJ 13630; MILAGRES: MNRJ 55445; PACOTI: UFC 2885; SANTANA DO CARIRI: MZUSP 54751; TIANGUÁ: CHFURG 2155-2173;; UBAJARA: UFC 4539; *Physalaemus albifrons*: CAUCAIA: UFC 4093; JATI: MNRJ 55529; MILAGRES: MNRJ 55944; SÃO GONÇALO DO AMARANTE: URCA-H 5603, 6401, 6405; TRAIRI: URCA-H 5666; VIÇOSA DO CEARÁ: CFBH 16137-16141; *Physalaemus cicada*: CRATEÚS: MNRJ 55888; NOVA RUSSAS: CFBH 23753-23755; SANTA QUITÉRIA: CFBH 19391-19392; *Physalaemus cuvieri*: CAUCAIA: MNRJ 55889-55890; JATI: 55538; MILAGRES: 55899; PACATUBA: URCA-H 2377; UBAJARA: CFBH 16136, 16170; *Pipa pipa*: FORTALEZA: MNRJ 55884; *Pleurodema diplolister*: LAGOINHA: CFBH 23769-23770; MILAGRES: MNRJ 71653; TIANGUÁ: CHFURG 2134-2135; TRAIRI: URCA-H 5790; VIÇOSA DO CEARÁ: CFBH 23771-23774; *Pristimantis sp.*: GRANJA: MNRJ 55484; GUARAMIRANGA: CFBH 20316-20318; MARANGUAPE: CFBH 24530-24534; PACATUBA: MNRJ 55882-55883; UBAJARA: CFBH: 20313-20315; URUBURETAMA: CFBH: 25413-25414; *Proceratophrys aridus*: JATI: MNRJ 71652; MILAGRES: MNRJ 55778-55780; *Proceratophrys caramashii*: PARACURU: URCA-H 5773-5774; SÃO GONÇALO DO AMARANTE: 5775, 5860; UBAJARA: CFBH 16112-16114; VIÇOSA DO CEARÁ: CFBH 16119-16120; *Proceratophrys renalis*: MARANGUAPE: CFBH 24528; *Pseudopaludicola pocoto*: FORTALEZA: CHFURG 2179-2184; JATI: MNRJ 55887, 55893; MISSÃO VELHA: URCA-H 1954; NOVA RUSSAS: CFBH 20285-20287; SANTA QUITÉRIA: CFBH 26842-26847; *Pseudopaludicola mystacalis*: CAUCAIA: UFC 4086; UBAJARA: UFC 4547; VIÇOSA DO CEARÁ: CFBH 20298-20300; *Pseudopaludicola jaredi*: VIÇOSA DO CEARÁ: CFBH 20288-20292; *Rhinella casconi*: GUARAMIRANGA: MNRJ 55533; CFBH: 28170-28175; *Rhinella granulosa*: FORTALEZA: MNRJ 55350; JATI: MNRJ 55348; MILAGRES: MNRJ 55773; VIÇOSA DO CEARÁ: CFBH 16106, 16110; *Rhinella hoogmoedi*: GUARAMIRANGA: CFBH 23407-23411; *Rhinella jimi*: CAUCAIA: URCA-H 3413; JATI: MNRJ 55563; UBAJARA: CFBH 23395-23400; *Scinax sp. (aff. hayii)*: GUARAMIRANGA: CFBH 25422-25425; PACOTI: MNRJ 55443; *Scinax sp (gr. ruber)*: VIÇOSA DO CEARÁ: CFBH 25430; *Scinax fuscomarginatus*: BEBERIBE: CHFURG 2174; CAUCAIA: UFC 4084; VIÇOSA DO CEARÁ: CFBH 19397; *Scinax nebulosus*: CAUCAIA: UFC 4083; TIANGUÁ: MNRJ 55531-55532; TRAIRI: URCA-H 5656-5660; UBAJARA: CFBH 25433; *Scinax x-signatus*: CAUCAIA: UFC 4082; CRATEÚS: MNRJ 55539; GUARAMIRANGA: MNRJ 55552; JATI: MNRJ 55549; MILAGRES: MNRJ 55534; TIANGUÁ: CHFURG 2140-2144; UBAJARA: CFBH 25429; *Siphonops sp. (aff. paulensis)*: GUARAMIRANGA: CHFURG 2175; UBAJARA: CFBH 20409-20411; *Trachycephalus atlas*: JATI: MNRJ 55562, 55777; *Trachycephalus typhonius*: GUARAMIRANGA: MNRJ 55774-55775; UBAJARA: CFBH 20419; VIÇOSA DO CEARÁ: CFBH 20416-20418.

Supplementary file S4

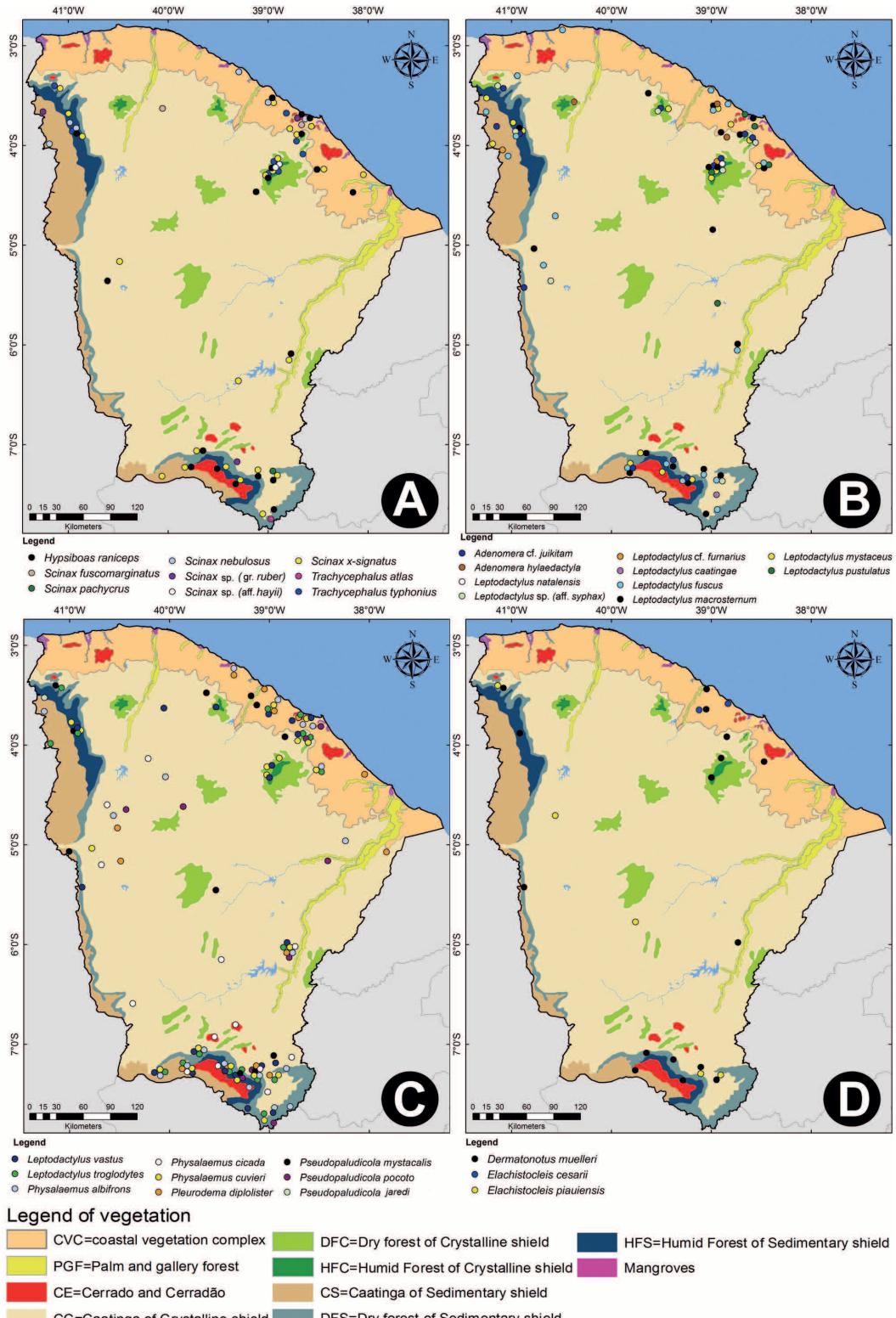
Specimens of reptiles analyzed in this study, with its respective municipalities of occurrence and voucher numbers

Ameiva ameiva: MILAGRES: CHUNB 56547, 56569; PACATUBA: CHUNB 56556; PARAIPABA: URCA-H 5651, 5796; SÃO GONÇALO DO AMARANTE: URCA-H 10114; UBAJARA: UFRGS 4958; *Amerotyphlops bronnersmianus*: TRAIRI: URCA-H 5646, 5653, 5698; UBAJARA: IBSP 76365, 76845-76847; *Amerotyphlops paucisquamus*: CAUCAIA: IBSP 76985; *Amphisbaena alba*: TRAIRI: URCA-H 4737; UBAJARA: CRIB 484-485; *Amphisbaena anomala*: UBAJARA: ZUEC 3412, 3418; *Amphisbaena vermicularis*: CRATO: URCA-H 3073; SÃO GONÇALO DO AMARANTE: URCA-H 5634-5641; PARAIPABA: URCA-H 5643; PARACURU: URCA-H 5674-565677; TRAIRI: URCA-H 5667; UBAJARA: ZUEC 3431; VIÇOSA DO CEARÁ: UFRGS 4945; *Amphisbaena pretrei*: PARACURU: URCA-H 5684; SÃO GONÇALO DO AMARANTE: URCA-H 5749, 5758; TRAIRI: URCA-H 5862; UBAJARA: ZUEC 3379, 3411; *Amphisbaena polystega*: PARACURU: URCA-H 5836, 5846-5848; PARAIPABA: URCA-H 5747, 5821-5822; SÃO GONÇALO DO AMARANTE:

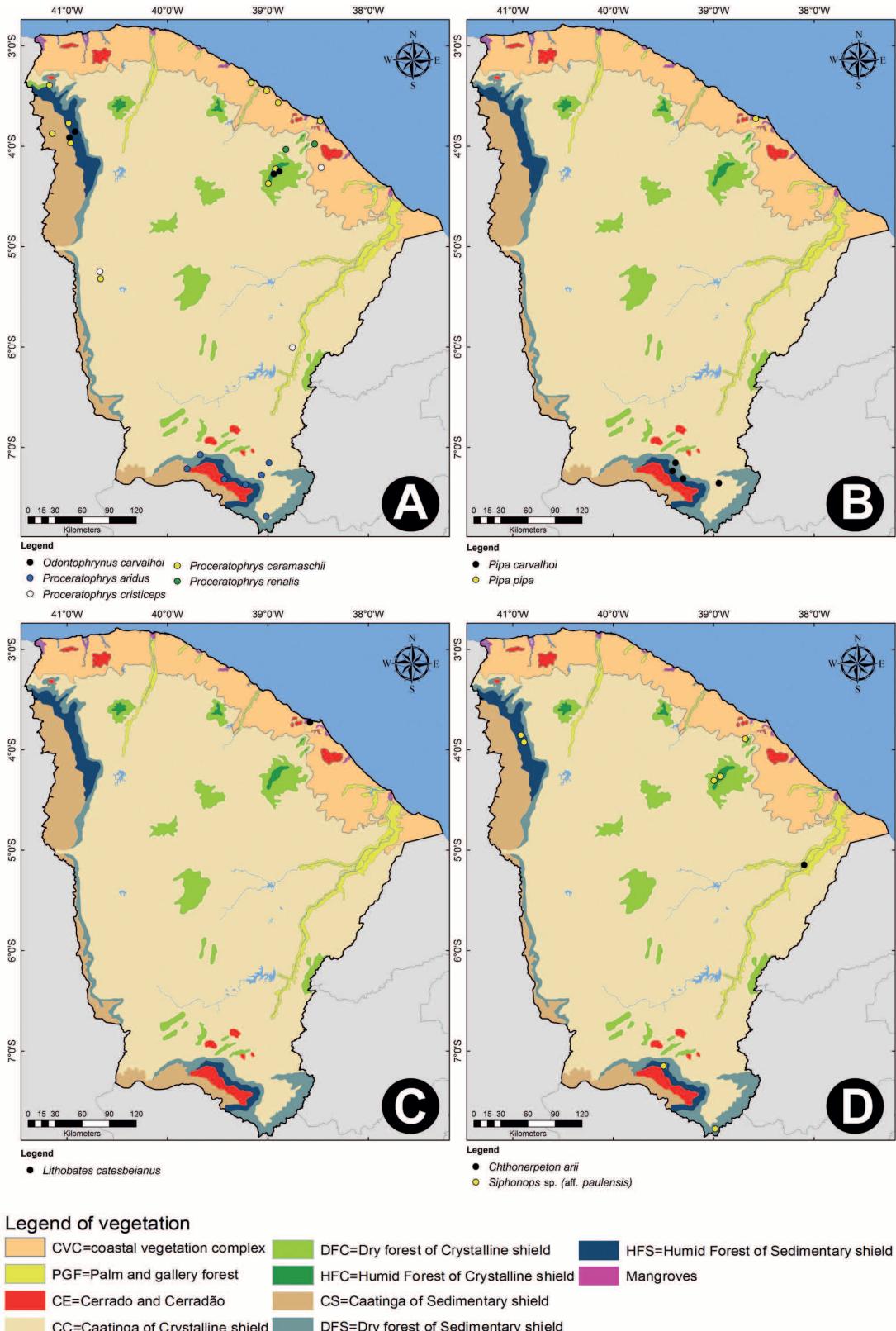
URCA-H 5809-5817; TRAIRI: URCA-H 5835; UBAJARA: CHUNB 57372; *Anolis fuscoauratus*: UBAJARA: UFRGS 4946, 4959-4960; *Apostolepis cearensis*: ICAPUÍ: URCA-H 2383; JIJOCA: 10245; PARACURU: URCA-H 5700, 5702; TIANGUÁ: IBSP 77109; UBAJARA: IBSP 76855, 77101; VIÇOSA DO CEARÁ: IBSP 77509; *Apostolepis* (gr. *nigrolineata*): UBAJARA: ZUEC 3384; *Atractus ronnie*: TIANGUÁ: MNRJ 17326; *Boa constrictor*: PARACURU: URCA-H 5693; UBAJARA: IBSP 77053; *Boiruna sertaneja*: PARAIPABA: URCA-H 5694; UBAJARA: IBSP 77514; *Bothrops* sp. (aff. *atrox*): IBIAPINA: IBSP 77103; UBAJARA: IBSP 77064, 77067, 77010; *Bothrops lutzi*: UBAJARA: ZUEC 3373-3376; *Chironius bicarinatus*: PACOTI: IBSP 76994-76995; UBAJARA: IBSP 77076; *Chironius flavolineatus*: GRANJA: IBSP 76984; UBAJARA: IBSP 77058-77059; VIÇOSA DO CEARÁ: 77113-77114; *Cnemidophorus ocellifer*: CAUCAIA: URCA-H 5872; ICAPUÍ: CHUNB 56530; MILAGRES: CHUNB 56557, 56565; PARACURU: URCA-H 5786, 5793, 5870; SÃO GONÇALO DO AMARANTE: URCA-H 5776, 5782, 5783, 5800-5802; TRAIRI: URCA-H 5654, 5670, 5861; UBAJARA: ZUEC 3381-3383; *Coleodactylus meridionalis*: CAUCAIA: CHUNB 56531; PARAIPABA: URCA-H 5807; SÃO GONÇALO DO AMARANTE: URCA-H 5873; TRAIRI: URCA-H 5719; UBAJARA: ZUEC 3385-3400; *Colobosauroides cearensis*: GRANJA: CHUNB 56532-56534; SÃO GONÇALO DO AMARANTE: URCA-H 5803-5805; TRAIRI: URCA-H 5788, 5791, 5794; UBAJARA: ZUEC 3429-3430, 3413; *Corallus hortulanus*: JATI: URCA-H 3281; UBAJARA: IBSP 77056; *Crotalus durissus*: VIÇOSA DO CEARÁ: IBSP 77241-77243; *Drymarchon corais*: PACOTI: IBSP 76983; VIÇOSA DO CEARÁ: IBSP 77237; *Drymoluber brasili*: MILAGRES: IBSP 76968; *Drymoluber dichrous*: UBAJARA: IBSP 77074, 77506; *Enyalius bibrornii*: GRANJA: CHUNB 56555; UBAJARA: CHUNB 57375-57379; *Epicrates assisi*: TIANGUÁ: IBSP 77105; UBAJARA: IBSP 77062, 77325, 77086; *Epictia borapeliotes*: ARATUBA: IBSP 76987; *Erythrolamprus poecilogyrus*: CANINDÉ: IBSP 77520-77521; UBAJARA: IBSP: 77099; VIÇOSA DO CEARÁ: 77238; *Erythrolamprus reginae*: UBAJARA: IBSP 77051, 77097, 77100; *Erythrolamprus taeniogaster*: UBAJARA: IBSP 77050, 77084, 77098; *Erythrolamprus viridis*: MILAGRES: MNRJ 19883; VIÇOSA DO CEARÁ: IBSP 77108; *Gonatodes humeralis*: TRAIRI: URCA-H 6389-6395; *Gymnodactylus geckoides*: MILAGRES: URCA-H 3289-3290; *Hemidactylus agrius*: SÃO GONÇALO DO AMARANTE: URCA-H 5784, 5792, 5869; UBAJARA: UFRGS 4953; VIÇOSA DO CEARÁ: UFRGS 4955-5956; *Hemidactylus brasiliensis*: MILAGRES: CHUNB 56559-56564; *Hemidactylus mabouia*: UBAJARA: CHUNB 57374; *Iguana iguana*: FRECHEIRINHA: CHUNB 57364; JATI: CHUNB 56558; *Imantodes cenchra*: UBAJARA: IBSP 77072; *Kinosternon scorpioides*: SOBRAL: ZUEC 3377; *Leposoma baturitensis*: MARANGUAPE: URCA-H 3409; PACATUBA: CHUNB 56545; UBAJARA: UFRGS 4957; *Leptodeira annulata*: JATI: URCA-H 3279-3280; MILAGRES: IBSP 76992; TIANGUÁ: IBSP 77526, UBAJARA: IBSP 77054, 77060, 77525; VARJOTA: IBSP 77524; *Leptophis ahaetulla*: JATI: IBSP 77041; TRAIRI: URCA-H 5696; UBAJARA: IBSP 77075; VIÇOSA DO CEARÁ: IBSP 77240; *Liophylops cf. ternetzi*: UBAJARA: 76856; *Lygodactylus klugei*: JATI: CHUNB 56575; MILAGRES: CHUNB 56574, 56573; *Lygophis dilepis*: CANINDÉ: IBSP 77115; *Lygophis paucidens*: TRAIRI: URCA-H 5706; *Mabuya arajara*: GRANJA: CHUNB 56570-56571; UBAJARA: CHUNB 57367, 57370; *Mabuya heathi*: MILAGRES: CHUNB 56572; TRAIRI: URCA-H 5663, 5777, 5779; UBAJARA: CHUNB 57368-57369; *Mabuya nigropunctata*: UBAJARA: CHUNB 57366, 57371; *Mastigodryas boddaerti*: UBAJARA: IBSP 76844, 77234, 77510; *Mesoclemmys perplexa*: VIÇOSA DO CEARÁ: CRIB 289; *Mesoclemmys tuberculata*: VIÇOSA DO CEARÁ: CRIB 0618; *Micrablepharus maximiliani*: CAUCAIA: CHUNB 56524; MILAGRES: CHUNB 56524-54528; PARAIPABA: URCA-H 5789; TRAIRI: URCA-H 5652, 5795; UBAJARA: UFRGS 4949; VIÇOSA DO CEARÁ: UFRGS 4950; *Micrurus* sp. (aff. *ibiboboca*): CAUCAIA: IBSP 76088; MILAGRES: URCA-H 3284; SÃO GONÇALO DO AMARANTE: URCA-H 5729, 5740; UBAJARA: IBSP 77073, 77081, 77091; *Micrurus lemniscatus* *lemniscatus*: TIANGUÁ: IBSP 76989; UBAJARA: IBSP 77079; *Micrurus lemniscatus* *ditius*: UBAJARA: IBSP 77096; *Ophiodes* sp. (aff. *striatus*): TIANGUÁ: UFRGS: 4943; UBAJARA: UFRGS 4898-4915; *Oxybelis aeneus*: TRAIRI: URCA-H 5649; UBAJARA: IBSP 77088, 77237; VIÇOSA DO CEARÁ: IBSP 77532; *Oxyrhopus melanogenys* *orientalis*: GUAMARIRANGA: IBSP 76979; PACOTI: IBSP 76980; UBAJARA: IBSP 77061, 77069, 77082; *Oxyrhopus trigeminus*: IPU: IBSP 77111; JATI: URCA-H 3283; MILAGRES: MNRJ 19882; TRAIRI: URCA-H 5721, 5723; UBAJARA: IBSP 77057, 77085, 77092; VIÇOSA DO CEARÁ: IBSP 77539-77540; *Philodryas natator*: BATURITÉ: IBSP 76854; JATI: IBSP 76965; JIJOCA: URCA-H 10239; MILAGRES: IBSP 76964; SOBRAL: IBSP 76840; TRAIRI: URCA-H: 5705, 5727; UBAJARA: IBSP 77083; *Philodryas olfersii*: CAUCAIA: URCA-H 3361, IBSP 76967; JATI: IBSP 76966; PARAIPABA: URCA-H 5695; SÃO GONÇALO DO AMARANTE: 5707; TRAIRI: 5697; UBAJARA: IBSP 77077, 77536, VIÇOSA DO CEARÁ: IBSP 77535, 77537, 77538; *Phyllopezus pollicaris*: IBIAPINA: CHUNB 57417, 57421; JAGUARIBARA: CHUNB 56577; MILAGRES: CHUNB 56579-56578; TIANGUÁ: CHUNB 57388-57390; VIÇOSA DO CEARÁ: CHUNB 57391-57292; *Phyllopezus periosus*: JAGUARIBARA: CHUNB 56576; MILAGRES: CHUNB 56581; *Polychrus acutirostris*: VIÇOSA DO CEARÁ: CRIB 0612-0614; *Polychrus marmoratus*: UBAJARA: CHUNB 57381-57385; *Placosoma* sp: MARANGUAPE: URCA-H 3410, CHUNB 56543; *Pseudoboaa nigra*: JATI: IBSP 76991; UBAJARA: IBSP 77052; *Psomophis joberti*: TRAIRI: URCA-H 5664, 5714; VIÇOSA DO CEARÁ: IBSP 76843; *Sibon nebulatus*: TRAIRI: URCA-H 5699; UBAJARA: IBSP 76848, 77063; *Spilotes pullatus*: UBAJARA: ZUEC 3401; VIÇOSA DO CEARÁ: IBSP 77503; *Spilotes sulphureus*: UBAJARA: IBSP 77055, 77504; *Taeniophallus affinis*: UBAJARA: IBSP 76363-76364; *Taeniophallus occipitalis*: TIANGUÁ: ZUEC 3405; UBAJARA: IBSP 76852, 77508; *Tantilla melanocephala*: JIJOCA: URCA-H 10238; MILAGRES: URCA-H 3346-3350; PARACURU: URCA-H 5708, 5715; SÃO GONÇALO DO AMARANTE: URCA-H 5734-5739; TRAIRI: URCA-H 5665-5668; UBAJARA: MNRJ 17331-17336; *Thamnodynastes almarae*: MILAGRES: IBSP 76969; *Thamnodynastes sertanejo*: JATI: URCA-H 3277-3278; SÃO GONÇALO DO AMARANTE: URCA-H 5741; *Thamnodynastes* sp.: JATI: IBSP 76973; *Trilepida brasiliensis*: VIÇOSA DO CEARÁ: ZUEC 3380; *Tropidurus hispidus*: CAUCAIA: URCA-H 5865; MERUOCA: ZUEC 3425-3426; MILAGRES: URCA-H 3285-3286; SÃO GONÇALO DO AMARANTE: URCA-H 5781; VIÇOSA DO CEARÁ: UFRGS 4952; *Tropidurus jaguaribanus*: JAGUARIBARA: CHUNB 56546-56547; *Tropidurus semitaeniatus*: MILAGRES: CHUNB 56548-56552; VIÇOSA DO CEARÁ: UFRGS 4951, 4961; *Tupinambis merianae*: UBAJARA: ZUEC 3372; *Vanzosaura multiscutata*: MILAGRES: URCA-H 3412; PARAIPABA: URCA-H 5808; SÃO GONÇALO DO AMARANTE: URCA-H 5871; TRAIRI: URCA-H 5662; VIÇOSA DO CEARÁ: CHUNB 57373; *Xenodon merremii*: MILAGRES: IBSP 76986; TRAIRI: URCA-H 5671; UBAJARA: IBSP 77066, 77533-77534; *Xenopholis undulatus*: UBAJARA: IBSP 76832, 77110.



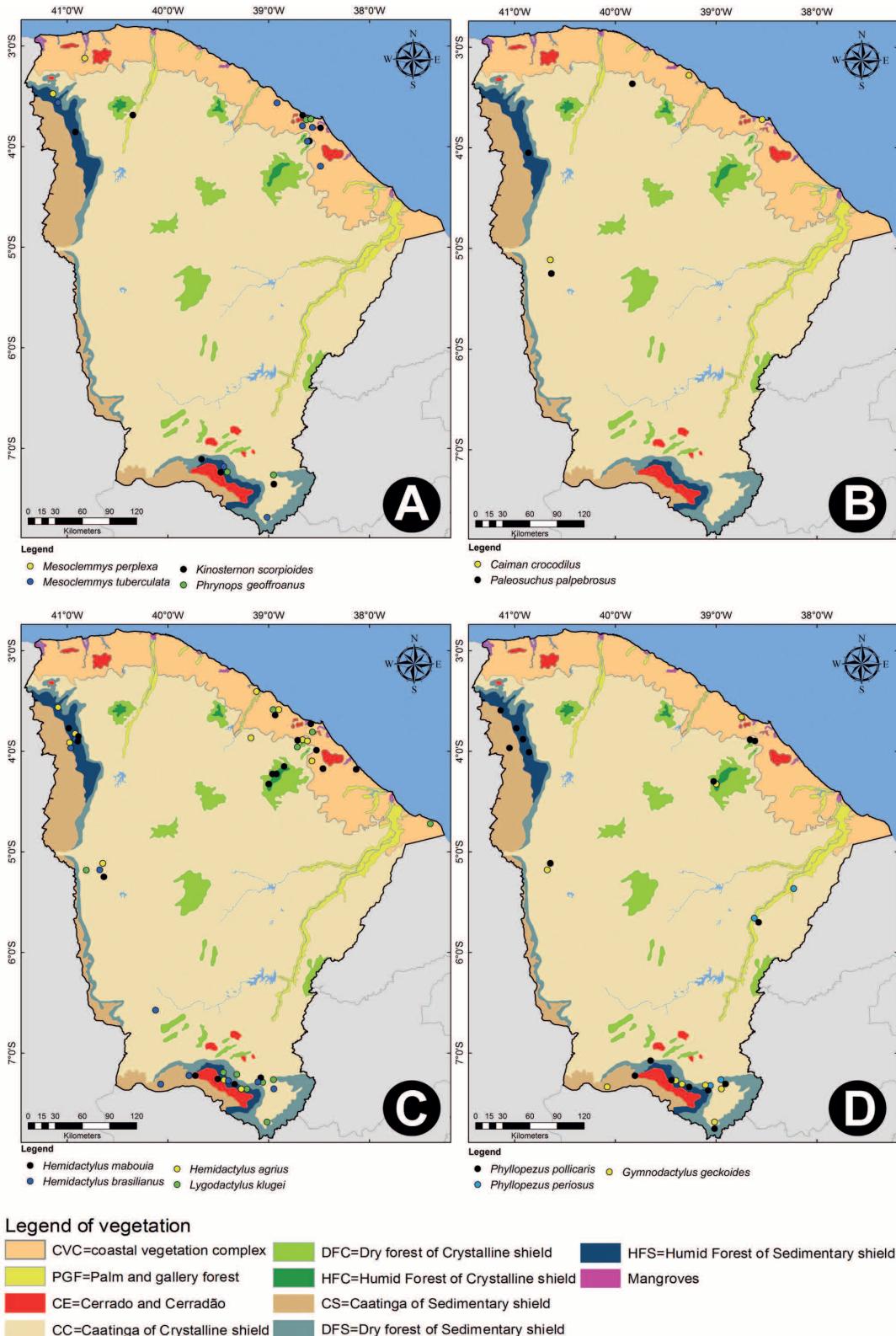
Supplementary figure 1. Amphibian species distribution in the major phytoecological units in the state of Ceará (A-Family Bufonidae: *Rhinella* spp; B-Family Craugastoridae: *Pristimantis* sp; C-Family Eleutherodactylidae: *Adelophryne* spp.; D-Order Gymnophiona: *Siphonops* aff. *paulensis*, *Chthonerpeton* *arii*).



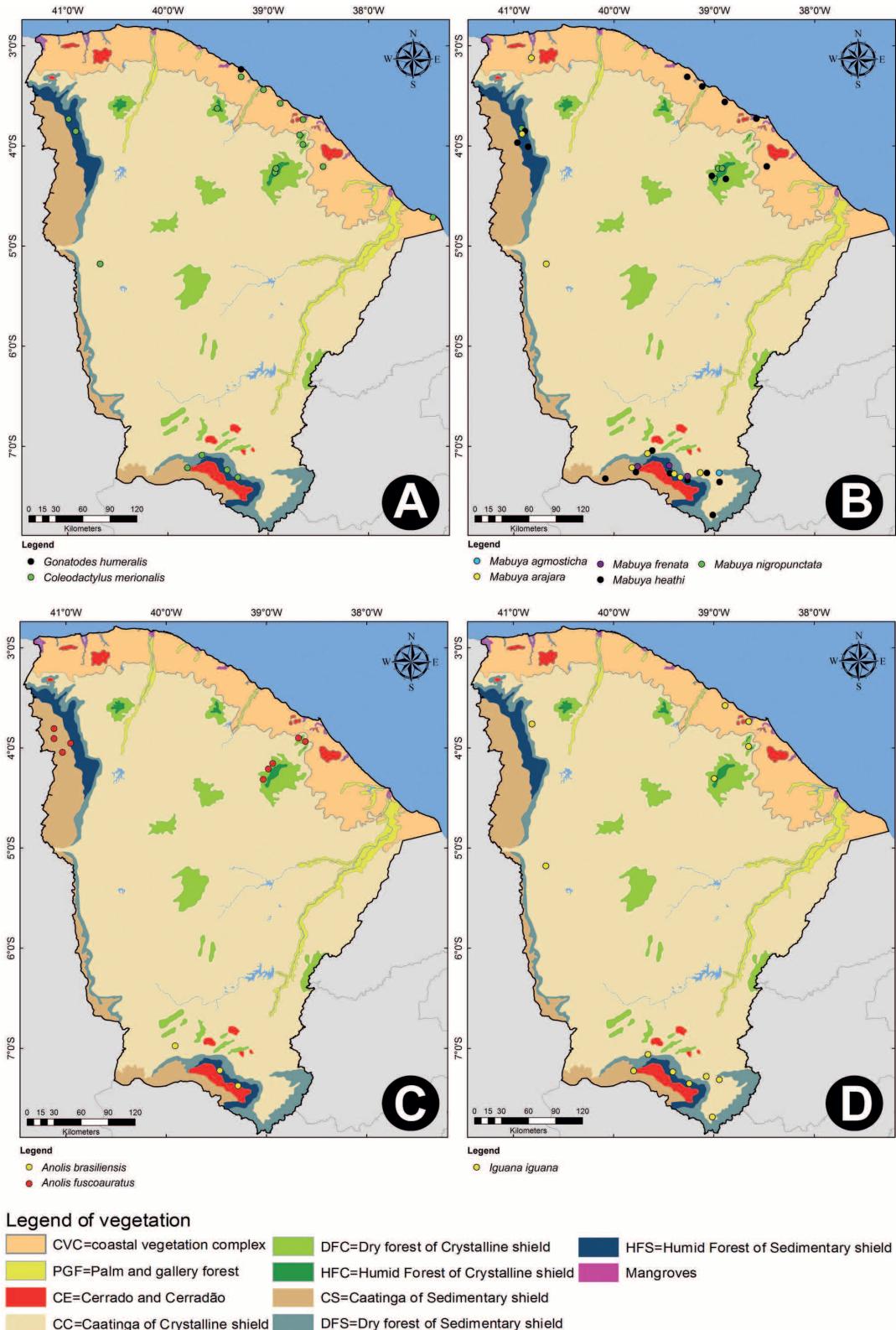
Supplementary figure 2. Amphibian species distribution in the major phytoecological units in the state of Ceará (A-Family Hylidae: *Corythomantis greeningi*, *Dendropsophus* spp., *Phyllomedusa nordestina*, *Hypsiboas raniceps*; B-Family Hylidae: *Hypsiboas multifasciatus*, *Scinax* spp., *Trachycephalus* spp.; C-Family Leptodactylidae: *Leptodactylinae*: *Leptodactylus* spp., *Adenomera* spp., *Leptodactylus natalensis*, *L. aff. syphax*, *L. cf. furnarius*, *L. caatingae*, *L. fuscus*, *L. macrosternum*, *L. mystaceus*, *L. pustulatus*; D- Family Leptodactylidae: *Leptodactylinae*: *Leptodactylus* spp., *Leiuperinae*: *Physalaemus* spp., *Pleurodema* spp., *Pseudopaludicola* spp.).



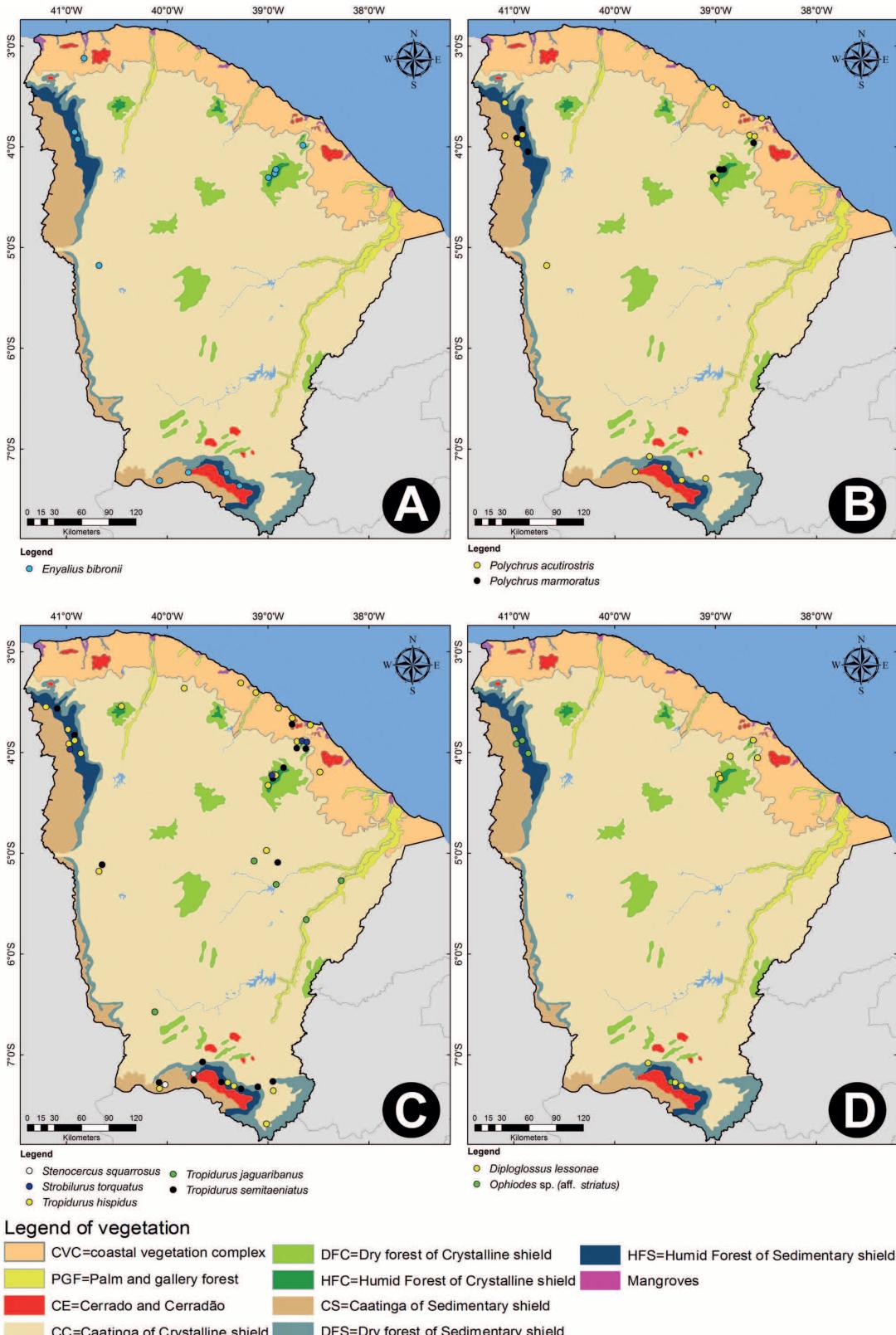
Supplementary figure 3. Amphibian species distribution in the major phytoecological units in the state of Ceará (A-Family Microhylidae: *Dermatonotus muelleri*, *Elachistocleis* spp.; B-Family Odontophrynidae: *Proceratophrys* spp., *Odontophryne carvalhoi*; C-Family Pipidae: *Pipa* spp.; D-Family Ranidae: *Lithobates catesbeianus*).



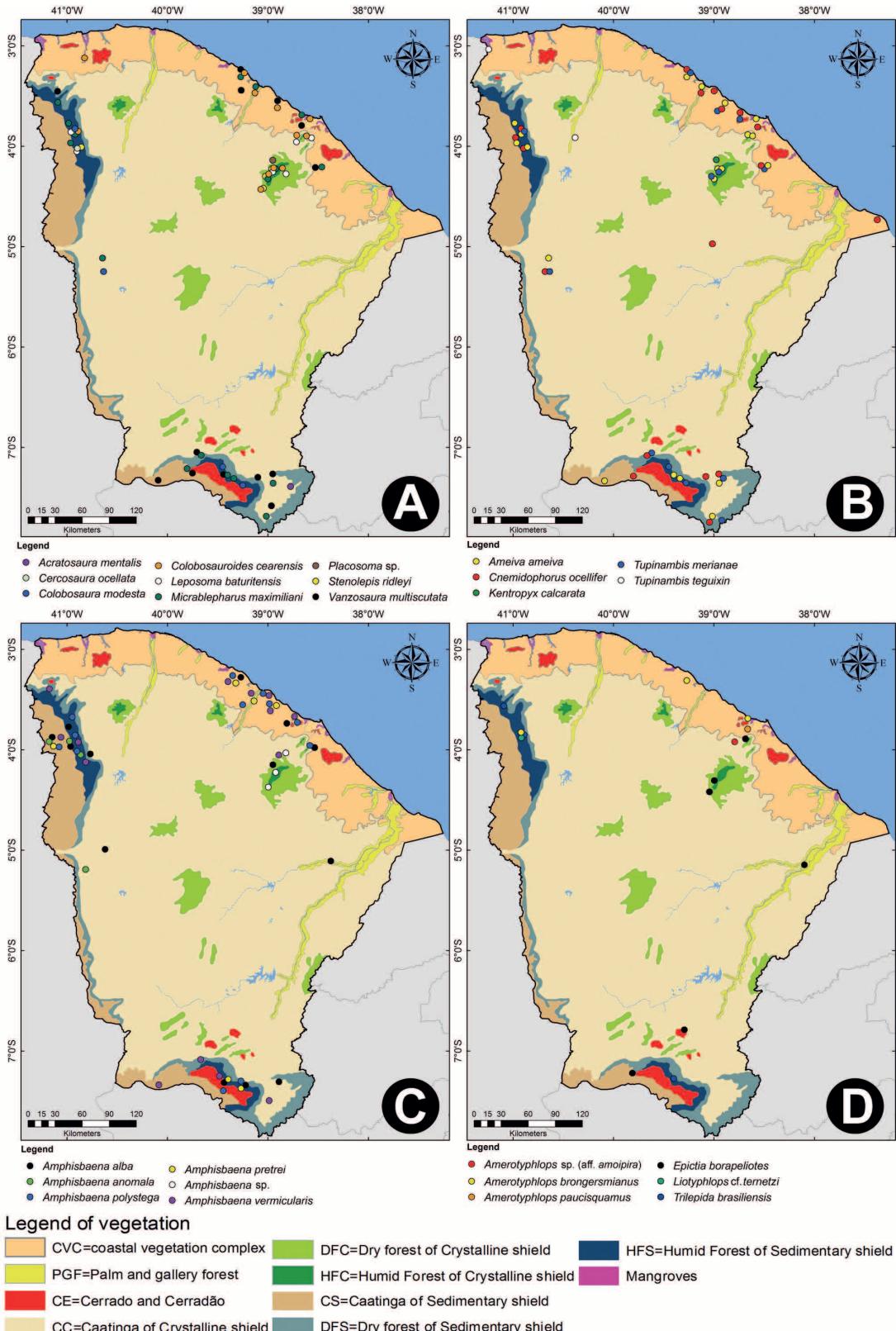
Supplementary figure 4. Reptile species distribution in the major phytoecological units in the state of Ceará (A-Order Crocodylia, Family Alligatoridae: *Caiman crocodilus*, *Paleosuchus palpebrosus*; B-Order Squamata, Family Gekkonidae: *Hemidactylus* spp., *Lygodactylus klugei*; C-Order Testudines, Family Chelidae: *Mesoclemmys* spp., *Phrynosoma geoffroyi*; Kinosternidae: *Kinosternon scorpioides*; D-Order Squamata, Family Diploglossidae: *Diploglossus lessonae*, *Ophiodes* sp.).



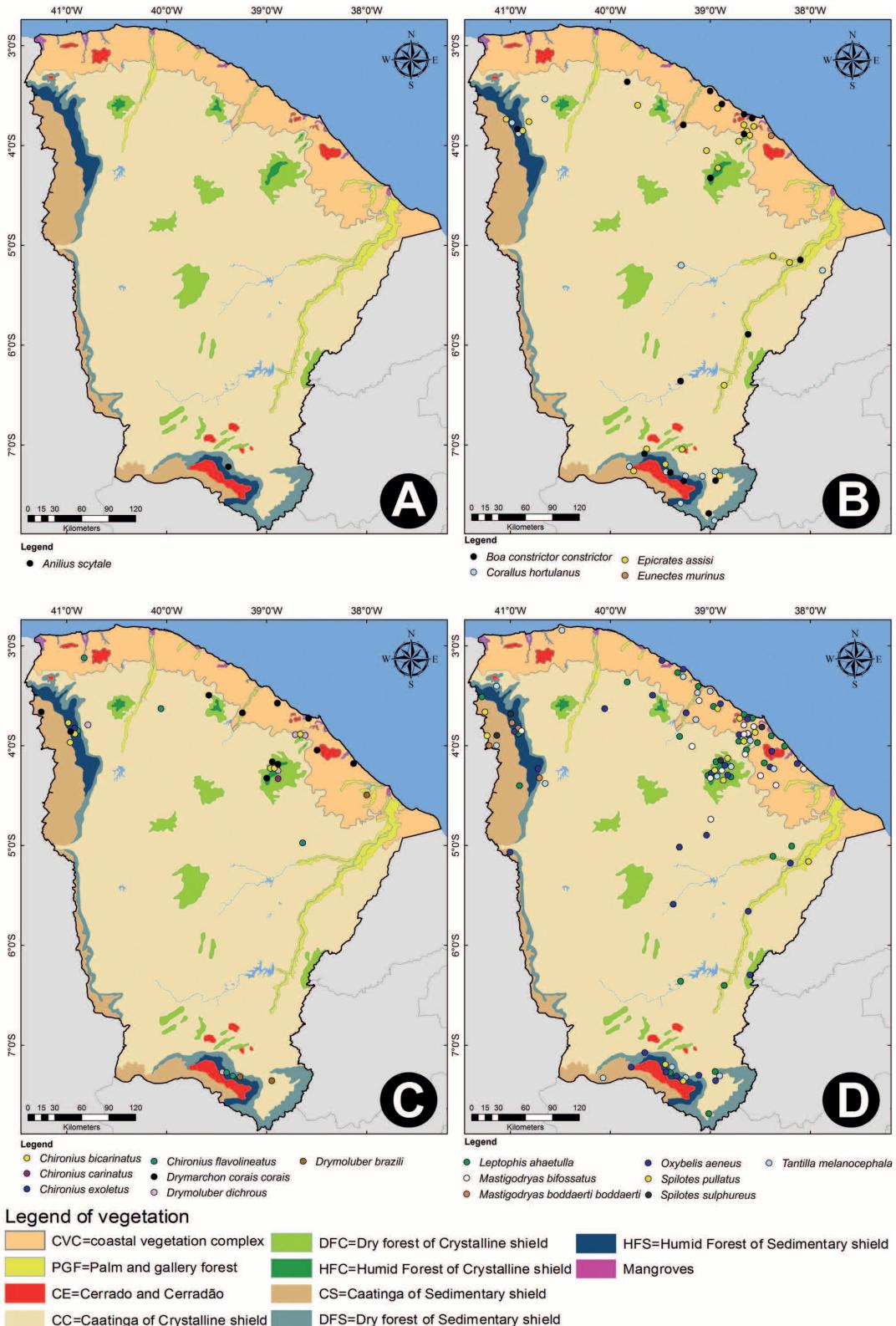
Supplementary figure 5. Reptile species distribution in the major phytoecological units in the state of Ceará (A-Family Gymnophthalmidae: *Acratosaura mentalis*, *Cercosaura ocellata*, *Colobosaura modesta*, *Colobosauroides cearensis*, *Leposoma baturitensis*, *Micrablepharus maximiliani*, *Placosoma* sp., *Stenolepis ridleyi*, *Vanzosaura multiscutata*; B-Family Iguanidae: *Iguana iguana*; C-Family Leiosauridae: *Enyalius bibronii*; D-Family Scincidae: *Mabuya* spp.).



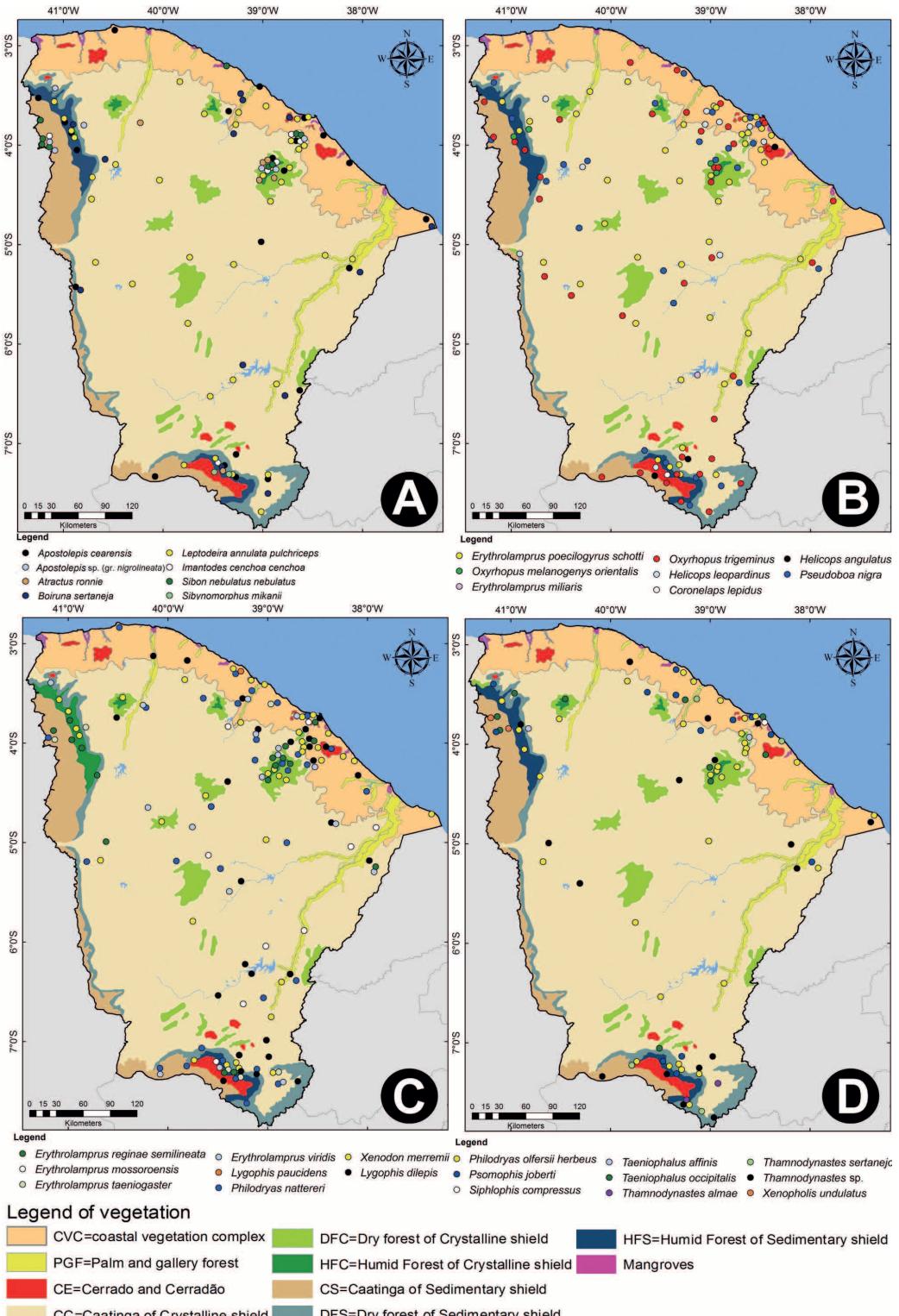
Supplementary figure 6. Reptile species distribution in the major phytoecological units in the state of Ceará (A-Family Phyllodactylidae: *Phyllopezus* spp., *Gymnodactylus geckoides*; B- Family Polychrotidae: *Polychrus* spp.; C-Family Sphaerodactylidae: *Coleodactylus meridionalis*, *Gonatodes humeralis*; D-Family Teiidae: *Ameiva ameiva*, *Cnemidophorus ocellifer*, *Kentropyx calcarata*, *Tupinambis* spp.).



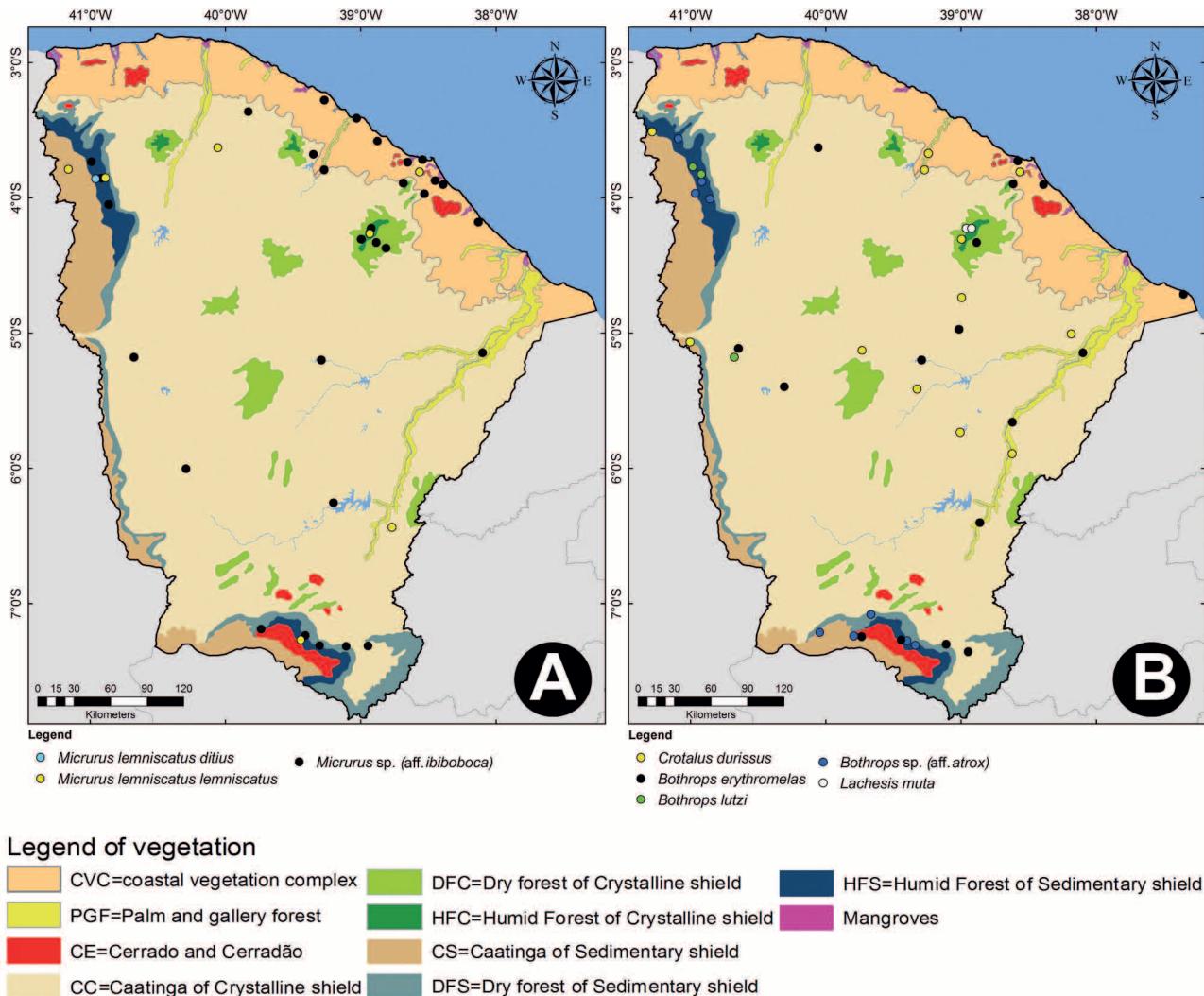
Supplementary figure 7. Reptile species distribution in the major phytoecological units in the state of Ceará (A-Family Tropiduridae: *Stenocercus squarrosus*, *Strobilurus torquatus*, *Tropidurus* spp.; B-Family Amphisbaenidae: *Amphisbaena* spp; C-Family Liophlopidae: *Liophlops cf. ternetzi*; D-Family Typhlopidae: *Amerotyphlops* spp.; Family Leptotyphlopidae: *Epictia borapeliotes*, *Trilepida brasiliensis*.).



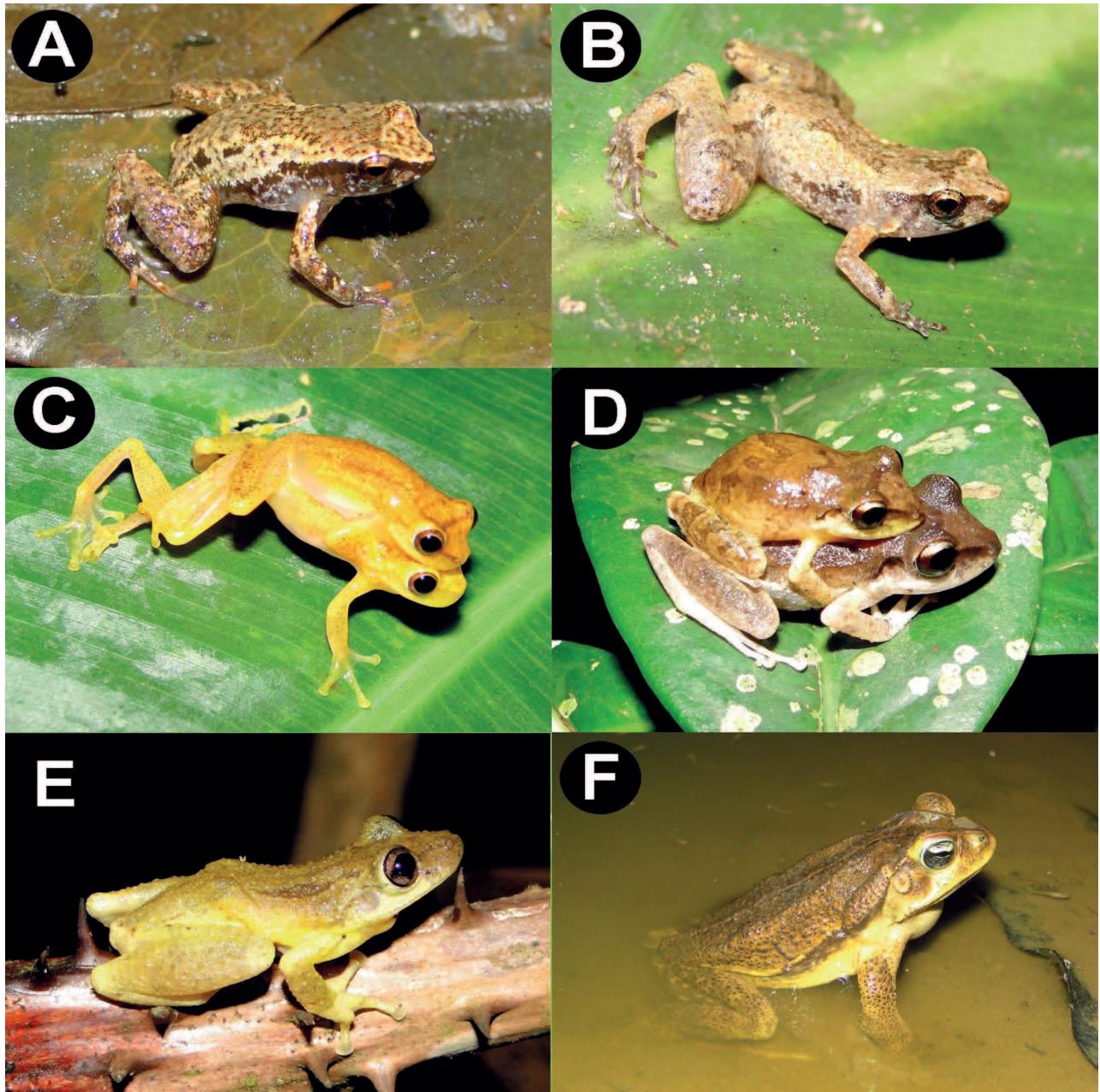
Supplementary figure 8. Reptile species distribution in the major phytoecological units in the state of Ceará (A-Family Aniliidae: *Anilius scytale*; B-Family Boidae: *Boa constrictor*, *Corallus hortulanus*, *Epicrates assisi*, *Eunectes murinus*; C-Family Colubridae: *Chironius* spp., *Drymarchon corais*, *Drymoluber* spp.; D-Family Colubridae: *Leptophis ahaetulla*, *Mastigodryas* spp., *Oxybelis aeneus*, *Spilotes sulphureus*, *Spilotes pullatus*, *Tantilla melanocephala*.).



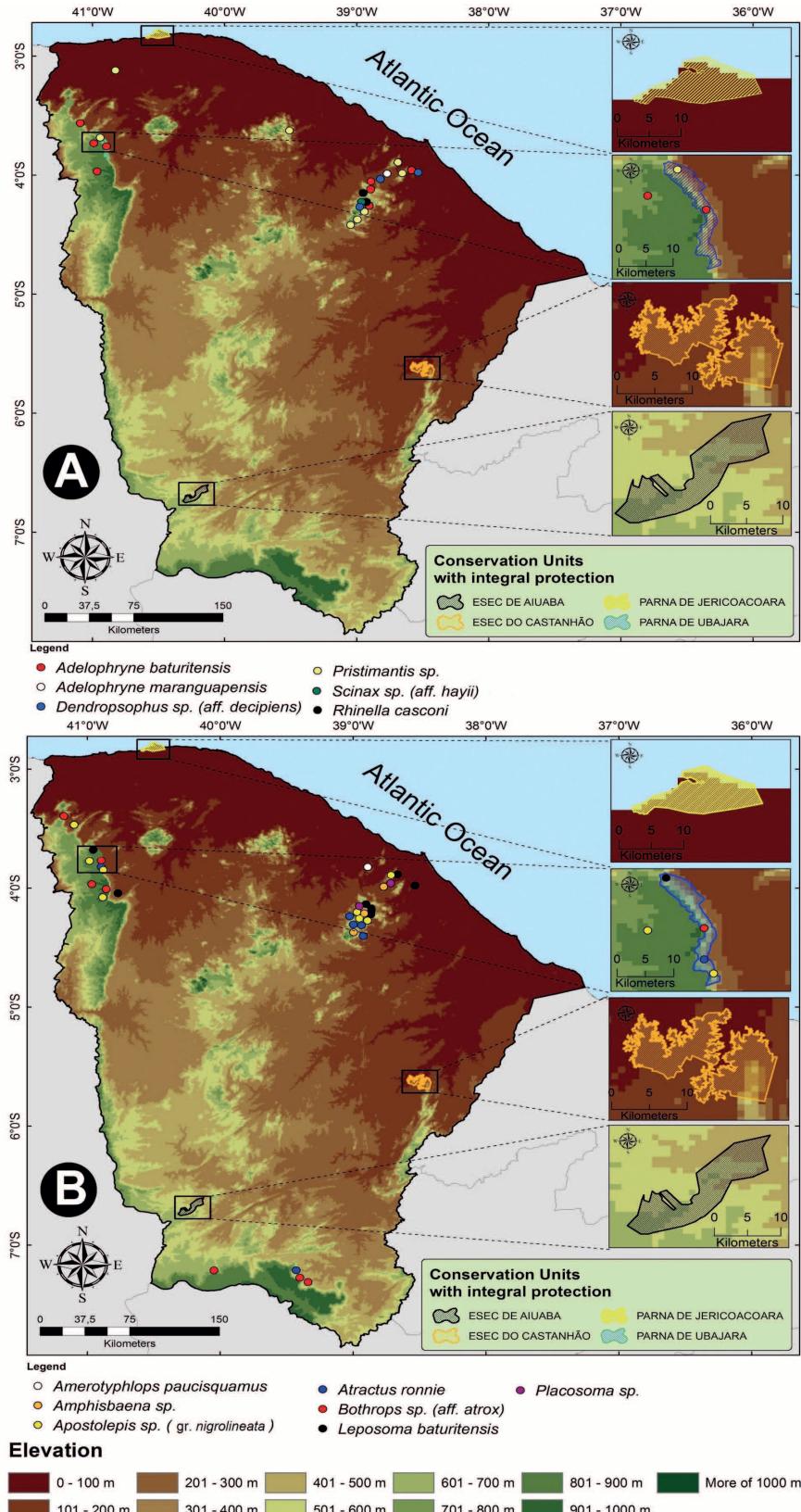
Supplementary figure 9. Reptile species distribution in the major phytoecological units in the state of Ceará (A-Family Dipsadidae: Apostolepis spp., Atractus ronnie, Boiruna sertaneja, Leptodeira annulata, Imantodes cenchoa, Sibon nebulatus, Sibynomorphus mikanii; B-Family Dipsadidae: Erythrolamprus poecilogyrus, E. miliaris, Oxyrhopus spp., Helicops spp., Pseudoboa nigra, Coronelaps lepidus; C-Family Dipsadidae: Erythrolamprus reginae, E. mossoroensis, E. taeniogaster, E. viridis, Lygophis spp., Philodryas nattereri, Xenodon merremii; D-Family Dipsadidae: Philodryas olfersii, Psomophis joberti, Siphlophis compressus, Taeniophallus spp., Thamnodynastes spp., Xenopholis undulatus).



Supplementary figure 10. Reptile species distribution in the major phytoecological units in the state of Ceará (A-Family Elapidae: *Micrurus* spp.; B-Family Viperidae: *Bothrops* spp., *Crotalus durissus*, *Lachesis muta*.).



Supplementary figure 11. Endemic and/or threatened amphibian species that occur in the state of Ceará: A) *Adelophryne maranguapensis*; B) *A. baturitensis*; C) *Dendropsophus* sp. (aff. *decipiens*); D) *Pristimantis* sp.; E) *Scinax* sp. (aff. *hayii*); F) *Rhinella casconi*.



Supplementary figure 12. Maps showing gap and protected species of A) amphibians and B) reptiles in the state of Ceará with their corresponding distributions in Conservation Units of Integral Protection.



Supplementary figure 13. Endemic and/or threatened amphibian species that occur in the state of Ceará: A) *Leposoma baturitensis* (female); B) *Placosoma* sp.; C) *Amerotyphlops paucisquamus*; D) *Apostolepis* sp. (gr. *nigrolineata*); E) *Atractus ronnie*; F) *Bothrops* sp. (aff. *atrox*).