

# The squamata fauna of the Chapada do Araripe, Northeastern Brazil.

## *A fauna de Squamata da Chapada do Araripe, Nordeste do Brasil.*

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### Resumo

Procurando ajudar na compreensão do conjunto de espécies de répteis da Chapada do Araripe, nós inventariamos os espécimes coletados e depositados na coleção do Laboratório de Zoologia da Universidade Regional do Cariri/ LZ-URCA. Apesar de ser assinalada como uma área prioritária para a conservação de répteis, com extrema importância biológica, a Chapada do Araripe conta ainda com poucos estudos herpetofaunísticos. Nós registramos um total de 37 espécies de répteis: dez famílias de lagartos (14 gêneros, 17 espécies), uma de anfisbênia (dois gêneros, três espécies) e quatro de serpentes (15 gêneros, 17 espécies), representando um total de 67% da fauna total registrada para a Chapada. Três novos registros de serpentes são também apresentados, *Corallus hortulanus*, *Helicops sp.* e *Atractus sp.* Apresentamos também uma atualização taxonômica das espécies ocorrentes na Chapada do Araripe. O presente estudo objetivou caracterizar a fauna de Squamata da Chapada do Araripe, e serve de subsídio para posteriores estudos para conservação da biodiversidade neotropical.

Palavras-chave: Biodiversidade, Répteis, Lagartos, Serpentes, Chapada do Araripe.

### Abstract

In order to document the species present in the Chapada do Araripe, Brazil, an inventory was made of the reptile specimens collected and deposited in the Zoology Laboratory of the Universidade Regional do Cariri / LZ-URCA. Although this area is considered a priority region for reptile conservation and is of very high biological importance, it has actually seen very few herpetological studies. We encountered a total of 37 species of reptiles: ten families of lizards (14 genera, 17 species), one amphisbaena family (two genera, three species) and four snake families (15 genera, 17 species) representing a total of 67% of the total fauna recorded for the Chapada. Three new genus of snake, *Corallus hortulanus*, *Helicops sp.* and *Atractus sp.*, was also recorded. We also present here an up-to-date list of the species that occur in the Chapada do Araripe. This study aimed to characterize the Squamata fauna of the Chapada do Araripe, and serves for further studies that are essential for conservation of neotropical biodiversity.

Keywords: Biodiversity, Reptiles, Lizards, Snakes, Chapada do Araripe.

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## INTRODUCTION

Brazil has the richest fauna and flora in all of Central and South America, although most of the information available about its reptiles is still preliminary (RODRIGUES, 2005), with innumerable biomes poorly sampled in existing collections (PRUDENTE *et al.*, 2005) and with many gaps in studies related to the geographic distribution of the species and their natural and ecological histories (BARROS-FILHO & VALVERDE, 1996; RODRIGUES, 2000).

Important work has been undertaken and published for the Northeastern region of Brazil (VANZOLINI, 1974, 1981; VANZOLINI *et al.*, 1980; VITT & VANGILDER, 1983; BORGES-NOJOSA & CARAMASCHI, 2003; VITT, 1995; RODRIGUES, 1996, 2003).

This growing collection of surveys was initiated with research undertaken VANZOLINI (1974, 1981), VANZOLINI *et al.* (1980) and has resulted in many important publications concerning the reptiles of the Caatinga (dryland) and its more humid enclaves.

This author was the first to call attention to the differences in the composition and structure of the fauna as well as the species richness of these Atlantic Forest enclaves (VANZOLINI, 1981) locally known as "Brejos-de-altitude" (ANDRADE-LIMA, 1964).

The differences between these areas and the importance of their conservation were examined in more detail in subsequent publications (RODRIGUES, 1990; BORGES, 1991; LIMA, 1999; BORGES-NOJOSA & CARAMASCHI, 2003).

The different regions within the Atlantic Forest biome, especially the forest remnants in Northeastern Brazil, are among the less-studied environments on that continent and although the Chapada do

Araripe is indicated as a priority area for the conservation of reptiles and amphibians of extreme biological importance (MINISTÉRIO DO MEIO AMBIENTE, 2000) few studies on reptiles have been undertaken there (VANZOLINI, 1981; BORGES-NOJOSA, 2000; BORGES-NOJOSA & CARAMASCHI, 2003). Even less is known about the amphibians, outside of a preliminary survey (BORGES-NOJOSA, 2000).

The Chapada has one endemic species, the lizard *Mabuya arajara* Rebouças-Spieker, 1981, although it is quite possible that more detailed studies will reveal some surprises.

Within this context, the present work reports on an inventory made of the reptile species collected in the Chapada do Araripe and deposited in the collection of the Zoology Laboratory of the Universidade Regional do Cariri / LZ-URCA.

This effort was made to increase our understanding of the species found there and to stress the importance of conserving this important natural heritage.

## MATERIALS AND METHODS

The Chapada do Araripe Environmental Protection Area (APA) was created by Federal Decree in 1997 and occupies parts of three states (Ceará, Piauí, and Pernambuco) in Northeastern Brazil. The total area of the APA is 10,425 Km<sup>2</sup>, and includes the Chapada do Araripe Range (07°15'S, 39°28'W), which is located in the southern meridian region of Ceará State, approximately 450 km from the Atlantic coast. The region is dominated by formations of the Cretaceous era (Araripe group), having altitudes varying from 850-900 m. A number of different vegetation physiognomies are found there, including: Sub-perennial Tropical Pluvio-Nebular

Forest (Humid Forest), Sub-deciduous Tropical Pluvial Forest (Dry Forest), Sub-deciduous Tropical Xeromorphic Forest (Cerradão), Cerrado and Carrasco (scrub) (FERNANDES, 1990; CAMPELO et al., 2000).

Occasional collections have been made since 2004 in the Chapada do Araripe with the primary objective of determining the nature of the parasitic endofauna of its reptiles (LOPES et al., 2006., ALMEIDA et al., 2006a, b; ALMEIDA et al., 2007, 2008; ANJOS et al., 2007, 2008; ALMEIDA et al., in press), and these studies have aided in the characterization of the reptile species found there.

Different collection methods have been used to sample the different habitats and micro-habitats in the region, including: active collecting (AURICCHIO & SALOMÃO, 2002), visual searches (BLOMBERG & SHINE, 1996) and pitfall

traps with drift fences (CECHIN & MARTINS, 2000) (Figure 1). Collecting by consignment has also been considered in order to complement our sampling (see CUNHA & NASCIMENTO, 1978).

After capture, the animals were taken to the laboratory, euthanized with ether or by quick-freezing, fixed in 10% formalin and conserved in 70% alcohol (AURICCHIO & SALOMÃO, 2002). All of the specimens were labeled and registered in the LZ-URCA.

Identification of the specimens was based on the specialized literature (e.g. VANZOLINI et al. [1980]; PETERS & DONOSO-BARROS [1970]; PETERS & OREJAS-MIRANDA [1970]; RODRIGUES [1987]), original descriptions, and field guides (FREITAS & SILVA, 2005, 2007). Some species were taxonomically up-dated as required (SBH, 2008)

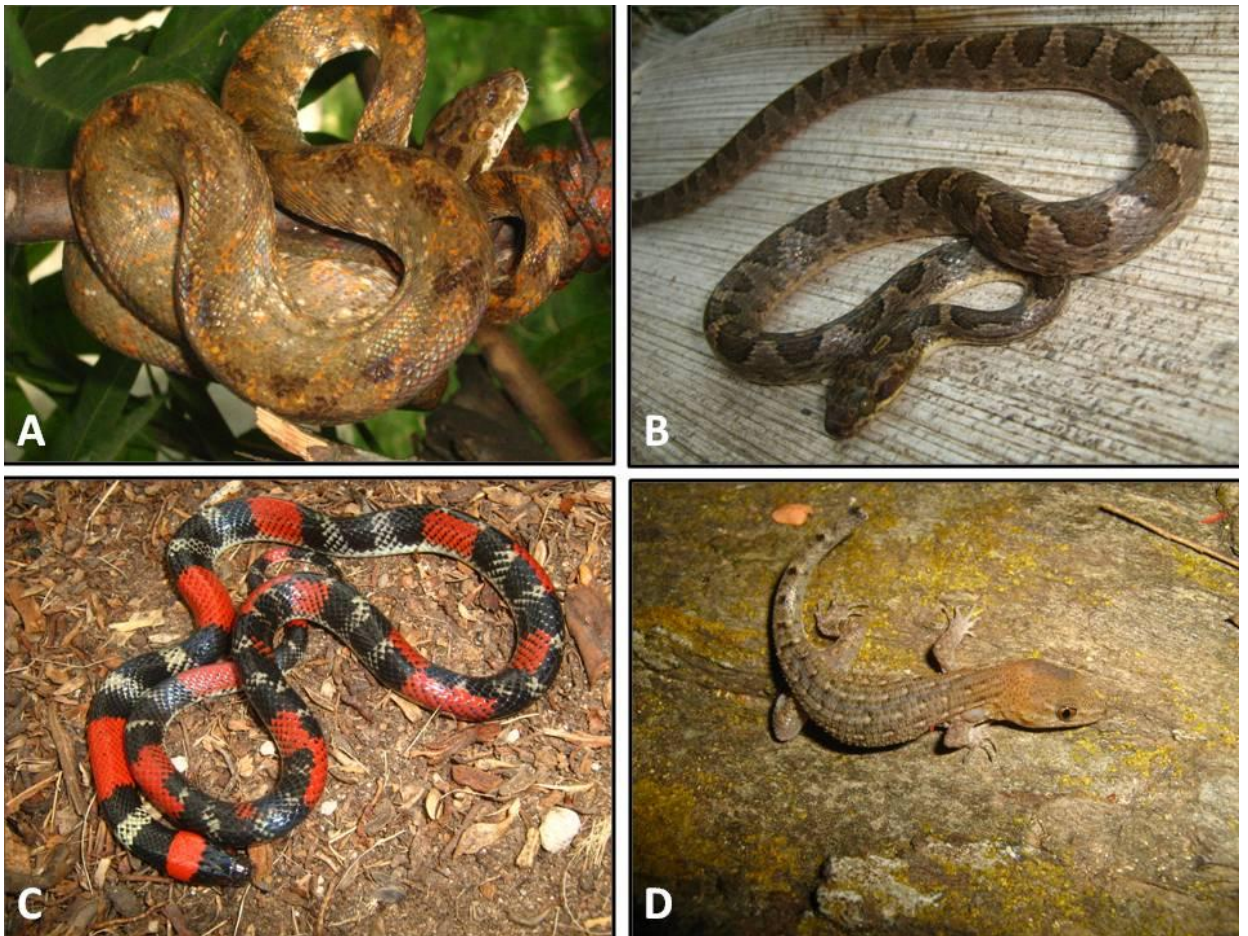


**Figure 1:** Pitfall trap with drift fence used in Herpetological collect.

## RESULTS AND DISCUSSIONS

The total of 37 reptile species, distributed among ten lizard families (14 genera, 17 species), one amphisbaenian family (Two genera, Three species), and four snake families (15 genera, 17 species) have been incorporated into the collection of the Zoology Laboratory of the URCA (Figure 2).

This information is presented in Table 1, which also includes species not yet incorporated into the collection but that were published in earlier studies (VANZOLINI, 1981; VANZOLINI *et al.*, 1980; BORGES-NOJOSA, 2000; BORGES-NOJOSA & CARAMASCHI, 2003).



**Figure 2:** Specimens collected and deposited in the LZ-URCA: (A) *Corallus hortulanus*, (B) *Leptodeira annulata*, (C) *Oxyrhopus trigeminus*, (D) *Gymnodactylus geckoides*

We also include here three non-poisonous snakes: *Corallus hortulanus*, which is arboricolous and nocturnal;

*Helicops* sp. an aquatic species; and *Atractus* sp., a semifossorial snake that

lives among the leave-litter on the forest floor.

This raises to 24 the number of snake genera reported, totaling 31 species. The

Chapada do Araripe additionally has four species of amphisbaenians and 20 species of lizards, totaling 55 species of reptile of the order Squamata (Table 1).

**Table 1.** Species of Squamata registered for the Chapada do Araripe.

		<i>Amphisbaena alba</i> Linnaeus, 1758	
<b>AMPHISBAENIANS</b>	<b>Amphisbaenidae</b>	<i>Amphisbaena pretrei</i> Duméril & Bibron, 1839 *	
		<i>Amphisbaena vermicularis</i> , Wagler, 1824	
		<i>Leposternon polystegum</i> (Duméril, 1851)	
		<b>Anguidae</b>	
		<i>Dipoglossus lessonae</i> Peraca, 1890	
		<i>Hemidactylus agrius</i> Vanzolini, 1978*	
	<b>Gekkonidae</b>	<i>Hemidactylus brasilianus</i> (Amaral, 1935)	
		<i>Hemidactylus mabouia</i> (Moreau de Jonnès, 1818)	
		<i>Micrablepharus maximiliani</i> (Reinhart & Lutken, 1862)*	
		<i>Vanzosaura rubricauda</i> (Boulenger, 1902)*	
	<b>Iguanidae</b>	<i>Iguana iguana</i> (Linnaeus, 1758)	
	<b>Leiosauridae</b>	<i>Enyalius bibronii</i> Boulenger, 1885	
		<i>Gymnodactylus geckoides</i> Spix, 1825	
	<b>Phyllodactylidae</b>	<i>Phyllopezus pollicaris</i> (Spix, 1825)	
<b>LIZARDS</b>		<i>Anolis nitens brasiliensis</i> Vanzolini & Williams, 1970	
	<b>Polychrotidae</b>	<i>Polychrus acutirostris</i> Spix, 1825	
		<i>Mabuya arajara</i> Reboças-Spieker, 1981	
	<b>Scincidae</b>	<i>Mabuya heathi</i> Schimdt & Inger, 1951	
		<b>Sphaerodactylidae</b>	<i>Coleodactylus meridionalis</i> (Boulenger, 1888)
		<i>Ameiva ameiva</i> (Linnaeus, 1758)	
		<b>Teiidae</b>	<i>Cnemidophorus ocellifer</i> (Spix, 1825)
		<i>Tupinambis meriana</i> (Duméril & Bribon, 1839)	
		<i>Tropidurus hispidus</i> (Spix, 1825)	
		<b>Tropiduridae</b>	<i>Tropidurus semitaeniatus</i> (Spix, 1825)

**Table 1.** Species of Squamata registered for the Chapada do Araripe.

	<b>Leptotyphlopidae</b>	<i>Leptotyphlops cf. brasiliensis</i> *
		<i>Bothrops erythromelas</i> Amaral, 1923*
	<b>Viperidae</b>	<i>Bothrops leucurus</i> Wagler, 1824
		<i>Crotalus durissus</i> Linnaeus, 1758*
		<i>Boa constrictor</i> Linnaeus, 1758
	<b>Boidae</b>	<i>Corallus hortulanus</i> (Linnaeus, 1758)
		<i>Epicrates cenchria</i> (Linnaeus, 1758)*
	<b>Elapidae</b>	<i>Micrurus ibiboboca</i> (Merrem, 1820)
		<i>Atractus</i> sp.
		<i>Boiruna maculata</i> (Boulenger, 1896)*
		<i>Chironius flavolineatus</i> (Boettger, 1885)
		<i>Drymoluber dichrous</i> (Peters, 1863)*
		<i>Helicops</i> sp.
		<i>Helicops leopardinus</i> (Schlegel, 1837)*
		<i>Leptodeira annulata</i> (Linnaeus, 1758)
		<i>Leptophis ahaetulla</i> (Linnaeus, 1758)
		<i>Liophis dilepis</i> (Cope, 1862)
		<i>Liophis mossoroensis</i> Hoge & Lima-Verde, 1972*
		<i>Liophis poecilogyrus</i> (Wied, 1825)*
<b>SNAKES</b>	<b>Colubridae</b>	<i>Liophis reginae</i> (Linnaeus, 1758)
		<i>Liophis viridis</i> Gunther, 1862*
		<i>Oxybelis aeneus</i> (Wagler, 1824)
		<i>Oxyrhopus trigeminus</i> Duméril, Bibron & Duméril, 1854*
		<i>Philodryas naterreri</i> Steindachner, 1870
		<i>Philodryas olfersii</i> (Lichtenstein, 1823)
		<i>Pseudoboa nigra</i> (Duméril, Bibron & Duméril, 1854)*
		<i>Psomophis joberti</i> (Sauvage, 1884)
		<i>Sibynomorphus mikkani</i> (Schlegel, 1837)*
		<i>Spilotes pullatus</i> (Linnaeus, 1758)
		<i>Thamnodynastes</i> sp.*
		<i>Waglerophis merremii</i> (Wagler, 1824)*

Total: 55 reptiles / \* Sources: VANZOLINI *et al.* (1980); VANZOLINI (1981); BORGES

In relation to the lizards, which have been relatively well studied, the Chapada do Araripe has a rather low number of species in comparison to other “Brejos-de-altitude” areas in Ceará State (BORGES-NOJOSA & CARAMASCHI, 2003).

This relatively low number of lizard species, in addition to the report presented here of three snakes previously unknown to the area (with *Atractus* being relatively well collected during the field work), demonstrates the lack of detailed and long-term studies undertaken there - in contrast to much better survey coverage in the Serra de Baturité (BORGES-NOJOSA, 1991; BORGES-NOJOSA & CARAMASCHI, 2003), the Serra de Maranguape (LIMA, 1999; BORGES-NOJOSA & CARAMASCHI, 2003) and in the Ibiapaba plateau (BORGES-NOJOSA & CARAMASCHI, 2003). Due to the small number of collecting campaigns undertaken in the Chapada do Araripe we strongly believe that the reptilian fauna of the region continues to be poorly sampled, principally in terms of the fossorial and semi-fossorial species (which are difficult to observe and to collect due to their secretive habits).

The present report represents the first time that the reptile collection at the LZ-URCA was catalogued and published, and we now consider it to be a small regional scientific collection (MARTINS, 1994). The collection harbors only reptiles of the Order Squamata (approximately 507 specimens), mostly lizards of the family Tropicuridae. 66% of the total fauna of the Chapada do Araripe is represented in this collection, which also harbors specimens from various localities in southern Ceará State – many of them are reference animals for important studies that have been published on pulmonary endoparasites (LOPES *et al.*, 2006; ALMEIDA *et al.*, 2006a, b, 2008; ANJOS *et al.*, 2007, 2008; ALMEIDA *et al.*, *in press*).

Regional collections such as this are extremely important, for the intensive collecting that they represent comes very close to representing the entire local fauna (AURICCHIO & SALOMÃO, 2002). The examination of such regional collections will facilitate studies of the distribution of the national (and even continental) fauna - a common procedure in many other countries (MARTINS, 1994). Additionally, these collections are indispensable for taxonomic and systematic revisions, as well as biogeographical and ecological studies (among others) (PRUDENTE, 2003; PRUDENTE *et al.*, 2005)

## CONCLUSIONS

Knowledge of the fauna of any given region is one of the indispensable requirements for sustainable development as it provides the foundation to evaluate actions that could severely alter environments harboring endemic, rare or threatened species.

These collections also aid in evaluating the populational status of these animals, and they add to the factual base necessary for developing relevant species conservation strategies. Within this context, it is our hope that the data concerning the reptiles of the Chapada do Araripe collected and deposited in the Regional Scientific Collection of the Zoology Laboratory at the Universidade Regional do Cariri - LZ-URCA will aid in future in-depth studies of the species occurring there.

We take the opportunity here to report the occurrence of three new snake species, and to stress the importance of undertaking more detailed studies of the local fauna, as well as developing strategies to conserve this important natural area that contains an interesting and little known biological heritage – now threatened by exploitive human action.

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