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Serpentes da Caatinga:
Diversidade, história natural, biogeografia e conservação

Thaís Barreto Guedes

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2012

Ah! Que saudade do luar da minha terra

Lá na serra branquejando folhas secas pelo chão

Este luar, cá da cidade tão escuro

Não tem aquela saudade do luar lá do sertão

Não há, ó gente, ó não

Luar como esse do sertão...

[Luar do Sertão – Luiz Gonzaga, em 2012 são100 anos do Rei do Baião]

Minha Mainha!

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Índice

*Os capítulos 1 e 2 desta tese correspondem a artigos e seguem as normas das revistas científicas, com exceção do alinhamento à esquerda por motivo estético para a tese. O Capítulo 1 será submetido ao South American Journal of Herpetology (normas para submissão disponível em http://www.sbherpetologia.org.br/sajh2010/authors.asp) e o Capítulo 2 será submetido ao Journal of Biogeography (normas para submissão disponível em: http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)13652699/homepage/ForAuthors.html).

Resumo geral

Estudos sobre conhecimento taxonômico, riqueza, distribuição espacial e biogeografia da biota são urgentes na Caatinga. Esta região natural brasileira é a terceira mais alterada por ações antrópicas, a mais negligenciada quanto a conservação da sua biodiversidade e menos protegida em áreas de conservação de proteção integral. Além disso, a Caatinga é uma das porções naturais brasileiras menos conhecidas no que diz respeito a sua biodiversidade, o que dificulta a implementação de medidas para conservação. Esta escassez de dados também impede o conhecimento mais abrangente sobre diversidade e biogeografia tropical. Neste trabalho, é apresentado um estudo amplo sobre riqueza, história natural, distribuição geográfica e biogeografia das espécies de serpentes da Caatinga. Este é o primeiro estudo de enfoque na ampla região da Caatinga, reunindo informações obtidas a partir da análise direta de 7.102 espécimes tombados em 17 coleções zoológicas, somados à 250 registro obtidos em literatura. Foram confirmadas a ocorrência de 112 espécies de serpentes para a região da Caatinga (pertencentes a nove famílias), das quais 22 (20%) são endêmicas. Mapas detalhados de distribuição são fornecidos para todas as espécies com pelo menos um registro na Caatinga. Os valores de riqueza duplicam os valores conhecidos para a área, a lista de endêmicos é a primeira. Os dados mostram que a fauna de serpentes da Caatinga é complexa, compartilhando espécies presentes em outros domínios de paisagens brasileiras, mas também é constituída de espécies únicas. A área mais rica são as áreas elevadas (com mais de 500 m de altitude), e as dunas do médio Rio São Francisco abrigam o maior número de endêmicos. De forma geral, as espécies de serpentes da Caatinga usam predominantemente o solo como substrato, tem a dieta constituída por vertebrados e são diurnas. A Caatinga não é homogênea, é regionalizada e isto também é refletido nos padrões de distribuição das serpentes na área, que parecem responder eventos de vicariância. As serpentes mostram distribuição agrupada, revelando oito áreas dentro desta região que corroboram as maiores divisões topográficas, pedológicas e vegetacionais conhecidas para a Caatinga. Baseado nos dados sobre diversidade, distribuição geográfica e biogeografia são apresentadas informações relacionadas a conservação do grupo e da Caatinga.

Palavras-chave: Diversidade, história natural, distribuição geográfica, biogeografia, Caatinga, conservação

General abstract

Studies on taxonomy, richness and geographic distribution are imperative on Caatinga, the third most degraded Brazilian natural region and the most neglected about conservation, with a small portion of legally protected areas. Moreover, the Caatinga is one of least studied natural Brazilian region, and this lack of data hampers the implementation of conservation measures. The scarce data for the Caatinga also hampers a more comprehensive knowledge on biodiversity and biogeography of the Neotropics. Herein we provide an extensive study about richness, natural history, geographic distribution and biogeography of the Caatinga snake fauna. This is the first study focusing in the more comprehensive Caatinga region, based on information collected from the direct analysis of 7,102 specimens housed in 17 collections of natural history, plus 250 records obtained from literature. The Caatinga harbors 112 snake species (in nine families), of which 22 species (20%) are endemics. Detailed maps are provided for all species that occurs in Caatinga. The richness values doubles known values for the area, and the snake endemic list is the first provided in the region. Our data show that the Caatinga snake fauna is complex, sharing species with other Brazilian natural regions, but also harboring a unique biota of regionalized endemics. The richest areas are highlands (altitude upper 500 m), and São Francisco Dunes hosts the most endemic species. Generally, the Caatinga snake species uses predominantly the ground as substrate, the diet is formed by vertebrate prey, and are diurnal. The Caatinga snake fauna is not homogeneous, with major distribution patterns corroborating central predictions of the vicariance model. The snakes showed significantly clustered ranges, forming eight biotic elements inside Caatinga. Distribution patterns corroborate major topographical, pedological and vegetational divisions known to Caatinga. Based on diversity data, geographic distribution and biogeography provided here, the conservation of the snakes and Caatinga is discussed.

Key-words: Diversity, natural history, geographic distribution, biogeography, Caatinga, conservation.

Introdução Geral

O conhecimento taxonômico, a riqueza e a distribuição espacial das espécies são requisitos básicos para estudos sobre a diversidade faunística (Vanzolini, 1976; Graham *et al*., 2004; Whittaker *et al*., 2005). Contudo, esses dados sobre composição e distribuição das espécies são relativamente escassos para a maioria dos grupos taxonômicos e regiões, resultando no chamado impedimento Linneano e Wallaceano (ver Brown & Lomolino, 1998; Whittaker *et al.,* 2005; Bini *et al*., 2006).

Dados de coleções de história natural constituem a mais importante fonte de informações para sínteses de diversidade de espécies, composição, distribuição e conservação (Graham *et al*., 2004). Os dados acumulados em coleções fornecem a informação bruta necessária para análise de padrões de riqueza de espécies, composição taxonômica e distribuição geográfica dos organismos. Tais informações são essenciais para formular hipóteses sobre os processos evolutivos capazes de explicar a atual biodiversidade (Graham *et al*., 2004). Contudo, há limitações no conhecimento básico e estas são pouco acuradas nos Neotrópicos (Graham *et al.,* 2004), onde sínteses de padrões gerais sobre a composição das espécies são escassas e limitadas pela falta de recursos e taxonomistas treinados (Graham *et al*., 2004).

A Caatinga é uma região exclusivamente brasileira (Silva *et al*., 2002), ocupando aproximadamente 1.000.000 de km² (Ab'Saber, 1974; Rizzini, 1997; Prado, 2005), que corresponde a 70% da região nordeste e 11% do território nacional (Bucher, 1982). É um dos raros domínios semi-áridos da faixa tropical do globo, entremeado por áreas mais úmidas (Ab'Saber, 1967; 1974; Rodrigues, 1986). Sua vegetação mostra características xerofíticas (Rizzini, 1997; Velloso *et al*., 2002; Maia, 2004; Prado, 2005), como estratégia de sobrevivência ao stress hídrico face a baixa pluviosidade e chuvas erráticas anuais que definem o caráter semi-árido da região (Ab'Saber, 1974; Rodrigues, 1986; Velloso *et al*., 2002; Prado, 2005). Proporcionalmente, é a porção menos estudada entre as regiões naturais brasileiras (Leal *et al*., 2005), sendo também a mais negligenciada quanto à conservação de sua biodiversidade e menos protegida em áreas de conservação de proteção integral (Leal *et al.,* 2005; Zanella & Martins, 2005).

Durante algum tempo, a biota da Caatinga foi descrita na literatura como tendo baixa riqueza e endemismo (Vanzolini, 1974; 1976; 1988; Mares *et al*., 1985) e, portanto, de baixa prioridade para conservação (Castelletti *et al.,* 2005). Esta ideia prevaleceu também entre herpetólogos, que

acreditavam que os répteis ali encontrados eram, de modo geral, os mesmos que ocorriam na grande diagonal de formações abertas sul-americana (Vanzolini, 1974; 1976). Com base principalmente no trabalho de Vanzolini *et al.* (1980), a fauna de répteis da Caatinga passou a ser melhor conhecida. Contudo, mesmo após avanços recentes (Vanzolini *et al*., 1980; Rodrigues 1984a, 1984b, 1991a, 1991b, 1991c, 1991d, 1992, 1996; Rodrigues & Juncá, 2002; Borges-Nojosa & Caramaschi, 2005; Rodrigues & Santos, 2008; Loebmann & Haddad, 2011; Filho & Montingelli, 2011), o grau de conhecimento sobre a composição, taxonomia, distribuição e ecologia da herpetofauna da Caatinga ainda é escasso, fragmentado e insatisfatório face às demais regiões brasileiras (Rodrigues, 2005). Atualmente são conhecidas 52 espécies de serpentes, 47 lagartos e 10 anfisbênias da Caatinga (Rodrigues, 2005). Os endemismos estão geralmente associados à regiões com solos arenosos, tendo destaque o campo das dunas do Rio São Francisco (Rodrigues, 1986; 1991a; 1991b; 1991c; 1992; 1993; 1996), e áreas de elevada altitude no estado do Ceará (Borges-Nojosa & Caramaschi, 2005).

As extensas lacunas no conhecimento estão relacionadas, principalmente, a má cobertura geográfica das amostragens uma vez que grande parte dos inventários e sínteses de fauna têm sido pontuais (Rodrigues, 2005). Entretanto, para um grande número de localidades os dados ainda são escassos (Rodrigues, 2004; 2005). Também não se sabe se há outras áreas ainda inexploradas com importância histórica, ecológica e evolutiva similar à registrada para as dunas do rio São Francisco (Rodrigues, 2005). As informações disponíveis sobre a diversidade de serpentes são limitadas a inventários, comentários taxonômicos e informações sobre biologia de espécies (Vanzolini *et al*., 1980; Vitt, 1980, 1983; Vitt & Vangilder, 1983). Não existem dados suficientes para afirmar se espécies que são conhecidas de uma ou de poucas localidades da Caatinga são endêmicas destes sítios.

Dessa forma, conhecer com precisão a composição e distribuição geográfica da herpetofauna é fundamental para compreender os processos históricos e ecológicos atuantes. Estudos com esse enfoque auxiliam a fornecer evidências para a reconstrução de eventos históricos determinantes na composição da fauna de serpentes da Caatinga (Rodrigues, 2004; 2005). Diante do exposto, **no capítulo um é apresentada síntese detalhada e descrição da diversidade de serpentes, história natural e distribuição geográfica na região da Caatinga, fornecendo uma lista atualizada das espécies e mapeamento detalhado, baseado na revisão cuidadosa de dados em coleções de história natural e literatura taxonômica**.

Os estudos biogeográficos têm como objetivo descrever os padrões distribuição dos organismos do planeta e dar explicações sobre a história que teria levado a tais configurações espaciais (Nelson & Platnick, 1981; Platnick & Nelson, 1978; Humphries & Parenti, 1999; Almeida & Santos, 2010). Dedica-se à difícil tarefa de compreender os motivos pelos quais os táxons são encontrados em determinadas áreas e não em outras. Em ampla escala, fornece a perspectiva histórica necessária para compreensão da evolução das biotas (Almeida & Santos, 2010). O ponto de partida para esses estudos é delinear e definir unidades básicas de análise que servirão de base para formular hipóteses sobre a formação das biotas (Carvalho, 2010).

A maioria das espécies não está distribuída ao acaso e, sim, agrupadas em áreas (Morrone, 1994; Hausdorf, 2002). Esse padrão de agrupamento das espécies em áreas muitas vezes pode ser explicado por meio da biogeografia vicariante. O modelo de vicariância (Croizat *et al*., 1974; Rosen, 1978; Platnick & Nelson, 1978; Nelson & Platnick, 1981; Humphries & Parenti, 1999; Hausdorf & Hennig, 2003; Almeida & Santos, 2010) postula que o aparecimento de barreira, que divide uma área anteriormente continua, pode separar um ancestral de uma espécie em duas subpopulações. Tais populações isoladas podem responder independentemente às pressões do meio e se diferenciar, resultando na formação de duas espécies novas. Muitas vezes, a barreira é efetiva para grupos taxonômicos muito distintos, dividindo suas populações de maneira semelhante. Tais padrões de disjunções compartilhadas pode vir a ser reconhecido atualmente como um padrão biogeográfico (Almeida & Santos, 2010).

Até então, estudos com enfoques biogeográficos, conduzidos na região Neotropical focaram principalmente áreas florestadas (Müller, 1973; Prance, 1982; Prado & Gibbs, 1993; Ávila-Pires, 1995; Silva & Sites, 1995; Amorim & Pires, 1996; Haffer, 1997; Costa *et al*., 2000; Azevedo-Ramos & Galatti, 2002; Carnaval, 2002; Silva *et al*., 2004; Queiroz, 2006; Werneck & Colli, 2006; DaSilva & Pinto-da-Rocha, 2010; Barbo, 2012; Camardelli & Napoli, 2012). Como esperado, estudos biogeográficos na Caatinga permanecem escassos para a maioria dos grupos taxonômicos. Assim, estudos de padrões de distribuição em áreas abertas neotropicais são requeridos como passo fundamental para o entendimento da história das biotas dos Neotrópicos.

Apesar de algumas similaridades detectadas entre as sub-unidades da diagonal de formações abertas da América do Sul (ver Prado, 2000; Veloso *et al*., 2002; Colli, 2005; Werneck & Colli, 2006; Zanella, 2010; Werneck *et al.*, 2012), a Caatinga é uma região natural que tem número significante de

riqueza de espécies e endemismos. Também é reconhecida como província florística única, tratada como unidade biogeográfica na maioria dos estudos (*e.g.* Prado & Gibbs, 1993; Prado, 2000; Pennington *et al*., 2000; Zanella & Martins, 2005; Queiroz, 2006; Cardoso & Queiroz, 2010; Zanella, 2010).

O único estudo zoogeográfico sobre a fauna de répteis da Caatinga reconheceu quatro maiores padrões de distribuição: espécies típicas das dunas do Rio São Francisco, espécies de distribuição restrita, espécies amplamente distribuídas na Caatinga e espécies dependentes da rede de drenagem (Rodrigues, 2005). A maioria dos dados usados neste estudo foram de lagartos. Por outro lado, dados de distribuição de serpentes ou anfíbios foram considerados insuficientes para definir padrões (Rodrigues, 2005). O conjunto de dados de lagartos foi a mais importante fonte de informações para indicar que os endemismos na Caatinga são associados a áreas com solos arenosos. Assim, tais dados foram importantes para indicação de áreas prioritárias para a conservação (ver Rodrigues, 1986; 1991a; 1991b; 1991c; 2004; 2005; Camardelli & Napoli, 2012). No que diz respeito às serpentes, um estudo de síntese (Rodrigues, 2005) detectou lacunas extensivas de amostragem e necessidade de estudos taxonômicos básicos antes que qualquer padrão possa ser definido.

O único estudo biogeográfico na Caatinga utiliza dados de anfíbios (Camardelli & Napoli, 2012). Tal estudo usou Análise de Parsimônia de Endemicidade e dois limites disponíveis da região para identificar oito centros de endemismo. A maioria das áreas detectadas compreende maciços montanhosos, detectados como centros de especiação em estudos filogeográficos prévios que definiam essas áreas como relictos de Floresta Atlântica (Carnaval, 2002; Carnaval & Moritz, 2008).

Dada a natureza complexa da região, Velloso *et al*. (2002) também dividiu a Caatinga em oito maiores unidades regionais (ou ecorregiões, *sensu* Bailey, 1998), que foram reconhecidas baseada em fatores bióticos e abióticos. Usando dados de plantas Leguminosas, analisados pelo índice de similaridade de Sørensen e UPGMA, Queiroz (2006) e Cardoso & Queiroz (2010) reconheceram sete das oito ecorregiões propostas por Velloso *et al*. (2002) como centros de endemismo. Apenas uma delas não foi corroborada como uma unidade independente (Queiroz, 2006). Além disso, o estudo de Queiroz (2006) apoia a visão de que a Caatinga compreende duas biotas separadas, uma associada com solos derivados do embasamento cristalino, e outra de solos de superfície sedimentar.

Com base na informação fornecida acima, a Caatinga têm fatores bióticos (Camardelli & Napoli, 2012; Velloso *et al*., 2002; Queiroz, 2006; Cardoso & Queiroz, 2010) e abióticos (*e.g.*

topográficos, geomorfológicos, pedológicos. Velloso *et al*., 2002) que sugerem a regionalização desta região em áreas que abrigam uma biota distinta. A Caatinga é heterogênea, mas a maioria dos estudos indica apenas as áreas elevadas e dunas do Rio São Francisco como áreas de endemismo da herpetofauna (Velloso *et al*., 2002; Rodrigues, 2005; Queiroz, 2006; Camardelli & Napoli, 2012). Baseado nisto, **o capítulo dois tem como objetivo analisar a existência de padrão de distribuição da fauna de serpentes, testando se este pode ser interpretado como resultado de diversificação por processos vicariantes entre as grandes unidades de relevo, solo e/ ou topografia.**

As informações fornecidas em ambos capítulos não irão apenas contribuir para o conhecimento sobre a diversidade e padrões de distribuição de serpentes da Caatinga. Essas informações são de extrema importância no auxílio do desenvolvimento de estratégias de conservação para a Caatinga. Assim, o tema é discutido nos dois capítulos no intuito de auxiliar o processo de indicação de áreas prioritárias ou implementação de unidades de proteção e ações de conservação, que devem representar pelo menos os padrões atuais conhecidos da biodiversidade (Whittaker *et al*., 2005).

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Capítulo 1

DIVERSITY, NATURAL HISTORY AND DISTRIBUTION OF SNAKES IN THE CAATINGA, NORTHEASTERN BRAZIL*

Diversidade, história natural e distribuição geográfica das serpentes da Caatinga, nordeste do Brasil

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DIVERSITY, NATURAL HISTORY AND DISTRIBUTION OF SNAKES IN THE CAATINGA, NORTHEASTERN BRAZIL

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KEY-WORDS: Snakes; Diversity; Natural history; Distribution; Conservation; Caatinga region

ABSTRACT: The present study is a synthesis on snake diversity and distribution in the Caatinga region, which provides an updated species list, data on natural history and geographic distribution. Our study is based on the careful revision of about 7,102 voucher specimens, housed in 17 herpetological collections, complemented by data on taxonomic literature. We registered a total of 112 snake species in the Caatinga, belonging to nine families Anomalepididae, Leptotyphlopidae, Typhlopidae, Aniliidae, Boidae, Viperidae, Elapidae, Colubridae and Dipsadidae. Our list includes at least 15 new records of species in this region, as well as new distribution records for species previously known of the Caatinga. The snake assemblage in Caatinga includes mainly terrestrial species (38.39%), followed by fossorial/cryptozoic (26.79%), arboreal/semi-arboreal (26.79%) and aquatic/semi-aquatic (7.14%) species. Vertebrates are the most important dietary item (80.36%), with 56.67% of species being generalist consumers of this kind of prey; 24.44% are frog-eater, 7.78% prey on caecilians/amphisbaena, 6.67% lizard-eater, and 3.33% mammal-eater, and 1.11 are fish-eater. Only 18.75% of the snakes eat invertebrate prey, (as arthropods and mollusks). In relation to time of activity, 35.71% are diurnal, 33.04% of snakes are strictly nocturnal, and 30.36% both diurnal and nocturnal. The snake assemblage of the Caatinga is complex and share species that also occurs in other Brazilian biomes in open areas (38.39%), forested areas (27.68%) and both open and forested areas (32.14%). The richest area was isolated plateaus, followed by transitional areas, semi-arid caatinga and sandy dunes of the São Franscisco River. At least 58 (51.7%) of these species with restricted distribution in some of these areas. We identified 22 endemic species of the Caatinga, with sandy dunes of São Franscico River showing the highest endemism level (12 species, with six endemic species restricted to this area) followed by semi-arid caatinga and isolated plateaus (eight endemic species each, and six and three endemic species with restrict distribution to each area, respectively). The data provided herein correspond to five times greater sampling effort than was available in literature, increases the list of snake species in the region from 52 to 112, and and includes detailed data on the occurrence of each species in the region by means of maps and detailed information about geographic distribution. The data provided herein reveal that the snake assemblage of Caatinga shows high richness and endemism levels, and highlights the usefulness of basic natural history data and revision of voucher specimens for providing information for biogeographic studies conservation strategies for this region.

RESUMO**:** Apresentamos uma síntese e descrição da diversidade e distribuição de serpentes na região da Caatinga, fornecendo uma lista atualizada de espécies com dados de história natural e mapas de distribuição. O dados foram baseados na revisão cuidadosa de 7.102 espécimes depositados em 17 coleções científicas, complementados com dados da literatura. Ao todo registramos 112 espécies de serpentes na Caatinga pertencentes a nove famílias: Anomalepididae, Leptotyphlopidae, Typhlopidae, Aniliidae, Boidae, Viperidae, Elapidae, Colubridae e Dipsadidae. Os dados acrescentam 15 novos registros de espécies para a região e ampliam a distribuição geográfica de espécies previamente conhecidas da Caatinga. As serpentes da Caatinga são principalmente terrestres (38,39%), seguidas por fossórias ou criptozoicas (26,79%), arborícolas ou semi-arborícolas (26,79%), aquáticas ou semi-aquáticas (7,14%). Vertebrados constituem o principal item da dieta (80,36%) e entre as espécies que comem esse item 56,57% são generalistas, 24,44% especialistas em anfíbios, 7,78 comem animais de corpo alongado como cecílias e anfisbênias, 6,67 lagartos, 3,33% mamíferos e 1,11 se alimentam de peixes. Apenas 18,75% das espécies comem invertebrados, como artrópodes e moluscos. Com relação ao período de atividade, 35,71% são estritamente diurnas, 33,04% noturnas e 30,36% tanto diurnas como noturnas. A fauna de serpentes da Caatinga é complexa, compartilhando espécies presentes em outros domínios de paisagens brasileiras. A fauna da Caatinga é dominada por espécies registradas para outras áreas abertas (38,39%), florestadas (27,68%) e presentes tanto em áreas abertas como florestadas (32,14%). As regiões mais ricas da Caatinga foram áreas de altitude, seguidas pelas áreas de transição, caatinga semi-árida e dunas paleoquaternárias do Rio São Francisco, com pelo menos 58 (51,7%) espécies apresentando distribuição restrita a algumas dessas áreas. Identificamos 22 espécies endêmicas da Caatinga, sendo as dunas do Rio São Francisco a área com o maior número de endemismos (12 espécies, incluindo seis espécies restritas a estas áreas), seguido pela caatinga semi-arida e áreas de elevada altitude (oito espécies registradas em cada área com seis e três espécies restritas a estas áreas, respectivamente). Os dados apresentados aqui correspondem a um esforço amostral cinco vezes maior do que era disponibilizado na literatura, eleva a lista de espécies de serpentes da região de 52 para 112, e inclui dados detalhados de ocorrência de cada espécie na região por meio de mapas e informações detalhadas de distribuição. Os dados revelam que a assembleia de serpentes da Caatinga mostra elevada riqueza e endemismos, e destaca a utilidade de dados básicos e revisão de espécimes tombados em coleções para fornecer informações para estudos biogeográficos e estratégias de conservação para esta região.

INTRODUCTION

In order to understand historical and ecological processes acting on current biodiversity, we must first describe and delineate basic patterns of faunal composition and distribution (Vanzolini, 1976; Ron, 2000; Colli, 2005; Whittaker et al., 2005). Knowledge on taxonomy, species richness and spatial distribution are basic requirement to study faunal diversity (Vanzolini, 1976; Graham et al., 2004; Whittaker et al., 2005). However, basic data on composition and distribution of species is relatively scarce for most taxonomic groups and in most regions, resulting in the so called Linnean and Wallacean shortfalls (see Brown and Lomolino, 1998; Whittaker et al., 2005; Bini et al., 2006).

Natural history collection data are the most important source of information for synthesis on species diversity, composition, distribution and conservation (Graham et al., 2004). The accumulated data stored in collections provide the necessary raw information for analyses on species richness patterns, taxonomic composition and geographical distribution of organisms, crucial information for hypotheses on evolutionary processes invoked to explain current biodiversity (Graham et al., 2004). Moreover, analyses of distribution patterns are central for conservation planning, as the location of reserves and conservation actions must at least represent current biodiversity patterns (Whittaker et al., 2005). However, limitations on basic knowledge are especially more acute in the rich and relatively poorly studied Neotropics (Graham et al., 2004), where syntheses on general patterns of species composition are scarce and limited by lack of funding and trained taxonomists (Graham et al., 2004).

One of the least studied portions of the Neotropical region is the Caatinga of northeastern Brazil. The Caatinga is a large area that cover about 1,000,000 km^2 and whose vegetation shows xerophytic characteristics (Rizzini, 1997; Velloso et al., 2002; Maia, 2004; Prado, 2005), as a survival strategy to resist water stress in the face of low and erratic annual rainfall that defines the character of this semi-arid region (Ab'Saber, 1974; Rodrigues, 1986; Velloso et al., 2002; Prado, 2005). The Caatinga is exclusive to Brazil (Silva et al., 2002), and represents a semi arid domain inside the tropical zone, with humid forested and cerrado savana enclaves (Ab'Saber, 1967, 1974; Rodrigues, 1986; Velloso et al., 2002). Proportionally, it is the least studied among Brazilian natural regions (Leal et al., 2005), being also neglected in terms of conservation actions (Leal et al., 2005; Zanella and Martins, 2005): currently the Caatinga is the third most degraded natural region of Brazil, and 30.4% to 51.7% of its area have already been altered by antropic actions (Castelletti et al., 2005; Leal et al., 2005;

116 PMDBBS, 2008). Additionaly, less than 2% of its area is protected by conservation units (Leal et al.,
117 2005).

118 Studies on the Caatinga started in the 17th century, conducted by the early European naturalists
119 including Johann Baptiste von Spix, George Marcgrave, Johann Wagler, Maxilimilian zu Wied-
120 Neuwied and Johann Natterer (Teixeira, 1995; Vanzolini, 1996a; Pickel, 2008). These early studies
121 provided the first accounts on the diversity of South American fauna, and were not directed to specific
122 regions of taxonomic groups (Vanzolini, 1996a). Detailed studies on the herpetofauna of the Caatinga
123 have only emergedduring the final part of the 20th century (Vanzolini et al., 1980; Vitt, 1980, 1983; Vitt
124 and Vangilder, 1983). The regional herpetofauna was initially described as poor, with few endemic
125 species (Vanzolini, 1974, 1976; Vanzolini et al., 1980; Castelletti et al., 2005), and studies were
126 conducted mainly at a single locality: Exu, in Pernambuco state (Vanzolini et al., 1980; Vitt, 1980,
127 1983; Vitt and Vangilder, 1983).

128 After these initial efforts several recent studies added important information on the Caatinga
129 herpetofauna (Vanzolini et al., 1980; Vanzolini, 1996a; Rodrigues 1984a, b, 1991a, b, c, d, 1992, 1996;
130 Rodrigues and Juncá, 2002; Borges-Nojosa and Caramaschi, 2005; Rodrigues and Santos, 2008;
131 Loebmann and Haddad, 2010; Filho and Montingelli, 2011). Given current knowledge, at least 52
132 snakes, 47 lizards and ten amphisbaenians species are known for the Caatinga (Rodrigues, 2005). The
133 few known endemic species are associated to areas of relictual quaternary sand dunes ("dunas do São
134 Francisco", Rodrigues, 1996; Rodrigues, 2005) or to high isolated plateau areas ("brejos de altitude",
135 Borges-Nojosa and Caramaschi, 2005; Borges-Nojosa, 2006; Loebmann and Haddad, 2010) scattered
136 within the Caatinga.

137 Despite these early advances, knowledge on composition, taxonomy, distribution and ecology
138 of the herpetofauna of the Caatinga remains scarce and fragmentary, and many extensive regional gaps
139 in basic taxonomical or distributional knowledge are still evident, even in recent syntheses (Rodrigues,
140 2005). These rely mostly on data gathered at a few well sampled localities, including the municipality
141 of Exú, state of Pernambuco (Vanzolini et al., 1980; Vitt, 1980, 1983; Vitt and Vangilder, 1983), or the
142 Paleoquaternary sand dunes of middle São Francisco River, state of Bahia (Rodrigues, 1996), and
143 occasional data from high altitudes areas in the state of Ceará (Borges-Nojosoa, 2006; Borges-Nojosa
144 and Caramaschi, 2005; Loebmann and Haddad, 2010).

Most zoogeographical and ecological data for Caatinga Squamates are restricted to lizards (Rodrigues, 1986, 1991a, c, 1995, 2005; Nogueira, 2006). The available information on snake diversity is limited to a species list, taxonomic comments and information about biology of some species (Vanzolini et al., 1980; Vitt, 1980, 1983; Vitt and Vangilder, 1983). As an example, spatial information for conservation priorities for the herpetofauna of the Caatinga was based mostly on lizard diversity patterns (Rodrigues, 2004; 2005). Given the relatively poor geographic coverage of well sampled localities, inferences on richness and diversity for Caatinga squamates are still based on incomplete data. Recent interpretations acknowledge these limitations (Rodrigues, 2005), which prevent a more complete view on the role of historical, ecological and evolutionary determinants on the Caatinga herpetofaunal diversity. Meanwhile, as data accumulates, some lizard and snake genera previously considered narrow endemics, with relictual distribution at the São Francisco Paleoquaternary sand dunes, were recently recorded for other localities, especially along the Caatinga and Cerrado contact areas (Delfim et al., 2006; Nogueira, 2006; Fernandes et al., 2010).

Herein we present a detailed synthesis and account on snake diversity, natural history and distribution in the Caatinga region, providing an updated list of species and detailed mapping of vouchered data, based on careful revision of data in natural history collections and in taxonomic literature. This information will not only contribute to knowledge about the diversity and evolution of the herpetofauna but will also aid in the development of spatially informed conservation strategies for the Caatinga of northeastern Brazil.

MATERIALS AND METHODS

Study area

The Caatinga comprises an estimated area of 800.000 km² to 1.000.000 km² in the Brazilian states of Ceará, Rio Grande do Norte, Paraíba, Pernambuco, Piauí, Alagoas, Sergipe, Bahia, Minas Gerais and a small portion of Maranhão (Ab' Saber, 1974; Prado, 2005; see Fig. 1). The area of the Caatinga considered in this study represents the union of the Caatinga limits provided by Instituto Brasileiro de Geografia e Estatística (IBGE, 1993, 2001, 2004) and Velloso et al. (2002). As it is imprecise define linear cartographic limits between large ecorregions (Ab'Saber, 1967), resulting in discrepant limits of the Caatinga according to different authors and maps (see Ab'Saber, 1967) we considered as transitional areas ("TA", Fig. 1) disparate marginal areas defined in at least one defined limit fo the Caatinga. These areas show strong influence of the adjacent natural regions, such as the as Cerrado savannas (west), and Atlantic Forest (east, named *agreste* sensu Ab'Saber, 1960; Figs. 1 and 2.1). The concept herein adopted excludes the Amazonic Caatinga (sensu Anderson, 1981) because it is not historically related with Caatinga of northeastern Brazil. Insular areas, as the Caatinga of the Fernando de Noronha Island, are also not considered.

The majority of the Caatinga develops in interplateau depressions (Ab' Saber, 1974), in areas generally below 500 m of altitude, and herein named "the semi-arid Caatinga" ("SAC", Figs. 1, 2.2 and 2.3), forming the typical and predominant environment for the occurrence of Caatinga vegetation. This area is characterized by high mean annual temperatures (around 26°C), scarce and irregular rainfall, both during the year or along different years (50% of the area receives less than 750 mm on annual rainfall), low relative humidity and high solar radiation (Ab' Saber, 1974; Velloso et al., 2002; Prado, 2005). The semi-arid Caatinga is dominated by open vegetation forms, including xerophytes and deciduous or semi-deciduous plant species, forming a complex mosaic of phytophysiognomies, including herbaceous caatinga (*caatinga herbácea*), bush caatinga (*caatinga arbustiva*) and arboreal caatinga (*caatinga arbórea*) (Andrade-Lima, 1975; Rizzini, 1997; Velloso et al., 2002; Prado, 2005). These plants show green foliage during the rainy season (average duration of three months) and during the dry season they dry up and lose their leaves (Figs. 2.2 and 2.3). In most part of the semi-arid caatinga the soil is dominated by yellow-red latosols and dark-brown vertisoil (Ab'Saber, 1974). Within the semi-arid Caatinga, open rocky areas with shallow litosoil and exposed boulders are also

205 common, and are locally named as *campo de matacões* (sensu Ab'Saber, 1974), *lajedos*, harboring
206 granite outcrops (inselbergs) and relictual stony mountain ranges (Figs. 2.4 and 2.5) (Andrade-Lima,
207 1964; Ab'Saber, 1974; Prado, 2005).

208 We call "SDSF" for "Quaternary sand dunes of middle São Francisco River" (Fig. 1, see
209 Rodrigues, 1991a), a part of the Caatinga situated in Bahia State, altitude 250 to 500 m. This area
210 comprises a strip of depositional sandy terrains along the São Francisco River, and covered by open
211 areas with same overall climatic conditions of semi-arid caatinga. The right bank of the river is covered
212 by xerophytic vegetation than includes bush caatinga, arboreal caatinga and herbaceous caatinga. The
213 soil is stony and sandy soil with inselbergs and stony ridges (Fig. 2.6) (Rodrigues, 1991a). The left
214 bank is dominated by a dune field fixed by pioneer vegetation (Fig. 2.7). The vegetation is bush and
215 herbaceous caatinga, the plants are sparse and green throughout the year. The soil formed by high
216 sandy with dunes, from 50 to 100 m in heigh (Rodrigues, 1991a).

217 The Caatinga region also harbors "exception landscapes" (Ab'Saber, 2003). These
218 "Highlands" ("HL", Fig. 1) inside Caatinga comprises 43 areas know as *Brejos Nordestinos* situated in
219 states of Ceará, Pernambuco, Paraíba and Bahia (see Tabarelli and Santos, 2004) and the Diamantina
220 Plateau, part of Espinhaço range region (according to Velloso et al., 2002). All these areas are located
221 in mountain ranges with at least 600 m elevation, scattered within the Caatinga. These areas receive
222 more than 1200 mm annual rainfall and are subject to lower mean temperatures (around 22°C)
223 (Tabarelli and Santos, 2004). The phytophysiognomies in these elevated areas is very complex and
224 include bush caatinga (Fig. 2.8), arboreal caatinga, elements of cerrado savannas like *campos rupestres*
225 (rocky outcroups) and *carrasco* (Fig. 2.9), and relictual forested areas (Fig. 2.10). Soil types in these
226 areas include deep, sandy depositional latosols, often in flat tabletops covered by savannas or semi-
227 open woodlands, and occasional stony of dark humic soils on escarpments and ravines, frequently
228 covered with more dense or forested vegetation (Borges-Nojosa and Caramaschi, 2005; Juncá, 2005;
229 Prado, 2005; Borges-Nojosa, 2006; Loebmann and Haddad, 2010). These heterogeneous environments
230 have been explained by combination of topography, rainfall patterns, edaphic, geological and
231 geomorphological conditions (Cole, 1960; Ab'Saber, 1967, 1974; Andrade-Lima, 1975; Prado, 2005).

232 **Data collection**

233 The data presented herein results from the direct analysis of 7,102 specimens of Caatinga
234 snakes, collected since the year 1904, and deposited in the following scientific collections: 1. Coleção

235 herpetológica “Alphonse Richard Hoge” do Instituto Butantan (IBSP); 2. Museu de Zoologia da
236 Universidade de São Paulo (MZUSP); 3. Coleção de répteis do Museu de Zoologia da Unicamp
237 (ZUEC); 4. Coleção de répteis do Museu Nacional da Universidade Federal do Rio de Janeiro (MNRJ);
238 5. Coleção herpetológica do Instituto Vital Brazil (IVB); 6. Coleção herpetológica da Pontifícia
239 Universidade Católica de Minas Gerais (MCNR); 7. Coleção herpetológica da Fundação Ezequiel Dias
240 (FUNED); 8. Coleção herpetológica do Museu de Zoologia João Moojen da Universidade Federal de
241 Viçosa (MZUFV); 9. Coleção herpetológica da Universidade de Brasília (CHUNB); 10. Coleção
242 herpetológica do Museu de Zoologia da Universidade Federal da Bahia (MZUFBA); 11. Coleção
243 herpetológica do Museu de Zoologia da Universidade Estadual de Feira de Santana (MZUEFS); 12.
244 Coleção herpetológica da Universidade Federal de Sergipe (CHUFS); 13. Coleção herpetológica do
245 Museu de História Natural da Universidade Federal de Alagoas (MUFAL); 14. Coleção herpetológica
246 da Universidade Federal da Paraíba (UFPB); 15. Coleção herpetológica do departamento de Botânica,
247 Ecologia e Zoologia da Universidade Federal do Rio Grande do Norte (CHBEZ); 16. Coleção
248 herpetológica da Universidade Federal do Ceará (CHUFC) e 17. Coleção herpetológica do Museu
249 Paraense Emílio Goeldi (MPEG). All specimens used in this study were examined by one or more
250 authors and we identified based on current taxonomic literature.

251 Data on geographic distribution was obtained by georeferencing locality data associated with
252 verified museum specimens (Appendix 1), plus 250 records obtained from literature data (Appendix 2).
253 The geographic coordinates were obtained in electronic gazzetters (USBGN and CidVil, 1998),
254 scientific publications, or based on direct visual inspection of georeferenced layers (municipalities,
255 main drainage systems, villages) in ArcView (ESRI, 1999), Google Earth and whenever possible,
256 contacting the collectors for precise GPS coordinates. Records lacking precise locality data were
257 georeferenced using municipality centroids. To complete the data on geographic distribution and
258 natural history we also included records from the literature. These scientific papers were chosen
259 (Appendix 2) according to criteria of geographic and taxonomic reliability, and presence of a voucher
260 list. We share the opinion of Zaher et al. (2011) and Nogueira et al. (2011) that species occurrence
261 databases available on the internet (e.g. Species Link) contain many taxonomic and positional errors
262 and innacuracies, and should not be directly included as baseline data for studies on geographic
263 distribution. Thus, our spatial database includes only revised records obtained after careful examination
264 of deposited vouchered material. In our view, raw data available in electronic databases are useful for

265 providing a first general view of diversity and composition of records housed in collections, but should
266 not be used for scientific purposes unless after a careful examination of voucher material.
267 Data about ranges outside the Caatinga, necessary for a wider view on distribution patterns
268 and for detecting endemic species, as well information on natural history, were obtained from literature
269 data (Cunha and Nascimento, 1978; Strussman and Sazima, 1993; Martins and Oliveira, 1998; Cechin,
270 1999; Marques et al., 2001; Nogueira, 2001; Valdujo and Nogueira, 2001; Lema, 2002a; Argôlo, 2004;
271 Colli, 2005; Marques et al., 2005; Rodrigues, 2005; Guedes, 2006; Marques et al., 2006; Cicchi et al.,
272 2007; Recoder and Nogueira, 2007; Bérnils et al., 2008; Parpinelli and Marques, 2008; Sawaya et al.,
273 2008; Bertoluci et al., 2009; Condez et al., 2009; Marques et al., 2009; Scartozzoni, 2009; Valdujo et
274 al., 2009; Alencar, 2010; Costa et al., 2010; Forlani et al., 2010; Loebmann and Haddad, 2010;
275 Nogueira et al., 2010; Zaher et al., 2011; Freitas et al., 2012a).
276 The species were classified as endemic or non-endemic to the Caatinga following previous
277 studies in Nogueira et al. (2011). Endemic species were those with locality records fully or largely
278 coincident with the approximate limits of Caatinga area defined here, which includes transitional areas
279 within neighboring morphoclimatic domains (Ab'Saber, 1977). Thus, due to inadequacies of scale in
280 continental vegetation maps, which are not intended to provide detailed descriptions of complex limits
281 between adjacent vegetation types, species with most records within the Caatinga but with marginal
282 records in transitional adjacent areas were considered as Caatinga endemics (Nogueira et al., 2011).
283 According to Nogueira et al. (2011), the adherence to a strict definition of endemism, following
284 artificial, linear regional boundaries, could lead to the omission of species whose evolutionary and
285 biogeographical affinities are closely tied to the Caatinga region, despite occurring only marginally
286 outside the uncertain limits of a continuous Caatinga area
287 **Taxonomic considerations**
288 Recent phylogenetic studies on morphological and molecular data proposed changes on the
289 taxonomy and systematics of Neotropical snakes (Curcio et al., 2009; Fenwick et al., 2009; Hoser,
290 2009; Zaher et al., 2009; Pyron et al., 2011; Wüster and Bérnils, 2011; Carrasco et al., 2012; Grazziotin
291 et al., 2012). Here we discuss the reasons for accepting or rejecting these recent proposals.
292 Since the first molecular studies, *Bothrops* has been recovered as paraphyletic because of the
293 genus *Bothriopsis* (Werman, 1992; Salomão et al., 1997; Parkinson, 1999; Salomão et al., 1999;
294 Gutberlet and Campbell, 2001; Wüster et al., 2002). In view of this scenario, two solutions were

295 possible: the synonymization of the *Bothriopsis* to *Bothrops* (Salomão et al., 1997; Wüster et al., 2002,
296 2008) or the maintenance of the genus *Bothriopsis* and the splitting of *Bothrops* (Parkinson, 1999;
297 Gutberlet and Campbell, 2001; Castoe and Parkinson, 2006). Fenwick et al. (2009) based on
298 phylogenetic analysis of molecular and morphological data proposed the division of the genus in four
299 genera (*Bothrops*, *Bothriopsis*, *Bothropoides* and *Rhinocerophis*), although the phylogeny showed was
300 similar to that previous reported. Carrasco et al. (2012) opted to keep *Bothrops* as a large and
301 heterogeneous assemblage under a single generic name due to incongruences in the analysis presented.
302 Here we agree with nomenclature and argument proposed by Wüster et al., 2002 and Carrasco et al.
303 (2012) until further data clearly indicate the real need to divide this genus.

304 The rattlesnakes genera *Crotalus* was recently underwent revision taxonomic by Hoser (2009).
305 Hoser (2009) used molecular phylogeny provided by Murphy et al. (2002) to resurrect genera
306 *Caudisona* that allocated the Neotropical rattlesnakes. However we follow the opinion of Wüster and
307 Bérnils (2011) which said "…recommend the continued use of the generic name *Crotalus* for the
308 Neotropical rattlesnake, *Crotalus durissus*, as well as all other rattlesnakes not currently included in
309 *Sistrurus*, both as the best reflection of our current understanding of the phylogeny of these animals,
310 and as the best means for ensuring the stability of the nomenclature".

311 The new phylogeny of Caeniophidia (Zaher et al., 2009) pointed *Liophis* as paraphyletic in
312 relation to *Umbrivaga* and *Erythrolamprus*. To solve this problem, *Liophis* was synonymized with
313 *Erythrolamprus* (Zaher et al., 2009). However, Curcio et al. (2009) questioned this taxonomic change
314 based on the International Code of Zoological Nomenclature, that states that "application of genus-
315 group names should be determined by reference to type species" and also drew attention to the priority
316 of the name *Erythrolamprus*. Curcio et al. (2009) rejected the nomenclatural changes suggested by
317 Zaher et al. (2009), keeping genus *Liophis*, *Lygophis* and *Erythrolamprus*, but did not provide
318 additional evidence pointing to the monophyly of the genus *Liophis* if the type species is included.
319 Herein, we agree with Forlani et al. (2010) and Grazziotin et al. (2012) that decided to follow the
320 taxonomy suggested by Zaher et al. (2009), with the distinction that *Liophis* Wagler, 1830 is now
321 considered synonymous with *Erythrolamprus* Boie, 1826, which has priority according to Curcio et al.
322 (2009). We also adopted taxonomic changes recently proposed by Grazziotin *et al.* (2012) for some
323 species of the genus *Phimophis,* now named *Rodriguesophis*.

When possible, we identified taxa until species level based on currently taxonomic literature (e.g. Amaral, 1934; Duellman, 1958; Vanzolini, 1976; Dixon and Hendricks, 1979; Dixon, 1989; Deiques and Cechin, 1990; Rodrigues, 1991d, 1992; Zaher and Caramaschi, 1992; Dixon et al., 1993; Rodrigues, 1993; Srocchi et al., 1993; Vanzolini, 1996b; Zaher, 1996; Henderson, 1997; Curcio et al., 2002; Fernandes et al., 2002; Franco and Ferreira, 2002; Rodrigues and Juncá, 2002; Lema, 2004; Bailey et al., 2005; Ferrarezzi et al., 2005; Sclargel et al., 2005; Yuki and Lema, 2005; Passos et al, 2007; Passos and Fernandes, 2008; Silva and Rodrigues, 2008; Freire et al., 2010; Lema and Albuquerque, 2010; Passos et al., 2010; Pinto and Curcio, 2011). We used the signs aff. or cf. (According to Bengtson, 1988) whenever we were unable to identify the taxa to the specific level due to taxonomic problems in genera or species groups (e.g. *Bothrops* gr. *atrox*, *Micrurus*, *Helicops* and *Thamnodynastes*). Finally, we used the sign sp. to indicate that the specimen can not be related to any established species (according to Bengtson, 1988).

We follow the arrangement proposed by Zaher et al. (2009) to determine families, subfamilies and tribe. Regional popular names in Portuguese were obtained by TBG, according to local names adopted by local residents in the Caatinga.

RESULTS

Species composition

We recorded a total of 112 snake species of nine families in the Caatinga (Table 1). Of the species recorded, 15 are here reported for first time and the most of species had new data about geographic distribution (see geographic distribution topic) in this region. The more speciose family is Dipsadidae with (66 spp., 58.93 %), followed by Colubridae (18 spp., 16.07 %), Viperidae (9 spp., 8.04 %), Boidae (5 spp., 4.46 %), Elapidae, Typhlopidae and Leptotyphlopidae each with four (each with 3.57%), and Anomalepididae and Aniliidae (each with 1 spp. 0.89 %).

The Caatinga has species that also occurs in other natural regions of the Brazil as Cerrado (66 species, 59 % of the total), Atlantic Forest (56 species, 50.5 % of the total), Amazon Forest (34 species, 30.6 %), Pantanal (32 species, 28.8 %) and Pampas (19 species, 17.1 %). The snake assemblage of the Caatinga is composed mainly by species typical from open areas (38.39%), some occurs in forested and open areas (32.14%), and others inhabit forested areas (27.68%).

The richest region inside Caatinga was highland with 80 (71.43 %) snake species recorded, followed by transitional areas (67 species, 59.82 %), semi-arid caatinga (49 species, 43.75 %) and paleoquaternary sand dunes of middle São Francisco River (32 species, 28.57 %) (Fig. 3). We identified 58 (51.7%) snake species with restricted distribution in specific areas inside caatinga as sandy soil, highland or specific condictions of vegetation (for example, bush or arboreal caatinga allow arboreal and semiarboreal snakes). Other 54 species (48.3%) have widespread distribution across caatinga.

The Caatinga is fourth region with more richness and endemism in Brazil (Fig. 4). We identified twenty-two endemic species of the Caatinga (see Table 1). The paleoquaternary sandy dunes of middle São Francisco River is the region harboring most endemic species (12 endemics), with six snake species restricted to SDSF. Other six endemic occur in the SDSF but are present in other regions of the Caatinga. The semi-arid caatinga region has eight endemic species where six are restricted to SAC. The higland has three endemic species, totally restricted to elevated areas, plus other five that were also found in other regions of the Caatinga. We detected seven endemic species in transitional areas, but all of them are endemic of the semi-arid caatinga whose distribution reach transitional areas.

Natural history

The snake fauna is composed mainly by species that use the soil as substrate (Fig. 5), where 38.39% are terrestrial and 26.79% are fossorial and/or cryptozoic species. We also recorded arboreal or semi-arboreal (26.79%) species, as well as aquatic or semi-aquatic (7.14%) snakes. The diet of snakes is composed mainly of vertebrate prey (80.36 %) where 56.67% of them are generalist in this kind of prey, 24.44% are frog specialist, 7.78 eat caecilian and amphisbaena, 6.67% are lizard specialist, and 3.3% are mammal specialist, and 1.11% are fish specialist. Only 18.75% eat invertebrate as artrophoda and/or mollusk. The activity period of the snakes seems uniform with 35.71% diurnal, 33.04% nocturnal, and 30.36% are nocturnal and diurnal. We cannot infer the substrate use, diet and activity period for 0.89% because in literature, we have not any information about the species *Lioheterophis iheringi*.

Geographic distribution

FAMILY ANILIIDAE Stejneger, 1907

Anilius scytale (Linnaeus, 1758). "Falsa coral" (Figs. 6.1 and 7.1)

First record in the Caatinga. The unique record is on Ceará State, municipality of Crato, altitude 426 m. We have not obtained information on habitat use of this snake in Caatinga, but it dwells forested areas in Amazon Forest (Martins and Oliveira, 1998) and gallery forest in Cerrado (Nogueira et al., 2010). Thus, this species may occur on relictual forested areas of highland in Caatinga.

FAMILY ANOMALEPIDIDAE Taylor, 1939

Liotyphlops cf. *ternetzii* (Boulenger, 1896). "Cobra-cega" (Figs. 6.2 and 7.1)

Only one specimen was recorded in state of Ceará, Parque Nacional de Ubajara, Ibiapaba-Araripe Plateau, altitude 519 m. The specimen was collected on arboreal caatinga next to river on red-yellow latosols (Loebmann, 2009; Loebmann and Haddad, 2010).

FAMILY LEPTOTYPHLOPIDAE Stejneger, 1891

Epictia borapeliotes (Vanzolini, 1996). "Cobra de chumbinho" (Figs. 6.3 and 7.2)

Caatinga endemic species. Occurs in the states of Ceará, Rio Grande do Norte, Paraíba, Pernambuco, Alagoas, Sergipe, and Bahia. The most of records are from low areas; from sea level to 500 m

414 maximum elevation covered with open vegetation, including areas with bush caatinga, arboreal
415 caatinga and herbaceous caatinga with sandy soils. Only recently, this species was recorded in Mucugê
416 on Diamantina plateau where altitude can reach 938 m, in Cerrado enclave (Freitas et al., 2012a). Five
417 records of this species where also observed near the coast (TBG pers. obs.) in municipalities of Natal
418 (Rio Grande do Norte State) and João Pessoa (Paraíba State). Apparently, this species has a wide
419 tolerance to variations in humidity levels, which allows its occurrence in Caatinga (low humidity) and
420 coastal areas (high humidity) (Vanzolini, 1996b).
421
422 *Epictia* sp. "Cobra de chumbinho" (Fig. 7.1)
423 Only one specimen was recorded. It was collected in Bahia State, altitude 538 m. This area is next to
424 highland known as Diamantina Plateau complex. The vegetation includes all phytophisiognomy of
425 caatinga, cerrado vegetation and moist forested areas. In this area the caatinga vegetation are green
426 over the year, because have many headwater of river there (belonging to Rio Itapicurú).
427
428 *Trilepida brasiliensis* (Laurent, 1949). "Cobra de chumbinho" (Figs. 6.4 and 7.2)
429 It occurs in states of Ceará, Paraíba and Bahia. This species occurs in low and high altitudes. This
430 species occurs in highlands with altitude 500 to 717 m and it was also recorded marginally in Caatinga,
431 altitude 452 m in municipality of Barreiras, Bahia State. This species is considered widely distributed
432 in Cerrado (Curcio et al., 2002; Nogueira et al., 2010; Pinto and Curcio, 2011) in savannas over sandy
433 soils (Vitt et al., 2002). This species inhabits portions of cerrado in highland inside Caatinga (Borges-
434 Nojosa et al., 2009).
435
436 *Trilepida koppesi* (Amaral, 1955). "Cobra de chumbinho" (Figs. 6.5 and 7.1)
437 This species was recorded only in Bahia State, district of Cascavel, municipality of Mucugê (Freitas et
438 al., 2012a). The area is situated in a flat upland plateau, at around 1100 m altitude in a section of
439 Diamantina Plateau and has vegetation that includes forested areas along the river valleys and cerrado
440 formation (locally known as *carrasco*) (Freitas and Silva, 2007; Freitas et al., 2012a).
441
442 FAMILY TYPHLOPIDAE Merrem, 1890
443 *Typhlops amoipira* Rodrigues and Juncá, 2002. "Cobra-cega" (Figs. 6.6 and 7.3)

444 Caatinga endemic species. Recorded in the states of Bahia and Minas Gerais. It is distributed only in
445 areas with elevation between 553 and 629 m. This snake inhabits bushy and herbaceous caatinga with
446 bromeliads and clumps of grass, on sandy soils (Rodrigues and Juncá, 2002) in São Francisco sandy
447 dunes. It also occurs in Cerrado *sensu stricto* with sandy soils, dissected by veredas and riparian forests
448 in transitional area (Fernandes et al., 2010).
449
450 *Typhlops brongersmianus* Vanzolini, 1976. "Cobra-cega" (Figs. 6.7 and 7.3)
451 This species was recorded in the state of Sergipe, next to Parque Nacional Serra de Itabaiana, and in
452 Ceará on the Ibiapaba-Araripe Plateau. The altitude of occurrence of this species is from sea level to in
453 altitude superior to 847 m. Occurs in moist forested area in Ceará (Loebmann and Haddad, 2010) and
454 can also be found in open areas of bush and arboreal caatinga on sandy soil, but with strong influence
455 of Atlantic Forest adjacent in Sergipe (Carvalho and Vilar, 2005). The only one record for low altitude
456 is in hydroelectric plant area in Alagoas State in xerophitic caatinga vegetation.
457
458 *Typhlops reticulatus* (Linnaeus, 1758). "Cobra-cega" (Figs. 6.8 and 7.3)
459 First record in the Caatinga. The single record of this species in Caatinga was obtained in state of Ceará
460 (Dixon and Hendricks, 1979), municipality of Limoeiro do Norte, 30 m of altitude. This area has
461 arboreal caatinga, bush caatinga and herbaceous caatinga.
462
463 *Typhlops yonenagae* Rodrigues, 1991. "Cobra-cega" (Figs. 6.9 and 7.3)
464 Caatinga endemic species. Recorded only in the type-locality, Santo Inácio village, municipality of
465 Gentio do Ouro, Bahia State (Rodrigues and Juncá, 2002). It was recorded only on the right bank of
466 Rio São Francisco, altitude 475 m. The vegetation is xerophytic with bush caatinga, growing over
467 rocky outcrops, inselbergs, red latosols or stony and sandy soils (Rodrigues, 1991a; Rodrigues and
468 Juncá, 2002).
469
470 FAMILY BOIDAE Gray, 1825
471 *Boa constrictor* Linnaeus, 1758. "Cobra de veado, Salamanta-boi, Jibóia" (Figs. 6.10 and 7.4)
472 This species occurs in all portions of the Caatinga, in areas with altitude is 0 to 750 m. There are no
473 records from central region of the state of Bahia (e.g. municipalities of Jacobina, Seabra, Mundo Novo,

474 Iramaia, Boninal, Barra do Mendes) probably due to low sampling. This species inhabits all habitats
475 within the region, including typical caatinga, cerrado formations, caatinga on dunes and relictual
476 forested areas. The wide range in the Caatinga is in accordance with its wide occurrence in all natural
477 regions of Brazil, except the Pampas grasslands, over 25 degrees latitude south (Martins and Oliveira,
478 1998; Cechin, 1999; Marques et al., 2001; Lema, 2002a; Marques et al., 2005; Bérnils et al., 2008;
479 Nogueira et al., 2010).
480
481 *Corallus hortulanus* (Linnaeus, 1758). "Cobra veadeira" (Figs. 6.11 and 7.5)
482 Occur in states of Piauí, Ceará, Rio Grande do Norte, Alagoas, Bahia and Minas Gerais. This species
483 show occurrence in altitudes until 847 m. We detected many gaps on sampling as Pernambuco, Paraíba
484 and Sergipe states where this species probably occurs but was not sampled yet. Although it is an
485 exclusively arboreal species (Henderson, 1997; Marques et al., 2001) it seems to inhabit all
486 phytophisiognomies of the Caatinga.
487
488 *Epicrates assisi* Machado, 1945. "Salamanta, Cobra arco-íris" (Figs. 6.12 and 7.6)
489 Caatinga endemic species. There are records for this species in all portions of the Caatinga. It is
490 distributed in areas from 0 to 983 m of altitude. This snake inhabits all phytophisiognomies of the
491 Caatinga and was observed also in the Atlantic Forest domain near the coast, perhaps as a result of
492 deforestation of these areas (P. Passos, pers. comm). It is sintopic species with *E. crassus* in north
493 Minas Gerais (Passos and Fernandes, 2008).
494
495 *Epicrates crassus* Cope, 1862. "Salamanta, Cobra arco-íris" (Figs. 6.13 and 7.6)
496 This species was only recorded in northern Minas Gerais, municipalities of Manga and Mato Verde,
497 440 and 541 m of altitude respectively. These cities are located next to Cerrado, and the vegetation of
498 this area is bush and arboreal caatinga, but has strong influence of cerrado vegetation because it is
499 closeness, probably incuding isolated enclaves of cerrado. This species is typical of the Cerrado where
500 it is wide distribution on open areas (Passos and Fernandes, 2008; Nogueira et al., 2010; 2011). We do
501 not exclude possible future records for others localities along the transitional area Caatinga-Cerrado in
502 the states of Bahia, Piauí and Maranhão.
503

Eunectes murinus (Linnaeus, 1758). "Sucurí" (Figs. 6.14 and 7.5)

This species is recorded from a single site in the Caatinga, northern Ceará, municipality of Aquiraz (Mendonça et al., 2009), altitude 14 m. This area has most types of caatinga vegetation, but there is influence of the coast in this area and it is high humidity where the caatinga reach next the coast. According to Freitas and Silva (2007), this species also can be found near São Francisco, Paraguaçu, Itapicuru, Contas and Jequitinhonha rivers in Bahia State but this information can not be confirmed herein because we did not found voucher specimens from these areas in collections or scientific literature.

FAMILY VIPERIDAE Laurenti, 1768

Bothrops erythromelas (Amaral, 1923). "Jararaca-da-seca, jararaquinha" (Figs. 6.15 and 7.7)

Caatinga endemic species. It is the only viperid snake endemic of the Caatinga, being recorded throughout the region. Most records for this species are from low altitude areas, 0 to 600 m. This is a conspicuous species found in arboreal, bush and herbaceous caatinga on yellow-red latosoils with inselbergs. However, it can be found on forest edge in northeast Atlantic Forest states of Rio Grande do Norte (Natal city), Paraíba (João Pessoa city), Pernambuco (Torre Madalena) and Bahia (Itaparica) (TBG pers. obs.) perhaps because deflorestation of these areas previously forested areas.

Bothrops jararaca (Wied, 1824). Jararaca (Figs. 6.16 and 7.8)

This species was only recorded for high altitude areas (532 to 1027 m of altitude), in state of Bahia, municipalities of Ibicoara, Palmeiras, Miguel Calmon and Mucugê (Handam et al., 2007; Freitas et al., 2012a). These localities are inside the Diamantina Plateau complex. We have not obtained information on habitat use of this snake in Caatinga but it may occurs associated to forested areas as recorded other regions (Marques et al., 2001; Marques et al., 2005; Barbo et al., 2011; Zaher et al., 2011).

Bothrops leucurus Wagler, 1824. "Jararaca" (Figs. 6.17 and 7.8)

The species was recorded in the states of Alagoas, Pernambuco, Sergipe, and Bahia, generally close to the eastern borders of the Caatinga and its contact area with the Atlantic Forests. It was recorded in low altitude near to the Atlantic Forest in transitional areas; but only in highland (altitude 750 to 900 m) inside semi-arid caatinga. It can be found on moist forest vegetation and caatinga in high altitudes as

described in Juncá (2005), and Filho and Montingelli (2011), and wetter arboreal and bush caatinga close to the Atlantic Forest. As other members of the *atrox* species group (Werman, 1992), this species is typical of forested habitats (Cunha and Nascimento, 1978; Martins and Oliveira, 1998; Nogueira et al., 2003; Campbell and Lamar, 2004).

Bothrops lutzi (Miranda-Ribeiro, 1915). "Jararaca" (Figs. 6.18 and 7.7)

This species was recorded in the western portions of the Caatinga, close to its transition with the Cerrado in the states of Piauí, Ceará, Pernambuco and Bahia. It occurs in altitudes of 308 to 847 m in areas near to Cerrado in transitional areas and only in in highland inside semi-arid caatinga. Loebmann and Haddad (2010) mentioned this species in caatinga vegetation in high altitude areas on Ibiapaba-Araripe Plateau. But apparently this species inhabits only cerrado relictual vegetation in high altitudes, as it is typical and relatively common in plateau areas covered by Cerrado (Recoder and Nogueira, 2007; Nogueira et al., 2011; Recoder et al., 2011) and it can be found on caatinga phytophysiognomies in transitional areas where there are strong cerrado vegetation influence, such as open areas in the Araripe plateau.

Bothrops moojeni Hoge, 1966. "Jararaca" (Figs. 6.19 and 7.8)

First record in the Caatinga. This species was recorded only in Bahia State and Minas Gerais. This snake occurs in altitudes of 440 to 630 m near to Cerrado. It is the most conspicuous viperid snake of the Cerrado (Melgarejo, 2003). This species inhabits riparian areas in the Cerrado and is typical of gallery forests (Nogueira et al., 2003). Its distribution in the Caatinga is restricted to Caatinga-Cerrado transitional areas. We not discard new future records into relictual cerrado vegetation inside Caatinga.

Bothrops neuwiedi (Wagler, 1824). "Jararaca-pintada" (Figs. 6.20 and 7.9)

This species occurs in the states of Bahia and Minas Gerais. Most records are next to Atlantic Forest and Cerrado, but there is a unique record in semi-arid caatinga, municipality of Itiúba (Bahia State). All records are between 377 and 760 m. It was previously known to Cerrado and Atlantic Forest (Silva and Rodrigues, 2008), thus this species may be distributed in phytophysiognomies of the caatinga vegetation under influence of both ecorregions.

Bothrops sp. (gr. *atrox*). "Jararaca" (Figs. 6.21 and 7.9)

This species was recorded only in few localities in the state of Ceará. It occurs in altitude upper than 600 m. This snake may dwell moist forest relictual area in high altitude (Loebmann and Haddad, 2010) on highland in Ceará State. This snake seems common in florest of slopes near stream that descend from the plateau, in Crato (CN pers. obs.)

Crotalus durissus (Linnaeus, 1758). "Cascavel" (Figs. 6.22 and 7.10)

This species occurs throughout the Caatinga, and was recorded in both low and high altitudes from sea level to 1,100 m. It is a typical snake of open areas. Authough it can be found also in forest edges in the Atlantic Forest (TBG pers. obs), in highland areas it was detected only in opens caatinga vegetation.

Lachesis muta (Linnaeus, 1766). "Surucucu pico de jaca" (Figs. 6.23 and 7.9)

This species was recorded for two localities in Caatinga region in the states of Ceará and Pernambuco; altitudes of 190 to 736 m. It is occurs in highland on Baturité range (Borges-Nojosa and Lima-Verde, 1999), and next to Atlantic Forest in low altitude areas. It is a rare snake, typical of forested areas in Caatinga. It can be found in moist forest relictual on highland and arboreal and bush caatinga with strong Amazonian or Atlantic Forest influence.

FAMILY ELAPIDAE Boie, 1827

Micrurus aff. *leminiscatus* (Linnaeus, 1758). "Cobra de coral, Coral da legítima" (Fig. 7.11)

This species was recorded in the states of Ceará and Bahia.The records are in altitudes between 422 and 760m. Apparently this snake has a restricted distribution to highlands in the Diamantina and Araripe plateaus. This species may inhabits forested areas in highlands. In the Cerrado region *M. lemniscatus* is found mostly in forested areas (Nogueira et al., 2011), however it has been previously founded on arboreal and bush caatinga vegetation in the Araripe highlands in Ceará state (Loebmann and Haddad, 2010).

Micrurus brasiliensis Roze, 1967. "Cobra de coral, Coral da legítima" (Figs. 6.24 and 7.11)

First record for the Caatinga. This species was recorded only two localities on Bahia and Minas Gerais State close to the contact with the Cerrado. It was found in altitude of 452 to 630 m. This endemic

snake is widely distributed in the Cerrado region (Nogueira et al., 2011) and may found on Cerrado enclaves inside caatinga phytophysiognomies or others areas in Caatinga-Cerrado contact.

Micrurus frontalis (Duméril, Bibron and Duméril, 1854). "Cobra de coral, Coral da legítima" (Figs. 6.25 and 7.11)

First record for the Caatinga. This species is known from only one specimen from Bahia State, municipality of Barreiras, in the contact between Caatinga and Cerrado. It was found in low altitude area, 452 m. Apparently this snake can be found on cerrado enclaves inside Caatinga. Its occurrence was expected in the Caatinga, and Vanzolini et al. (1980) mentioned the possible record of this species for Caatinga from Minas [Gerais]. Therefore, this species can be recorded to other areas in Caatinga-Cerrado contact or/and relictual cerrado in highland areas.

Micrurus sp. (aff. *ibiboboca*) (Merrem, 1820). "Cobra de coral, Coral da legítima" (Figs. 6.26 and 7.12)

Caatinga endemic species. It was recorded in all states in the Caatinga, being most abundant and widespread coral snake in this region. It was called *Micrurus ibiboboca* by Vanzolini et al. (1980), but they questioned the possibility of specimens collected in semi-arid constitute a new species because it did not fit the original description proposed by Merrem (1820), and actually it has been described (Matheus Godoy pers. comm.). It is distributed in all phytophysiognomies described for Caatinga in this work, in altitudes of sea level to 800 m.

FAMILY COLUBRIDAE Oppel, 1811

Chironius bicarinatus (Wied, 1820). "Cobra de cipó" (Figs. 6.27 and 7.13)

This species was recorded in states of Ceará, Paraíba, Sergipe and Bahia. It was found mostly in high altitudes (720 to 920 m), with records in low altitudes only next to northeast Atlantic Forest (altitude 188 to 460 m). This species seems be restricted to forested areas in Caatinga, along its contact area with the Atlantic Forest and highland on Ceará State.

Chironius carinatus (Linnaeus, 1758). "Cobra de cipó" (Fig. 7.13)

This species was recorded in states of Piauí, Ceará, Alagoas and Bahia in Caatinga, in areas with low altitudes (0 to 368 m). The records are sparce, but this species seems to occur in forested areas, including dense arboreal Caatinga. Freitas and Silva (2007) comment about distribution of this species in open areas of Sergipe state, but we cannot confirm this data because we did not found voucher specimens for this area in scientific collections and the literature.

Chironius exoletus (Linnaeus, 1758). "Cobra de cipó" (Figs. 6.28 and 7.14)

First record in the Caatinga. This species is distributed in states of Ceará, Paraíba, Pernambuco and Bahia. All records are in highland, altitude more than 500 m. Several of these records like the occurrence of this species in São Caitano range (Pernambuco) and Mata do pau ferro (Paraíba) show that this species can occur in forested areas.

Chironius flavolineatus (Boettger, 1885). "Cobra de cipó" (Figs. 6.29 and 7.14)

This species was recorded in all areas of the Caatinga except in Rio Grande do Norte, perhaps it is sampling gap. It occurs mostly below 500 m of altitude, but can reach 930 m in Diamantina plateau. It has sparse points of its distribution in Caatinga. This species is found both in forested and open areas (Dixon et al., 1993; Nogueira et al., 2010; 2011; Hamdan and Lira-da-Silva, 2012). It can be found in bush and arboreal caatinga on semi-arid because it is a semi-arboreal species and maybe for this reason it was not found on dunes of São Francisco River where psamophilic species are predominant. In Diamantina plateau was reported from cerrado enclaves (Freitas and Silva, 2007).

Chironius quadricarinatus (Boie, 1827). "Cobra de cipó" (Figs. 6.30 and 7.13)

We have only one record for this species in the Bahia state, municipality of Mucugê, Diamantina plateau, altitude near 1000 m. This area has a complex phytophisionogmyc including caatinga, cerrado and moist forest vegetation. *Chironius quadricarinatus* may occurs in all environments dwelling both open and forested areas (Dixon et al., 1993; Marques et al., 2001; Nogueira et al., 2010), but Freitas and Silva (2007) reported this species in cerrado vegetation in Diamantina plateau. There are no enough information about restrict distribution of this species to cerrado vegetation in Caatinga region, however the species is widely distributed in the Cerrado region, where it is often found in riparian areas or open interfluvial savannas (cf. Nogueira et al., 2011).

Dendrophidion atlantica (Freire, Caramaschi and Gonçalves, 2010). (Fig. 7.15)

First record in the Caatinga. This species was record in Alagoas state on municipalities of São Miguel dos Campos and Quebrângulo. These localities are next to Atlantic Forest and near to type-locality (Ibateguara, Alagoas; Freire et al., 2010), altitude 370 m. This snake possibly dwells transition areas between caatinga vegetation and Atlantic Forest, or forested enclaves in marginal area of the Caatinga.

Drymarchon corais (Boie, 1827). "Papa ovo", "Papa ova", "Papa Pinto" (Figs. 6.31 and 7.15)

This species is distributed in all areas of the Caatinga. The most of records are in low altitude (0 to 520 m), but we have only one record in highland in Diamantina Plateau (that can reach 1,100m). It inhabits all kinds of vegetation of the Caatinga described above. There are no records for interior areas of the states Rio Grande do Norte, Paraíba and Pernambuco, probably due to sampling gaps.

Drymoluber brazili (Gomes, 1918). (Figs. 6.32 and 7.16)

This species was recorded for states of Piauí, Ceará, Paraíba and Bahia. It occurs in altitudes between 334 and 1,100 m. This species was known from few localities in the Caatinga, but it seems to have wide distribution in the Cerrado where was considered endemic (Nogueira et al., 2011). This is a very rare snake, with few data on habitat use; Valdujo et al. (2009) report the use of typical cerrado in Emas National Park region. Besides Freitas and Silva (2007) report this species only to cerrado enclaves in Diamantina plateau, according to distribution map this snake also dwells bush, herbaceous and arboreal caatinga red-yellow latosols.

Drymoluber dichrous (Peters, 1863). (Figs. 6.33 and 7.16)

This species was recorded only in states of Ceará and Bahia, where altitude is upper 300m. On Ceará, it occurs only in highland where it can be found in relictual moist forests (Loebmann and Haddad, 2010). In Bahia state it occurs in transitional area near the Atlantic Forest in caatinga vegetation with strong influence of Atlantic Forest because the closeness and seems to be rare (Freitas and Silva, 2007).

683 *Leptophis ahaetulla* (Linnaeus, 1758). “Cobra de jericoá, Cipó verde” (Figs. 6.34 and 7.17)

684 Recorded in all portions of the Caatinga, except the Rio Grande do Norte, probably due to sampling
685 gaps. Also not sampled in sandy dunes to São Francisco River. This species is predominantly of low
686 altitude area (0 to 500 m), but there are few recordes in highland in Ibiapaba-Araripe plateau (900 m of
687 altitude) and Diamantina plateau (until 740 m). This snake occurs in all phytophisiognomies of the
688 Caatinga, but preferably in bush and arboreal caatinga vegetation.

689

690 *Mastigodryas bifossatus* (Radi, 1820). (Figs.6.35 and 7.18)

691 This species was recorded in all states in Caatinga, except Pernambuco and Sergipe perhaps because
692 gap on sampling. Most of records are from lower altitudes (0 to 500 m), except for two records on
693 highland (reaching 900 m) in. There is a sampling gap in interior of states Ceará, Paraíba and
694 Pernambuco. It is distributed in all phytophisiognomies of Caatinga.

695

696 *Mastigodryas boddaerti* (Sentzen, 1796). (Figs. 6.36 and 7.18)

697 This species was recorded only in states of Piauí (Sete Cidades National Park) and Ceará (Ibiapaba-
698 Araripe plateau). Thus, it was registered in both high (775 m) and low (60 m) altitude in a relatively
699 restricted area. It was recorded in forested area in relictual moist forest and highland semi-arid caatinga
700 (Nascimento and Lima-Verde, 1989; Loebmann and Haddad, 2010; Montingelli et al. 2011), and also
701 was found in typical cerrado vegetation in Sete Cidades National Park (Rocha and Prudente, 2010).

702

703 *Oxybelis aeneus* (Wagler, 1824). “Cipó bicuda” (Figs. 6.37 and 7.19)

704 This species is distributed in all regions of the Caatinga and was recorded in high and low altitudes
705 (between 0 and 1,100 m). This species is widespread and abundant, and it inhabits all kinds of
706 vegetation described for Caatinga including areas with sparce bush and arboreal Caatinga and
707 prevalence of herbaceous (TBG pers. obs.).

708

709 *Pseustes sulphureus* (Wagler, 1824). “Papa pinto, Papa-ova” (Figs. 6.38 and 7.20)

710 There are two records of this species in the Caatinga in state of Ceará, municipalities of Pacotí and
711 Fortaleza. These areas have altitude of 736 m and 21 m, respectively. This snake inhabits relictual
712 moist forested in highlands (Borges-Nojosa et al., 2006; Loebmann and Haddad, 2010) and probably

713 bush and arboreal caatinga in semi-arid near the coast. Freitas and Silva (2007) report this species to
714 forested areas (floresta estacional) in Diamantina plateau, Bahia State, but the vouchers for these
715 records could not be found during data collection for this study.
716
717 *Simophis rhinostoma* (Schlegel, 1837). "Falsa coral" (Figs. 6.39 and 7.20)
718 First record in the Caatinga. The only one record of this species in Caatinga is in state of Bahia,
719 municipality of Mucugê, Diamantina Plateau, 1,100 m of altitude. This species probably can be found
720 in cerrado vegetation in Cerrado enclave in high altitude, because it is considered an open area species
721 (Nogueira et al., 2010).
722
723 *Spilotes pullatus* (Linnaeus, 1758). "Caninana" (Figs. 6.40 and 7.20)
724 Recorded in all states of the Caatinga, except Rio Grande do Norte probably due gap sampling. The
725 most of records were in low and high altitudes (0 to 1000 m). This snake inhabits all
726 phytophisiognomies of the Caatinga, preferably bush and arboreal caatinga vegetation and also forested
727 enclaves (Marques, 1998; Barbo et al. 2011; Zaher et al., 2011; Hamdan and Lira-da-Silva, 2012).
728
729 *Tantilla marcovani* Lema, 2004. (Figs. 6.41 and 7.21)
730 Caatinga endemic species. Known only one for type-locality on Paraíba State, Jabre Peak, municipality
731 of Maturéia (Lema, 2004; Filho et al., 2011), altitude 1090 m. Jabre Peak is moist forested relictual call
732 as "forest on mountain range" (*mata serrana*) (Lema, 2004). Thus, this snake shows a restricted
733 distribution dwelling forested area. There is one occurrence of *Tantilla* cf. *marcovani* to Diamantina
734 plateau, municipality of Mucugê (Freitas and Silva, 2007), but the determination of this species is
735 problematic and we prefer to list as *T. marcovani* only specimens collected in type-locality until the
736 determination about this taxa be clarified.
737
738 *Tantilla melanocephala* (Linnaeus, 1758). (Figs. 6.42 and 7.21)
739 Recorded in all states of the Caatinga, except Rio Grande do Norte where there are not a good sampling
740 for Caatinga. It was found in low and high altitudes (0 to 1000 m). This snake can be found on all kinds
741 of vegetation described in this study.
742

FAMILY DIPSADIDAE Bonaparte, 1838

Apostolepis ammodites Ferrarezzi, Barbo and Albuquerque, 2005. "Cobra de ferrão, cobra rainha" (Figs. 6.43 and 7.22)

First record in the Caatinga. Recorded only in state of Bahia next to Cerrado region, altitude 440 m. It is a widespread species in Cerrado (Ferrarezzi et al., 2005); and considered a Cerrado endemic (Nogueira et al., 2010), found also in transitional areas with vegetation of the Caatinga-cerrado in Caatinga.

Apostolepis arenaria Rodrigues, 1992. (Figs. 6.44 and 7.23)

Caatinga endemic species. This species is recorded only to type-locality in state of Bahia, Alagoado village in municipality of Casa Nova. This locality has altitude 400 m. It was recorded only left bank on herbaceous and bush caatinga with dunes and sandy soils (Rodrigues, 1992).

Apostolepis assimilis (Reinhardt, 1861). "Cobra de ferrão, cobra rainha" (Figs. 6.45 and 7.22)

Recorded only states of Bahia and Minas Gerais. It was recorded only in areas next to Cerrado but was also reported in semi-arid caatinga by Lema (2002b), maximum altitude 254 to 440 m. It inhabits bush and herbaceous caatinga with strong influence of the cerrado vegetation, with sandy soils or cerrado enclaves inside marginal area of the Caatinga.

Apostolepis cearensis Gomes, 1915. "Cobra de ferrão, cobra rainha" (Figs. 6.46 and 7.22)

Caatinga endemic species. It was recorded in states of Piauí, Ceará, Paraíba, Alagoas and Bahia. It inhabits areas with low and high altitudes from 0 to 1000 m, but the most pof records are in lowlands. We have not records in the states of Rio Grande do Norte and Pernambuco, perhaps it is sampling gap in Caatinga area because this species is known to restinga area of Rio Grande do Norte (TBG pers. obs.). It inhabits herbaceous, bush and arboreal caatinga, and moist forest relictual in caatinga, with sandy soils. It is the most common species of the genus in Caatinga.

773 *Apostolepis gaboi* Rodrigues, 1992. (Figs. 6.47 and 7.23)

774 Caatinga endemic species. It is known only for state of Bahia, municipalities of Barra and Pilão
775 Arcado. It was recorded only in left bank where there are bush and herbaceous caatinga, dunes and
776 sandy soil (Rodrigues, 1992). Recorded in low altitudes from 394 to 406 m.

777

778 *Apostolepis* sp. 1 (gr. *pymi*) (Figs. 6.48 and 7.23)

779 Caatinga endemic species. Recorded only in in Ibiapaba Plateau to Ceará State, Baturité and
780 Maranguape ranges. It inhabits altitude upper to 600 m and it was found on moist relictual forests
781 within the Caatinga (Loebmann and Haddad, 2010).

782

783 *Apostolepis* sp. 2 (Fig. 7.23)

784 The only two specimens were recorded in Bahia State, municipality of Poções. The area is highland,
785 altitude 760 m. We have no information about the specific habitat where this species can be found. We
786 believe that it occurs in sandy soils as well other species of the genera.

787

788 *Atractus* aff. *maculatus* Günther, 1858. (Figs. 6.49 and 7.24)

789 Recorded to Sergipe State, municipality of Lagarto and Simão Dias, altitude 183 and 263 m
790 respectively. The species *Atractus maculatus* was previously recorded to state of Alagoas and
791 Pernambuco in Atlantic Forest remnant (Passos et al., 2010). This snake was collected in arboreal
792 caatinga with sandy soil inside semi-arid region (G. Nunes pers. comm.) and show considerable
793 differences in color pattern compared to *Atractus maculatus* and has been analyzed by expert in this
794 genus (P. Passos).

795

796 *Atractus caete* Passos, Fernandes, Bérnils and Moura-Leite, 2010. (Fig. 7.24)

797 Recorded only for state of Alagoas, in municipality of Quebrângulo, altitude of 366 m. This area is
798 next to Atlantic Forest but according to the adopted map is Caatinga region. According to Passos et al.
799 (2010), it was found in remnants of submountane forest.

800

801

802

Atractus potschi Fernandes, 1995. (Fig. 7.24)

Recorded to states of Sergipe and Bahia. It has restricted distribution in Caatinga where occurs next to Atlantic Forest and highland area in Diamantina Plateau. It can be found in plain and sub-mountains, 0 to 900 m of altitude. It is distributed on forested area that can include arboreal and bush caatinga with Atlantic Forest influence (*agreste*), due to proximity.

Atractus ronnie Passos, Fernandes and Borges-Nojosa, 2007. (Figs. 6.50 and 7.24)

Caatinga endemic species. It is only recorded to Ceará State in Baturité range and Ibiapaba-Araripe plateau. These localities are situated in isolated plateaus above 600 m. The available records indicates that the species inhabits moist forest relictual in Caatinga (Passos et al., 2007; Loebmann et al., 2009; Passos et al., 2010; Loebmann and Haddad, 2010).

Boiruna sertaneja Zaher, 1996. "Mussurana, cobra de leite, cobra preta" (Figs. 6.51 and 7.25)

Caatinga endemic species. It was recorded in all the portions of the Caatinga. It was more abundant in low altitudes, but can be found in high altitudes in Bahia and Ceará States (0 to 1,000 m). It inhabits xerophyttic vegetation (Zaher, 1996) that include herbaceous, arboreal and bush caatinga, forest relictual on highland, and cerrado vegetation on highland and transitional areas.

Clelia plumbea (Wied, 1820). "Mussurana, cobra de leite, cobra preta" (Figs. 6.52 and 7.25)

This species was recorded in the northern portion of Minas Gerais and eastern Bahia. This species occurs only in lowlying areas in Caatinga, 0 to 230 m of altitude. It inhabits transitional areas next to Atlantic Forest (*agreste*) and Cerrado.

Dipsas sazimai Fernandes, Marques and Argôlo, 2010. "Dormideira" (Figs. 6.53 and 7.26)

First record in the Caatinga. This species was recorded only in the state of Bahia, municipalities of Elísio Medrado (Jibóia Range), Jequié and Miguel Calmon. These areas are highland and transitional areas mostly above 300 m. This species has restricted distribution to different mountains ranges on the Diamantina Plateau, where it probably inhabits forested areas, the typical habitat of its congeners (Peters, 1960). In transitional areas it can be found in xerophitic vegetation next the Atlantic Forest. It

was previously known to Altantic Forest from Alagoas to São Paulo, also in high altitudes (Fernandes et al., 2010).

Dipsas variegata (Duméril, Bibron and Duméril, 1854). "Dormideira" (Fig. 7.26)

Recorded only in state of Alagoas, municipality of Quebrângulo. This is transitional area, altitude 370 m. The locality has arboreal and bush caatinga with strong influence of Atlantic Forest. It probably inhabits forested areas, the typical habitat of its congeners (Peters, 1960).

Erythrolamprus almadensis (Wagler, 1824). (Figs. 6.54 and 7.26)

Recorded to Rio Grande do Norte and Pernambuco in transitional area and Bahia semi-arid Caatinga. All records are below 500 m of altitude. This species appears to be rare in Caatinga. This is a tipical open area species that occurs in xerophytic vegetation and that includes bush and arboreal Caatinga.

Erythrolamprus maryellenae Dixon, 1985. (Figs. 6.55 and 7.26)

Recorded for only one locality in state of Bahia, municipality Mucugê, in Diamantina plateau, altitude 983 m. This species was previously known to Cerrado where is considered endemic (Nogueira et al., 2010) and seem be found in cerrado vegetation like *campos rupestres* present in highland.

Erythrolamprus miliaris (Linnaeus, 1758). "Cobra d'água" (Figs. 6.56 and 7.27)

Recorded in the states of Ceará, Rio Grande do Norte, Pernambuco, Alagoas, and Bahia. This snake inhabits low altitudes areas (0 to 552 m) in transitional areas and semi-arid. This species have few and sparse records inside Caatinga and frequenty associated with water bodies inside the xerophitic vegetation sometimes next to coast. It is sympatric with *L. mossoroensis*.

Erythrolamprus mossoroensis Hoge and Lima-Verde, 1972. (Figs. 6.57 and 7.27)

Caatinga endemic species. Recorded in large area of the Caatinga in Ceará, Rio Grande do Norte, Pernambuco, Bahia and north Minas Gerais. All records are in low altitude (above 500 m) and open areas. Most records in herbaceous, bush and arboreal caatinga area (Vanzolini et al., 1980).

Erythrolamprus poecilogyrus (Wied, 1825). "Casco de burro" (Figs. 6.58 and 7.28)

Occurs in all portions of the Caatinga and is abundant in all of phytophysiognomies of the Caatinga. It can be found in low and high altitudes areas (0 to 1,100m). There are records in all kinds of Caatinga described in this work.

Erythrolamprus reginae (Linnaeus, 1758). "Cobra verde" (Figs. 6.59 and 7.27)

This species was recorded in the states of Piauí, Ceará, Alagoas and Sergipe and it was most abundant in Ceará State. The most records are in high altitude (upper than 600 m) and forested areas, but we have some records for semi-arid and transitional areas near the coast (below 500 m of altitude). Their distribution is in moist forest area in high altitude Caatinga and eventually recorded in xerophytic caatinga with strong influence of the Atlantic Forest (*agreste*).

Erythrolamprus taeniogaster Jan, 1863. (Fig. 7.29)

Recorded in the states of Ceará, Alagoas and Bahia. This snake inhabits altitudes upper than 600 m highland and low altitudes (0 to 500 m) next to Atlantic Forest. Despite the sparce records, this species seems to inhabit moist forested areas in highland and xerophytic arboreal and bush caatinga where there is influence of the Atlantic Forest climate.

Erythrolamprus viridis Günther, 1862. "Cobra verde" (Figs. 6.60 and 7.29)

Caatinga endemic species. It is distributed in all states in the Caatinga. Most records are in low altitudes with few records above 500 m in ranges in Ceará State. This snake inhabits all kinds of the caatinga vegetation.

Helicops aff. *infrataeniatus* (Jan, 1865). "Cobra d'água" (Fig. 7.30)

First record in the Caatinga. Recorded only in state of Paraíba, municipality of Campina Grande, based on one specimen. This area is situated on Borborema Plateau, altitude 560 m, with strong influence of the adjacent Atlantic Forest, After the analysis of 319 specimens of genera *Helicops* from Caatinga, we found only one specimen of *H.* aff. *infrataeniatus,* and we infer that this species appears to be rare and geographicaly restricted to a small area in the Caatinga. The area has arboreal with bush caatinga wetter than rest of semi-arid because is near to coastal Atlantic Forest in high altitudes (*agreste*).

Helicops angulatus (Linnaeus, 1758). "Cobra d'água" (Figs. 6.61 and 7.30)

This species was recorded in the states of Piauí, Ceará, Paraíba and Sergipe. The records are in low altitudes (below 560 m) in Caatinga (Roberto et al., 2009). It inhabits arboreal and bush caatinga next to northeast Atlantic Forest (east) and moist forested relictual in highland. As other congenerics, it is an aquatic snake; consequently its distribution is determined by the presence of water bodies and dependent of drenaige system (see Rodrigues, 2005).

Helicops leopardinus (Schlegel, 1837). "Cobra d'água, Jararaca d'água" (Figs. 6.62 and 7.31)

Recorded in all portions of the Caatinga, except in Rio Grande do Norte where we believe this species probably occurs but has not been sampled. The specimens were recorded in altitudes less than 750 m. As it is an aquatic snake, consequently its distribution is determined by the presence of water bodies and dependent of drenaige system (see Rodrigues, 2005). It is sympatric with *H. angulatus* only in areas next to the Atlantic Forest.

Helicops modestus Günther, 1861. "Cobra d'água" (Figs. 6.63 and 7.30)

This species was recorded only in the state of Bahia, municipality Caitité. This area has altitude 970 m. We have only specimen recorded (Freitas and Silva, 2011) and we believe this species has restricted distribution to high altitude areas. As other congenerics, it is an aquatic snake; consequently its distribution is determined by the presence of water bodies and dependent of drenaige system (see Rodrigues, 2005). This specimen was found on dry forest that includes xerophytic phytophysiognomies of the arboreal and bush caatinga and cerrado vegetation run over on the road (M. A. Freitas pers. comm.).

Hydrops triangularis (Wagler, 1824). "Cobra d'água" (Figs. 6.64 and 7.30)

First record in the Caatinga. It was recorded only in the state of Maranhão, municipality of Timon in the northwesterns borders of the Caatinga and contact with Cerrado and Amazonia. We believe this species can be found in other areas of the Caatinga next to Cerrado in open areas along transitional areas. It is an aquatic snake that inhabits water bodies (Scartozzoni, 2009) where can have arboreal and bush caatinga vegetation on around.

Imantodes cenchoa (Linnaeus, 1758). "Dormideira" (Figs. 6.65 and 7.32)

Recorded in the states of Ceará, Pernambuco and Alagoas. Occurs only in areas with altitude upper than 500 m. This species is apparently restricted to moist relictual forest in Caatinga (Loebmann and Haddad, 2010).

Leptodeira annulata (Linnaeus, 1758). "Jararaquinha, dormideira, Jararaca de tabuleiro" (Figs. 6.66 and 7.32)

This species was recorded in all portions of the Caatinga. We have no records in large area of Pernambuco State and central portion of Bahia State neither in paleoquaternary sandy dunes of middle São Francisco River, perhaps due to sampling gaps. It inhabits low and high altitudes (0 to 1,100 m) and it can be found on arboreal and bush caatinga vegetation, in arid or moist forests next to the Atlantic Forest. It was recorded also in cerrado vegetation know as *campo rupestre* in highland on Bahia State (Juncá, 2005).

Lioheterophis iheringi Amaral, 1934. (Fig. 7.32)

Caatinga endemic species. This species is known only for the type-locality in Paraíba State, municipality of Campina Grande. This area is situated on Borborema plateau with strong influence of the Atlantic Forest adjacent, altitude 560 m. This species is known only one specimen (holotype, voucher lost TBG pers. obs.) collected in 1934 (Amaral, 1934). Thefore it appears to be rare. Apparently inhabit forested area because the locality is arboreal and bush caatinga (wetter than rest of semi-arid) situated in *agreste*, near to coastal Atlantic Forest.

Lygophis dilepis (Cope, 1862). "Cobra de cadarço" (Figs. 6.67 and 7.33)

Recorded in the states of Piauí, Ceará, Rio Grande do Norte, Paraíba, Pernambuco, Bahia and Minas Gerais. It can be found in lower and upper altitude, maximum altitude recorded was 850 m in Araripe plateau, Ceará State. Most records are in xerophytic caatinga that includes bush, herbaceous and arboreal vegetation and we believe that it also inhabits xerophitic vegetation in highlands.

Lygophis paucidens (Hoge, 1853). “Cobra de cadarço” (Figs. 6.68 and 7.33)

First record in the Caatinga. Recorded only in three localities, in the states of Piauí and Bahia altitudes less than 500 m. This species is found mostly in open savannas and grasslands on sandy soils, and is considered a Cerrado endemic (Nogueira et al., 2011). Both records are in low altitude areas but we have one record to Diamantina plateau in highlands. It probably occurs in areas with relictual cerrado enclaves (CN pers. comm.).

Oxyrhopus guibei Hoge and Romano, 1978. “Falsa coral” (Figs. 6.69 and 7.34)

We have few record of this species in Bahia State, municipalities of Mucugê and Rio de Contas. These areas have altitude upper 800 m. These areas recorded are on Diamantina Plateau and has a vegetation complex that includes phytophysiognomies of the caatinga, cerrado and humid forest.

Oxyrhopus petola (Linnaeus, 1758). “Falsa coral” (Figs. 6.70 and 7.34)

First record in the Caatinga. This species was recorded in the states of Paraíba, Bahia and Minas Gerais. Occurs in highland and transitional areas. Inhabit altitude areas between 250 to 618 m. It appears to be found in moist relictual forest in highland and bush and arboreal caatinga, with Atlantic Forest influence, in *agreste*.

Oxyrhopus rhombifer Duméril, Bibron and Duméril, 1854 (Figs. 6.71 and 7.34)

This species was recorded only to Bahia State, municipalities of Mucugê and Paulo Afonso (Handam and Lira-da-Silva, 2008; Freitas et al., 2012a). Mucugê is situated in highland Diamantina plateau with more than 800 m altitude and Paulo Afonso has altitude 243 m. This species occurs in opens areas in other regions of this country (Marques et al., 2005; Bérnils et al., 2008; Nogueira et al., 2010) and we believe it inhabits open (including xerophitic vegetation) areas inside Caatinga. We believe it will be more sampled in Caatinga in states of Bahia and Minas Gerais.

Oxyrhopus sp. (gr. *melanogenys*) “Falsa coral” (Figs. 6.72 and 7.34)

Recorded only in Ibiapaba-Araripe Plateau and ranges on Ceará State. This species ocurs in highland, altitude upper than 600 m. It was recorded in moist forest relictual (Loebmann and Haddad, 2010).

Oxyrhopus trigeminus Duméril, Bibron and Duméril, 1854. "Falsa coral" (Figs. 6.73 and 7.35)

This species is distributed in all states of the Caatinga. It was recorded in low and high altitudes (0 to 1,100 m) and is distributed in all phytophysiognomies present in the Caatinga, including in cerrado enclaves. Absent from forested habitats.

Philodryas aestiva (Duméril, Bibron and Duméril, 1854). "Cobra de cipó verde" (Figs. 6.74 and 7.36)

Recorded only in Bahia State, municipality of Mucugê. This area is inside Diamantina plateau, altitude 980 m. The area has a complex phytophysiognomic that includes caatinga, cerrado and moist forest vegetation (Juncá et al., 2005; Freitas et al., 2012a). This species was reported to cerrado vegetation (Argôlo and Freitas, 2002; Freitas and Silva, 2007; Nogueira et al., 2010), and we believe that it inhabits the enclave of cerrado vegetation named *campo rupestre* in Caatinga.

Philodryas agassizii (Jan, 1863) (Figs. 6.75 and 7.36)

We have only one record for this species in municipality of Caitité, Bahia State. This area is parto f Diamantina Plateau complex, altitude 824 m. This species is know from open areas in Cerrado (Marques et al., 2006), and we believe this species can be found in enclaves of cerrado vegetation like *campos rupestres* areas in Diamantina Plateau.

Philodryas nattereri Steindachner, 1870. "Corre campo, corredeira" (Figs. 6.76 and 7.37)

This species is distributed in all portions of the Caatinga. It was recorded in low and high altitudes areas (0 to 1,100m) and was abundant and widespread. It is distributed in all phytophysiognomies inside Caatinga, including in cerrado enclaves. It seems occur only marginaly in forested habitats.

Philodryas olfersii (Lichtenstein, 1823). "Cobra de cipó verde" (Figs. 6.77 and 7.38)

This species was recorded in all portions of the Caatinga. It is distributed in low and high altitudes (0 to 1,100 m) and abundant species. It can be found in all phytophysiognomies of the Caatinga, except paleoquaternary sandy dunes of middle São Franscico River, which can be absent or was not sampled yet. This species is typical of forests or forest borders (Vitt, 1980; Hamdan and Lira-da-Silva, 2012; Nogueira et al., 2011), and may thus be absent form areas widely dominated by open sand dunes or savannas.

Philodryas patagoniensis (Girard, 1858). “Corre campo, corredeira” (Figs. 6.78 and 7.36)

First record in the Caatinga. Recorded in states of Rio Grande do Norte, Sergipe, Bahia and North Minas Gerais. It inhabits low altitude areas, between sea level to 500 m. The records of this species in Caatinga are sparse, but we can relate it inhabits caatinga vegetation, mainly herbaceous vegetation.

Phimophis guerini (Duméril, Bibron and Duméril, 1854). (Figs. 6.79 and 7.39)

Recorded in the states of Piauí and Bahia. It can be found on low and high altitudes (0 to 830 m). In highland inhabits Jibóia Range and Diamantina Plateau and in low altitude inhabit areas with xerophitic vegetation. Probably this snake is associated with latosoil areas (CN pers. obs.) with caatinga and cerrado vegetation cover inside Caatinga.

Pseudoboa nigra (Duméril, Bibron and Duméril, 1854). “Mussurana”, “cobra de leite”, “cobra preta” (Figs. 6.80 and 7.40)

Recorded for all regions of the Caatinga. It occurs from sea level to 900 m. It was found in all regions of Caatinga, except dunes of São Francisco River. It can be found in areas with bush, arboreal and herbaceous caatinga, cerrado vegetation and moist relictual forest.

Psomophis joberti (Sauvage, 1884). (Figs. 6.81 and 7.39)

This species was recorded in the states of Piauí, Ceará, Rio Grande do Norte, Paraíba and Bahia. It occurs in low altitude in transitional areas and semi-arid, and high altitudes in highland only in Ceará State. Altitude from sea level to 830 m. This snake was not recorded in sandy dunes of São Franscico River. The records of this species, especially in Caatinga core, are scarce and we have not many records for caatinga. So, this species seems inhabit open areas (Myers and Cadle, 1994) and we believe it occurs in many phytophysiognomies like xerophitic caatinga vegetation, and cerrado vegetation.

Rodriguesophis chui Rodrigues, 1993. (Figs. 6.82 and 7.41)

Caatinga endemic species. It is known only in type-locality in Bahia State, Santo Inácio village in municipality of Gentio do Ouro. The area has altitude 475 m. This species possess restricted distribution to right bank in herbaceous and bush caatinga with sandy soils (Rodrigues, 1993).

Rodriguesophis iglesiasi (Gomes, 1915). (Figs. 6.83 and 7.41)

Recorded in sparse localities in the states of Piauí and Bahia, at the dunes of São Francisco River, and Cerrado-Caatinga transition area. All records in low altitudes (less than 500 m). Associated with sandy areas with caatinga and cerrado vegetal cover inside Caatinga.

Rodriguesophis scriptocirbatus Rodrigues, 1993. (Figs. 6.84 and 7.41)

Caatinga endemic species. This species is only known only for the type-locality in Bahia State, Ibiraba village in municipality of Barra. This area has altitude 410 m. It was recorded to left bank on herbaceous and bush caatinga with sandy soils on sandy dunes of middle São Francisco River (Rodrigues, 1993).

Sibon nebulata (Linnaeus, 1758). "Dormideira" (Figs. 6.85 and 7.41)

This species is recorded only for few localities in Ceará State. It was recorded only above than 600 m in isolated plateaus. According to Loebmann and Haddad (2010), it is found on relictual moist forests in Caatinga.

Sibynomorphus mikanii (Schlegel, 1837). "Dormideira" (Figs. 6.86 and 7.42)

This species was recorded in states of Ceará, Bahia and Minas Gerais. Except for two records in transitional areas, all the others records are in altitude upper than 560 m. It inhabits open areas either in transitional areas (next to Atlantic Forest) as on highland.

Sibynomorphus neuwiedii (Ihering, 1911). "Dormideira" (Figs. 6.87 and 7.42)

This species was recorded in the states of Paraíba and Bahia. It was recorded on in highland, altitude 500 to 1030 m. This species is a typical forested area species, and its distribution in Caatinga may be restricted to humid, elevated forest enclaves.

Siphlophis compressus (Daudin, 1803). (Figs. 6.88 and 7.43)

This species was recorded in the states of Ceará, Sergipe and Bahia in Caatinga. The maximum altitude registered was 188 m (Guedes et al., 2011). Occurs in transitional areas, and we have one record to semi-arid caatinga in Fortaleza city (Ceará State). This snake occurs in forested areas which can

include arboreal caatinga areas and its distribution is restricted to low altitude areas (Guedes et al., 2011).

Siphlophis leucocephalus (Günther, 18673). (Figs. 6.89 and 7.43)

This species was recently recorded for first time to Bahia State, municipality of Mucugê by Freitas et al. (2012a). This area is a highland, altitude around 1100 m, in Diamantina plateau. This area has a complex phytophisiognomic we do not know, specifically, the habitat where this species occurs but we belive that inhabit forested area.

Taeniophallus affinis (Günther, 1858). (Figs. 6.90 and 7.43)

This species occurs in municipalities of Ubajara and Pacatuba (Ceará State) and Elísio Medrado (Bahia State). In Ceará this snake occurs in highland of the Ibiapaba-Araripe Plateau and Aratanha Range, with altitudes from 735 to 900 m, respectively, and in Bahia occurs in Jibóia Range from 600 to 839 m. It is a typical forest species (Marques, 1998; Marques et al., 2001; Barbo et al., 2011; Zaher et al., 2011) with restrict distribution in Caatinga. It inhabits relictual moist forest in high altitude as recorded by Loebmann and Haddad (2010) in Ceará.

Taeniophallus occipitalis (Jan, 1963). (Figs. 6.91 and 7.43)

This species is distributed in the states of Piauí, Ceará, Pernambuco, Sergipe and Bahia. On central portion of the Caatinga, it inhabits high altitude areas, maximum altitude recorded was 1,200 m. On transitional areas inhabits low altitudes, less than 500 m. In highland on Ceará State was recorded in arboreal caatinga (Loebman and Haddad, 2010) and in Diamantina plateau in Bahia State (Juncá, 2005) and Parque Nacional Serra de Itabaiana in Sergipe State was recorded in moist forest relictual. In Piauí State was recorded only in low altitudes in areas where cerrado phytophysiognomies are predominant, but there are caatinga vegetation influence (Rocha and Prudente, 2010). It is typical of open areas along its wide range in the Cerrado region (Recoder and Nogueira, 2007; Valdujo et al., 2009; Recoder et al., 2011; Nogueira et al., 2011).

Thamnodynastes almae Franco and Ferreira, 2003. “Jararaquinha” (Figs. 6.92 and 7.44)

Caatinga endemic species. This species was recorded in the states of Ceará, Paraíba, Pernambuco, Alagoas and Bahia (Joventino et al., 2009; Guedes, 2010; Jorge and Freire, 2011). It is known for areas with altitude less than 400 m. Although the records are sparse, available data indicate the association to xerophitic phytophysiognomies with stony soils and inselbergs.

Thamnodynastes cf. *nattereri* (Mikan, 1828). "Jararaquinha" (Figs. 7.45)

First record in the Caatinga. This species is known only Bahia State, municipality of Miguel Calmon. This species is known based one specimen collected in the area slope to Diamantina Plateau, 532 to 800 m elevation. This snake may inhabit open areas chacterized by open vegetation (F. Franco pers. comm.).

Thamnodynastes hypoconia (Cope, 1860). "Jararaquinha" (Figs. 6.93 and 7.44)

First record in the Caatinga. We have few records for this species in the states of Piauí, Bahia and Minas Gerais. This species may occur in altitude lower than 800 m and, apparently, inhabits wet areas in open areas like caatinga and cerrado vegetation inside caatinga. We have not records for sandy dunes of São Francisco river area.

Thamnodynastes pallidus (Linnaeus, 1758). "Jararaquinha" (Figs. 6.94 and 7.44)

Recorded in Pernambuco, Alagoas, Sergipe and Bahia. This species occurs in high altitudes on highland of the Sergipe and Bahia (maximum 800 m) and low altitudes in transitional areas next to northeast Atlantic Forest. This species was redescribed and its distribution was restricted only Amazon Forest areas (Bailey et al., 2005). However, this species was found on Caatinga area proving this species is disjoint distribution like mentioned by Franco and Ferreira (2002). It is a forested area species that can be found in relictual moist forest on highland, and bush and arboreal caatinga in transitional areas next to Atlantic Forest.

Thamnodynastes sertanejo Bailey, Thomas and Silva Jr., 2005. "Jararaquinha, Cipó do papo amarelo" (Figs. 6.95 and 7.45)

Caatinga endemic species. Recorded in Paraíba, Pernambuco, Bahia and north Minas Gerais. All records are in low altitudes, maximum 657 m. Inhabit open areas with bush and arboreal caatinga vegetation over semi-arid.

Thamnodynastes sp. (*Thamnodynastes* sp. 2, sensu Franco and Ferreira 2002) "Jararaquinha" (Figs. 6.96 and 7.46)

Caatinga endemic species. This species is the most abundant of the genera and distributed in all portions of the Caatinga. There are records since the sea level to Diamantina plateau (c. 1,000 m). It can be found in all kinds of caatinga vegetation, cerrado and moist forest vegetation of the Caatinga.

Tropidodryas striaticeps (Cope, 1869). (Figs. 6.97 and 7.47)

Recorded in the states Bahia and Minas Gerais. It is distributed in altitude less than 500 m in transitional area, semi-arid and altitude more than 600 m in highland on east portion of the Caatinga. This snake apparently inhabits arboreal and bush arid (semi-arid area) and humid forest (next to Atlantic Forest and in highland) (Handam and Lira-da-Silva, 2007; Guedes and Marques, 2011). It was correlated with cerrados and arboreal caatinga in highland Diamantina Plateau (Freitas and Silva, 2007).

Xenodon merremii (Wagler, 1824). "Cobra boca de caçapa, jararaca malha de cascavel, goipeba" (Figs. 6.98 and 7.48)

This is the most abundant species of the Caatinga and was recorded in all states and all areas inside Caatinga. It can be found in low and high localities; from sea level to maximum recorded 1200 m. The records show that species can be found in forested and open areas in all phytophysiognomies of the caatinga, cerrado and moist forest vegetation of the Caatinga region.

Xenodon nattereri (Steindachner, 1867) (Figs. 6.99 and 7.47) "Cobra nariguda"

The only one record of this species on Caatinga is from municipality of Rio de Contas, Bahia State (Argôlo, 2002). The area is part of Diamantina Plateau complex, altitude 1,050 m. We have not informations about the habitat were this specimen was found in Caatinga but we believe it inhabits

cerrado vegetation like *campos rupestres* in Diamantina Plateau because it is know from open areas inside Cerrado (Nogueira et al., 2010).

Xenopholis undulatus (Jensen, 1900). (Figs. 6.100 and 7.47)

This species was recorded only states of Ceará, Paraíba and Alagoas. It was recorded in highland altitude 850 m (Borges-Nojosa and Lima, 2009; Loebmann and Haddad, 2010; Filho and Montingelli, 2011), and transitional areas next to Atlantic Forest in altitude 20 m. This species was considered endemic from Cerrado (Nogueira et al., 2010) where it inhabits riparian forest (CN pers. obs.). In Caatinga, this snake also inhabits forested areas in relictual moist forest and *agreste*.

Taxonomic uncertainties and previous unconfirmed records for the Caatinga

We also identified in literature other 14 species previously reported for Caatinga region whose occurrence was not confirmed herein.

The species *Epicrates cenchria, Leptotyphlops albifrons, Boiruna maculata, Liophis lineatus, Thamnodynastes strigilis* and *T. strigatus* were recorded for semi-arid caatinga and highland recently (Arzabe et al., 2005; Borges-Nojosa and Cascon, 2005; Borges-Nojosa and Santos, 2005; Juncá, 2005; Rodrigues, 2005; Borges-Nojosa, 2006; Ribeiro et al., 2008; Freire et al., 2009). Apparently, an error in determination of those species due taxonomic changes, many of them recent (Dixon, 1989; Franco and Ferreira, 2002; Bailey et al., 2005; Passos and Fernandes, 2008; Vanzolini, 1996b; Zaher, 1996). For *Thamnodynastes* we have many taxonomic problems as well as species not formally described (Franco and Ferreira, 2002; Bailey et al., 2005). *Liophis lineatus* occurs in Panama, Colombia, Venezuela, Guyana, Suriname, French Guiana to the mouth of the Amazon River in Brazil (Dixon, 1989). The determination of specimens as *L. lineatus* (Freire et al., 2009: photo p. 71) must have been error of determination of *Lygophis dilepis*.

The species *Apostolepis polylepis* is know to Cerrado (Nogueira et al., 2010), and Freitas and Silva (2007) comment it could be found in transitional areas next to Caatinga. In this study none specimen was reported to any areas of the Caatinga but we cannot discard this possibility, including in Cerrado enclaves inside Caatinga.

The species *Micrurus* aff. *corallinus* was recorded for highland in Ceará State (Borges-Nojosa, 2006), but was not detected in this work even after reviewing more than 1500 snake specimens from highland of Ceará. Thus, this species was not considered here due to lack of voucher material.

The species *Erythrolamprus aesculapii* was recorded for semi-arid caatinga (Rodrigues, 2005; Freitas and Silva, 2007). There were one record for *E. aesculapii* from municipality of Brumado (Bahia State) but the voucher housed in ZUEC could not be found. So, this species could be confirmed for the Caatinga in future, but was not considered here due to lack of voucher material.

Liophis typhlus and *Xenodon rabdocephalus* were recorded for a highland in a synthesis article about the herpetofauna of the Diamantina plateau (Bahia State) that not provides a voucher list (Juncá, 2005; Freitas and Silva, 2007). After analyzing all specimens of the MZUEFS (where this snakes should be housed) we did not identified individuals belong to these species. *Liophis typhlus and X. rabdocephalus* were previously recorded on central Brazil (Dixon, 1989;Sawaya et al., 2008; Valdujo et al., 2009; Nogueira et al., 2010) and we believe it could be recorded in the Caatinga in states of Bahia and Minas Gerais in Caatinga-Cerrado contact areas and Cerrado enclaves inside Caatinga. However, due to lack of voucher material, these two species were not included in our list of the Caatinga.

A recent study described a new Leptotyphlopidae *Trilepida jani* (Pinto and Fernandes, 2012), to tropical Savanna and Tropical Rainforest domains in southeastern Brazil with limited distribution to Espinhaço Range region in Central parte of Minas Gerais State (Pinto and Fernandes, 2012). The authors comment about one specimen from municipality of Mucugê in Diamantina Plateau, Bahia State, apparently was identified as *T. jani*. However, this only specimen is broken in parts, making the meristic and morphometric analyses difficult, so they preferred not to consider in their study *as T. jani*. Consequently, we not included in our list of the Caatinga.

DISCUSSION

The Caatinga was initially described as a region with low species richness and endemism (Vanzolini, 1974, 1976; Vanzolini et al., 1980; Castelletti et al., 2005; Rodrigues, 2005) and this point of view was also shared among herpetologists. After effort of many reseachers, the last sintheses about Caatinga region (see Rodrigues, 2005) showed a richness of 116 species of reptiles. This total, 52 species of snakes (six families) were sampled of about 76 municipalities of the Caatinga.

Here, we recognized 112 species of snakes, belonging to nine families, with records for Caatinga region that were collected for about 400 municipalities. Thus, the data provided here doubled the richness values known for the Caatinga, after extensive data collection (five times more sampled counties). Despite this study show the best data compilation for diversity and distribution geographic of snakes of the Caatinga. Nevertheless, this data is still incomplete because there are information avalilable for only 30% of the area covered by caatinga vegetation. Thus, we still expect an increase in the richness and distributional knowledge of snake in the Caatinga after more inventories are completed in the region. This information is very important to biogeography studies and practices conservation of this region. However, we are confident that, given current level of knowledge, new information and better syntheses for the Cattinga are feasible and highly desirable.

A total of 15 species are reported for first time for the Caatinga in this study. The maps about geographical distribution of snake species also incorporate a huge amount of new information, including many new records for species previously recorded in the Caatinga region (e.g. *Thamnodynastes sertanejo*, *Epictia borapeliotes*, *Bothrops erythomelas*). This is an advance about informations of geographic patterns of distribution. Before, data on geographic distribution was restricts only to informations about occurrence in Quaternarydandy dunes of São Francisco River and municipality of Exú (Pernambuco State), or if the species had restrict distribution or wide distribution without describing the region where each species occurs (Rodrigues, 2005).

The assemblage snake of Caatinga is complex sharing species with Pantanal, Cerrado, Atlantic Forest, Amazon and Pampas (Cunha and Nascimento, 1978; Marques, 1998; Martins and Oliveira, 1998; Marques et al., 2001; Marques et al., 2005; Nogueira et al., 2010; 2011; Bérnils et al., 2008). The relationships among all these regions probably reflect the distinct distribution patterns of different lineages of Neotropical colubrids (see Cadle and Greene, 1993). However, the Caatinga region was

1246 considered poor in species with ecological data only for the municipality of Exú in Pernambuco State
1247 (Vitt and Vangilder, 1983) that excluded several important lineages and ecological data of snakes
1248 because an area is not representative of the all.

1249 Data on ecology of snakes of the Caatinga was obtained mainly for locality of Exú, Pernambuco
1250 state, by Vitt and Vangilder (1983). In this study a total of 19 snake species were sampled. The most
1251 snakes were terrestrial, following by arboreal/semi-arboreal and only one fossorial species (*Micrurus*
1252 *ibiboboca*). The diet of these snakes consist on vertebrate preys including mammals, birds (and its
1253 eggs), lizards, snakes, amphibians and reptile eggs. None of the species feed on invertebrate preys. The
1254 species also were recognized as strictly diurnal, following by diurnal and nocturnal and the small part
1255 of species were strictly nocturnal. Our data show that the assemblage snakes of Caatinga is
1256 predominantly terrestrial and fossorial/cryptozoic, following by arboreal/semi-arboreal. The previous
1257 scarse records of fossorial snakes in Caatinga (Vanzolini et al., 1980; Vitt and Vangilder, 1983) was
1258 probably due to sampling /or limiting characteristics of soil structure at a single locality, Exu
1259 (Vanzolini, 1971; Strüssmannn and Sazima, 1993). Our data show a different and large view about
1260 ecology of snakes of the Caatinga with some records that was not made by Vitt and Vangilder (1983).
1261 For example, our data shows the caatinga soil including sandy soils scattered in several area of
1262 Caatinga are important to shelter the high number of fossorial and cryptozoic snake species species
1263 recorded here.

1264 Although the Caatinga is dominated by open areas, it harbors a high proportion of species with
1265 arboreal/semi-arboreal habits. This unexpected feature indicates that the more poor arboreal and bushy
1266 phytophysiognomies of the Caatinga also can support an richness arboreal snakes fauna as that one in
1267 Atlantic Forest, Amazon Forest and riparian areas in Cerrado (e.g. *T. striaticeps*, *I. cenchoa*, *S.*
1268 *compressus*, *C. hortulanus*, *C. bicarinatus*) (Guedes and Marques, 2010; Guedes et al., 2011; Bérnils et
1269 al., mans. in prep.). Moreover, even open areas and habitats may harbor arboreal or semi arboreal
1270 species (e.g. *Oxybelis aeneus* was found in open cerrado habitats, see Recoder et al., 2011).

1271 Terrestrial and fossorial/cryptozoic also were the most abundant species in localities of Amazon
1272 Forest (Martins and Oliveira, 1998) and Cerrado (Strüssmannn and Sazima, 1993; Sawaya et al., 2008).
1273 Snake species on Pantanal are predominantly terrestrial (Strüssmannn and Sazima, 1993; Strüssmannn
1274 et al., 2009) whereas in Atlantic Forest arboreal/semi-arboreal are predominant (Marques, 1998).
1275 Fossorial snakes are scarcely recorded in Pantanal (Strüssmannn and Sazima, 1993; Strüssmannn et al.,

2009) and Atlantic Forest (Marques, 1998). In Pantanal, periodic drastic changes in soil hydric condictions (due to annual floods) may be limiting factor for subterranean life (Strüssmannn and Sazima, 1993). Aquatic/semi-aquatic snake species were rare in Caatinga (this study), Cerrado (Sawaya et al., 2008) and Amazonia (Martins and Oliveira, 1998).

The lower consume of invertebrates than vertebrates by assemblage snakes of Caatinga is similar to Amazon Forest (Martins and Oliveira, 1998), Pantanal (Strüssmannn and Sazima, 1993), Cerrado (Sawaya et al., 2008) and Atlantic Forest (Marques, 1998). The proportion of diurnal and nocturnal species is similar in this study, like Amazon Forest (Martins and Oliveira, 1998), Atlantic Forest (Marques, 1998), Pantanal (Strüssmannn and Sazima, 1993) and Cerrado (Sawaya et al. 2008).

We must emphasize that the informations about natural history showed here (Table 1) were obtained from studies conducted in other natural regions apart from the Caatinga. We do not know precisely where some species, listed here, can be found, how use the substrate, what eat and how reproduce in Caatinga region, and there is an important gap in studies with this focus in the Caatinga region, except for the ecological studies in Exu (Vitt, 1980; Vitt and Vangilder, 1983). Nevertheless, according to Cadle and Greene (1993), the possible trends of natural history traits of snake assemblage of Caatinga indicate that historical factors may have played an important role in the current ecological patterns observed in this fauna.

The richest area documented in the Caatinga was highland presenting a complex mixed composition of fauna, with species from different Brazilian regions. The inclusion of the highland as part of the Caatinga is controverse, these areas are called Atlantic Forest relict by Tabarelli and Santos (2004) based in vegetacional data, and Filho and Montingelli (2011) based on snake data to highland in Paraíba and Pernambuco State. According to Borges-Nojosa and Caramaschi (2005), based on lizards data, the existence of the highland is interpreted as evidence of the integration the present and past between Atlantic Forest /Amazon Rainforest and the Caatinga. According with this study data, we agree with Borges-Nojosa and Caramaschi (2005) and Filho and Montingelli (2011) that there are species of snakes similar to previouly recorded in Atlantic Forest and Amazon Forest. But we believe that integration also involves the Cerrado, because these elevated areas have Cerrado relicts that also harbor species previously recorded as endemic of this region (e.g. *Trilepida brasiliensis, Xenopholis undulatus*, *Bothrops lutzi*, *Chironius flavolineatus*) (in agreement with Cole, 1986 and Vanzolini, 1976). The highland also harbor eight endemic species, three restrict to this areas (two of them are not

formally described). The high richness and endemism indicate these areas as spatial priorities for conservation (Borges-Nojosa and Caramaschi, 2005; Rodrigues, 2004; 2005; Loebmann and Haddad, 2010; Filho and Montingelli, 2011). By conserving these areas we would also be conserving valuable information on the history of the Caatinga biota, which are essential for understanding of the current diversity patterns in the Caatinga region.

The paleoquaternary sandy dunes of middle São Francisco River presents moderate richness, but harbors a high number of endemic species, including six species restrict to these areas. Therefore, we agree with Rodrigues (2004, 2005) considering this area as a high priority for conservation. Perhaps the low richness is a mere result of the size of the area in question, coupled with lack of data: although the area encompassed 17 municipalites we have data only for nine of them.

The semi-arid caatinga is also a high diverse area and have eight endemic species, six of them widespread in the lowlying areas that characterize the Caatinga region (e.g. *Epictia borapeliotes*, *Apostolepis cearensis*, *Erythrolamprus viridis*, *Thamnodynastes almae*, *T. sertanejo* and *Bothrops erythromelas*). We highlight that the endemism in Caatinga is not only related to highland and sandy soil areas (Borges-Nojosa and Caramaschi, 2005; Rodrigues 2005). Thus, semi-arid caatinga is perhaps the most typical and widespread Caatinga sub-unit, and these areas need to be conserved in order to protect the most typical and widespread Caatinga snake fauna. These widespread species, although relatively neglected in previous mapping initiatives, are also the most typical of the entire Caatinga, and show distributions that are highly coincident with the limits of this ecoregion. The conservation of these species would require wide actions, but however would be confined to the Caatinga.

We hope this study helps to clarify that the former vision considering the Caatinga as a species poor region and lacking relevant endemism was a result of lack of proper sampling and analyses. Our results recovered a rich snake fauna, moreover, the recovered species are not evenly distributed in Caatinga region, and future biogeographic studies may test for non-random patterns of regionalization, inferred by our raw distribution data. Informations about richness, endemism and distribution available here could be used to conservation of the Caatinga, a threatened region and so far relatively neglected in conservation strategies (Leal et al., 2005).

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APPENDIX CAPTIONS

Appendix 1. Voucher list of specimens examined in scientific collections organized by families and species alphabetical order.

Appendix 2. List of snake records obtained in scientific literature organized by families and species alphabetical order.

TABLE CAPTION

Table 1.List of snakes from Caatinga with detailed data about their geographic distribution and natural history. Biomes: Atlantic forest (AF), Amazon forest (AM), Caatinga (CAA), Cerrado (CE), Pampas (PM) and Pantanal (PN); Distribution in the Caatinga: Highland (HL), paleoquaternary dunes of middle São Francisco river (SDSF), semi-arid Caatinga (SAC), transitional area (TA); Habitat: forested area (F), open area (O), psammophylic (P); Substrate: aquatic (AQ), arboreal (AR), cryptozoic (CR), fossorial (FO), terrestrial (TE); Activity: diurnal (D) and nocturnal (N); Main items of Diet: amphisbaena and caecilians (AC), arthropods (ART), birds (BI), fish (FI), frogs (FR), lizards (LI), mammals (MA), mollusk (MO) and snakes (SN). We used ? when have not know information about natural history and the * for endemic snakes of the Caatinga.

FIGURE CAPTIONS

Figure 1. Caatinga map showing the semi-arid caatinga área (SAC), Highland (HL), Sandy dunes of São Francisco River (SDSF) and transitional areas (TA) considered in this study.

Figure 2. Phytophysiognomies in the Caatinga region. 2.1. Transitional area next to Atlantic Forest, municipality of Pocinhos, Paraíba State; 2.2. Bush vegetation in semi-arid caatinga during dry season, Saco dos veados farm, municipality of Currais Novos, Rio Grande do Norte State; 2.3. Bush vegetation in semi-arid caatinga with stony soil during wet season, municipality of Parnamirim, Pernambuco State; 2.4. Inselberg in semi-arid caatinga, pedra da trouxa, municipality of Serra de São Bento, Rio Grande do Norte State; 2.5. Lajedo area with bush and arboreal vegetation around in semi-arid caatinga during wet season, municipality of Parnamirim, Pernambuco State; 2.6. View of caatinga on right bank in paleoquaternary sandy dunes of middle São Francisco River during dry season, Xique-xique dunes

region, State of Bahia; 2.7. View of caatinga on left bank in paleoquaternary sandy dunes of middle São Francisco River during dry season, Xique-xique dunes region, State of Bahia; 2.8. View of caatinga in high altitude areas in highland, Flores range, municipality of Viçosa do Ceará, Ceará State. Photos: 2.1:Edilson Guedes; 2.6 and 2.7: Miguel Rodrigues; 2.8:Daniel Loebmann.

Figure 2. – Contin. 2.9. View of cerrado (*campo rupestre*) in highland, Flores range, municipality of Viçosa do Ceará, Ceará State; 2.10. View of moist forested area in highland, Reserva Estadual Mata do Pau-Ferro, municipality of Areia, Paraíba State. Photo: 2.9: Daniel Loebmann.

Figure 3. Richness and endemism detected in Caatinga areas based on informations of this study.

Figure 4. Richness and endemism detected in Brazilian biomes: Caatinga (this study), Atlantic Forest (Barbo, 2012), Amazon Forest (Ávila-Pires et al., 2007), Cerrado (Nogueira et al., 2010), Pantanal (Strüssmannn et al., 2007) and Pampas (Bérnils et al., 2008). The numbers above bars show the percentage of endemism in each biome.

Figure 5. Summary about natural history informations of the snakes of the Caatinga.

Figure 6. Snakes recorded in the Caatinga region. Photos with * were obtained of species collected and photographed in Caatinga region. 6.1. *A. scytale*; 6.2. *L.* cf. *ternetzii**; 6.3. *E. borapeliotes**; 6.4. *T. brasiliensis**; 6.5. *T. koppesi*; 6.6. *T. amoipira**; 6.7. *T. brongersmianus**; 6.8. *T. reticulatus*. Photos: 6.2 and 6.4: Daniel Loebmann; 6.3: Felipe Curcio; 6.6: Miguel Rodrigues; 6.7: Marco Sena; 6.8. Luíz Turci.

Figure 6. – Contin. 6.9. *T.yonenagae* *; 6.10. *B. constrictor*; 6.11. *C. hortulatus**; 6.12. *E. assisi**; 6.13. *E. crassus*; 6.14. *E. murinus*; 6.15. *B. erythromelas**; 6.16. *B. jararaca*. Photos: 6.9: Miguel Rodrigues; 6.16: Ricardo Sawaya.

Figure 6. – Contin. 6.17. *B. leucurus*; 6.18. *B. lutzi* *; 6.19. *B. moojeni*; 6.20. *B. neuwiedi*; 6.21. *Bothrops* sp. (gr. *atrox*)*; 6.22. *C. durissus**; 6.23. *L. muta**; 6.24. *M. brasiliensis*. Photo: 6.21: Daniel Loebmann.

Figure 6. – Contin. 6.25. *M. frontalis*; 6.26. *Micrurus* sp. (aff. *ibiboboca*)*; 6.27. *C. bicarinatus*; 6.28. *C. exoletus*; 6.29. *C. flavolineatus*; 6.30. *C. quadricarinatus*; 6.31. *D. corais*; 6.32: *D. brazili*. Photo: 6.32: Paula Valdujo.

Figure 6. – Contin. 6.33. *D. dichrous*; 6.34. *L. ahaetulla*; 6.35. *M. bifossatus*; 6.36. *M. boddaerti*; 6.37. *O. aeneus*; 6.38. *P. sulphureus*; 6.39. *S. rhinostoma*; 6.40. *S. pullatus**. Photos: 6.33. Paulo Bernarde.

Figure 6. – Contin. 6.41. *T. marcovani**; 6.42.*T. melanocephala*; 6.44; *A. ammodites*; 6.45. *A. arenaria**; 6.45. *A. assimilis*; 6.46. *A. cearensis**; 6.47. *A. gaboi**; 6.48. *Apostolepis* sp.1 (gr. *pymi*)*. Photos: 6.41: Gentil Filho; 6.42: Ivan Sazima; 6.45 and 6.47: Miguel Rodrigues and 6.48: Daniel Loebmann.

Figure 6. – Contin. 6.49. *Atractus* aff. *maculatus**; 6.50. *A. ronnie**; 6.51. *B. sertaneja**; 6.52. *C. plumbea*; 6.53. *D. sazimai*; 6.54. *E. almadensis*; 6.55. *E. maryellenae*; 6.56. *E. miliaris*. Photos: 6.49: Crizanto Carvalho; 6.50: Daniel Loebmann; 6.53: João Gasparini.

Figure 6. – Contin. 6.57. *E. mossoroensis**; 6.58. *E. poecilogyrus*; 6.59. *E. reginae*; 6.60. *E. viridis*; 6.61. *H. angulatus*; 6.62. *H. leopardinus*; 6.63. *H. modestus*; 6.64. *H. triangularis*. Photo: 6.58: Ivan Sazima.

Figure 6. – Contin. 6.65. *I. cenchoa*; 6.66. *L. annulata**; 6.67. *L. dilepis**; 6.68. *L. paucidens*; 6.69. *O. guibei*; 6.70. *O. petola*; 6.71. *O. rhombifer*; 6.72. *Oxyrhopus* sp. (gr. *melanogenys*)*. Photos: 6.67: Silvaney Medeiros; 6.72: Daniel Loebmann.

Figure 6. – Contin. 6.73. *O. trigeminus**, 6.74. *P. aestiva*; 6.75. *P. agassizii;* 6.76. *P. nattereri**; 6.77. *P. olfersii**; 6.78. *P. patagoniensis*; 6.79. *P. guerini*; 6.80. *P. nigra*. Photo: 6.75: Ricardo Sawaya.

1929 Figure 6. – Contin. 6.81. *P. joberti;* 6.82. *R. chui**; 6.83. *R. iglesiasi*; 6.84. *R. scriptocirbatus**; 6.85. *S.*
1930 *nebulata**; 6.86. *S. mikanii*; 6.87. *S. neuwiedii*; 6.88. *S. compressus*. Photos: 6.82: Felipe Curcio; 6.84:
1931 Miguel Rodrigues; 6.85: Daniel Loebmann; 6.88: Marco Sena.
1932
1933 Figure 6. – Contin – 6.89. *S. leucocephalus**; 6.90. *T. affinis*; 6.91. *T. occipitalis*; 6.92. *T. almae**; 6.93.
1934 *T. hypoconia*; 6.94. *T. pallidus**; 6.95. *T. sertanejo**; 6.96. *Thamnodynastes* sp.*. Photo: 6.89: Rodrigo
1935 Souza; 6.92: Marcelo Duarte; 6.95: Breno Handam; 6.96: Silvaney Medeiros.
1936
1937 Figure 6. – Contin. 6.97. *T. striaticeps**; 6.98. *X. merremii**; 6.99. *X. nattereri*; 6.100. *X. undulatus*.
1938 Photo: 6.99: Ricardo Sawaya.
1939
1940 Figure 7. Geographic distribution records for snakes of the Caatinga region. 7.1. *A. scytale*, *Epictia* sp.,
1941 *Liotyphlops* cf. *ternetzii* and *T. koppesi*; 7.2. *E. borapeliotes* and *T. brasiliensis*; 7.3. *T. amoipira*, *T.*
1942 *brongersmianus*, *T. reticulatus* and *T. yonenagae*; 7.4. *B. constrictor*.
1943
1944 Figure 7. – Contin. 7.5. *C. hortulanus* and *E. murinus*; 7.6. *E. assisi* and *E. crassus*; 7.7. *B.*
1945 *erythromelas* and *B. lutzi*; 7.8. *B. jararaca*, *B. leucurus* and *B. moojeni*.
1946
1947 Figure 7. – Contin. 7.9. *B. neuwiedi, Bothrops* sp. (gr. *atrox*), and *L. muta*; 7.10. *C. durissus*; 7.11.
1948 *Micrurus* aff. *lemniscatus, M. brasiliensis* and *Micrurus* frontalis; 7.12. *Micrurus* sp. (aff. ibiboboca).
1949
1950 Figure 7. – Contin. 7.13. *C. bicarinatus*, *C. carinatus* and *C. quadricarinatus*; 7.14. *C. exoletus* and *C.*
1951 *flavolineatus*; 7.15. *D. atlantica* and *D. corais*; 7.16. *D. brazili* and *D. dichrous*.
1952
1953 Figure 7. – Contin. 7.17. *L. ahaetulla*; 7.18. *M. bifossatus* and *M. boddaerti*; 7.19. *O. aeneus*; 7.20. *P.*
1954 *sulphureus*, *S. rhinostoma* and *S. pullatus*.

Table 1.

Snake species	Biomes	Caatinga	Habitat	Substrate	Activity	Diet
Aniliidae						
Anilius scytale (Linnaeus, 1758)	AM, CAA, CE	HL	F	AQ, CR, FO	D, N	AC, FI, LI, SN
Anomalepididae						
Liotyphlops cf. *ternetzii* (Boulenger, 1896)	CAA	HL	O	FO	N	ART
Leptotyphlopidae						
Epictia borapeliotes (Vanzolini, 1996)*	CAA	HL, SAC, SDSF, TA	O	FO	D, N	ART
Epictia sp.	CAA	HL	O	FO	D, N	ART
Trilepida brasiliensis (Laurent, 1949)	CAA, CE	HL, TA	O	FO	D, N	ART
Trilepida koppesi (Amaral, 1955)	CAA, CE, PN	HL	F	FO	D, N	ART
Typhlopidae						
Typhlops amoipira Rodrigues & Juncá, 2002 *	CAA	SDSF, TA	O	FO (P)	D, N	ART
Typhlops brongersmianus Vanzolini, 1976	AF, AM, CAA, CE, PM, PN	HL, SAC	F, O	FO	N	ART
Typhlops reticulatus (Linnaeus, 1758)	AM, CAA	SAC	O	FO	D, N	ART
Typhlops yonenagae Rodrigues, 1991*	CAA	SDSF	O	FO (P)	D, N	ART
Boidae						

Boa constrictor Linnaeus, 1758	AF, AM, CAA, CE, PN	HL, SAC, SDSF, TA	F, O	AR, TE	D, N	BI, LI, MA
Corallus hortulanus (Linnaeus, 1758)	AF, AM, CAA, CE, PN	HL, SAC, SDSF, TA	F, O	AR	N	BI, LI, MA
Epicrates assisi Machado, 1945 *	CAA	HL, SAC, SDSF, TA	F, O	AR, TE	N	BI, MA
Epicrates crassus Cope, 1862	AF, CAA, CE	TA	O	AR, TE	N	BI, MA
Eunectes murinus (Linnaeus, 1758)	AF, AM, CAA, CE, PN	SAC	O	AQ, TE	D, N	BI, FI, LI, MA
Viperidae						
Bothrops erythromelas (Amaral, 1923) *	CAA	SDSF, SAC, TA	O	TE	N	ART, FR, LI, MA
Bothrops jararaca (Wied, 1824)	AF, CAA, CE, PN	HL	F	TE	N	ART, BI, FR, LI, MA
Bothrops leucurus Wagler, 1824	AF, CAA	HL, TA	F	TE	N	BI, FR, LI, MA
Bothrops lutzi (Miranda-Ribeiro, 1915)	CAA, CE	HL, TA	O	TE	N	MA
Bothrops moojeni Hoge, 1966	CAA, CE	TA	O	TE	N	ART, BI, FR, LI, MA
Bothrops neuwiedi (Wagler, 1824)	AF, CAA, CE	SAC, TA	O	TE	N	FR, LI, MA
Bothrops sp. (gr. *atrox*)	CAA	HL	F	TE	N	MA
Crotalus durissus (Linnaeus, 1758)	AF, CE, PM, PN, CAA	HL, SAC, SDSF, TA	O	TE	N	LI, MA
Lachesis muta (Linnaeus, 1766)	AF, CAA	HL, TA	F	TE	N	MA
Elapidae						

Micrurus aff. *leminiscatus* (Linnaeus, 1758)	CAA	HL	F, O	FO	D, N	AC, SN
Micrurus brasiliensis Roze, 1967	CAA, CE	TA	O	FO	D, N	AC, SN
Micrurus frontalis (Duméril, Bibron & Duméril, 1854)	AF, CAA, CE, PM, PN	TA	O	FO	D, N	AC, LI, SN
Micrurus sp. (aff. *ibiboboca*) (Merrem, 1820)*	CAA	HL, SAC, SDSF, TA	F, O	FO	D, N	AC, SN
Colubridae						
Chironius bicarinatus (Wied, 1820)	AF, CAA, CE, PM	HL, TA	F	AR, TE	D	FR
Chironius carinatus (Linnaeus, 1758)	AF, AM, CAA	HL, TA	F	AR, TE	D	FR
Chironius exoletus (Linnaeus, 1758)	AF, CAA, CE, PN	HL	F	AR, TE	D	FR
Chironius flavolineatus (Boettger, 1885)	AF, AM, CAA, CE, PN	HL, SAC, TA	O	AR, TE	D	FR
Chironius quadricarinatus (Boie, 1827)	AF, AM, CAA, CE, PN	HL	F, O	AR, TE	D	FR
Dendrophidion atlantica (Freire, Caramaschi & Gonçalves, 2010)	AF, CAA	TA	F	TE	D	FR
Drymarchon corais (Boie, 1827)	AF, AM, CAA, CE, PN	HL, SAC, SDSF, TA	F, O	AR, TE	D	FR, LI, SN
Drymoluber brazili (Gomes, 1918)	AF, CAA, CE	HL, SDSF, SAC	O	TE	D	FR, LI
Drymoluber dichrous (Peters, 1863)	AM, CAA	HL, TA	F	TE	D	FR, LI
Leptophis ahaetulla (Linnaeus, 1758)	AF, CAA, CE, PM, PN	HL, SAC, TA	F, O	AR	D	FR, LI
Mastigodryas bifossatus (Radi, 1820)	AF, AM, CAA, CE, PM, PN	HL, SAC, SDSF, TA	F, O	TE	D	FR, LI, MA
Mastigodryas boddaerti (Sentzen, 1796)	AM, CAA, CE, PN	HL, SAC	F	TE	D	BI, FR, LI, SN

Oxybelis aeneus (Wagler, 1824)	AF, AM, CAA, CE, PN	HL, SAC, SDSF, TA	F, O	AR	D	FR, LI
Pseustes sulphureus (Wagler, 1824)	AF, AM, CAA, CE	HL, SAC	F	AR, TE	D	BI, LI, MA
Simophis rhinostoma (Schlegel, 1837)	AF, CAA, CE	HL	O	TE	D	FR
Spilotes pullatus (Linnaeus, 1758)	AF, AM, CAA, CE, PN	HL, SAC, SDSF, TA	F, O	AR, TE	D	BI, MA
Tantilla marcovani Lema, 2004 *	CAA	HL	F	CR	D, N	ART
Tantilla melanocephala (Linnaeus, 1758)	AF, AM, CAA, CE, PM, PN	HL, SAC, SDSF, TA	F, O	CR	D, N	ART
Dipsadidae						
Apostolepis ammodites Ferrarezzi, Barbo & Albuquerque, 2005	CAA, CE	TA	O	FO (P)	D, N	AC
Apostolepis arenaria Rodrigues, 1992 *	CAA	SDSF	O	FO (P)	D, N	AC
Apostolepis assimilis (Reinhardt, 1861)	AF, CAA, CE	SAC, TA	O	FO (P)	D, N	AC
Apostolepis cearensis Gomes, 1915	AF, CAA	HL, SAC, SDSF, TA	F, O	FO (P)	D, N	AC
Apostolepis gaboi Rodrigues, 1992 *	CAA	SDSF	O	FO (P)	D, N	AC
Apostolepis sp. 1 * (gr. *pymi*)	CAA	HL	F	FO	D, N	AC
Apostolepis sp. 2	CAA	HL	?	FO	D, N	AC
Atractus aff. *maculatus* Günther, 1858	AF, CAA	SAC	F	CR, FO	D, N	MO
Atractus caete Passos, Fernandes, Bérnils & Moura-Leite, 2010	AF, CAA	TA	F	CR, FO	D, N	MO
Atractus potschi Fernandes, 1995	AF, CAA	HL, TA	F	CR, FO	D, N	MO

Atractus ronnie Passos, Fernandes & Borges-Nojosa, 2007 *	CAA	HL	F	CR, FO	D, N	MO
Boiruna sertaneja Zaher, 1996 *	CAA	HL, SAC, SDSF, TA	F, O	TE	D, N	LI, MA, SN
Clelia plumbea (Wied, 1820)	AF, CAA, CE	TA	O	TE	D, N	MA, SN
Dipsas sazimai Fernandes, Marques & Argôlo, 2010	AF, CAA	HL, TA	F	AR	N	MO
Dipsas variegata (Duméril, Bibron & Duméril, 1854)	AM, CAA	TA	F	AR	N	MO
Erythrolamprus almadensis (Wagler, 1824)	AM, CAA, CE, PM, PN	SAC, TA	O	TE	D	FR
Erythrolamprus maryellenae Dixon, 1985	CAA, CE	TA	O	TE	D	FR, LI
Erythrolamprus miliaris (Linnaeus, 1758)	AF, CE, CAA	SAC, TA	O	AQ, TE	D, N	FR, FI
Erythrolamprus mossoroensis Hoge & Lima-Verde, 1972 *	CAA	SAC, TA	O	TE	D	FR
Erythrolamprus poecilogyrus (Wied, 1825)	AF, CAA, CE, PM, PN	HL, SAC, SDSF, TA	F, O	AQ, TE	D, N	FR
Erythrolamprus reginae (Linnaeus, 1758)	AF, AM, CAA, PN	HL, SAC, TA	F	TE	D	FR, LI
Erythrolamprus taeniogaster Jan, 1863	AF, CAA, CE, PN	HL, TA	F	TE	D, N	FR, LI
Erythrolamprus viridis Günther, 1862	AF, CAA	HL, SAC, SDSF, TA	F, O	TE	D	FR
Helicops aff. infrataeniatus (Jan, 1865)	CAA	HL	F, O	AQ	D, N	FI, FR
Helicops angulatus (Linnaeus, 1758)	AM, CAA, CE, PN	HL, TA	F	AQ	D, N	FI, FR, LI
Helicops leopardinus (Schlegel, 1837)	AM, CAA, CE, PM	SAC, SDSF, TA	F, O	AQ	D, N	FI, FR
Helicops modestus Günther, 1861	CAA, CE	HL	O	AQ	D, N	FI, FR
Hydrops triangularis (Wagler, 1824)	AM, CAA, CE	TA	O	AQ	D, N	FI

Imantodes cenchoa (Linnaeus, 1758)	AF, AM, CAA, CE	HL	F	AR	N	FR, LI
Leptodeira annulata (Linnaeus, 1758)	AF, AM, CAA, CE, PN	HL, SAC, TA	F, O	AR, TE	N	FR
Lioheterophis iheringi Amaral, 1934 *	CAA	HL	?	?	?	?
Lygophis dilepis (Cope, 1862)	CAA, CE	HL, SAC, SDSF, TA	F, O	TE	D	FR
Lygophis paucidens (Hoge, 1853)	CAA, CE	SDSF, HL	O	TE	D	FR
Oxyrhopus guibei Hoge & Romano, 1978	AF, CAA, CE	HL	F, O	TE	N	LI, MA
Oxyrhopus petola (Linnaeus, 1758)	AF, AM, CAA, CE, PN	HL, TA	F	TE	N	LI, MA
Oxyrhopus rhombifer Duméril, Bibron & Duméril, 1854	AF, AM, CAA, CE, PM	HL, TA	O	TE	N	LI, MA
Oxyrhopus sp. *	CAA	HL	F, O	TE	N	LI, MA
Oxyrhopus trigeminus Duméril, Bibron & Duméril, 1854	CAA, CE, PN	HL, SAC, SDSF, TA	F, O	TE	N	FR, LI
Philodryas aestiva (Duméril, Bibron & Duméril, 1854)	AF, CAA, CE, PM	HL	F, O	AR, TE	D	FR, MA
Philodryas agassizii (Jan, 1863)	CAA, CE	HL	O	TE	D	ART
Philodryas nattereri Steindachner, 1870	CAA, CE, PN	HL, SAC, SDSF, TA	F, O	AR, TE	D	FR, LI, MA
Philodryas olfersii (Lichtenstein, 1823)	AF, CAA, CE, PN, PM	HL, SAC, TA	F, O	AR, TE	D	BI, FR, LI, MA
Philodryas patagoniensis (Girard, 1858)	AF, CAA, CE, PM, PN	SAC, TA	O	TE	D	LI, MA
Phimophis guerini (Duméril, Bibron & Duméril, 1854)	AM, CAA, CE, PN	HL, SAC	O	FO (P), TE	N	LI, MA
Pseudoboa nigra (Duméril, Bibron & Duméril, 1854)	AF, CAA, CE, PN	HL, SAC, TA	F, O	TE	N	LI, SN
Psomophis joberti (Sauvage, 1884)	AF, AM, CAA, CE	HL, SAC, TA	F, O	TE	D	FR, LI

Phimophis chui Rodrigues, 1993 *	CAA	SDSF	O	FO (P)	D, N	LI
Phimophis iglesiasi (Gomes, 1915)	CAA, CE	SDSF, SAC	O	FO (P), TE	D, N	LI
Phimophis scriptocirbatus Rodrigues, 1993 *	CAA	SDSF	O	FO (P)	D, N	LI
Sibon nebulata (Linnaeus, 1758)	AF, AM, CAA	HL	F	AR, TE	N	MO
Sibynomorphus mikanii (Schlegel, 1837)	AF, CAA, CE, PN,	HL, TA	O	TE	N	MO
Sibynomorphus neuwiedii (Ihering, 1911)	AF, CAA	HL	F	AR, TE	N	MO
Siphlophis compressus (Daudin, 1803)	AF, AM, CAA	SAC, TA	F, O	AR, TE	N	LI
Siphlophis leucocephalus (Günther, 1863)	CAA, CE	HL	F, O	AR, TE	N	LI
Taeniophallus affinis (Günther, 1858)	AF, CAA	HL	F	CR, TE	D	FR
Taeniophallus occipitalis (Jan, 1963)	CAA, CE, PM, PN	HL, TA	F, O	CR, TE	D	FR, LI
Thamnodynastes almae Franco & Ferreira, 2003 *	CAA	SAC	O	AR, TE	N	FR
Thamnodynastes cf. *nattereri* (Mikan, 1828)	AF, CAA, CE	HL	O	AR, TE	N	FR
Thamnodynastes hypoconia (Cope, 1860)	AF, CAA, CE, PM	HL, SAC, TA	F, O	AR, TE	N	FR, LI
Thamnodynastes pallidus (Linnaeus, 1758)	AM, CAA	HL, TA	F	TE	N	FR
Thamnodynastes sertanejo Bailey, Thomas & Silva Jr., 2005 *	CAA	SDSF, SAC	O	AR	N	FR
Thamnodynastes sp. 1 *	CAA	HL, SAC, SDSF, TA	F, O	TE	N	FR
Tropidodryas striaticeps (Cope, 1869)	AF, CAA, PM	HL, SAC, TA	F, O	AR, TE	D	LI, MA
Xenodon merremii (Wagler, 1824)	AF, CAA, CE, PM, PN	SDSF, HL, SAC, TA	F, O	TE	D	FR

Xenodon nattereri (Steindachner, 1867)	CAA, CE	HL	O	TE	D	LI
Xenopholis undulatus (Jensen, 1900)	CAA, CE	HL, TA	F	CR	N	FR

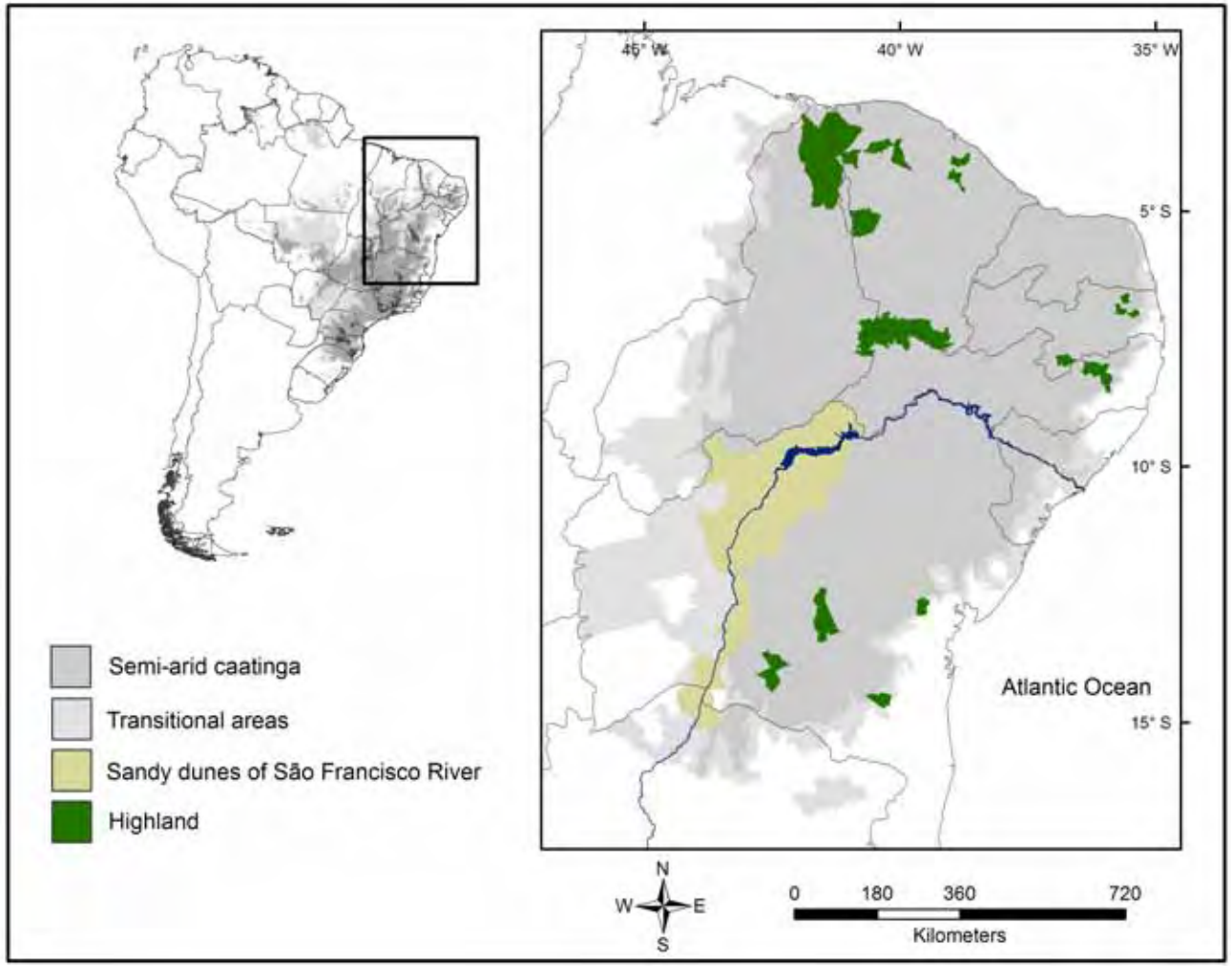
45° W
40° W
35° W
5° S
10° S
15° S
Atlantic Ocean
Semi-arid caatinga
Transitional areas
Sandy dunes of São Francisco River
Highland
N
W
E
S
0
180
360
720
Kilometers

Figure 1.....

Figure 2 (2.1 to 2.8).....

Figure 2 (2.9 to 2.10).....

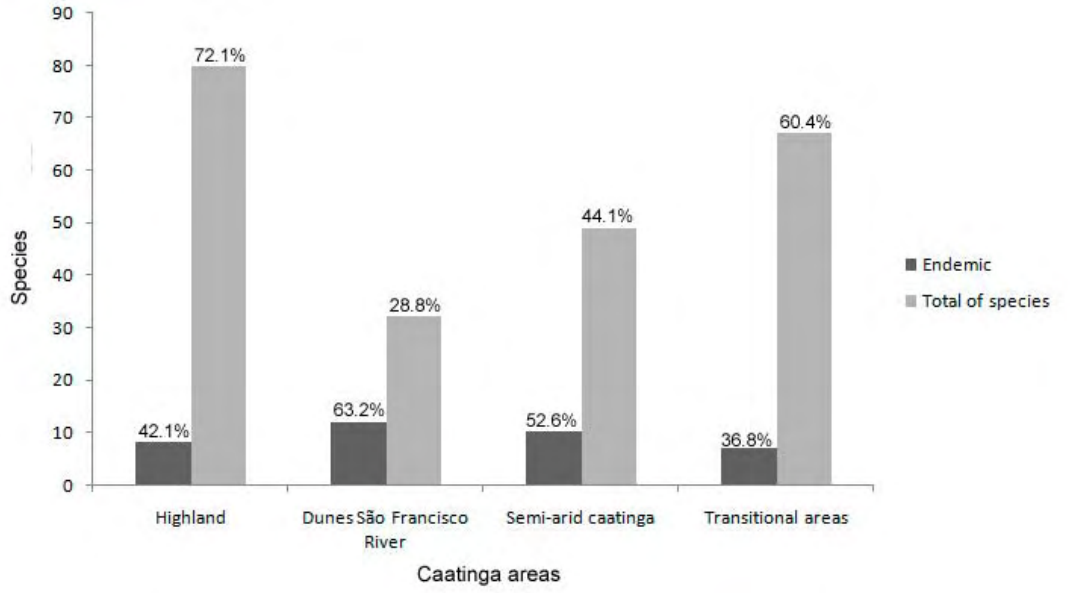

Figure 3……

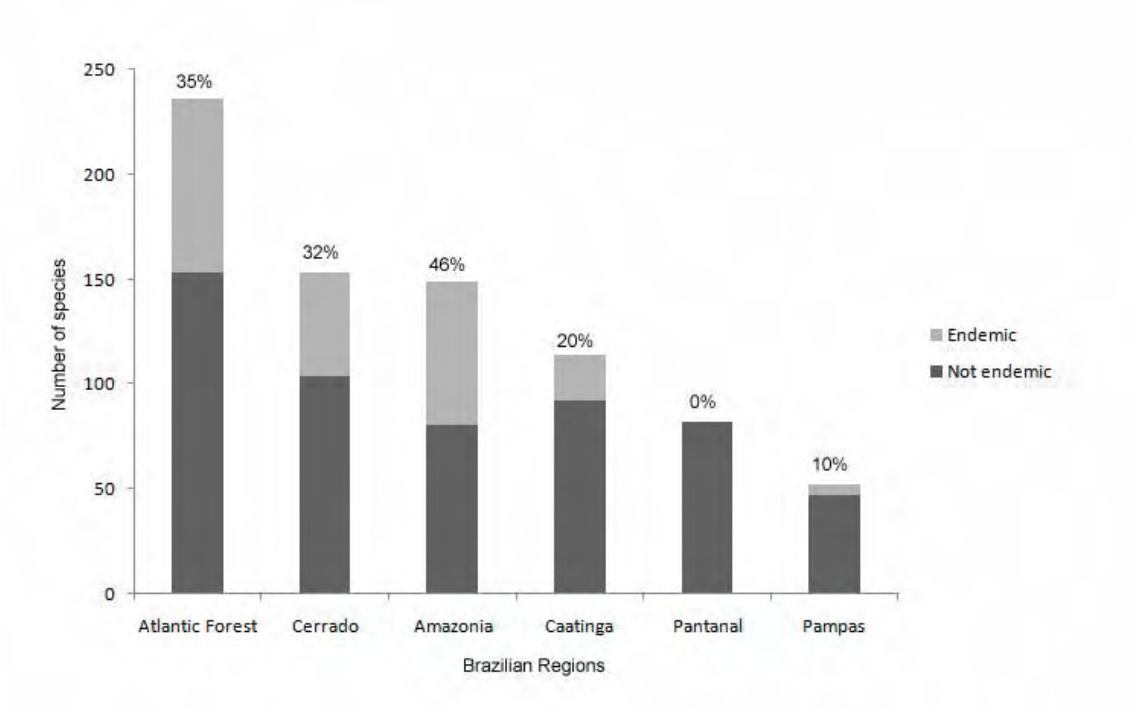

Figure 4……

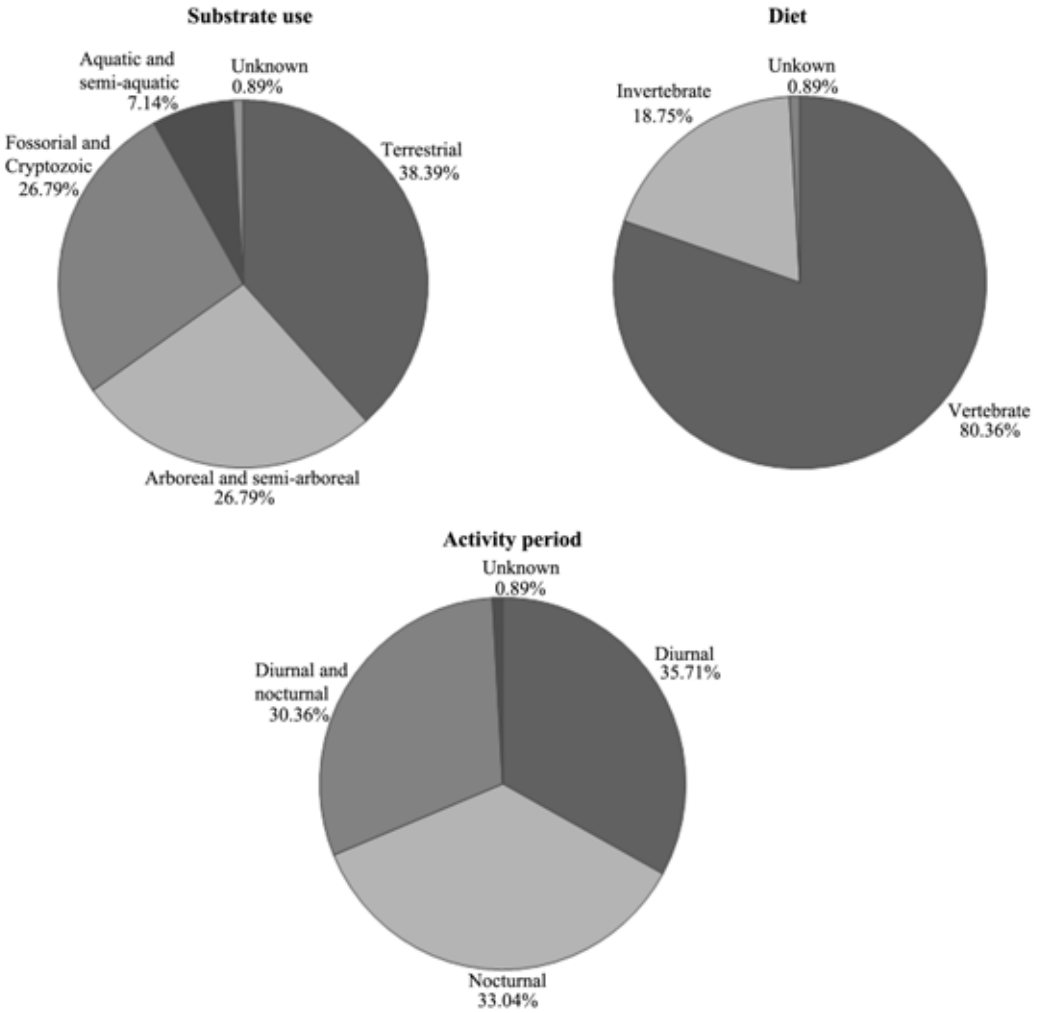
Substrate use
Aquatic and semi-aquatic 7.14%
Unknown 0.89%
Terrestrial 38.39%
Fossorial and Cryptozoic 26.79%
Arboreal and semi-arboreal 26.79%
Diet
Unkown 0.89%
Invertebrate 18.75%
Vertebrate 80.36%
Activity period
Unknown 0.89%
Diurnal 35.71%
Diurnal and nocturnal 30.36%
Nocturnal 33.04%

Figure 5.....

Figure 6 (6.1 to 6.8).....

Figure 6 (6.9 to 6.16)……

Figure 6 (6.17 to 6.24)…….

Figure 6 (6.25 to 6.32)…….

Figure 6 (6.33 to 6.40)…….

Figure 6 (6.41 to 6.48)…….

Figure 6 (6.49 to 6.56)…….

Figure 6 (6.57 to 6.64)……

Figure 6 (6.65 to 6.72)…….

Figure 6 (6.73 to 6.80)…….

Figure 6 (6.81 to 6.88)…….

Figure 6 (6.89 to 6.96)…….

Figure 6 (6.97 to 6.100)…….

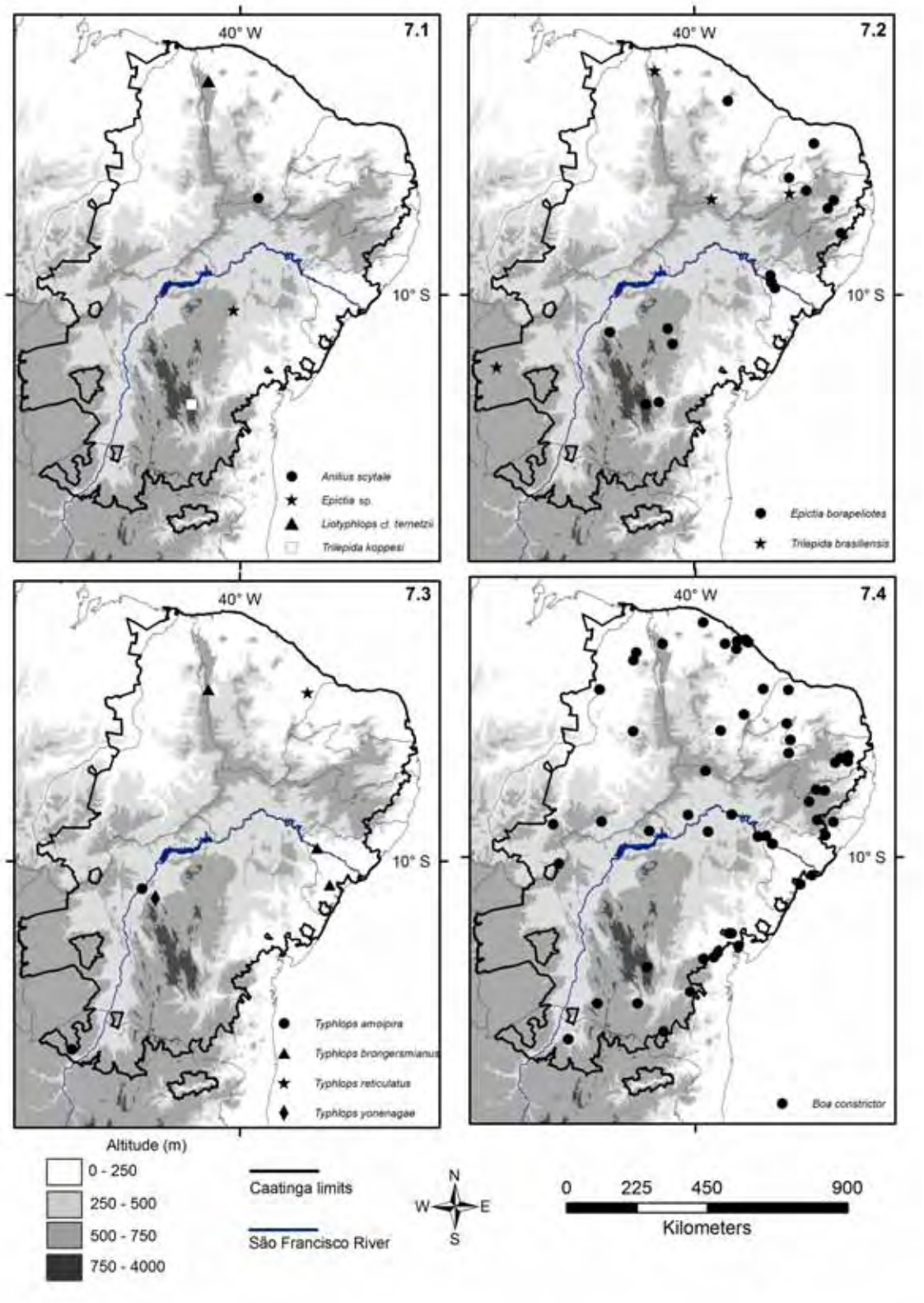

Figure 7 (7.1 to 7.4)……

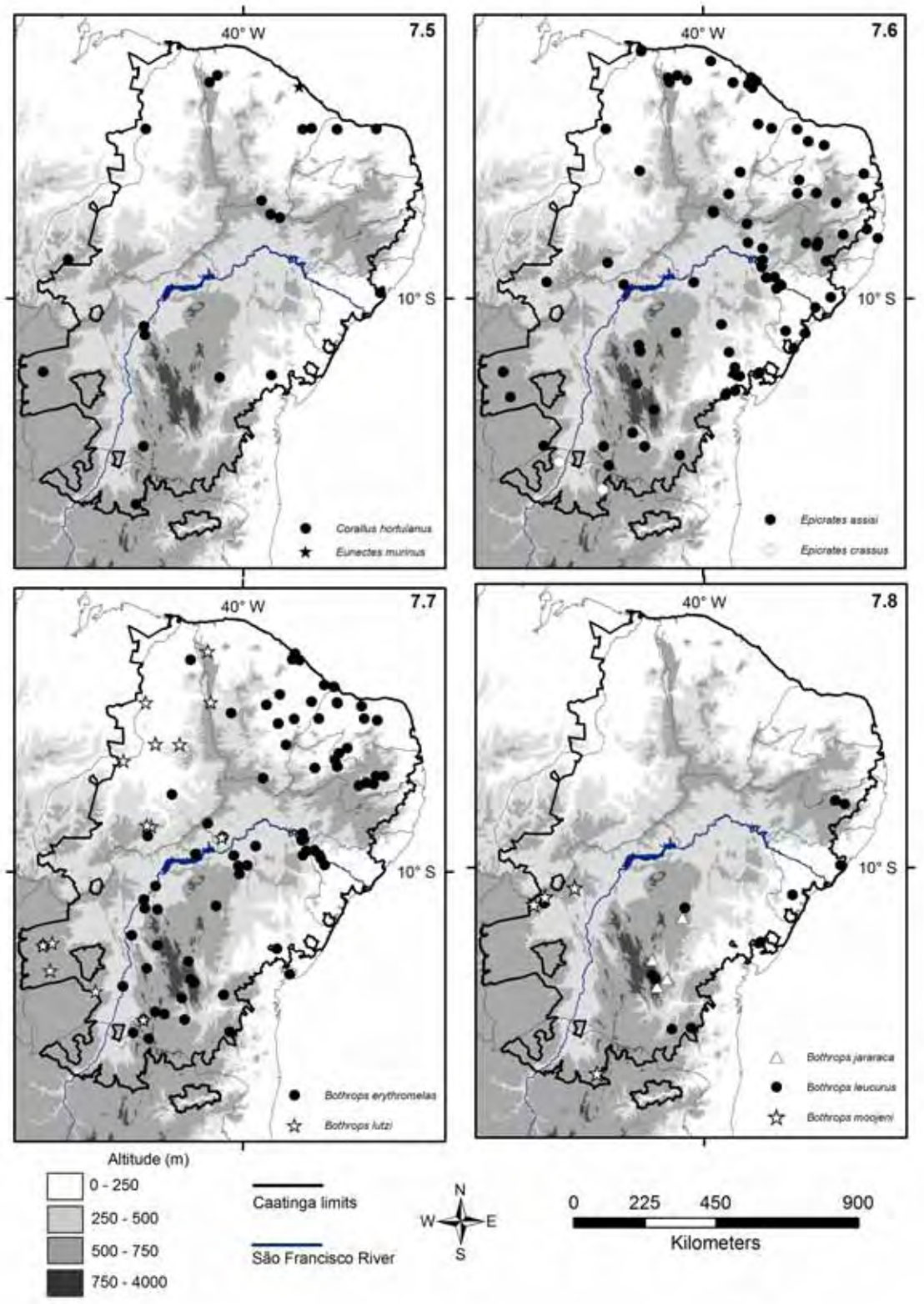

Figure 7 (7.5 to 7.8)…….

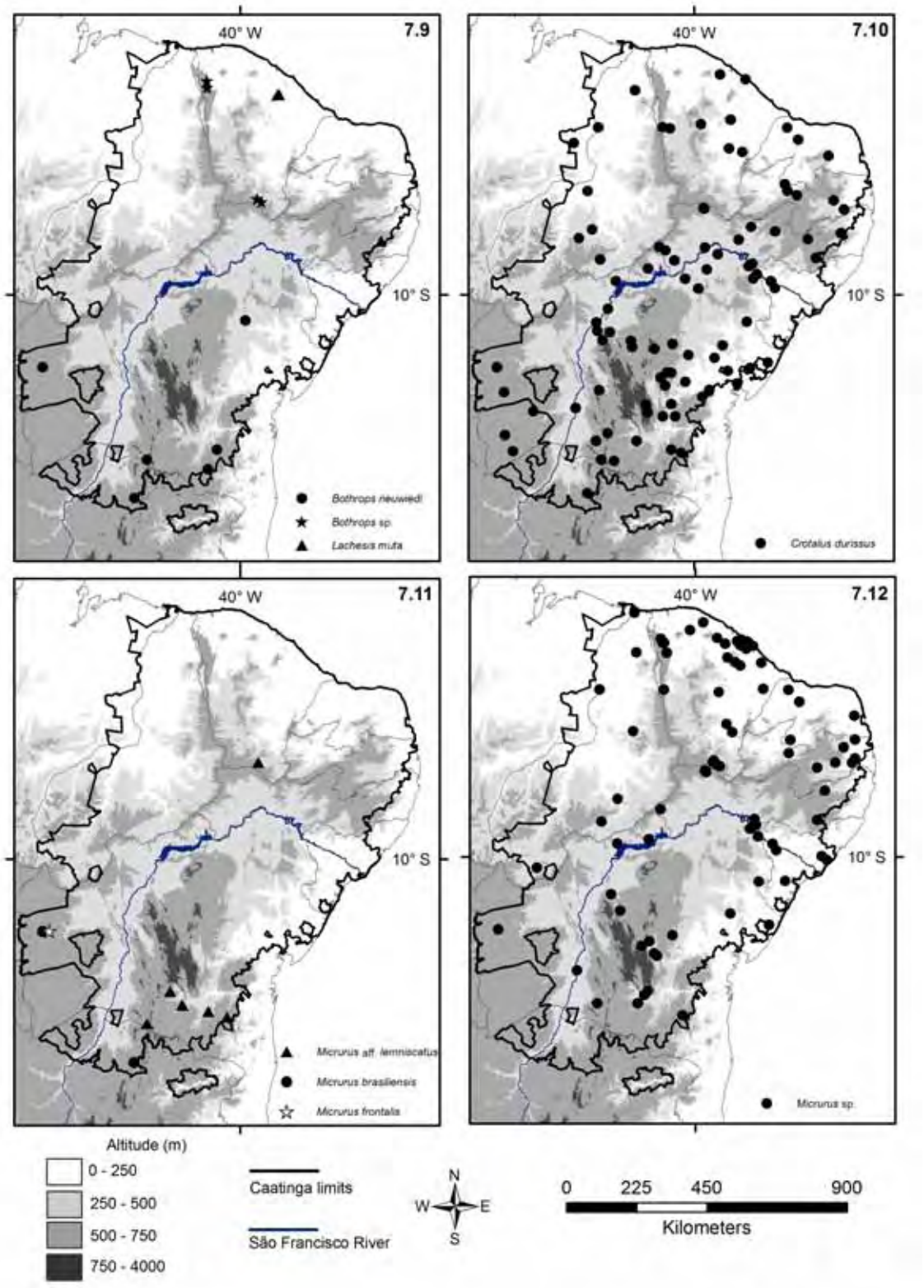

Figure 7 (7.9 to 7.12)……

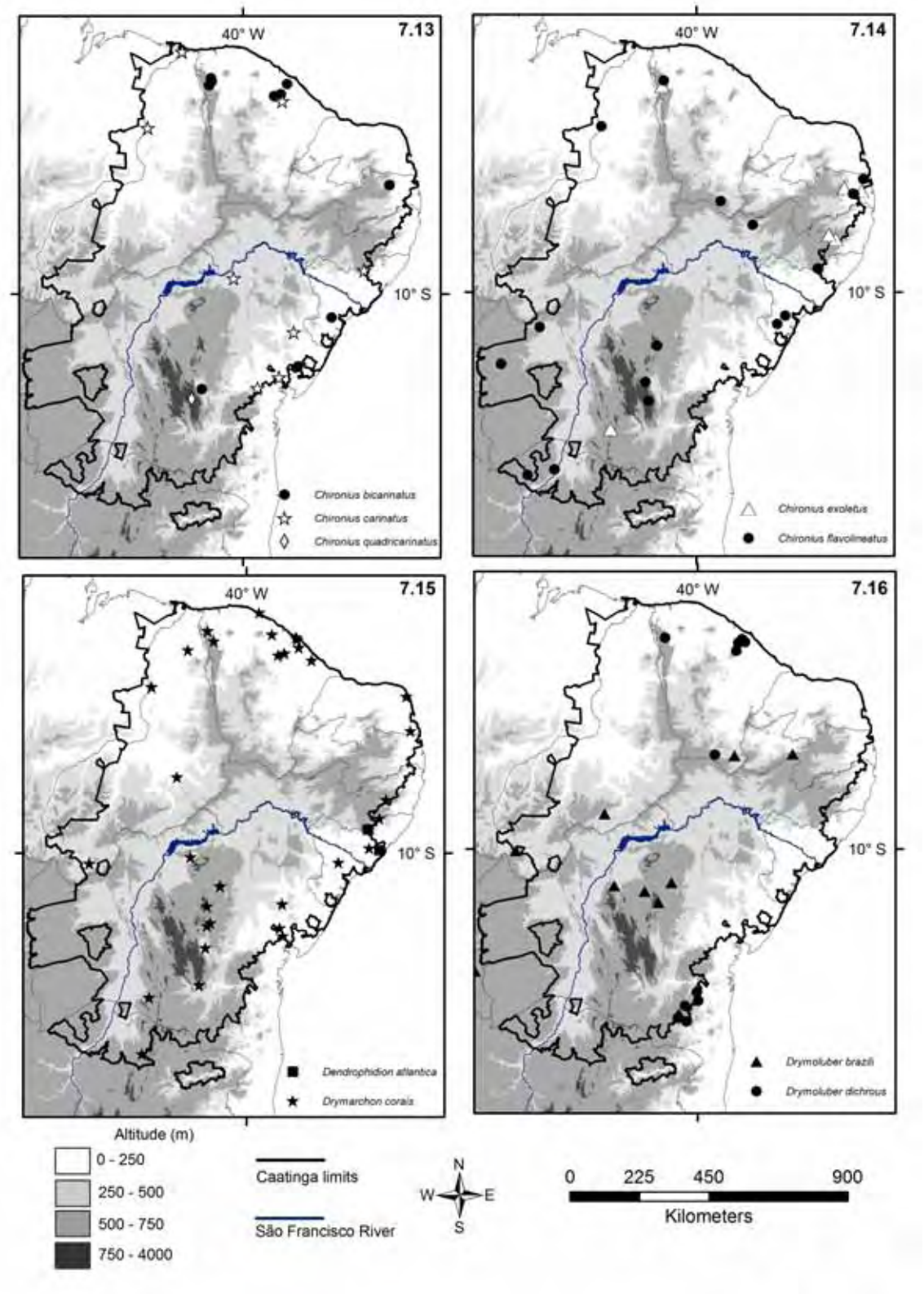

Figure 7 (7.13 to 7.16)……

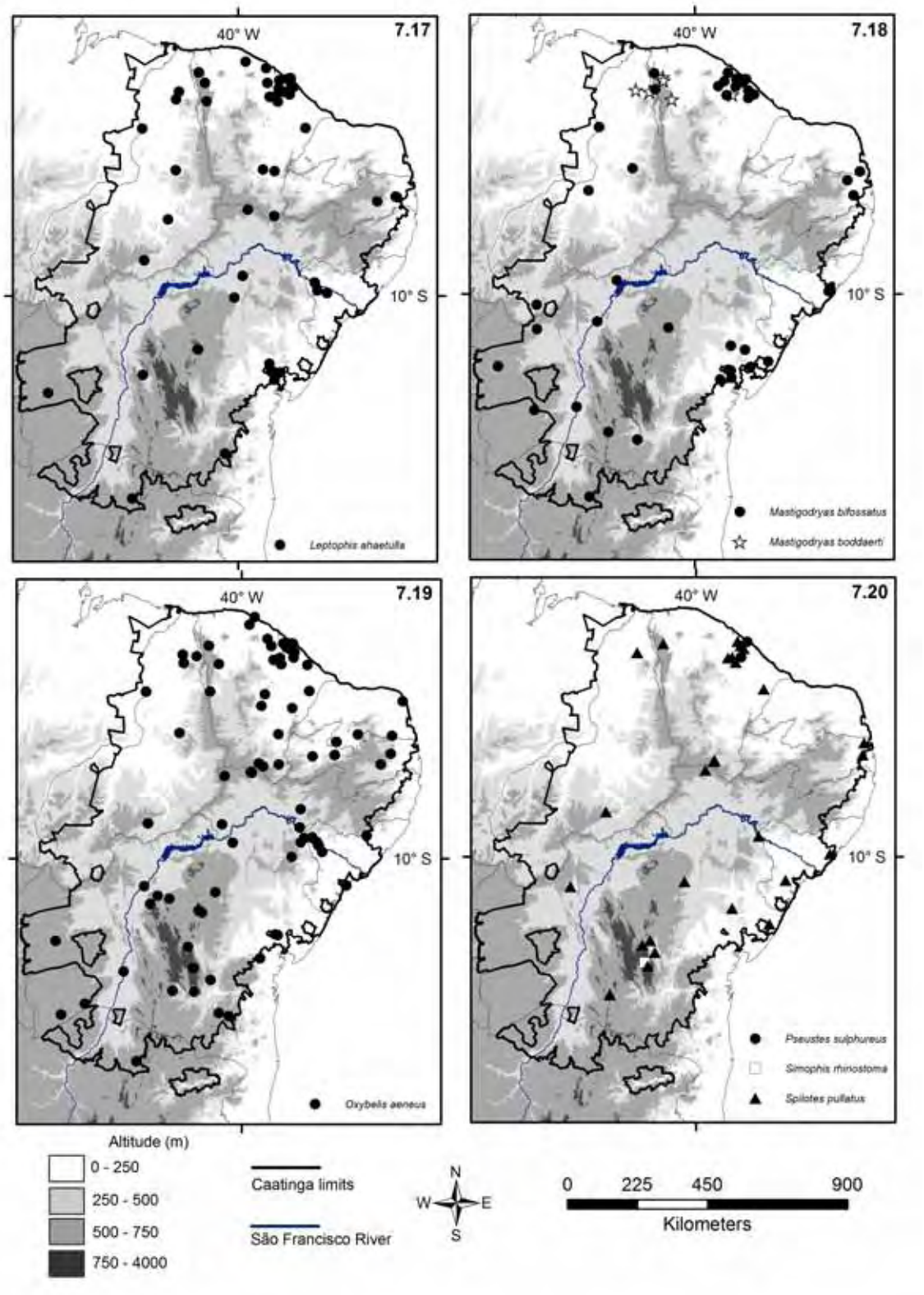

Figure 7 (7.17 to 7.20)……

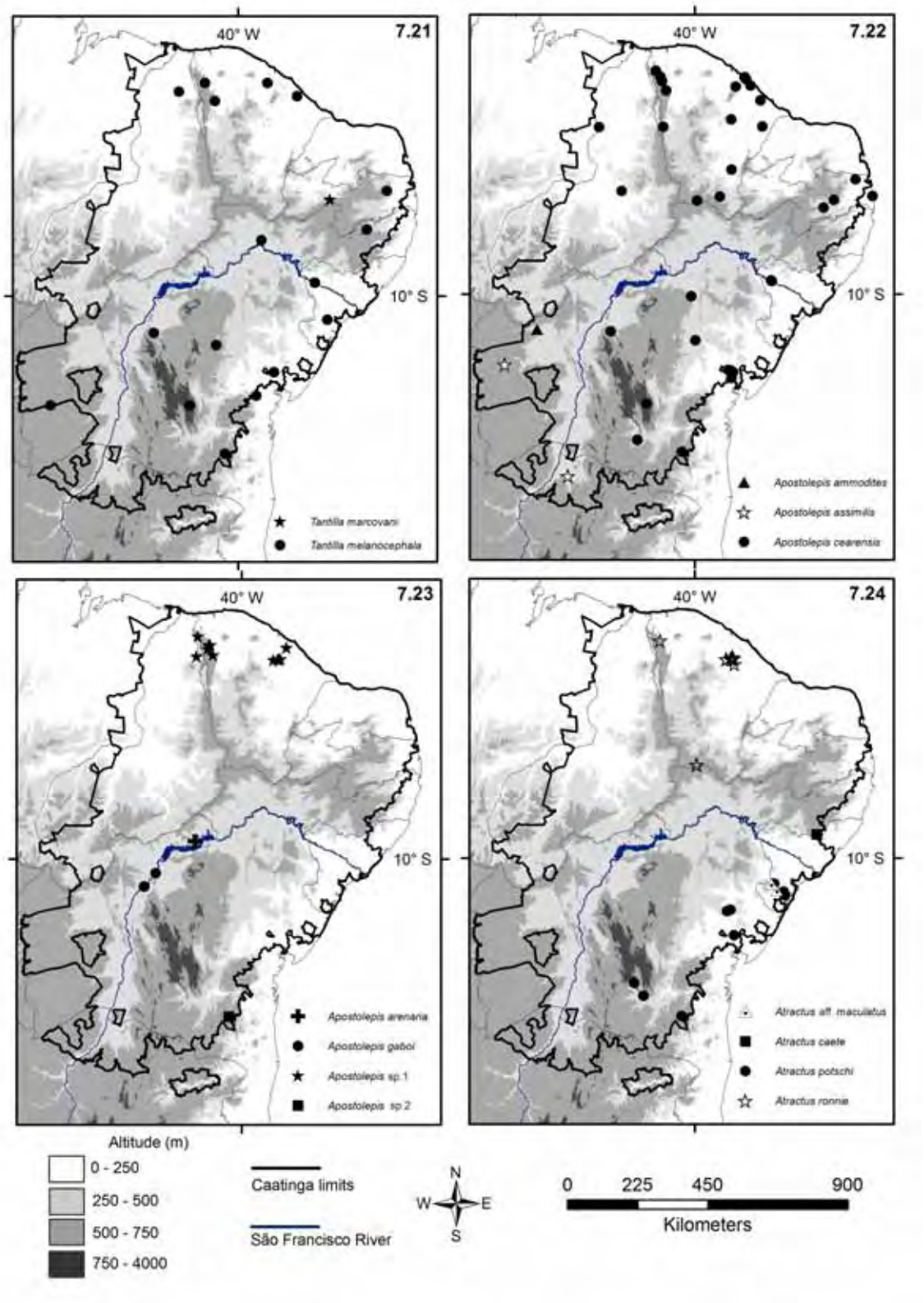

Figure 7 (7.21 to 7.24)……

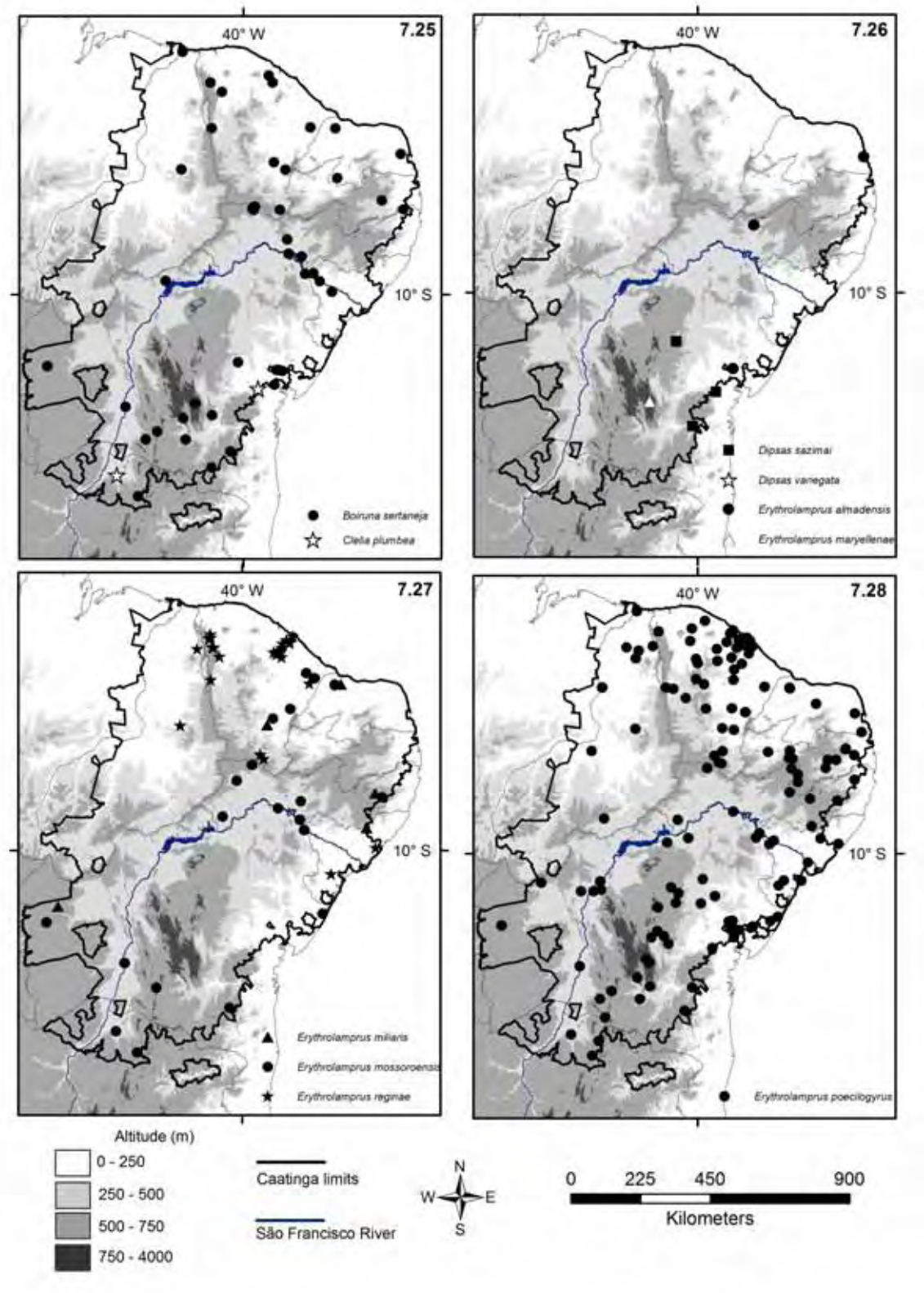

Figure 7 (7.25 to 7.28)……

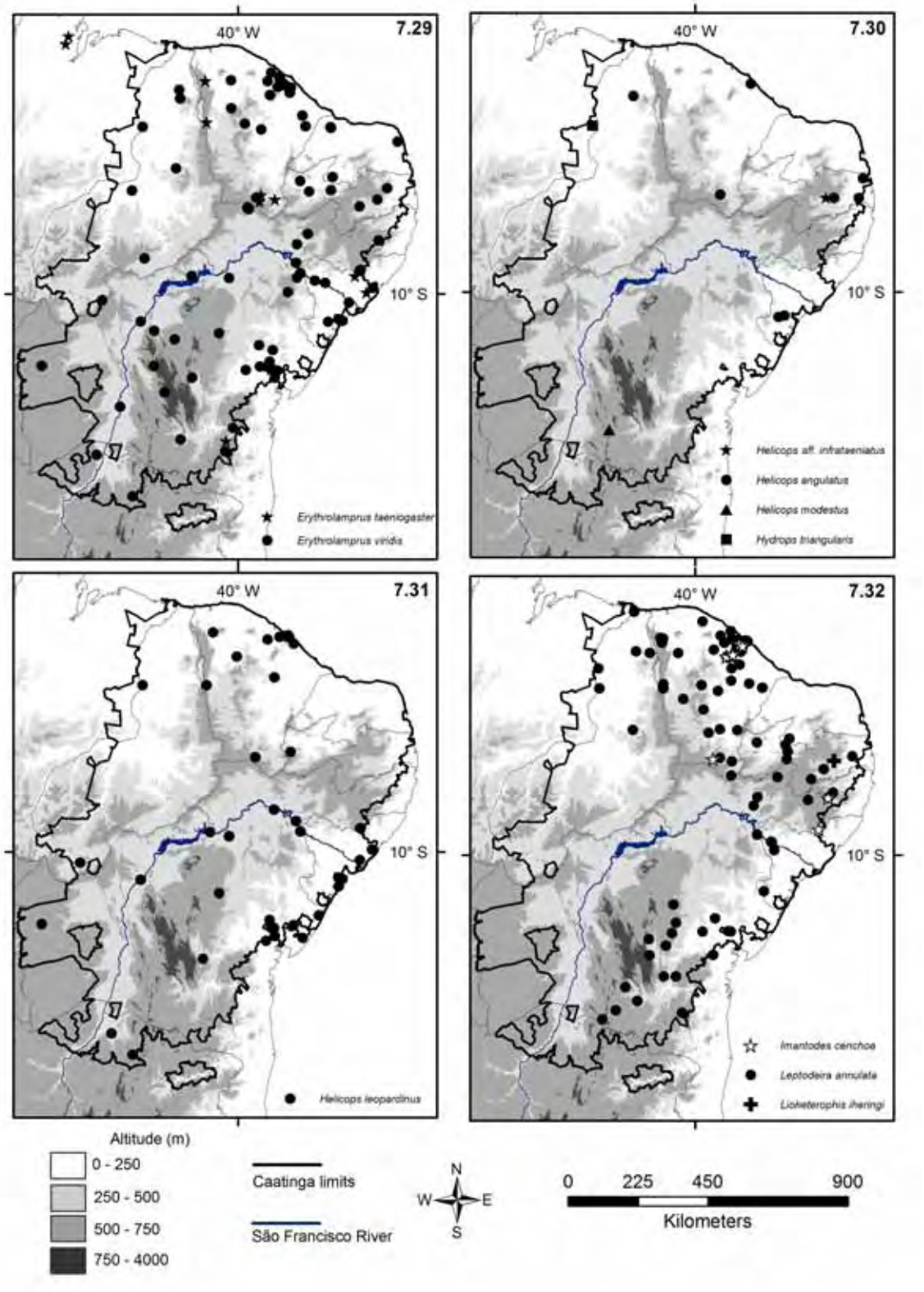

Figure 7 (7.29 to 7.32)……

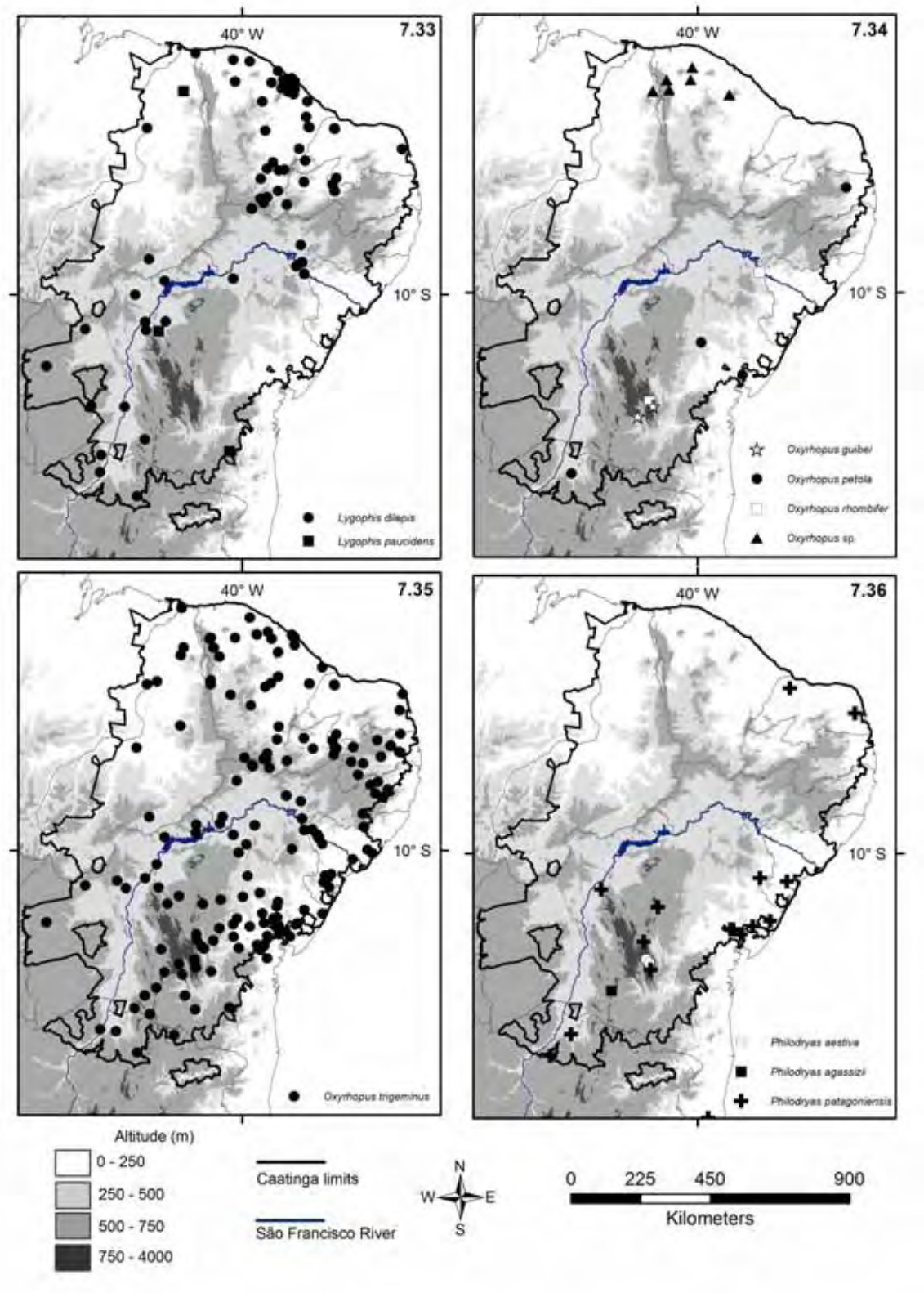

Figure 7 (7.33to 7.36)…….

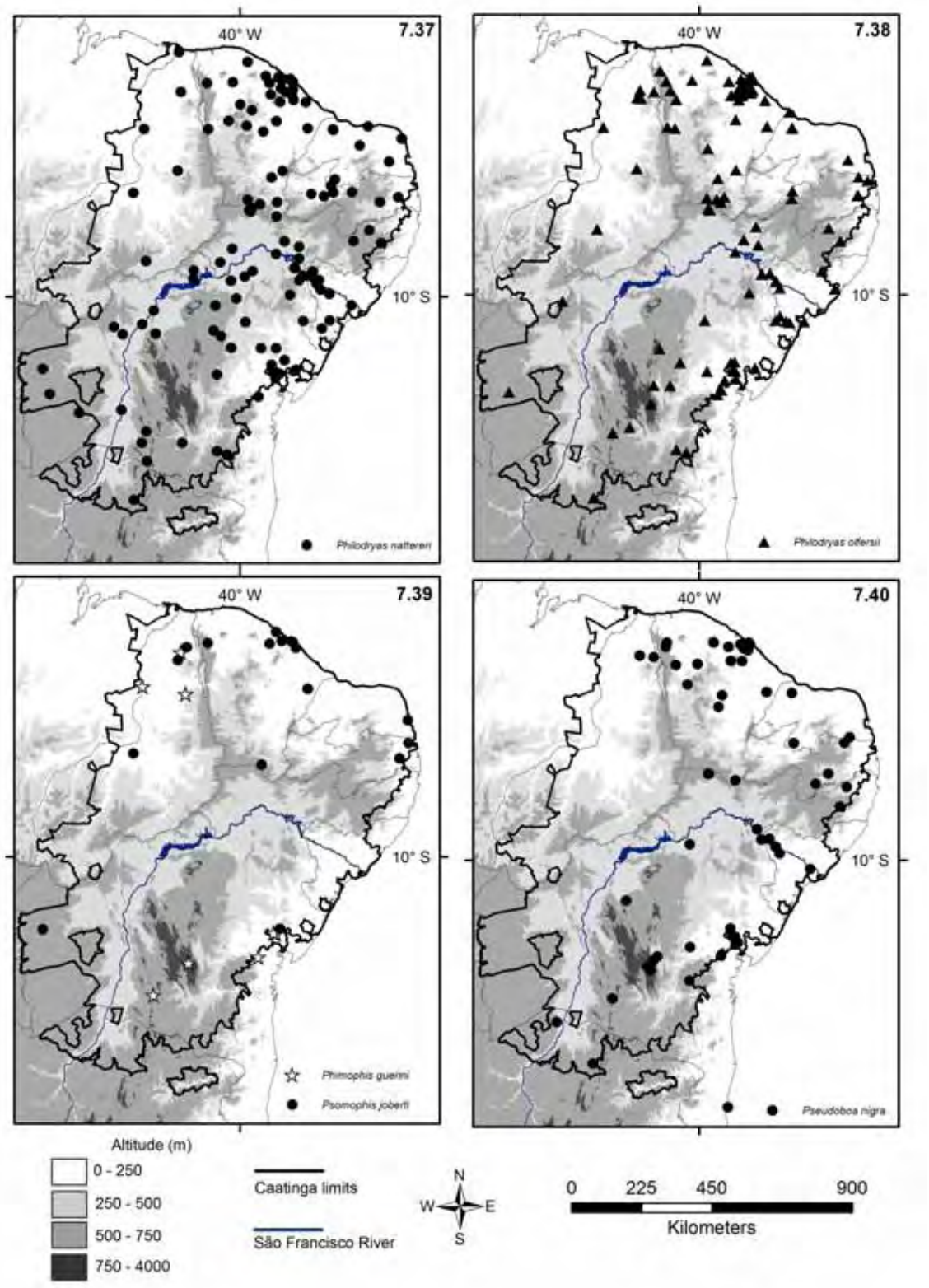

Figure 7 (7.37 to 7.40)…….

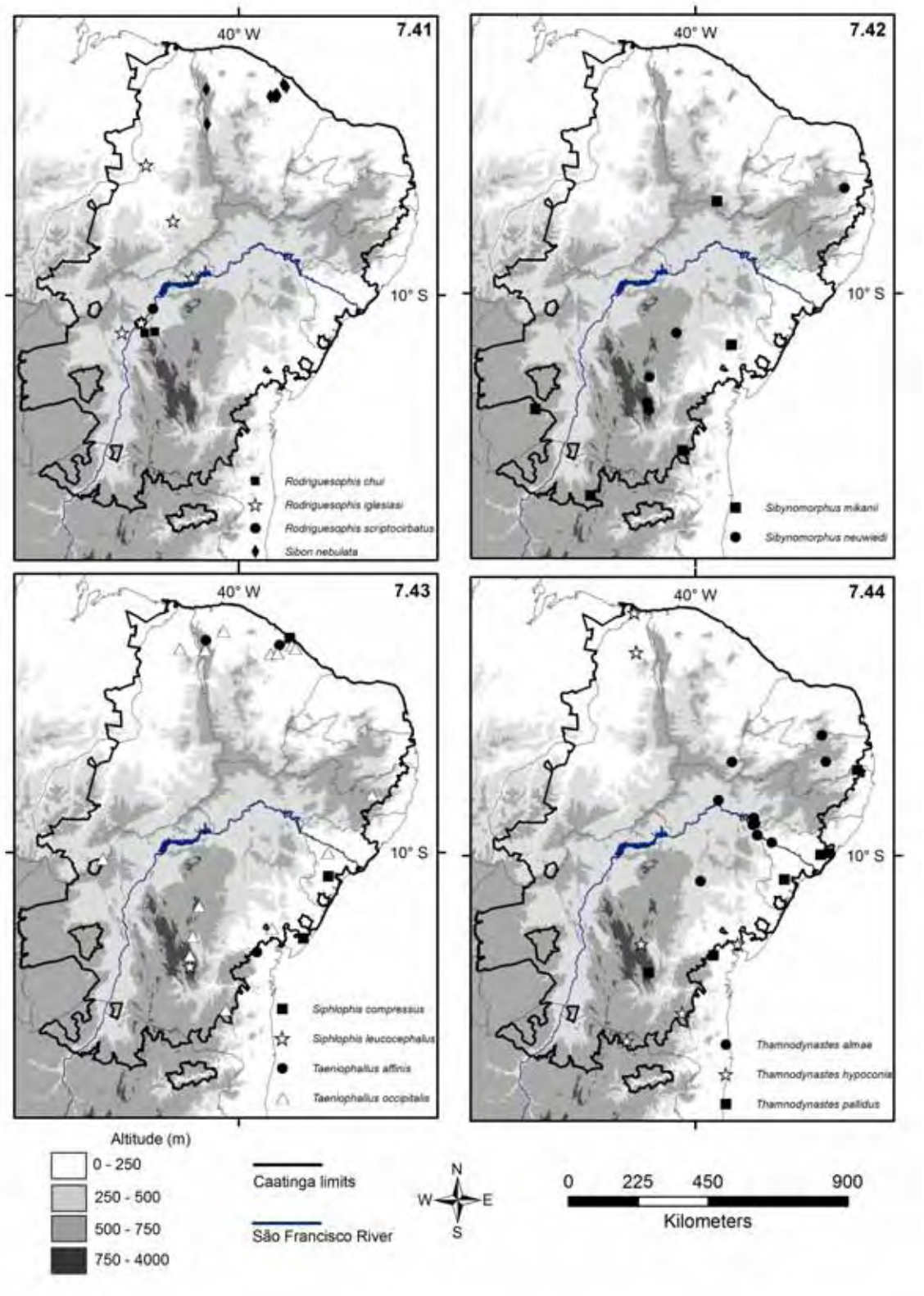

Figure 7 (7.41 to 7.44)……

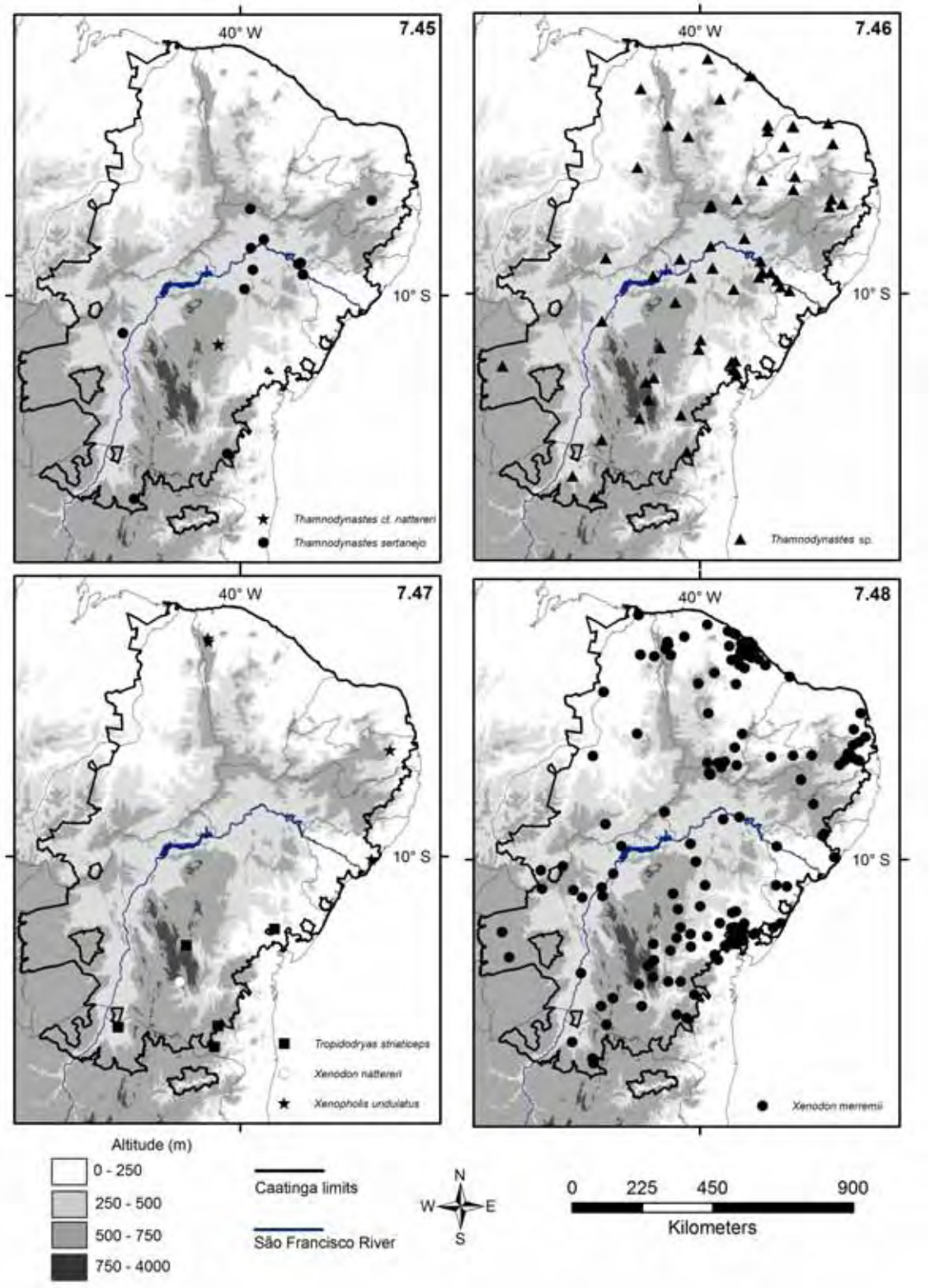

Figure 7 (7.45 to 7.48)…….

Appendix 1.

ANOMALEPIDIDAE - *Liotyphlops* cf. *ternetzii* - CEARÁ**:** *Ubajara*: IBSP 76856.

LEPTOTYPHLOPIDAE **-** *Epictia borapeliotes* - ALAGOAS**:** *Olho D'Água do Casado*: MZUSP 10947; *Piranhas*: CHUFS 3201, 3248, 3418, 3419, MZUSP 1950, 10951, 10952, 10953, 10954, 10955; BAHIA**:** *Gentio do Ouro*: MZUFBA 1713, 1714, 1715, 1716, 1717, 1718, 1719, 1720, MZUSP 8958, 8959, 8960, 8961, 8962, 8963, 8964, 8965, 8966, 8967, 8970, 8971, 8972, 8973, 9593, 9595, 9624, 9625, 9626, 9627, 9628, 9629, 9630, 9631, 9632, 9633, 9634, 10021, 10022, 10023, 10544, 10545, 13956, 14049; *Itaetê*: MZUFBA 1829; *Jacobina*: MZUSP 7530; *Miguel Calmon*: MZUFBA 1825; CEARÁ**:** *Aratuba*: IBSP 76987; PARAÍBA**:** *Boqueirão*: MNRJ 10035; *Campina Grande*: IBSP 73736, MNRJ 17054; *Junco do Seridó*: MZUSP 5958; PERNAMBUCO**:** *Bezerros*: IBSP 55111; RIO GRANDE DO NORTE: *Angicos*: MZUSP 13954, 13955; *Serra Negra do Norte*: CHUNB 30571; SERGIPE**:** *Canindé de São Francisco*: MZUSP 10956, 10957, 10958, 10959; *Poço Redondo*: CHUFS 530. *Epictia* sp. – BAHIA**:** *Senhor do Bonfim*: MZUSP 1897. *Trilepida brasiliensis* – BAHIA: *Barreiras*: IBSP 50436, UMMZ 108817; CEARÁ**:** *Viçosa do Ceará*: ZUEC 3380; PARAÍBA**:** *Patos*: UFPB 3763.

TYPHLOPIDAE - *Typhlops amoipira* – BAHIA**:** *Barra*: MZUSP 12298, 12299, 12300, 12301, 12302, 12303. *Typhlops brongersmianus* – ALAGOAS**:** *Piranhas*: MZUFBA 1190; SERGIPE**:** *Itabaiana*: CHUFS 425. *Typhlops yonenagae* – BAHIA: *Gentil do Ouro*: MZUFBA 1705, 1706, 1707, 1708, 1709, 1710, 1711, 1712, MZUSP 10086, 10471, 10541, 10985, 12497, 12498, 12499, 12500, 12501, 12502, 12503, 12504, 12505, 12506.

ANILIIDAE - *Anilius scytale* – CEARÁ**:** *Crato*: IBSP 20013.

BOIDAE - *Boa constrictor* – ALAGOAS: *Piranhas*: MZUFBA 885, 886, 1165, 1166, 1167, 1168, 1303, MZUSP 10986; *São José da Laje*: IBSP 54434; *Viçosa*: IBSP 50890, 50891; BAHIA**:** *Brumado*: IBSP 68250; *Caravelas*: IBSP 46004, 52378; *Casa Nova*: IBSP 31054; *Curaçá*: IBSP 74005; *Elísio Medrado*: MZUEFS 1193; *Feira de Santana*: IBSP 53291, MZUEFS 1161, 1251, 1320, 1382, 1398; *Guanambí*: IBSP 52059, 52306, 53862; *Itapetinga*: IBSP 20670; *Jequié*: IBSP 55000; *Milagres*: IBSP 26971, 45453; *Paulo Afonso*: MZUFBA 304, 305, 306, 307, 308; *Porto Castro Alves*: IBSP 26645; *Vitória da Conquista*: IBSP 24745; CEARÁ**:** *Caucaia*: CHUFC 1197; *Fortaleza*: CHUFC 718, 1105, 2301, 3128,

IBSP 19999, 20639, 23608, 49976, 66754; *Iguatú*: IBSP 51955, 51956; *Itapipoca*: IBSP 20241; *Jaguaribe*: IBSP 31266, 31267; *Limoeiro do Norte*: CHUFC 5, 12, 468, 469, 470, 471, 472, 474; *Maranguape:* CHUFC 731; *Pentecoste*: CHUFC 2990, 3111; *Ubajara*: IBSP 77053; MINAS GERAIS: *Jaíba*: FUNED 1464; PARAÍBA: *Alagoa Grande*: IBSP 53117; *Belém do Brejo do Cruz*: CHUFC 92; *Campina Grande*: IBSP 49856; *Ingá*: IBSP 21965; *Lagoa Seca*: IBSP 49856; *Patos*: IBSP 33403, 33404; PERNAMBUCO**:** *Belém de São Francisco*: UFPB 2361; *Brejo da Madre de Deus*: UFPB 3738; *Cabo de Santo Agostinho*: IBSP 50028, 50270, 51009; *Exú*: MZUSP 6615, 6616, 6617, 7004, 7005; *Garanhuns*: IBSP 51960; *Jataúba*: IBSP 30435, 30564; *Lagoa Grande*: IBSP 53117; *Pesqueira*: IBSP 51839; *Recife*: IBSP 22923, 28467, 43589, 48028, 49629, 51441; PIAUÍ: *Avelino Lopes*: IBSP 42610; *Piracuruca*: MPEG 22853; *Piri-piri*: IBSP 77522; *Santa Luz*: IBSP 42719; *São Raimundo Nonato*: IBSP 42615, MNRJ 8343; *Teresina*: IBSP 20642, 49535, 60516; *Valença do Piauí*: MZUSP 5791; RIO GRANDE DO NORTE: *Mossoró*: CHUFC 99; *Serra Negra do Norte*: CHBEZ 1254, 1328, 1329, 1331, 1332, 1394; SERGIPE: *Canindé de São Francisco*: MUFAL 1325; *Pacatuba*: IBSP 7495; *Santo Amaro das Brotas*: MZUSP 9012. *Corallus hortulanus* – ALAGOAS: *São Miguel dos Campos*: MNRJ 3957; BAHIA**:** *Anguera*: MZUEFS 389; *Barra*: MZUSP 10036, 10037; *Guanambí*: IBSP 53398; *Ruy Barbosa*: IBSP 45953; *Xique-xique*: IBSP 40318; CEARÁ: *Coreau*: CHUFC 1290; *Crato*: IBSP 20015; *Jardim*: CHUNB 56914; *Jatí*: IBSP 75990; *Limoeiro do Norte*: CHUFC 30, 475, 477, 478; *Quixeramobim*: CHUFC 1246; *Ubajara*: IBSP 77056; MINAS GERAIS: *Jaíba*: MZUFV 998; PIAUÍ: *Teresina*: IBSP 49773, UFPB 2833; RIO GRANDE DO NORTE: *Galinhos*: IBSP 58694; *Mossoró*: IBSP 43385, 53852, 53853. *Epicrates assisi* – ALAGOAS**:** *Piranhas*: MZUFBA 849, 1542; *Piranhas*: CHUFS 2460, 2631, MZUSP 10988, MUFAL 1326, 1327; *Teotônio Vilela*: MNRJ 14242; BAHIA**:** *Alagoinhas*: IBSP 57844; *Barreiras*: IBSP 48154, 48159; *Brumado*: IBSP 32172, 32179, 34456, 40374, 40384, 40542, 41087, 42145, 44052, 45721, 48585, 49379; *Cansanção*: IBSP 62953; *Conceição do Coité*: MZUEFS 1600; *Feira de Santana*: IBSP 20914, 74002, MZUEFS 37, 97, 125, 128, 142, 163, 183, 222, 253, 293, 565, 628, 815, 1088, 1045, 1055, 1063, 1100, 1119, 1121, 1201, 1214, 1264, 1267, 1316, 1327, 1604, 1715; *Guanambí*: IBSP 50341, 53857; *Irecê*: IBSP 43890; *Jacobina*: MZUSP 7531; *Juazeiro*: IBSP 74004, MZUEFS 1286, 1287; *Lapão*: IBSP 55304, 55305; *Livramento do Brumado*: IBSP 29817, 29818, 29819; *Muritiba*: IBSP 49309, 49310, 49333, 49334, 49335, 51119, 52257; *Paulo Afonso*: MZUFBA 152, 153, 154, 155, 225, 226, 227; *Poções*: MZUFBA 1911, 1920; *Remanso*: IBSP 28706; *Rodelas*: IVB 872; *Santa Luzia*: IBSP 3210; *São Desidério*: MZUFBA 1778; *Seabra*: MZUSP 7529; *Tanquinho*: MZUEFS 54; *Urandí*: IBSP 25883, 25884; *Vila Nova*: MZUSP 1338; CEARÁ**:** *Caucaia*: CHUFC 3359; *Fortaleza*: CHUFC 1631, 2919, IBSP 20007, 20257; *Icó*: IBSP 20191; *Itapipoca*: MZUSP 3637; *Limoeiro do Norte*: CHUFC 76, 473; *Maracanaú*: CHUFC 2662; *Maranguape*: CHUFC 2074; *Morada Nova*: CHUFC 1633; *Pacatuba*: CHUFC 1768; *Pentecoste*: CHUFC 3095, 3096, 3163; *Tianguá*: IBSP 77105; *Ubajara*: IBSP 77062, 77086, 77235, 77523; PARAÍBA**:** *Boa Vista*: UFPB 1844; *Gurinhém*: UFPB 2488; *Patos*: IBSP 33409; PERNAMBUCO**:** *Carnaubeira da Penha*: MZUSP 5001, 5002; *Caruarú*: IBSP 51954; *Exu*: MZUSP 6467, 6619, 6620, 6621, 6622, 6623, 6624, 6625, 6923, 6579, 6944, 7006, 7008, 7009, 7010,7011, 7012, 7013, 7014, 7015, 7016, 7017, 7018, 7019, 7020, 7021, 7022, 7023, 7024, 7025, 7026, 7027, 7028, 7029, 7030; *Garanhuns*: IBSP 51777; *Pesqueira*: IBSP 42896, 42933, 46613, 51379, 51380, 51381, 51382, 51383; *Petrolândia*: ZUEC 638; *São José do Belmonte*: IBSP 32914; PIAUÍ: *Parnaíba*:

IBSP 49932, 49934, 77107; *Redenção do Gorgueia*: IBSP 67523; *Teresina*: IBSP 51085; Valença *do Piauí*: MZUSP 5792; RIO GRANDE DO NORTE**:** *Angicos*: IBSP 72445; *Assú*: IBSP 52896, 53107, 53108; *Mossoró*: IBSP 51065; *Nova Cruz*: IBSP 20917; *Serra Negra do Norte*: CHBEZ 1085; SERGIPE**:** *Canindé de São Francisco*: IBSP 54254, 54257; *Crasto*: MZUSP 11086; *Lagarto*: IBSP 77889; *Propriá*: MZUFBA 1541. *Epicrates crassus* - MINAS GERAIS: *Manga*: MNRJ 8136. *Eunectes murinus* – CEARÁ**:** *Aquiraz*: CHUFC 3054

COLUBRIDAE - *Chironius bicarinatus* – BAHIA**:** *Alagoinhas*: IBSP 48655; CEARÁ**:** *Guaramiranga*: CHUFC 1389, 1414, 1533, 3305, 3308; *Ibiapina*: CHUFC 3300; *Maranguape*: CHUFC 2103; *Pacotí*: CHUFC 2446, 2597, 2607, 2626, 2628, 2772, 2826, 2840, 2846, 3257, 3259, 3260, 3301, 3302, 3303, 3304, 3307, 3309, IBSP 76994, 76995; *Tianguá*: CHUFC 3249; *Ubajara*: CHUFC 2152; PARAÍBA: *Arara*: UFPB 77; SERGIPE: *Itabaiana*: CHUFS 238. *Chironius carinatus* – ALAGOAS**:** *Quebrângulo*: MZUSP 3163; BAHIA**:** *Juazeiro*: MZUEFS 1279; *Santa Teresinha*: MZUEFS 1181; *São Gonçalo dos Campos*: MZUEFS 4, 5; CEARÁ**:** *Baturité*: MZUSP 3633; PIAUÍ**:** *Parnaíba*: IBSP 49978, 77511; *Teresina*: IBSP 49445, 50348, 50709. *Chironius exoletus* – BAHIA: *Caitité*: MNRJ 6699; *Valença*: MZUEFS 1278; CEARÁ**:** *Ubajara*: CHUFC 1590; PARAÍBA**:** *Areia*: MZUSP 8898; *Sapé*: MZUSP 8911; PERNAMBUCO**:** *Agrestina*: MZUSP 4948; *São Caitano*: UFPB 2491. *Chironius flavolineatus* – ALAGOAS: *Quebrângulo*: MZUSP 3169; BAHIA**:** *Barreiras*: MNRJ 3064, 3065; *Morro do Chapéu*: MZUFBA 1657, MZUSP 7804, 7805; *Palmeiras*: MZUEFS 1519; *Santa Rita de Cássia*: MZUSP 3602. CEARÁ**:** *Barbalha*: CHUFC 2127; *Ubajara*: MZUSP 10504; MINAS GERAIS: *Jaíba*: MZUFV 943, 944, 946; PARAÍBA**:** *Gurinhém*: MZUSP 9656, UFPB 10; PERNAMBUCO**:** *Serra Talhada*: MZUSP 9011, UFPB 2617; PIAUÍ: *Teresina*: CHUFC 1570; SERGIPE**:** *Lagarto*: CHUFC 892; *Itabaiana*: CHUFS 419. *Chironius quadricarinatus* – BAHIA**:** *Mucugê*: MZUSP 15049. *Dendrophidion atlântica* – ALAGOAS**:** *Mangabeira*: MZUSP 2883, 2884; *Quebrângulo*: MZUSP 3182. *Drymarchon corais* – ALAGOAS: *Junqueiro*: MZUSP 7258; *Mangabeira*: MZUSP 2874; *Quebrângulo*: MZUSP 3212; BAHIA**:** *Andaraí*: MZUEFS 1134; *Cabuçú*: MZUEFS 767; *Feira de Santana*: MZUEFS 42, 647; *Guanambí*: IBSP 43464; *Ituaçú*: MZUFBA 231; *Jacobina*: MZUSP 7537, 7538, 7539, 7540, 7541; *Morro do Chapéu*: MZUSP 7809; *São Gonçalo dos Campos*: MZUEFS 89, 100; *Sento Sé*: MZUEFS 172; *Teofilândia*: MZUEFS 223; *Utinga*: IBSP 1164, 1165; *Wagner*: MZUSP 10627; CEARÁ: *Amontadas*: MZUSP 3641; *Beberibe*: CHUFC 1237, MZUSP 5324; *Fortaleza*: CHUFC 1223, IBSP 19802, 19803, 19804, 19805, 19806, 19807; *Guaramiranga*: MNRJ 8055; *Justiniano Serpa*: MZUSP 5323; *Pacotí*: IBSP 76983; *São Luís do Curú*: IBSP 19998; *Ubajara*: IBSP 77553; *Viçosa do Ceará*: IBSP 77238; MINAS GERAIS: *Jaíba*: MZUFV 914; PERNAMBUCO: *Agrestina*: MZUSP 4922, 4923, 4928, 4930, 4950, 4976; PIAUÍ**:** *Parnaguá*: IBSP 42447, 42449; *Piracuruca*: MPEG 22858; *Simplício Mendes*: IBSP 42452; *Teresina*: IBSP 477, 497, 693, 1223, 1224, 42609, 49944, 50261; RIO GRANDE DO NORTE**:** *Maxaranguape*: MZUSP 5955; *Pedro Velho*: IBSP 48566; SERGIPE**:** *Feira Nova*: IBSP 43200. *Drymoluber brazili* – BAHIA**:** *Jacobina*: MZUSP 7544; *Morro do Chapéu*: MZUSP 7807; *Gentil do Ouro:* MZUSP 9696; PARAÍBA: *Teixeira*: MZUSP 7562. *Drymoluber dichrous* – ALAGOAS**:** *Rio Largo*: MUFAL 462, 1420; CEARÁ**:** *Crato*: CHUFC 2189; *Maranguape*: CHUFC 2206, 2275, 2583,

3274, 3275; *Pacatuba*: CHUFC 2226; *Ubajara*: CHUFC 3015. *Leptophis ahaetulla* – ALAGOAS**:** *Piranhas*: MZUFBA 1136, 1137, 1138, 1140, 1141; BAHIA**:** *Coração de Maria*: MZUEFS 452; *Coribe*: CHUNB 6640; *Feira de Santana*: MZUEFS 213, 272, 941; *Jaguararí*: IBSP 33352; *Juazeiro*: MZUSP 10629; *Morro do Chapéu*: MZUFBA 1804*; Oliveira dos Brejinhos*: MZUEFS 1658; *Poções*: IBSP 67645; *São Desidério*: MZUFBA 1605; *São Gonçalo dos Campos*: MZUEFS 7, 407; *Tanquinho*: MZUEFS 292; CEARÁ**:** *Baturité*: IBSP 20135; *Caucaia*: CHUFC 2886, 2906; *Croatá*: IBSP 20009; *Fortaleza*: CHUFC 912, 1104, 1227, 1914, 1980, IBSP 52363, MNRJ 1959, 1960, 1961; *Guaiúba*: CHUFC 1442, 1919, 1928, 1929; *Icó*: IBSP 20184; *Itapipoca*: MZUSP 3629; *Jatí*: IBSP 77041; *Justiniano Serpa*: MZUSP 5321; *Limoeiro do Norte*: CHUFC 105, 210, 493, 498, 525, 528, 529, 560, 906; *Maranguape*: CHUFC 1244; *Pacajús*: CHUFC 1732, MZUSP 5300; *Pacotí*: CHUFC 2169, 2592, 2593, 2828, MZUSP 3630; *Paraipaba*: CHUFC 2565; *Pentecoste*: CHUFC 3061, 3077, 3082, 3108, 3135, 3136, 3161, 3162, 3191, 3192, 3507; *Ubajara*: IBSP 77075; *Viçosa do Ceará*: IBSP 77240; MINAS GERAIS: *Jaíba*: MZUFV 842, 913; PARAÍBA**:** *Campina Grande*: IBSP 51324; *Gurinhém*: MZUSP 8943, 9658; PERNAMBUCO**:** *Exú*: MZUSP 6719, 6720, 6721, 7093, 7094, 7095; PIAUÍ: *Piracuruca*: MPEG 22863, 22864; *Piri-piri*: MNRJ 11364; *São Raimundo Nonato*: IBSP 73550, MNRJ 7596; *Teresina*: IBSP 503; *Valença do Piauí*: MZUSP 5816; SERGIPE**:** *Poço Redondo*: CHUFS 346; *Porto da Folha*: CHUFS 431. *Mastigodryas bifossatus* – ALAGOAS**:** *Mangabeira*: MZUSP 2877, 2878, 2879, 2880, 2881, 2882; *São Miguel dos Campos*: MNRJ 3956; BAHIA**:** *Alagoinhas*: IBSP 48860; MZUEFS 3; *Barra*: MZUSP 10057; *Barreiras*: IBSP 55219; *Bom Jesus da Lapa*: MNRJ 2511, 2512; *Brumado*: IBSP 32200, 32201, 33193, 33194, 40369, 48583; *Caitité*: MNRJ 8714; *Esplanada*: IBSP 48364; *Feira de Santana*: MZUEFS 43, 84, 102, 174; *Jacobina*: MZUSP 7542; *Laje*: IBSP 74030; *Remanso*: IBSP 28721; *Santa Rita de Cássia*: MZUSP 3609; *Santo Estevão*: MZUEFS 137; *São Gonçalo dos Campos*: MZUEFS 391; *Sátiro Dias*: MZUEFS 964; *Teofilândia*: MZUEFS 817; CEARÁ**:** *Cascavel*: CHUFC 2851; *Caucaia*: CHUFC 2881; *Fortaleza*: CHUFC 2858, IBSP 20010; *Guaramiranga*: CHUFC 2375; *Horizonte*: CHUFC 1239; *Maracanaú*: CHUFC 2664; *Maranguape*: CHUFC 1173; *Mulungú*: CHUFC 2714; *Pacotí*: CHUFC 2715; *Pentecoste*: CHUFC 3084; *Quixadá*: MZUSP 7247; *São Gonçalo do Amarante*: IBSP 19995; *Ubajara*: CHUFC 1348, 2729; MINAS GERAIS: *Jaíba*: MZUFV 654; PARAÍBA**:** *Bananeiras*: MZUSP 8939; *Gurinhém*: UFPB 148; PIAUÍ**:** *Floriano*: MPEG 23480; *Parnaguá*: IBSP 42448; *Teresina*: IBSP 511, 42638; *Valença do Piauí*: MZUSP 5817; RIO GRANDE DO NORTE: *Pedro Velho*: IBSP 48558, 48705, 48706. *Mastigodryas boddaerti* – CEARÁ: *Ibiapina*: CHUFC 2141, 2482, 2484; *Ipú*: UFPN 3996, 3997, 3998; *Pacotí*: CHUFC 2825; *Tianguá*: CHUFC 3297; *Ubajara*: CHUFC 2409, 3293, 3296; PIAUÍ: *Piracuruca*: MPEG 22862. *Oxybelis aeneus* – ALAGOAS**:** *Olho D'Água do Casado*: MUFAL 906; *Piranhas*: CHUFS 538, 2639, 2743, MZUFBA 1142, 1143, 1144, 1145, 1146, 1302, 1305, MZUSP 10843, 10844; *Quebrângulo*: MZUSP 3394; BAHIA**:** *Barra*: MZUFBA 176; *Barra do Mendes*: MZUEFS 1025; *Bom Jesus da Lapa*: MNRJ 2498; *Central*: MNRJ 6695; *Elísio Medrado:* MZUEFS 906, 1009, 1481; *Feira de Santana*: IBSP 34453, MZUEFS 187, 442, 503, 1711; *Gentio do Ouro*: MZUSP 10453, 13848; *Iramaia*: IBSP 43098; *Ituaçú*: MZUFBA 368; *Jacobina*: MZUSP 7543; *Jeremoabo*: MZUEFS 1297; *Juazeiro*: MZUEFS 1388; *Livramento do Brumado*: IBSP 26650; *Morro do Chapéu*: CHUNB 3712; *Palmeiras*: MZUEFS 1257; *Paulo Afonso*: IBSP 42492, IVB 560, 821, 872, MZUFBA 179, 180, 181, 192, 193, 194, 244, 255, 256, 309, 310, 311;

Poções: MZUFBA 1564; CEARÁ**:** *Amontadas*: CHUFC 2283; *Barbalha*: MZUSP 7214; *Baturité*: MZUSP 3636; *Beberibe*: MZUSP 5322; *Caucaia*: CHUFC 608, 2889, 2907; *Crateús*: CHUFC 2254; *Crato*: CHUFC 2188, MZUSP 5941; *Fortaleza*: CHUFC 909, IBSP 19992, MNRJ 1962; *Icó*: IBSP 20185; *Ipú*: UFPB 4023; *Itapipoca*: MZUSP 3638; *Jaguaribara*: CHUFC 2736; *Justiniano Serpa*: MZUSP 5318; *Limoeiro do Norte*: CHUFC 49, 123, 212, 220, 222, 352, 353, 354, 355, 485, 486, 490, 494, 495, 499, 524, 526, 530, 531, 532, 533, 534, 535; *Maranguape*: CHUFC 2069, 2070, 2354; *Milagres*: MNRJ 18499; *Mulungú*: CHUFC 2356; *Pacajús*: MZUSP 5304; *Pacatuba*: CHUFC 1717; *Pacotí*: CHUFC 2168, 2636, 2823, 2842; *Pentecoste*: CHUFC 2946, 2964, 2984, 3010, 3022, 3023, 3047, 3048, 3078, 3084, 3110, 3114, 3116, 3145, 3146, 3147, 3148, 3149, 3150, 3151, 3158, 3169, 3170, 3214, 3215, 3216, 3322, 3323, 3339, 3340, 3351, 3356, 3373, 3382, 3383, 3384, 3385, 3509; *Quixeramobim*: IBSP 20143; *São Luís do Curú*: CHUFC 734; *Senador Pompeu*: UFPB 264; *Ubajara*: CHUFC 2361, IBSP 77088, 77237, 77532; MINAS GERAIS: *Jaíba*: MZUFV 668, 841; PARAÍBA**:** *Araruna*: UFPB 4222; *Areia*: MZUSP 8954; *Campina Grande*: IBSP 50031, 51617, 51618, 51619, 51620; *Coremas*: MZUSP 3392; *Patos*: IBSP 33402, 33750; PERNAMBUCO**:** *Araripina*: MNRJ 8221; *Exú*: MZUSP 5981, 6492, 6570, 6571, 6765, 6766, 6767, 6768, 6769, 6770, 6771, 6951, 7136, 7137, 7138; *Floresta*: ZUEC 630; *Petrolina*: CHUNB 3703; PIAUÍ: *Piracuruca*: MPEG 61164, 61165, 61166, 22896, 22897; *Piri-piri*: MZUSP 3366, 3367, 3368, 3369, 3370, 3371, 3372, 3373, 3374, 3375, 3376, 3377, 3378, 3379, 3380, 3381, 3382, 3383, 3384, 3385, 3386, 3387, 3388, 3389; *São Raimundo Nonato*: IBSP 42468, MNRJ 7594, 7595, 8889, 8890; *Teresina*: IBSP 491, 1284, 3185, 50710; *Valença do Piauí*: MZUSP 5818, 5819, 5820; RIO GRANDE DO NORTE**:** *Acarí*: MNRJ 8220; *Maxaranguape*: MZUSP 5952; *Serra Negra do Norte*: CHBEZ 1041, 1181, 1231, 1238, 1239, 1240, 1246, 1247, 1248, 1311; SERGIPE**:** *Canindé de São Francisco:* MUFAL 1341, 1342, 1343; *Poço Redondo*: CHUFS 237; *Santo Amaro das Brotas*: MZUSP 6999. *Pseustes sulphureus* – CEARÁ**:** *Fortaleza*: CHUFC 2665; *Pacotí*: CHUFC 2326. *Simophis rhinostoma* – BAHIA: *Mucugê*: MZUSP 8023. *Spilotes pullatus* – ALAGOAS**:** *Mangabeira*: MZUSP 2874, 2875, 2876; BAHIA**:** *Andaraí*: MZUEFS 1135; *Buritirama*: MZUSP 3658; *Caitité*: MNRJ 8121, MZUFBA 726, 766, 2040; *Esplanada*: UFPB 2440; *Lençóis*: MZUEFS 646, 1858; *Palmeiras*: MZUEFS 1261; *Paulo Afonso*: MZUFBA 276; *Pindobaçú*: MZUEFS 1277; *Teofilândia*: MZUEFS 216; CEARÁ**:** *Baturité*: MZUSP 3640; *Caucaia*: CHUFC 2867, 2879; *Crato*: MZUSP 6468, 7177, 7178; *Guaramiranga*: CHUFC 565, 2182; *Limoeiro do Norte*: CHUFC 530; *Maranguape*: CHUFC 2302; *Pacatuba*: CHUFC 2294; *Ubajara*: ZUEC 3401; PARAÍBA**:** *Mamanguape*: MNRJ 17062; *Sapé*: MZUSP 9019; PERNAMBUCO**:** *Exú*: MZUSP 6953; PIAUÍ: *Piracuruca*: MPEG 22859, 22860, 22861; *São Raimundo Nonato*: MNRJ 10158; SERGIPE**:** *Itabaiana*: CHUFS 227. *Tantilla melanocephala* – ALAGOAS: *Piranhas*: MZUFBA 1173, 1174; BAHIA**:** *Elísio Medrado*: MZUEFS 1056; *Feira de Santana*: MZUEFS 164, 177, 377, 447, 1331, 1650; *Gentio do Ouro*: MZUFBA 1679; *Miguel Calmon*: MZUFBA 1794; *Poções*: MZUFBA 1578, 1592, 1593, 1594; *São Desidério*: MZUFBA 1609; *Vila Nova*: MZUSP 123; CEARÁ**:** *Cascavel*: CHUFC 1522; *Ipú*: UFPB 4021; *Pentecoste*: CHUFC 3063, 3068; *Ubajara*: IBSP 76841; PARAÍBA**:** *Areia*: MZUSP 8969; PERNAMBUCO**:** *Brejo Madre de Deus*: UFPB 3747; *Cabrobó*: MZUFBA 1905; PIAUÍ: *Piracuruca*: MPEG 22867; SERGIPE**:** *Itabaiana*: CHUFC 460, 463.

DIPSADIDAE - *Apostolepis ammodites*: BAHIA**:** *Santa Rita de Cássia*: MZUFBA 728. *Apostolepis arenaria* – BAHIA**:** *Casa Nova:* MZUSP 10027, 10028, 10029, 10030, 10289. *Apostolepis assimilis* - MINAS GERAIS: *Jaíba*: FUNED 1465. *Apostolepis cearensis* – ALAGOAS: *Piranhas*: CHUFS 3217, 3365, MUFAL 1315. BAHIA: *Brumado*: IBSP 33651, 33685; *Camacarí*: MZUEFS 371; *Capim Grosso*: MZUEFS 294; *Feira de Santana*: MZUEFS 12, 19, 70, 71, 74, 86, 130, 162, 166, 203, 277, 310, 315, 429, 434, 463, 464, 505, 515, 615, 624, 637, 669, 672, 689, 771, 804, 836, 841, 895, 927, 1007, 1040, 1053, 1067, 1069, 1070, 1071, 1077, 1080, 1110, 1146, 1157, 1158, 1195, 1196, 1208, 1209, 1210, 1236, 1240, 1241, 1244, 1260, 1302, 1310, 1313, 1369, 1377, 1405, 1445, 1446, 1477, 1478, 1479, 1499, 1539, 1559, 1570, 1587, 1604, 1611, 1622, 1629, 1645, 1673, 1674; *Poções*: MZUFBA 1595, 1796, 1805, 1813, 1826, 1827; *São Gonçalo dos Campos*: MZUEFS 73, 825; CEARÁ**:** *Aquiraz*: CHUFC 1185; *Beberibe*: CHUFC 1628; *Crateús*: CHUFC 2238; *Crato*: IBSP 20385; *Fortaleza*: CHUFC 208, 826, 1240, 1242, 1243, 1524, 1525, 1526, 1527, 1528, 1529, 1531, 1539, 1620, 1621, 1622, 1623, 1623, 1624, 1625, 1626, 1627, 1629, 2001, 2236, 2287, 2243, 2633, IBSP 20020, 40262, 55318, 18219, 18220; *Icó*: IBSP 12106; *Juazeiro do Norte*: IBSP 20164; *Limoeiro do Norte*: IBSP 12775; *Maxaranguape*: CHUFC 2235; *Quixadá*: CHUFC 1221; *São Benedito*: CHUFC 2114, 2147; *Tianguá*: IBSP 77109; *Ubajara*: IBSP 76855, 77101; *Viçosa do Ceará*: IBSP 77509; PARAÍBA**.** *Cabaceiras*: MZUSP 9013; *Campina Grande*: IBSP 9050; *Lagoa de Dentro*: MNRJ 17055; PIAUÍ**:** *Teresina*: IBSP 49743. *Apostolepis gaboi* – BAHIA**:** *Barra*: MZUEFS 981, MZUFBA 1673, 1674, 1675, 1676, 1677, 1678, 1679, 1680, 1681, 1682, 1683, 1684, 1685, 1686, 1687, 1688, 1689, 1690, 1691, 1692, 1693, 1694, 1695, 1696, 1697, 1698, 1699, 1700, 1701, 1702, 1703, 1704; *Pilão Arcado*: MZUSP 10290. *Apostolepis* sp. 1 – CEARÁ**:** *Guaramiranga*: CHUFC 1950, 2067, 2353, 2371; *Ibiapina*: CHUFC 2337, 2340, 2342, 2343, 2351, 2437; *Maranguape*: CHUFC 2102, 2208, 2212, 2213, 2218, 2339, 2347; *Pacotí*: CHUFC 2344, 2346, 2463, 2731, 2841; *São Benedito*: CHUFC 2338; *Ubajara*: CHUFC 1349, 2085, 2110, 2137, 2154, 2341, 2350, 2769, 2954. *Apostolepis* sp. 2 – BAHIA**:** *Poções*: MZUFBA 1808, 1810, 1814. *Atractus caete* – ALAGOAS**:** *Quebrângulo*: MNRJ 16936. *Atractus maculatus* – SERGIPE**:** *Lagarto*: IBSP 77888; *Simão Dias*: CHUFS 377, 385, IBSP 77886, 77903. *Atractus potschi* – ALAGOAS**:** *Maceió*: IBSP 48438. BAHIA: *Brumado*: MZUFBA 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2068, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083; *Feira de Santana*: MZUEFS 454; *Poções*: MZUFBA 1801, 1803, 1815, 1590, 1591; *Serrinha*: MZUEFS 682; *Teofilândia*: IBSP 57119; SERGIPE**.** *Simão Dias*: IBSP 77901. *Atractus ronnie* – CEARÁ**:** *Baturité*: CHUFC 2578; *Guaramiranga*: CHUFC 2642, 2649, 2651; *Mulungú*: CHUFC 2645; *Pacotí*: CHUFC 1396, 2481, 2598, 2619, 2641, 2643, 2644, 2646, 2647, 2648, 2652, 2653, 2654, 2658, 2675, 2676, 2677, 2678, 2733, 3500, 3502, MNRJ 14194, 14195, 14196, 14197; *Tianguá*: MNRJ 17326. *Boiruna sertaneja* – ALAGOAS: *Piranhas*: MZUFBA 1304, MZUSP 10841, 10842; BAHIA**:** *Baixa Grande*: MZUSP 7803; *Barreiras*: MNRJ 2381, 2382, 2384, 2385*; Bom Jesus da Lapa*: MNRJ 2383, 2386; *Brumado*: IBSP 33068; *Caitité*: MNRJ 4494, 7532; *Feira de Santana*: MZUEFS 16, 25, 29, 93, 422, 458, 496, 635; *Guanambí*: IBSP 50101, 50340; *Iramaia*: IBSP 43101; *Itaparica*: MNRJ 3898; *Jaborandí*: CHUNB 51135; *Muritiba*: IBSP 49262, 49304; *Paulo Afonso*: MZUFBA 228, 229, 230, 241, 242, 243; *Poções*: IBSP 28168, MZUFBA 1853; *Remanso*: IBSP 28704; *Rio de Contas*: MZUFBA 1374; CEARÁ**:** *Brejo Santo*: MNRJ 9823; *Crateus*: CHUFC

2256; *Icó*: IBSP 13077; *Limoeiro do Norte*: CHUFC 2852; *Pentecoste*: CHUFC 3080, 3081; *Quixelô*: CHUFC 1925; *Reriutaba*: CHUFC 1566*; São Luíz do Curú*: CHUFC 730; *Ubajara*: IBSP 77514, ZUEC 3402; MINAS GERAIS: *Jaíba*: MZUFV 840, 920, 921, 922, 984; PARAÍBA**:** *Campina Grande*: IBSP 9060; PERNAMBUCO**:** *Carnaubeira da Penha*: MZUSP 4982, 4983, 4994; *Exú*: MZUSP 6524, 6525, 6526, 6553, 6554, 6555, 6556, 6557, 6568, 6559, 6560, 6626, 6627, 6628, 6629, 6630, 6631, 6632, 6633, 6634, 6635, 6636, 6638, 6924, 7032, 7033, 7034, 7035, 7036, 7037; *Itacurubá*: UFPB 2370, 2371; *Petrolândia*: IBSP 52106, 54258; *Timbaúba*: MNRJ 3934; PIAUÍ**:** *Parnaíba*: IBSP 49434, 51263; *Valença do Piauí*: MZUSP 5842, 5793, 5794; RIO GRANDE DO NORTE: *Macaíba*: CHBEZ 3107; *Mossoró*: IBSP 52261; *Serra Negra do Norte*: CHBEZ 1119; SERGIPE: *Porto da Folha*: CHUFS 359. *Clelia plumbea* - MINAS GERAIS: *Jaíba*: FUNED 1472. *Dipsas sazimai* – BAHIA**:** *Elísio Medrado*: MZUEFS 1065. *Dipsas variegata* – ALAGOAS: *Quebrângulo*: IVB 1626. *Erythrolamprus almadensis* – BAHIA**:** *Feira de Santana*: MPEG 18620; *Valença*: MNRJ 7739; PERNAMBUCO**:** *Serra Talhada*: UFPB 2719; *São Severino dos Ramos*: MZUSP 8035; RIO GRANDE DO NORTE: *Nísia Floresta*: CHUFC 193. *Erythrolamprus miliaris* – ALAGOAS**:** *Quebrângulo*: MZUSP 3393; BAHIA**:** *Barreiras*: MZUFV 766; CEARÁ**:** *Iguatú*: MPEG 17694; PERNAMBUCO: *São Caitano*: MZUSP 9017; RIO GRANDE DO NORTE: *Mossoró*: CHUFC 136. *Erythrolamprus mossoroensis* – BAHIA: *Barreiras*: MNRJ 2474, 2476, 2478, 2480; *Bom Jesus da Lapa*: MNRJ 2475, 2477, 2479, 2482; *Caitité*: MNRJ 7537; *Conde*: MNRJ 7741; *Paulo Afonso*: CHUFC 1505, 1507, 1510, 1511, 1513, 1558, MZUFBA 60, 61, 62, 63, 64, 65, 66, 77, 78, 200, 201, 202, 203, 204, 205, 207, 208, 211; *Poções*: IBSP 67585; CEARÁ**:** *Jaguaribe*: CHUFC 1912; *Limoeiro do Norte*: CHUFC 4, 9, 39, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, MPEG 17177; *Quixelô*: CHUFC 1923; *Russas*: CHUFC 190, 1186; MINAS GERAIS: *Jaíba*: MNRJ 7726, 8051, MZUFV 765, 837; PERNAMBUCO**;** *Agrestina*: MZUSP 4952, 4953; *Belém de São Francisco*: UFPB 2373, 2377, 2379; *Exú*: MZUSP 6499, 6500, 6741, 6742, 6743; *Floresta*: ZUEC 632; *Ouricurí*: CHUNB 56004, 56005, 56915; *Petrolina*: MZUSP 8115; RIO GRANDE DO NORTE: *Mossoró*: CHUFC 101, 109. *Erythrolamprus poecilogyrus* – ALAGOAS: *Marechal Deodoro:* IBSP 34447; *Piranhas*: MZUFBA 1087, 1187; *Tanque D'Arca*: IBSP 49506; BAHIA**:** *Alagoinhas*: IBSP 48656, 48657, 48831, MZUEFS 331; *Banco do Pedro*: MZUSP 614; *Barra*: MNRJ 7701, MZUEFS 976, 986, MZUSP 10056, 13960; *Barreiras*: MNRJ 2296, 2298, 2299, 2300, 2302, 2305, 2306, 2307, 2310, 2311, 2313, 2314, 2317, 2318, 2319; *Bom Jesus da Lapa*: MNRJ 2312; *Brumado*: IBSP 33988, 49864; *Caitité*: MNRJ 7533, 7616, 7716, 8712; *Conde*: MNRJ 7560, 7561; *Coração de Maria*: MZUEFS 923; *Esplanada*: MNRJ 9810, 9811; *Feira de Santana*: MZUEFS 32, 46, 48, 112, 124, 131, 132, 133, 135, 147, 148, 167, 196, 197, 204, 218, 224, 314, 317, 321, 330, 385, 386, 400, 401, 415, 424, 478, 668, 803, 838, 1322, 1334, 1384, 1407; *Guanambí*: IBSP 76108; *Ibiquera*: MZUEFS 257, 270; *Itiúba*: MZUSP 5434; *Ituaçú*: MZUFBA 432, 509, 558; *Jaborandí*: MNRJ 7714; *Jacobina*: MZUFBA 934, 937, MZUSP 7532, 7533, 7534, 7535, 7536; *Jequié*: IBSP 30400, MZUSP 4403; *Juazeiro*: IBSP 73335, 73999, 76094; *Lajedinho*: IBSP 48987; *Lençóis*: MZUFBA 788; *Maracujá*: MZUSP 3612; *Miguel Calmon*: MZUEFS 414; *Morro do Chapéu*: MZUSP 7806; *Mucugê*: MZUEFS 1230; *Paulo Afonso*: MZUFBA 5, 6, 7, 8, 9, 10, 11, 12, 13, 36, 37, 206, 212, 263, *Poções*: MZUFBA 1807, 1812, 1848; *Rio de Contas*: MZUFBA 1379; *Santa Bárbara*: MZUEFS 106, 109, 325; *Santa Teresinha*: MZUEFS 47; *Santaluz*: MZUFBA 989; *São Gonçalo dos Campos*: MZUEFS 114, 327, 474, 1442; *São José*: MZUEFS

1510; *São José do Macuco*: MZUSP 9085; *Sobradinho*: MZUFBA 369; *Tanquinho*: MZUEFS 55, 57; *Teixeira de Freitas*: IBSP 43880, 43959, 46301; *Urandí*: IBSP 27638; *Wagner*: MNRJ 13141; *Xique-xique*: MZUEFS 291; CEARÁ**:** *Aquiraz*: CHUFC 1724; *Araiçoaba*: CHUFC 1618; *Barbalha*: CHUFC 1683, 2667, MZUSP 7210, 7256; *Boa Viagem*: CHUFC 1781; *Canindé*: IBSP 77520, 77521; *Caririaçú*: CHUFC 1651; *Caucaia*: CHUFC 1089, 1125, 1170, 1648, 1885, 1926, 1990; *Crateús*: CHUFC 1747, 2248, IBSP 1487, 1488; *Fortaleza*: CHUFC 61, 87, 785, 900, 973, 1060, 1085, 1113, 1128, 1176, 1180, 1219, 1647, 1650, 1661, 1693, 1694, 1739, 1742, 1744, 1749, 1753, 1773, 1774, 1777, 1778, 1779, 1782, 1787, 1791, 1869, 1870, 1873, 1982, 1985, 1988, 2921, 2958, IBSP 19810, 19811, 19812, 19813, 19814, 19815, 20287, 20288, MPEG 17295; *General Sampaio*: CHUFC 1772, 1883; *Icó*: IBSP 12102, 12103, 20182, 20189, 20193, 20289, 20290; *Iguatú*: CHUFC 1887; *Independência*: CHUFC 1738; *Itapipoca*: CHUFC 1231; *Itapiúna*: CHUFC 726, 1056; *Jaguaribe*: CHUFC 1695, 1696, 1871; *Justiniano Serpa*: MZUSP 5317; *Limoeiro do Norte*: CHUFC 18, 23, 42, 51, 60, 69, 71, 88, 124, 178, 204, 225, 226, 274, 276, 279, 280, 281, 282, 283, 482, 1152, 1156, 1217, IBSP 12777, 20337, 20338; *Maracanaú*: CHUFC 1741; *Maranguape*: CHUFC 780, 874, 2071, 2362, 2869, MZUSP 3340, 3341, 3623; *Mombaça*: CHUFC 16; *Monsenhor Tabosa*: CHUFC 1983; *Mulungú*: CHUFC 2917; *Pacajús*: CHUFC 1784, MZUSP 5299; *Pacatuba*: CHUFC 318, 1780, 2295, MPEG 17208; *Pentecoste*: CHUFC 3021, 3064, 3065, 3066, 3067, 3069, 3070, 3072, 3076, 3079, 3098, 3099, 3100, 3101, 3102, 3141, 3159; *Quixadá*: CHUFC 1786, IBSP 1489; *Santa Fé*: IBSP 20384; *Santa Quitéria*: CHUFC 1775, 1834; *Santana do Acaraú*: CHUFC 1609, 1610; *São Gonçalo do Amarante*: CHUFC 1580, MPEG 17213; Sobral: CHUFC 1751, 1752; *Solonópole*: CHUFC 1770, 1771; *Taíba*: CHUFC 2918; *Viçosa do Ceará*: IBSP 77239; MINAS GERAIS: *Jaíba*: FUNED 1467; *Porteirinha*: MZUFV 827, 958, 979; PARAÍBA**:** *Areia*: MZUSP 8899, UFPB 498; *Boa Vista*: UFPB 2060, 2064; *Cabaceiras*: MZUSP 8268, 3058; *Campina Grande*: IBSP 9052, 9056, 9057, 30347, 30349, 76107; *Coremas*: MZUSP 3330; *Gurinhém*: MZUSP 9659; *Maturéia*: MNRJ 17068; *Monteiro*: MNRJ 8591; *Patos*: IBSP 33413, 33414, 33415, 33416, 33417, 33418, 33419, 33420, 33421, 33422, 33742, 33743, 33744, 33745, 33814; *Prata*: UFPB 6; *Teixeira*: MZUSP 7817; PERNAMBUCO**:** *Agrestina*: MZUSP 4951, 4972; *Belém de São Francisco*: UFPB 2374; *Bom Conselho*: MZUSP 5955, 5956, 5957; *Exú*: MZUSP 6379, 6520, 6521, 6522, 6639, 6640, 6641, 6642, 6643, 6644, 6645, 6646, 6647, 6648, 6649, 6650, 6651, 6652, 6653, 6654, 6655, 6656, 6657, 6658, 6659, 6660, 6661, 6662, 6663, 6664, 6665, 6666, 6667, 6668, 6669, 6670, 6671, 6672, 6673, 6674, 6675, 6676, 6677, 6678, 6679, 6680, 6681, 6682, 6683, 6684, 6685, 6686, 6687, 6688, 6689, 6690, 6691, 6692, 7038, 7039, 7040, 7041, 7042, 7043, 7044, 7045, 7046, 7047, 7048, 7049, 7050, 7051, 7052, 7053, 7054, 7055, 7056, 7057, 7058, 7059, 7060, 7061, 7062, 7063, 7064, 7065, 7066, 7067, 7068, 7069, 7080, 8119; *Limoeiro*: MNRJ 802, 803; *Pesqueira*: IBSP 76093; *Petrolina*: IBSP 28703, 71104, MZUEFS 746; *São José do Egito*: IBSP 9055; *Sertânia*: IBSP 57224; PIAUÍ: *Batalha*: CHUFC 1891; *Floriano*: MPEG 23476; *Parnaíba*: IBSP 51710, 51721; *Piracuruca*: CHUNB 61146, 61148, 61149, MPEG 22872, 22873; *Piri-piri*: IBSP 77518, 77519; *São João da Fronteira*: IBSP 77104; *São Raimundo Nonato*: MNRJ 8342; *Teresina*: IBSP 1260, 1261, 1262, 1263, 1264, 1265, 1266, 1267, 1268, 1269, 1270, 1271, 1272, 1273, 1274, 1275; *Valença do Piauí*: MZUSP 5795, 5796, 5797, 5798, 5799, 5800, 5801, 5802, 5803, 5804, 5805, 5806, 5807, 5808, 5809, 5810, 5811, 5975; RIO GRANDE DO NORTE: *Angicos*: IBSP 48203; *Macaíba*: CHBEZ 2732; *Mossoró*: CHUFC 7, 15, 34, 37, 41, 62, 67, 64, 75, 77, 84, 95, 122, IBSP 76109*; Pedro Velho*: IBSP

48710; SERGIPE**:** *Campo do Brito*: MZUSP 1180, 1182; *Canindé de São Francisco*: IBSP 67954, 67955; *Lagarto*: IBSP 37598; *Propriá*: UFPB 2494; *Santo Amaro das Brotas*: MZUSP 6997. *Erythrolamprus reginae* – ALAGOAS**:** *Mangabeiras*: MZUSP 2937, 3337; CEARÁ: *Barbalha*: MZUSP 7207, 7208, 7209; *Baturité*: IBSP 56325, MNRJ 7716; *Crateús*: CHUFC 2190; *Crato*: IBSP 1035, MZUSP 5244, 7593; *Fortaleza*: CHUFC 2821; *Guaramiranga*: CHUFC 1238, 1521, 1534, 1535, 1536, 1537, 2315, 2575, 3261; *Ibiapina*: CHUFC 2160, 2327, 2328; *Ipú*: UFPB 3990, 3991, 3992, 3993, 3994, 3995; *Limoeiro do Norte*: IBSP 12786; *Maranguape*: CHUFC 2068, 2209, 2210, 2313, 2620, 3280, MZUEFS 382, 383; *Mulungú*: CHUFC 1251, 2319, 2325, 2326, 2334, 2358, 2425, 2439, 2455, MZUSP 10798, 10799; *Pacatuba*: CHUFC 2230, 2280; *Pacotí*: CHUFC 1252, 2308, 2311, 2312, 2316, 2321, 2324, 2330, 2418, 2427, 2442, 2444, 2577, 2779, 2819, 2822, MZUSP 3632, 11498, 11499, 11500, 11501, 11502, 11503; *Palmácea*: CHUFC 1736; *São Benedito*: CHUFC 2113, 2123, 2148, 2317, 2318, 2809; *Tianguá*: CHUFC 2322, 2329, 2331; *Ubajara*: CHUFC 2092, 2093, 2122, 2133, 2310, 2333, IBSP 77051, 77099, 77100, 77233, 77551, 77552; PIAUÍ: *Valença do Piauí*: MZUSP 5812, 5813; SERGIPE: *Itabaiana*: CHUFS 228. *Erythrolamprus taeniogaster* – ALAGOAS**:** *Mangabeira*: MZUSP 2933, 2934, 2935, 2936, 2937, 2938, 2939, 2926, 2927, 2928, 2928, 2930, 2931, 2932; *Palmeira dos Índios*: MNRJ 2063; BAHIA**:** *Boa Nova*: MNRJ 14936; *Feira de Santana*: MZUEFS 1228, 1366, 913, 1310; CEARÁ**:** *Barbalha*: CHUFC 1579; *Crato*: IBSP 20006, 20138; *Ibiapina*: CHUFC 2145, 3300; *Milagres*: MNRJ 18488; *São Benedito:* CHUFC 2108, 2109, 2808; *Ubajara*: CHUFC 2320, 2332. *Erythrolamprus viridis* – ALAGOAS**:** *Pão de Açúcar*: IBSP 41484; *Piranhas*: MZUFBA 1183, 1188; *Quebrângulo*: MZUSP 3453; *São Miguel dos Campos*: MNRJ 3958; BAHIA: *Alagoado*: MZUSP 10031; *Barra*: MZUEFS 987; *Barreiras*: MNRJ 2500, 2501, 2503; *Bom Jesus da Lapa*: MNRJ 25102; *Brotas de Macaúbas*: IBSP 43064; *Brumado*: IBSP 31594; *Feira de Santana*: MZUEFS 68, 99, 103, 117, 198, 209, 215, 280, 334, 365, 373, 375, 408, 423, 425, 441, 460, 581, 595, 600, 844, 999, 1078, 1572, 1578, MZUFBA 628, 1322; *Gentio do Ouro*: MZUSP 8968, 13957; *Ipirá*: MZUFBA 561; *Irecê*: IBSP 42687; *Jacobina*: MZUEFS 558; *Jequié*: IBSP 41514; *Jeremoabo*: MZUSP 5438; *Juazeiro*: MZUEFS 1456; *Justiniano Serpa*: MZUSP 5319, 5320; *Lençóis*: MZUEFS 730; *Novo Horizonte*: MZUEFS 934; *Paulo Afonso:* CHUFC 1506, 1560, IBSP 42410, 42414, MZUFBA 79, 80, 81, 83, 91, 342; *Poções*: IBSP 28170, 28171, 28172, 28215, 28216, 73734, MZUFBA 1552, 1554, 1817, 1818, 1859; *Retirolândia*: IBSP 55669; *São Gonçalo dos Campos*: MZUEFS 149; *Serra Preta*: MZUEFS 237; *Tanquinho*: MZUEFS 62, 63, 64; CEARÁ**:** *Boa Viagem*: IBSP 20200; *Catunda*: CHUFC 1599; *Caucaia*: CHUFC 1899, 1902, 1977; *Crato*: IBSP 49175; *Limoeiro do Norte*: CHUFC 29, 65, 179, 317, 319, 320, 321, 357, 362, 363, 364, 568, 575, 576, 580, 581, 583, 585, 587, 588, 596, 1897, 1898, IBSP 12776, 12777, MPEG 17178, 18218; *Maranguape*: CHUFC 1123, 3265, MZUSP 3342, 3450; *Mulungú*: CHUFC 3298; *Pacajús*: CHUFC 1716, 1745, 2002, 2650; *Pentecostes*: CHUFC 3097, 3106, 3505; *Quixeramobim*: IBSP 20142; *Russas*: CHUFC 3027, 3028, 3029; *São Gonçalo do Amarante*: CHUFC 1597; *Sobral*: CHUFC 1978; MINAS GERAIS**:** *Manga*: MNRJ 2505; *Porteirinha*: MNRJ 9065, MZUFV 959; PARAÍBA**:** *Areia*: UFPB 490; *Campina Grande*: IBSP 76125; *Coremas*: MZUSP 3451; *Patos*: IBSP 33424, 33425, 33426, 33427; *São João do Cariri*: MZUEFS 122; *Sousa*: MNRJ 1980; PERNAMBUCO: *Agrestina*: MZUSP 4925, 4942, 4946, 4965, 4970; *Betânia*: CHUFC 2263; *Exú*: MZUSP 6693, 6694, 6695, 6696, 6697, 6698, 6699, 6700, 6701, 6702, 6703, 6704, 6705, 6706, 6707, 6708, 6709, 6710, 6711, 6712, 6713, 6714, 6715, 6716, 6717, 6718, 6920,

6921, 6940, 6941, 6942, 6943, 6950, 7071, 7072, 7073, 7074, 7075, 7076, 7077, 7078, 7079, 7080, 7081, 7082, 7083, 7084, 7085, 7086, 7087, 7087, 7088, 7089, 7090, 7091, 7092; *Floresta*: ZUEC 629; PIAUÍ**:** *Avelino Lopes*: MZUSP 5177; *Floriano*: MPEG 23477, 23478, 23479; *Piracuruca*: CHUNB 61147, MPEG 22869, 22870; *Piri-piri*: MZUSP 3424, 3427, 3428, 3429, 3433, 3435, 3436, 3437, 3438, 3441, 3443, 3445; *São Raimundo Nonato*: IBSP 42482, ZUEC 1926; *Teresina*: IBSP 360, 473, 1210, 1211, 1212, 1213, 1214; *Valença do Piauí*: MZUSP 5814; RIO GRANDE DO NORTE**:** *Mossoró*: CHUFC 8, 26, 28, 47, 54, 117, 118, 121, 127, 181, 188, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, IBSP 76087, 76088, 76089, 76090; *Serra Negra do Norte*: CHBEZ 1183, 1307, 1308, 3104; SERGIPE**:** *Itabaiana*: MZUSP 11073; *Propriá*: MZUFBA 1570; *Santo Amaro das Brotas*: MZUSP 6985, 7306. *Helicops* aff. *infrataeniatus* – PARAÍBA**:** *Campina Grande*: MNRJ 17063. *Helicops angulatus* – ALAGOAS: *Ibateguara*: CHBEZ 2198; *São José da Laje*: CHBEZ 507; BAHIA *Itaetê*: MZUSP 10795; *Cachoeira*: MZUSP 7495; CEARÁ**:** *Aquiraz*: CHUFC 2961; *Juazeiro do Norte*: IBSP 20158, 20161; PARAÍBA**:** *Campina Grande*: IBSP 51817; *Pilar*: IBSP 34458; PIAUÍ**:** *Piri-piri*: MNRJ 11550; SERGIPE**:** Itabaiana: CHUFS 226; *São Domingos*: CHUFS 256. *Helicops leopardinus* – ALAGOAS**:** *Mangabeira*: MZUSP 2885, 2886, 2887, 2888, 2889, 2890, 2891, 2892, 2893, 2894, 2895, 2896, 2897, 2898, 2899, 2900, 2901, 2902, 2903, 2904, 2905, 2906, 2907, 2909; *Penedo*: MUFAL 1973; *Quebrângulo*: MZUSP 3158, 3159, 3160, 3161, 3247, 3248, 3249, 3250, 3251, 3252, 3253, 3254, 3255, 3256; BAHIA**:** *Alagoinhas*: MZUFBA 1523; *Barra*: MZUFBA 1767, MZUSP 9589, 10038, 10039, 10040, 10041, 10042, 10043, 10044, 10045, 10046, 10047, 10048, 10049, 10050, 10051, 10052; *Barreiras*: MNRJ 2469; *Cabaceiras do Paraguaçú*: IBSP 43483; *Conde*: MNRJ 4777; *Feira de Santana*: MZUEFS 11, 184, 448, 466, 523, 684, 944, 1058, 1141, 1203, 1246, 1317, 1330, 1619; *Itaetê*: IBSP 66389; *Jacobina*: MZUSP 6453; *Juazeiro*: IBSP 74000, 74512, 74513, MZUEFS 1282, 1283, 1386, 1387; *Mata de São João*: IBSP 1057; *Paulo Afonso*: MZUFBA 249, 251, 252, 253, 254, 303, 357; *Rodelas*: CHUFC 1559; *São Gonçalo dos Campos*: MZUEFS 219, 397, 1609; *Sobradinho*: MZUFBA 279; *Tanquinho*: MZUEFS 1152; CEARÁ**:** *Aquiraz*: CHUFC 1837, 1838, 3014; *Caucaia*: CHUFC 937, 1178, 1812; *Coreau*: CHUFC 1850; Crateús: CHUFC 2251; *Fortaleza*: CHUFC 31, 898, 920, 938, 1110, 1124, 1136, 1137, 1143, 1160, 1161, 1201, 1292, 1293, 1294, 1295, 1296, 1297, 1298, 1299, 1300, 1301, 1302, 1303, 1304, 1305, 1306, 1307, 1308, 1309, 1310, 1311, 1312, 1313, 1314, 1315, 1316, 1317, 1318, 1319, 1320, 1321, 1322, 1323, 1324, 1325, 1326, 1327, 1328, 1329, 1330, 1331, 1332, 1333, 1334, 1335, 1336, 1337, 1338, 1339, 1340, 1341, 1342, 1343, 1344, 1345, 1346, 1351, 1766, 1788, 1789, 1790, 1792, 1793, 1794, 1795, 1796, 1797, 1798, 1799, 1801, 1802, 1803, 1804, 1805, 1806, 1807, 1808, 1809, 1810, 1811, 1813, 1814, 1815, 1816, 1817, 1818, 1819, 1820, 1827, 1830, 1836, 1839, 1841, 1842, 1843, 1845, 1846, 1847, 1849, 1851, 1852, 1853, 1854, 1855, 1856, 1857, 1858, 1859, 1860, 1861, 1862, 1863, 1864, 1927, 2261, 2500, 2582, 2601, 2666, 2832, 2884, 2991, IBSP 20024, 20025, 20026, 20027, 20028, 20029, 20030, 20031, 20032, 20033, 20034, 20035, 20036, 20037, 20038, 20039, 20040, 20041, 20042, 20043, 20044, 20045, 20046, 20047, 20048, 20049, 20242, 20243, 20244, 20628, MPEG 17182, 17183, 17187, 17315, 17318, 17319, 17320, 17321, 17322, 17323, 17324, 17325, 17326, 17327, 17328, 17329, 17330, 17331, 17332, 17333, 17696, 17697, MZUEFS 513; *Pentecoste*: CHUFC 2989; *Quixadá*: CHUFC 1134, 1785; *Santa Quitéria*: CHUFC 1835; MINAS GERAIS: *Jaíba*: MCNR 2871, MZUFV 838, 915, 916, 957; *Manga*: MNRJ 7265; PARAÍBA**:** *São José de Piranhas*: IBSP 9046, 9048, 9049.

PERNAMBUCO**:** *Petrolândia*: UFPB 2376, 2378; PIAUÍ**:** *Parnaguá*: IBSP 42445, 42462, 42465; *Teresina*: CHUFC 2011; SERGIPE**:** *Santo Amaro das Brotas*: MZUSP 6989. *Hydrops triangularis* – MARANHÃO**:** Timon: IBSP 44149. *Imantodes cenchoa* – CEARÁ**:** *Crato*: IBSP 20332; *Guaramiranga*: CHUFC 1358; *Maranguape*: CHUFC 2219, 2713; *Monguba*: CHUFC 2716; *Pacatuba*: CHUFC 2276, 2277; *Pacotí*: CHUFC 2657, 2663, 2670, 2671, 2672, 2674, 2692, 2818; PERNAMBUCO**:** *Lagoa do Ouro*: MZUFBA 390; *São Caitano*: MZUSP 8897. *Leptodeira annulata* – ALAGOAS**:** *Piranhas*: MZUFBA 835, 845, 1148, 1149, 1150, 1151, 1152, 1153, 1154, 1155, 1156, 1157, 1158, CHUFS 2498, 2813, 2941, 2968, 2969, 3077, 3118, 1333, 1334, 1335, 1336, 1337; BAHIA**:** *Andaraí*: MZUSP 10628; *Brumado*: CHUFC 165, IBSP 31532, 32323, 33343, 34107, 40014, 4046; *Caculé*: IBSP 22894; *Feira de Santan*a: MZUEFS 622, 625, 1118; *Ibiquera*: MZUEFS 945, 996, 1109; *Ipirá*: MZUEFS 727; *Iramaia*: IBSP 43094; *Lençóis*: MZUEFS 1628; *Livramento do Brumado*: IBSP 29825, 26648, 29824; *Maracás*: IBSP 26481, 26482, 26483, MNRJ 18394; *Miguel Calmon*: IBSP 33901; *Paulo Afonso*: MZUFBA 257, 258, 259, 260, 261; *Poções*: IBSP 67648; 27117; *Riachão de Jacuípe*: MZUEFS 666; *Ruy Barbosa*: IBSP 29061, MZUEFS 688; *Elísio Medrado*: MZUEFS 1037; *São José do Macuco*: MZUSP 9084; *Urandí*: IBSP 27117; CEARÁ**:** *Araiçoaba*: CHUFC 1603; *Boa Viagem*: CHUFC 1171, IBSP 51950, 52949; *Caucaia*: CHUFC 2909; *Crateús*: CHUFC 1614, 2909; *Fortaleza*: CHUFC 1634, 20254, 20256, IBSP 20255; *Guaiúba*: CHUFC 1637; *Ibiapina*: CHUFC 2143, 2144, 2145, 2475, 2724; *Icó*: IBSP 20124, 20178, 20179; *Iguatú*: CHUFC 1220; *Independência*: MPEG 17219; *Itapipoca*: IBSP 20016; *Itapiuna*: CHUFC 291; *Jatí*: IBSP 76933; *Juazeiro do Norte*: IBSP 20162; *Jucas*: CHUFC 931; *Limoeiro do Norte*: CHUFC 931, 24, 44, 116, 500, 565, 571, 572, 573, 574, 577, 582, 594, 595, 609, 1154, 1155; *Maranguape*: CHUFC 299, 2075, 2871; *Milagres*: IBSP 76992; *Mombaça*: CHUFC 36*; Morada Nova*: CHUFC 1635; *Mulungú*: CHUFC 2364, 2722; *Pacatuba*: CHUFC 2227, 2234; *Pentecoste*: CHUFC 2685, 2950, 3075, 3137, 3138, 3164, 3201; *Quixeramobim*: IBSP 20146, 20147, 20148; *São Gonçalo do Amarante*: CHUFC 1901, 2948; *São Luis do Curú*: MPEG 17210; *Tianguá*: CHUFC 2727, IBSP 77526; *Ubajara*: CHUFC 1581, 2723, 2728, 3267, IBSP 77054, 77060, IBSP 77525; *Varjota*: IBSP 77524; PARAÍBA**:** *Cabaceiras*: MZUSP 8912, 8269, 9014, 9015, UFPB 915, 916, 936; *Congo*: MNRJ 9243; *Gurinhém*: MZUSP 9657; *Maturéia*: MNRJ 17067; *Patos*: IBSP 33430, 33756, 33757, 33811, 33812; *São José de Espinharas*: MZUSP 5965; *Sousa*: MNRJ 1953, 1973; PERNAMBUCO**:** *Afogados da Ingazeira*: IBSP 51827; *Betânia*: CHUFC 2266; *Caruaru*: IBSP 56936; *Floresta*: ZUEC 628; *Pesqueira*: IBSP 51826*; São Caitano*: MZUSP 9016; PIAUÍ: *Teresina*: IBSP 1282, 1283, 49870; *União*: IBSP 499; *Valença do Piauí*: MZUSP 5815; RIO GRANDE DO NORTE: *Serra Negra do Norte:* CHBEZ 1179, 1180, 1218, 1251, 1252, 1332, 1333, 1334, CHUNB 30524; SERGIPE: *Poço Redondo*: CHUFS 158; *Tobias Barreto*: CHUFS 487. *Lygophis dilepis* – BAHIA**:** *Barra*: MZUFBA 1770, MZUSP 10053, 10054, 10055; *Barreiras*: MNRJ 2276, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291; *Bom Jesus da Lapa*: MNRJ 2269; *Glória*: ZUEC 607; *Guanambí*: MZUFV 38; *Itaguaçú da Bahia*: IBSP 26649; *Itaparica*: IBSP 52084, 52085, 52096, 52097, 52098, 52099, 52239; *Juazeiro*: FUNED 1468, IBSP 48093, 73983, MZUEFS 1391, 1392, 1393; *Paulo Afonso*: MZUFBA 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 209, 210, 231; *Pilão Arcado*: MZUFBA 1723; *Remanso*: IBSP 28772; *Santa Maria da Vitória*: CHUNB 61950; *Santa Rita de Cássia*: MZUSP 3620; *Xique-xique*: IBSP 26157; CEARÁ: *Aurora*: CHUFC 918; *Barbalha*: MZUSP

7211, 7212; *Beberibe*: MZUSP 5326, 5327, 5628; *Canindé*: IBSP 76851, 77115; *Carius*: IBSP 19991; *Caucaia*: CHUFC 871, 1090, 1091, 1188, 1707, 1938, 1955, 1961, 1962, 1966, 2612, 2889; *Crato*: IBSP 20134; *Fortaleza*: CHUFC 778, 935, 1131, 1145, 1148, 1150, 1169, 1175, 1232, 1936, 1940, 1941, 1942, 1946, 1947, 1948, 1949, 1952, 1953, 1954, 1959, 1969, 1970, 1971, IBSP 19801, 19817, 19818, 20266, 20267, 20268, 20269, 20270, 20271, 20272, 20633, 20634, 20635, MPEG 17181, 17188, 17217, 17220; *Guaiúba*: CHUFC 1917; *Icó*: IBSP 12796, 12797, 12798, 12799, 12800, 20126, 20186, 20187, 20188, MNRJ 1972; *Iguatú*: CHUFC 1126, 1937, 1958; *Iracema*: CHUFC 82; *Itapipoca*: CHUFC 1968*; Juazeiro do Norte*: IBSP 20157, 20171, 20175, 20195; *Justiniano Serpa*: MZUSP 5313, 5314, 5315, 5316; *Limoeiro do Norte*: CHUFC 59, 89, 96, 111, 112, 205, 277, 278, 344, 345, 346, 347, 348, 350, 351, 358, 360, 361, 366, 367, 584, 908, 911, 919, 1106, 1107, 1182, 1935, 1960, IBSP 12766; *Maracanaú*: CHUFC 732, 1944; *Maranguape*: CHUFC 1934, 1963, MZUSP 3363, 3364; *Marco*: CHUFC 1616; *Maurití*: CHUFC 799, MNRJ 9824; *Pacajús*: MZUSP 5301; *Pacatuba*: CHUFC 1168; *Pentecostes*: CHUFC 904, 1194, 3024, 3071, 3073; *Quixelô*: CHUFC 1643; *Quixeramobim*: IBSP 20145, 20197; *Russas*: CHUFC 1967, MNRJ 1968; *São Gonçalo do Amarante*: CHUFC 2520; *Sobral*: CHUFC 929, 1750, 1939, 1943, 1951; MINAS GERAIS: *Jaíba*: CHUFC 2289; *Manga*: MNRJ 2275; *Mocambinho*, *Porteirinha*: MZUFV 814, 822, 826; PARAÍBA**:** *Patos*: IBSP 33405, 33406, 33407, 33753, 33754, 33755; *São José de Espinharas*: MZUSP 5963; *Sousa*: MNRJ 1969, 1970; PERNAMBUCO**:** *Exú*: MZUSP 6744, 6745, 6746, 6747, 6748, 6749, 6750, 6751, 6752, 6753, 6754, 6755, 6757, 6758, 6759, 6760, 6761, 6762, 6763, 6764, 6918, 7114, 7115, 7116, 7117, 7118, 7119, 7120, 7121, 7122, 7123, 7124, 7125, 7126, 7127, 7128, 7129, 7130, 7131, 7132, 7133, 7134, 7135; *Floresta*: ZUEC 626, 627; *Petrolândia*: UFPB 2381, 2382, 2383, 2396; PIAUÍ: *Cajueiro da Praia*: MNRJ 17337; *São Raimundo Nonato*: IBSP 42535; *Teresina*: IBSP 49936, 50472; RIO GRANDE DO NORTE: *Mossoró*: CHUFC 19, 25, 27, 45, 55, 68, 78, 80, 85, 100, 107, IBSP 51801, 51802, 51803; *Pau dos Ferros*: MPEG 18891; *São Gonçalo do Amarante*: IBSP 8702, 8703, 8704; *Serra Negra do Norte*: CHBEZ 866, 1110, 1184, CHUNB 30570. *Lygophis paucidens* – BAHIA**:** *Gentio do Ouro:* MZUSP 9597; *Jaborandi*: MNRJ 18656; *Poções*: MZUFBA 1846, 1855; PIAUÍ**:** *Piracuruca*: CHUNB 61141, 61142, 61143, 61144; *Teresina*: IBSP 1225. *Oxyrhopus guibei* – BAHIA**:** *Rio de Contas*: MZUFBA 1376. *Oxyrhopus petola* – BAHIA**:** *Amélia Rodrigues*: MZUEFS 1255; *São José*: MZUEFS 549; MINAS GERAIS**:** *Jaíba*: FUNED 1491; PARAÍBA**:** *Areia*: IBSP 80222. *Oxyrhopus* sp. – CEARÁ**:** *Ibiapina*: CHUFC 2707; *Pacotí*: CHUFC 2839; *Santana do Acaraú*: CHUFC 1608; *São Benedito*: CHUFC 2117, 2705, 24334, 2454, 2762, 2573; *Sobral*: CHUFC 1191; *Ubajara*: CHUFC 2731. *Oxyrhopus trigeminus* – ALAGOAS**:** *Coruripe*: IBSP 69602; *Olho D'Água do Casado*: MUFAL 891, 892, 893, 894, 895, 896, 897, 899; *Piranhas*: MZUFBA 1175, 1176, 1177, 1178, 1179, 1180, 1181, 1182; *Quebrângulo*: MZUSP 3407, 3408; *Teotônio Vilela*: MNRJ 14315; *Piranhas*: CHUFS 2539, 2805, MZUSP 10845, 10846, 10847, MUFAL 1338, 1352, 1353; BAHIA: *Abaira*: MZUEFS 828; *Alagoado*: MZUSP 10032, 14619; *Alagoinhas*: IBSP 48787, 48803, 48937, 49955, 51268, 51660, MZUEFS 640, 645, 811, 890; *Amélia Rodrigues*: MZUFBA 855; *Andaraí*: MZUEFS 880, 951, MZUFBA 1780; *Aporá*: IBSP 44487, 44488, 44492; *Baixa Grande*: MZUFBA 1721; *Barra*: MZUEFS 973, MZUSP 3621, 10060; *Barreiras*: CHUNB 3656, 3663, IBSP 49762, MNRJ 2375; *Brumado*: IBSP 32318, 33066, 33146, 33307, 34106, 40168, 40171, 40172, 40247, 40302, 40357, 40368, 40390, 40394, 40458, 40462, 40673, 40820, 40822, 41148,

41185, 41782, 41794, 42171, 45781, 49685, 49865, 50210, 50211, 50216; *Caetité*: MNRJ 7539, 8707, 8708; *Capim Grosso*: MZUEFS 69, 205; *Caraíbas*: IBSP 33460; *Casa Nova*: MZUEFS 587, 1395; *Conde*: MNRJ 8311, MZUEFS 680; *Curaçá*: IBSP 43062, 46650; *Custódia*: MZUEFS 656; *Elísio Medrado*: MZUEFS 883, 1048, 1060, 1722; *Feira de Santana*: IBSP 37571, 37577, 43147, 69537, MZUEFS 50, 98, 110, 136, 138, 140, 152, 181, 211, 231, 301, 304, 311, 336, 393, 394, 395, 406, 421, 430, 439, 449, 472, 480, 512, 559, 564, 583, 629, 641, 655, 670, 671, 673, 711, 712, 769, 770, 802, 808, 816, 885, 896, 943, 967, 991, 992, 1003, 1004, 1005, 1041, 1054, 1059, 1061, 1064, 1066, 1073, 1087, 1091, 1098, 1104, 1106, 1112, 1113, 1123, 1124, 1151, 1155, 1168, 1169, 1200, 1204, 1235, 1238, 1245, 1353, 1397, 1476, 1480, 1493, 1495, 1497, 1498, 1501, 1504, 1505, 1506, 1511, 1513, 1514, 1540, 1571, 1573, 1580, 1603, 1606, 1625, 1627, 1634, 1649, 1717, 2173, 1930; *Guanambi*: IBSP 49240, 49242, 49956, 50103, 50104, 50106, 50361, 50362, 50363, 51667, 52015, 53430, 53723, 54680; *Iacú*: MZUEFS 150, MZUSP 7799; *Ibicoara*: MZUFBA 892, 1293, 1295; *Ibipeba*: CHUNB 3344; *Ibipitanga*: MZUEFS 1605; *Ibiquera*: MZUEFS 966, 1085, 1205; *Ipirá*: MZUEFS 170, 796, 1207, 1312; *Iramaia*: IBSP 43096, 43100; *Irecê*: IBSP 33827; Itaberaba: IBSP 1453; *Itiúba*: MZUSP 5426; *Jaborandi*: CHUNB 51118; *Jaguaraí*: IBSP 26409, 33351, MZUEFS 1103, 1111; *Jeremoabo*: MZUEFS 1294; *Juazeiro*: IBSP 46179, 48091, 48092, 48982, 49222, 49223, 49798, 49857, 49858, 49953, 49954, 51808, 51809, 51810, 51812, MZUEFS 1126, 1288, 1455; *Lençóis*: MZUFBA 789, 790, 791; *Macajuba*: MZUEFS 80, 90; *Miguel Calmon*: IBSP 33910, 33911; *Morro do Chápeu*: IBSP 53905, 53906, MZUEFS 1256; *Nova Redenção*: IBSP 60079; *Paramirim*: IBSP 62249; *Paulo Afonso*: MZUFBA 183, 184, 185, 186, 189, 190, 191, 197, 215, 217, 218, 219, 220, 221, 222, 224, 264, 265, 290; *Pilão Arcado*: MZUSP 10458; *Poções*: IBSP 28196, 28197, 28198, 28199, 28200, 28201, 28202, 28203, MZUEFS 824, 1574, 1575, 1576, 1820; *Porto Castro Alves*: MZUFBA 277, 278, 283; *Remanso*: IBSP 28717, 28718; *Riachão de Jacuípe*: MZUEFS 1250; *Rio de Contas*: MZUFBA 1373, 1377, 1378; *Ruy Barbosa*: IBSP 25311, 26214, MZUEFS 1252; *Santa Bárbara*: MZUEFS 259; *Santa Rita de Cássia*: MZUFBA 1946; *Santa Teresinha*: MZUFBA 41, 134, 309; *Santaluz*: MZUFBA 944; *Santo Estevão*: MZUEFS 207, 1607; *Santo Inácio*: MZUSP 10024, 10454, 13958; *São Gonçalo dos Campos*: MZUEFS 10, 1023, 1557; *Sebastião Laranjeiras*: CHUNB 3645, 3646; *Serra Preta*: MZUEFS 108, 1046; *Tanquinho*: MZUEFS 53, 178; *Teofilândia*: MZUEFS 366, 372; *Urandí*: IBSP 27171; CEARÁ**:** *Aracatí*: CHUFC 1669; *Barbalha*; CHUFC 2180, 7215, 7216; *Crateús*: CHUFC 2244, 2245, 2246, 2269; *Crato*: IBSP 20382; *Fortaleza*: CHUFC 1050, 2908, IBSP 20151, 20238, 20258, 43015, 43901, MNRJ 1019, MZUSP 10800; *Ibiapina*: CHUFC 2161, 2701, 2703; *Icó*: IBSP 20180; *Independência*: CHUFC 1877; *Ipú*: IBSP 2709, UFPB 4034; *Itapagé*: MNRJ 11374; *Itapipoca*: CHUFC 1164, 1606; *Jardim*: CHUNB 56003; *Juazeiro do Norte*: IBSP 20174; *Justiniano Serpa*: MZUSP 5307; *Lavras de Mangabeira*: IBSP 20128, 20129*; Limoeiro do Norte*: CHUFC 35, 40, 46, 50, 52, 73, 197, 271, 359; *Maurití*: CHUFC 1913; *Mombaça*: CHUFC 905; *Pentecoste*: CHUFC 2989, 3020, 3103, 3104, 3105, 3346; *Quixadá*: IBSP 20012; *Quixeramobim*: IBSP 20140; *São Benedito*: CHUFC 2105, 2696, 2697, 2699, 2702; *São Luis do Curu*: MPEG 17214; *Sobral*: MPEG 17221; *Ubajara*: CHUFC 2136, 2153, 2155, ZUEC 3404; MINAS GERAIS: *Itacarambí*: MPEG 17305; *Jaíba*: FUNED 624, 1135, 1470; *Porteirinha*: MZUFV 659, 666, 667, 821, 917, 952, 953, 954, 974; *São João do Paraíso*: MCNR 2879; PARAÍBA**:** *Areia*: IBSP 56996, MZUSP 8955, UFPB 491; *Barra de Santa Rosa*: IBSP 54188; *Caiçara*: UFPB: 3048; *Campina Grande*: IBSP 50829, 50830, 51829; *Congo*: MNRJ

8400; *Coremas*: MZUSP 3405; *Gurinhém*: MZUSP 8945, 8946, UFPB 2497; *Junco do Seridó*: IBSP 54909; *Maturéia*: MNRJ 17017; *Patos*: IBSP 33429, 33746, 33747, 33478, 33748, 33813; *São José do Cariri*: UFPB 4041; *São José de Espinharas*: MZUSP 5964; *São José dos Cordeiros*: UFPB 4390; *Sousa*: MNRJ 1913, 1915, 1916; PERNAMBUCO**:** *Agrestina*: MZUSP 4831, 4954, 4955; *Bezerros*: UFPB 3547; *Brejo da Madre de Deus*: MPEG 19167; *Carnaubeira da Penha*: MZUSP 4979, 4998; *Exú*: MZUSP 6518, 6772, 6773, 6774, 6775, 6776, 6939, 7139, 8118; *Floresta*: CHUFC 2271, ZUEC 625; *Garanhuns*: IBSP 51781, 51782, 51783; *Ouricuri*: CHUNB 56916, 56917; *Petrolândia*: IBSP 52082, 52083; *Petrolina*: IBSP 50215; *São Caitano*: MZUSP 9018; *Toritama*: ZUEC 912; PIAUÍ: *Altos*: CHUFC 1671, MNRJ 11352; *Floriano*: CHUFC 1673, MPEG 23487; *Parnaíba*: IBSP 49439, 51715, 51724, 51784, 49439, 49440, 51784; *Piracuruca*: CHUNB 61159, 61160, 61161, 61162, MPEG 22878, 22879, 22880, 22881, 22882, 22883, 22884, 22885, 22886; *Piri-piri*: CHUFC 1994, MNRJ 11359; *São Raimundo Nonato:* ZUEC 2046; *Teresina*: IBSP 1228, 1229, 1247, 46850, 49816, 49817; *Valença do Piauí*: MZUSP 5821, 5822, 5823, 5824, 5825, 5826; RIO GRANDE DO NORTE: *Macaíba*: CHBEZ 2857, 2858; *Maxaranguape*: MZUSP 5953, 5954; *Mossoró*: CHUFC 97, 113, 114, 115, IBSP 51077, 51173, 54683; *Serra Negra do Norte*: CHBEZ 919, 2434; SERGIPE: *Campo do Brito*: MZUSP 10883; *Canindé de São Francisco*: MUFAL 898; *Itabaiana*: CHUFS 173; *Lagarto*: IBSP 77890; *Poço Redondo*: CHUFS 362; *Propriá*: MZUFBA 1569; *Salgado*: CHUFS 524; *São Domingos*: CHUFS 255, 256. *Philodryas aestiva* – BAHIA**:** *Mucugê*: MZUSP 8021, 8022. *Philodryas nattereri* – ALAGOAS**:** *Água Branca:* MZUEFS 1010; *Delmiro Golveia*: MZUEFS 1295; *Olho D'Água do Casado*: MUFAL 902; *Piranhas*: MUFAL 587, MZUFBA 852, 853, 854, 887, 889, 903, 1088, 1089, 1090, 1091, 1093, 1094, 10, 95, 1096, 1097, 1098, 1099, 1100, 1101, 1102, 1103, 1104, 1106, 1107, 1108, 1109, 1110, 1111, 1112, 1113, 1114, 1115, CHUFS 131, 132, 133, 134, 135, MZUSP 10848, 10849, 10850, 10851, 10852, 10853, 10854, 10855, 10856, 108547, 10858, 10859; BAHIA**:** *Água Fria*: MZUEFS 662; *Alagoado*: MZUSP 10033; *Alagoinhas*: IBSP 48675, 48676, 48795, 48832, 49952; *Barra*: MZUEFS 631, MZUFBA 1607, 1759, 1762, 1768, MZUSP 198, 10540; *Barreiras*: IBSP 9781, 50234, 50431, 50580, 50781; *Bom Jesus da Lapa*: IBSP 49730; *Brumado*: IBSP 33695, 40013; *Buritirama*: MZUSP 3618; *Campo Formoso*: IBSP 18413; *Candido Sales*: MZUSP 6456; *Casa Nova*: MZUEFS 570; *Curaça*: MZUEFS 781; *Elísio Medrado*: MZUEFS 1501; *Feira de Santana*: MZUEFS 2, 31, 202, 287, 387, 465, 468, 526, 550, 562, 592, 606, 623, 639, 714, 715, 723, 724, 725, 726, 794, 797, 807, 871, 995, 1120, 1122, 1143, 1145, 1150, 1164, 1166, 1211, 1212, 1253, 1577, 1621; *Glória*: ZUEC 631; *Guanambí*: IBSP 50105, 50617, 51277; *Igapora*: MZUEFS 1408; *Itiúba*: MZUEFS 1408, 5427, 5428, 5429, 5431; *Jacobina*: MZUFBA 888, MZUSP 7545; *Jaguararí*: IBSP 26410, 33306; *Jeremoabo*: MZUSP 5436; *Juazeiro*: IBSP 73996, 73997, 73998, 74525, MZUSP 1280, 1389, 1390, 1452, 1453, 1454, 1902; *Paulo Afonso*: IBSP 42493, MZUSP 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 334, 335; *Pilão Arcado*: MZUSP 10459; *Poções*: IBSP 28163, 28164, 28165, 67644, MZUFBA 1910, 1913, 1918, MZUSP 1561; *Retirolândia*: IBSP 55668; *Ruy Barbosa*: MZUEFS 1120; *Santo Inácio*: MZUSP 7808, 9598, 10455, 14046; *São Desidério*: MZUFBA 1641; *Serrolândia*: MZUEFS 856; *Tanquinho*: MZUEFS 61; *Teofilândia*: MZUEFS 297, 475; *Urandí*: IBSP 27124, 27209, 27637; CEARÁ**:** *Baturité*: IBSP 76854, MZUSP 3634; *Beberibe*: MPEG 17215; *Boa Viagem:* CHUFC 1249; *Caridade*: CHUFC 1214; *Caucaia*: CHUFC 1167; *Cedro*: CHUFC 1097; *Crateus*: CHUFC 2247, 2521; *Fortaleza*: CHUFC 1100, 1352, 1568, 1605, 1632, 2279, 2292, IBSP

20252, 20253; *Guaiúba*: CHUFC 1920, 1921; *Icó*: IBSP 20121; *Itapipoca*: CHUFC 2803, MZUSP 3639; *Itatira*: CHUFC 2303; *Jatí*: IBSP 76965; *Justiniano Serpa*: MZUSP 5311; *Limoeiro do Norte*: CHUFC 91, 103, 125, 289, 375, 376; *Maranguape*: CHUFC 1229, IBSP 19990; *Milagres*: IBSP 76964; *Pacajús*: MZUSP 5302; *Pentecoste*: CHUFC 714, 3007, 3008, 3048, 3050, 3085, 3086, 3087, 3088, 3113, 3139, 3143, 3144, 3171, 3173, 3193, 3194, 3195, 3196, 3197, 3198, 3212, 3213, 3343, 3344, 3345, 3367, 3368, 3369, 3386, 3387, 3388, 3389, 3506; *Quixadá*: CHUFC 722, IBSP 1458, MZUSP 7257; *Quixeramobim*: CHUFC 1096, IBSP 20144; *Santana do Carirí*: MZUSP 7438, 7439; *Santa Quitéria*: MPEG 172107; *São Luis do Curú*: CHUFC 2903; *Sobral*: IBSP 76083; *Ubajara*: IBSP 77083; MINAS GERAIS: *Porteirinha*: MZUFV 669, 918; PARAÍBA**:** *Campina Grande*: IBSP 9043, UFPB 259, 762; *Catingueira*: UFPB 38; *Coremas*: MZUSP 3412; *Gurinhém*: UFPB 2486; *Junco do Seridó*: IBSP 54936, MZUSP 5961; *Patos*: IBSP 33393, 33394, 33395, 33396, 33397, 33398; *São José de Espinharas*: MZUSP 5962; PERNAMBUCO**:** *Agrestina*: MZUSP 4973, 4974, 4975*; Belém de São Francisco*: UFPB 2375; *Brejo da Madre de Deus*: MPEG 19166; *Carnaubeira da Penha*: MZUSP 4981, 4986, 4987, 4988, 4989, 4990, 4991, 4992, 4993; *Exú*: MZUSP 5000, 6455, 6488, 6489, 6490, 6505. 6506, 6507, 6508, 6509, 6510, 6511, 6512, 6517, 6519, 6530, 6531, 6532, 6533, 6534, 6535, 6536, 6537, 6538, 6539, 6540, 6541, 6542, 6543, 6544, 6545, 6549, 6550, 6551, 6777, 6778, 6779, 6780, 6781, 6782, 6783, 6784, 6785, 6786, 6787, 6788, 6789, 6790, 6791, 6792, 6793, 6794, 6795, 6796, 6797, 6798, 6799, 6800, 6801, 6802, 6803, 6804, 6805, 6806, 6807, 6808, 6910, 6911, 6912, 6913, 6914, 6915, 6922, 6925, 6926, 6927, 6928, 6929, 6930, 6931, 7140, 7141, 7142, 7143, 7144, 7145, 7146, 7147, 7148, 7149, 7150, 7151, 8116, 8117, UFPB 479; *Floresta*: CHUFC 2273; *Pesqueira*: IBSP 1200, 1249, 1250; *Petrolândia*: IBSP 28100; *Petrolina*: MZUSP 15690; PIAUÍ: *Floriano*: MPEG 23482, 23483; *Parnaíba*: IBSP 49714, 49715; *Piracuruca*: CHUNB 61169, 61170, 61171, MPEG 22871; *São Raimundo Nonato*: IBSP 42534, ZUEC 1927, 2050; *Teresina*: IBSP 49811, 49812, 49813, 51031*; Valença do Piauí*: MZUSP 5827, 5828, 5829, 5830, 5831, 5832; RIO GRANDE DO NORTE: *Angicos*: IBSP 49019; *Guamaré*: IBSP 49995, 77358; *Maxaranguape*: MZUSP 5947, 5948, 5949, 5950; *Mossoró*: CHUFC 13, 215, IBSP 51032, 51033, 76083, 76084; *Presidente Juscelino*: MZUSP 5956; *Serra Negra do Norte*: CHBEZ 636, 637, 1084, 1099, 1100, 1101, 1102, 1103, 1126, 1127, 1128, 1129, 1216, 1217, CHUNB 30647, 30648, 30649; SERGIPE**:** *Canindé de São Francisco*: MUFAL 901, 905, 1317, 1318, 1319, 1320, 1321, 1322; *Itabaiana*: MZUSP 5445; *Lagarto*: IBSP 77898; *Poço Redondo*: CHUFS 87, 420; *Poço Verde*: IBSP 77897; *Porto da Folha*: CHUFS 373; *Propriá*: UFPB 3071. *Philodryas olfersii* – ALAGOAS**:** *Piranhas*: CHUFS 2627, 2629, MZUFBA 1184, 1185, 1186, MZUSP 10860, 10861; *Quebrângulo*: MZUSP 3452; *São Miguel dos Campos*: MNRJ 3944; BAHIA**:** *Alagoinhas*: IBSP 48648, 48649, 49984; *Caitité*: MNRJ 6671, 8713; *Coribe*: CHUNB 3631; *Elísio Medrado*: MZUEFS 765, 1036*; Feira de Santana*: MZUEFS 14, 26, 30, 85, 113, 118, 129, 238, 419, 438, 469, 481, 485, 501, 556, 577, 584, 590, 602, 605, 611, 618, 638, 704, 773, 807, 832, 834, 894, 899, 1068, 1099, 1153, 1179, 1234, 1237, 1239, 1254, 1326, 1372, 1444, 1508, 1518, 1520, 1579, 1583, 1616, 1620, 1626, 1643, 1644, MZUFBA 1944; *Ibiquera*: MPEG 18773; *Ipirá*: MZUEFS 576, 729, 1565; *Itabuna*: MZUSP 1277, 1278; *Itiúba*: MZUSP 5424, 5425; *Jeremoabo*: MZUSP 5437; *Lençóis*: MZUEFS 877; *Livramento do Brumado*: IBSP 29823; *Morro do Chapéu*: UFPB 2782; *Mundo Novo*: MZUEFS 271; *Paulo Afonso*: MZUFBA 82, 84, 85, 86, 87, 88, 89, 90, 92, 93, 94, 95, 96, 97, 312; *Poções*: IBSP 28173, 28174, 28175, 28176, 28177, 28178, MZUFBA 1913, 1914*; Porto*

Castro Alves: MZUFBA 1553; *Santa Bárbara*: MZUEFS 52, 225; *Santo Estevão*: MZUEFS 772; *São Desidério*: CHUNB 51136; *São Gonçalo dos Campos*: MZUEFS 8, 938; *Tanquinho*: MZUFBA 553; CEARÁ**:** *Barbalha*: MZUSP 7217, 7218, 7219, 7220, 7221, 7222, 7223, 7224; *Baturité*: MNRJ 8448, MZUSP 3631, 3635; *Beberibe*: MZUSP 5325; *Cariús*: IBSP 20003; *Caucaia*: CHUFC 1198, 1218, 2278; *Crateús*: CHUFC 716, 1972, 2253; *Crato*: CHUFC 2187; *Fortaleza*: CHUFC 715, 717, 721, 728, 735, 832, 1098, 1103, 1146, 1189, 1193, 1205, 1354, 1583, 1711, 1712, 1715, 1720, 1737, 1905, 1973, 1974, 1975, 1976, 2290, 2684, 2938, 3060, IBSP 19820, MNRJ 6485, 6487, 6490; *Guaiúba*: CHUFC 1203, 1918; *Guaramiranga*: CHUFC 1714, 2181; *Horizonte*: CHUFC 2288; *Icapuí*: CHUFC 2992; *Icó*: IBSP 12107; *Ipú*: UFPB 4024; *Itapipoca*: CHUFC 1709; *Juazeiro do Norte*: IBSP 20169, 20170; *Limoeiro do Norte*: CHUFC 38, 70, 237, 238, 240, 248, 251, 252, 253, 254, 300, 363, 497, 578, 589, 591, 592, 592, 1248; *Maranguape*: CHUFC 2082, 2235; *Mombaça*: CHUFC 126; *Pacatuba*: CHUFC 1196, 1708, 1718, MNRJ 6489; *Pacotí*: CHUFC 2125, 2126, 2576, 2835, 3292, MNRJ 11491; *Pentecoste*: CHUFC 3006, 3129, 3142, 3160, 3189, 3190, 3349, 3508, MPEG 17180; *Quixadá*: IBSP 14654; *Redenção*: CHUFC 1932; *Santana do Cariri*: MZUSP 7440, 7441, 7442, 7443, 7444, 7445; *São Benedito*: CHUFC 2807, 2811, 3295; *Sobral*: CHUFC 1192; *Ubajara*: CHUFC 3294, IBSP 77536; *Viçosa do Ceará*: IBSP 77535, 77537, 77538; MINAS GERAIS: *Porteirinha*: MZUFV 813, 830, 836; PARAÍBA**:** *Caiçara*: UFPB 2498; *Gurinhém*: MZUSP 8948, 8949, 8950, 9660, UFPB 3078; *Mamanguape*: MZUSP 3455; *Patos*: IBSP 33428; *Teixeira*: UFPB 2725; PERNAMBUCO**:** *Agrestina*: MZUSP 4924, 4926, 4927, 4932, 4933, 4934, 4935, 4936, 4937, 4938, 4939, 4949, 4941, 4943, 4944, 4945, 4947, 4956, 4957, 4948, 4959, 4960, 4961, 4962, 4963, 4964, 4966, 4967, 4968, 4969, 4971; *Belém de São Francisco*: UFPB 2371*; Brejo da Madre de Deus*: MPEG 19164; *Carnaubeira da Penha*: MZUSP 4999; *Exú*: MZUSP 6491, 6498, 6514, 6515, 6516, 6523, 6566, 6567, 6569, 6809, 6810, 6811, 6812, 6813, 6814, 6815, 6816, 6817, 6818, 6819, 6820, 6821, 6822, 6823, 6824, 6825, 6826, 6827, 6828, 6829, 6830, 6831, 6832, 6833, 6834, 6835, 6836, 6837, 6838, 6839, 6840, 6841, 6842, 6843, 6844, 6845, 6846, 6848, 6849, 6850, 6851, 6852, 6853, 6854, 6855, 6856, 6857, 6858, 6859, 6860, 6861, 6862, 6863, 6864, 6865, 6866, 6945, 6947, 6952, 7152, 7153, 7154, 7155, 7156, 7157, 7158, 7159, 7160, 7161, 7162, 7163, 7164, 7165, 7166, 7167, 7168, 7169, 7170, 7171, 7172, 7173, 7174; *Floresta*: ZUEC 624; *Serra Talhada*: UFPB 2773; PIAUÍ: *Avelino Lopes*: IBSP 42580; *Canto do Buriti*: ZUEC 652, 653; *Piracuruca*: MPEG 22888; *Piri-piri*: MNRJ 11357, 11358, MZUSP 3425, 3426, 3430, 3431, 3432, 3434, 3439, 3440, 3442, 3444, 3447; *Teresina*: CHUFC 1571, IBSP 1240; *Valença do Piauí*: MZUSP 5833, 5834, 5835, 5836, 5837, 5838, 5839, 5840, 5841; RIO GRANDE DO NORTE: *Mossoró*: CHUFC 137, 182, 202; *Presidente Juscelino*: MZUSP 5957; SERGIPE**:** *Campo do Brito*: MZUSP 11084; *Canindé de São Francisco*: MUFAL 1316; *Itabaiana*: MZUSP 11072*; Pedra Mole*: CHUFS 203; *Poço Redondo*: CHUFS 430; *Santo Amaro das Brotas*: MZUSP 6998; *Simão Dias*: MZUSP 15841. *Philodryas patagoniensis* – BAHIA**:** *Amélia Rodrigues*: MZUEFS 1413; *Feira de Santana*: MZUEFS 471, 892, 603, 594, 792, 804, 399, 8-6, 800, 409, 766, 1370, 810; *Morro do Chapéu*: MZUFBA 1659; *Palmeiras*: MZUFBA 1006; *Xique-xique*: MZUEFS 1062; MINAS GERAIS: *Jaíba*: FUNED 1466; RIO GRANDE DO NORTE: *Macaíba*: CHBEZ 772, 1104; *Mossoró*: CHUFC 130. SERGIPE**:** *Itabaiana*: MZUSP 15840; *Poço Verde*: IBSP 77895. *Phimophis chui* – BAHIA**:** *Gentil do Ouro*: MZFUBA 1729, 1745, MZUSP 10025, 10291, 10989, 13961. *Phimophis guerini* - BAHIA**.** *Caitité*: MNRJ 7538; *Elísio Medrado*: MZUEFS 1170; *Feira de Santana*: MZUEFS 230, 459, 889, 1026,

1652; *Jaborandí*: MNRJ 18657, 18658; *Mucugê*: MZUEFS 1229; PIAUÍ: *Castelo do Piauí:* MPEG 22748, 22780, 22792, 22795, 22797; *Piracuruca*: CHUNB 61151, 61152, 61153; *Teresina*: IBSP 478, 479. *Phimophis iglesiasi* – BAHIA: *Alagoado*: MZUSP 10034; *Barra*: MZUEFS 974, 982, 983, 984, 985; MINAS GERAIS: *Januária*: IBSP 43694; PERNAMBUCO**:** *Petrolina*: MZUSP 15594; PIAUÍ**:** *Regeneração*: IBSP 513; *Simplicio Mendes*: IBSP 42486. *Phimophis scritocirbatus* – BAHIA**:** *Barra*: MZUFBA 1730, 1731, 1732, 1733, 1734, 1735, 1736, 1737, 1738, 1739, 1746, 1747, 1748, 1749, 1750, 1751, 1752, 1753, 1754, 1755, 1756, 1757, 1758, 1759, 1760, 1761, MZUSP 9591, 9592, 10061, 10062, 10063, 10064, 10065, 10066, 10067; MZUSP 13962, 13963, 13964; *Pilão Arcado*: MZUSP 10292, 10293, 10548, 10549. *Pseudoboa nigra* – ALAGOAS**:** *Piranhas*: CHUFS 2377, 2962, 3154, MZUFBA 1169, 1170, 1172, 1428, MZUSP 10862; BAHIA: *Andaraí*: MZUEFS 878, MZUSP 10362; *Caitité*: MNRJ 7530, 7531, MZUFBA 2039; *Central*: MNRJ 7838; *Feira de Santana*: MZUEFS 233, 351, 352, 367, 376, 435, 440, 444, 446, 450, 506, 524, 553, 597, 598, 643, 660, 716, 732, 837, 850, 864, 912, 1166, 1242, 1500, 1502, 1651, 1677; *Ituberaba*: MZUEFS 1138; *Juazeiro*: MZUEFS 1130; *Lajedo do Tabocal*: MNRJ 15137; *Mucugê*: MZUEFS 1708*; Paulo Afonso*: MZUFBA 232, 234, 235, 236, 237, 238, 239, 240, 245; *Porto Castro Alves:* MZUFBA 280; *Prado*: MNRJ 6670, MZUFBA 1772; *Rodelas*: CHUFC 1740, MZUSP 14506; *São Gonçalo dos Campos*: MZUEFS 168, 1220; *Tanquinho*: MZUEFS 888; CEARÁ**:** *Caucaia*: CHUFC 1601, 2804; *Fortaleza*: CHUFC 1704, 1888, 1993; *Guaramiranga*: CHUFC 2372; *Ipú*: UFPB 4022; *Itagapé*: MNRJ 11325, 11326; *Jatí*: MNRJ 18492; *Limoeiro do Norte*: CHUFC 104, 217, 219, 368, 369, 527, 570, 579; *Maranguape*: CHUFC 2566; *Pacatuba*: CHUFC 723, 724; *Pentecoste*: CHUFC 3107, 3115, 3140, 3165, 3188; *Quixeramobim*: CHUFC 1174, MNRJ 16927; *Redenção*: MNRJ 16928; *Santa Quitéria*: CHUFC 1833; *Senador Pompeu*: UFPB 311; *Tamboril*: CHUFC 1567; *Tianguá*: CHUFC 3247; *Ubajara*: CHUFC 2400, ZUEC 3403; MINAS GERAIS: *Manga*: 2380; *Porteirinha*: MNRJ 7840, MZUFV 823, 831, 835, 844, 978; PARAÍBA**:** *Araruna*: UFPB 3669; *Cabaceiras*: MZUSP 8270, UFPB 919, 961; *Cacimba de Dentro*: UFPB 2733; *Congo*: MNRJ 8399; São *João do Carirí*: UFPB 4247; PERNAMBUCO**:** *Agrestina*: MZUSP 4949; *Exú*: MZUSP 6494, 6495, 6496, 6497, 6867, 6868, 6869, 6916, 6917, 7175, 7176; *Surubim*: MZUSP 9323; PIAUÍ: *Piracuruca*: CHUNB 61154, 61155, 61156, MPEG 22892, 22893, 22894, 22895; RIO GRANDE DO NORTE**:** *Mossoró*: CHUFC 201; *Serra Negra do Norte*: CHBEZ 514, 515, 867, 1250, 2432; SERGIPE**:** *Canindé de São Francisco*: MUFAL 1323, 1324; *Poço Redondo*: CHUFS 361; *Propriá*: MZUFBA 1571. *Psomophis joberti* – BAHIA**:** *Barreiras*: MZUFV 767; *Feira de Santana*: MZUEFS 27, 28, 29, 410, 432, 436, 502, 683, 687, 709, 710, 791, 799, 805, 905, 993, 1197, 1199, 1301, 1318, 1503, 1575; CEARÁ**:** *Aquiraz*: CHUFC 1894; *Barbalha*: MZUSP 7225; *Caucaia*: CHUFC 934; *Fortaleza*: CHUFC 913, 1956, 1957, 2304, MNRJ 1956, 1957, MPEG 18217; *Limoeiro do Norte*: CHUFC 275, 284, 285, 286, 287, 288, 370, 371, 372, 373, 916; *Pentecoste*: CHUFC 3156, 3157; *São Gonçalo do Amarante*: CHUFC 2519; *Ubajara*: CHUFC 2172; PARAÍBA: *Gurinhém*: MZUSP 8944; PIAUÍ**:** *Floriano*: MPEG 23473; *Piracuruca*: CHUNB 61139, 61140, MPEG 22865, 22866; *Piri-piri*: MNRJ 11355, 11363. *Sibon nebulata* – CEARÁ**:** *Guaramiranga*: CHUFC 1347, 1350, 1379, 1380, 1383, 1516, 1517, 1518, 1519, 1520, 2009, 2374; *Ibiapina*: CHUFC 2124, 2138, 2139, 2140; *Maranguape*: CHUFC 3287; *Pacatuba*: CHUFC 2231; *Pacotí*: CHUFC 2175, 2237, 2440, 2459, 2460, 2479, 2606, 2608, 2618, 2621, 2679, 2780, 2836, 2837, 2838; *São Benedito*: CHUFC 2602. *Sibynomorphus mikanii* – BAHIA**:** *Poções*:

MZUFBA 1847, 1850; *Teofilândia*: MZUEFS 1680; CEARÁ**:** *Barbalha*: MZUSP 7626. MINAS GERAIS: *Porteirinha*: MZUFV 834. *Sibynomorphus neuwiedi* – BAHIA: *Ibicoara*: MZUFBA 1290; *Jacobina*: MZUFBA 902; PARAÍBA**:** *Areia*: UFPB 494. *Sibynomorphus* sp. – BAHIA: Lençóis: MZUFBA 800. *Siphlophis compressus* – CEARÁ**:** *Fortaleza*: IBSP 20295; SERGIPE**:** *Itabaiana*: IBSP 77894. *Taeniophallus affinis* – BAHIA: *Elísio Medrado*: MZUEFS 768; *Vitória da Conquista*: MNRJ 6465; CEARÁ**:** *Pacatuba*: MZUSP 9099; *Ubajara*: CHUFC 3262, 3264, 26944. *Taeniophallus occipitalis* – BAHIA: *Camaçarí*: MCT 18119; *Feira de Santana*: MZUEFS 614; *Jaborandí*: MNRJ 18635; *Lençóis*: MZUEFS 881; *Morro do Chapéu*: MNRJ 12499, MZUFBA 1656; *Mucugê*: MCT 18118; *Poções*: MZUFBA 1849; CEARÁ**:** *Fortaleza*: IBSP 19997, 20626, 20629; *Horizonte*: CHUFC 2878; *Meruoca*: CHUFC 2738; *Mulungú*: CHUFC 2594, 2595; *Pacotí*: CHUFC 3263; *Ubajara*: IBSP 76852, 77508, ZUEC 3405; PERNAMBUCO**:** *São Caitano*: UFPB 2453; PIAUÍ: *Avelino Lopes*: IBSP 54455; *Piracuruca*: CHUNB 61158, MPEG 22868; *Teresina*: IBSP 569; SERGIPE**:** *Itabaiana*: CHUFS 239, 529. *Thamnodynastes almae* – ALAGOAS**:** *Piranhas*: MZUFBA 847; BAHIA**:** *Itiúba*: MZUSP 5433, 5434; *Paulo Afonso*: MZUFBA 120, 121, 122, 123, 124, 125, 128, 129, 130, 131, 132, 133, 134, 135, 136, 138, 139; CEARÁ**:** *Milagres*: IBSP 76969; *Picuí*: CHUFC 1672; PARAÍBA**:** *Cabaceiras*: UFPB 4263; PERNAMBUCO**:** *Cabrobó*: MZUFBA 1904; *Petrolândia*: IBSP 52119, 53830. *Thamnodynastes* cf. *nattereri* – BAHIA**:** *Miguel Calmon*: MZUFBA 1798. *Thamnodynastes hypoconia* – BAHIA**:** *Palmeiras*: IBSP 71160; *Poções*: IBSP 28195; *Santo Amaro*: IBSP 75159; MINAS GERAIS**:** *São João do Paraíso:* MCNR 2878; PIAUÍ: *Parnaíba*: IBSP 77545, 77543, 77542, 77160, 77544; *Piracuruca*: CHUNB 61133, 61134, 61135, 61137. *Thamnodynastes pallidus* – ALAGOAS**:** *Mangabeiras*: MZUSP 3499; *Teotônio Vilella*: MUFAL 7161; BAHIA**:** *Elísio Medrado*: MZUEFS 1173; *Ibicoara*: MZUFBA 1292; PERNAMBUCO**:** *Vicência*: MZUSP 5004; SERGIPE: *Itabaiana*: CHUFS 169, 119, 426. *Thamnodynastes sertanejo* – BAHIA: *Barra*: CHUNB 57264; *Coribe*: CHUNB 3838; *Paulo Afonso*: MZUFBA 38, 39, 40, 41, 42, 43, 44, 45, 47, 48, 49, 50, 100, 101, 102, 103, 104, 140, 141; MINAS GERAIS: *Jaíba*: MNRJ 8048, 8583; PARAÍBA**:** *Boa Vista*: UFPB 4262; PERNAMBUCO**:** *Cabrobó*: MZUFBA 1907; *Exú*: MZUSP 7180, 7181; *Petrolândia*: CHUFC 1503, 1504, 1508, 1509, 1512, 1514, 1557, IBSP 52121, IVB 593. *Thamnodynastes* sp. – ALAGOAS**:** *Piranhas*: CHUFS 1695, 1696, 1736, 2302, 2947, FUNED 856, 858, 859, 860, 861, 862, 863, 864, 866, 868, 869, 870, 871, 872, 873, MZUFBA 840, 841, 842, 843, 844, 846, 848, 1116, 1117, 1118, 1119, 1120, 1121, 1122, 1123, 1124, 1125, 1126, 1127, 1128, 1129, 1130, 1131, 1132, 1133, 1134, MZUSP 10863, 10864, 10865, 10866, 10867, 10868, 10869, 10870, 10871, 10872, 10873, 10874, 10875, 10876, 10877, 10878, 10879, 10880, 10890, 13342, 13343, 13344, 13345, 13346, 13347, 13349, 13350, 13351, 13352, 13353, 13354, 13355, 13356, 13357, 13358, 13359, 13361, 13362; BAHIA: *Alagoado*: MZUSP 10462, 10538; *Barra*: MZUEFS 979; *Barreiras*: IBSP 50706, MNRJ 2620; *Campo Formoso*: IBSP 31328; *Capim Grosso*: MZUEFS 835; *Cocorobó*: MZUSP 5430; *Curaçá*: IBSP 43061, 43063, 43065, 43106; *Feira de Santana*: MZUEFS 801, 909, 1381, 1654; *Guanambí*: IBSP 50102, 50168, 70459; *Juazeiro*: IBSP 37461, 37597, 48941, 51719, MZUEFS 1281; *Lençóis*: MZUFBA 830; *Morro do Chapéu*: MZUSP 8957; *Mucugê*: MZUSP 8956, 10466; *Palmeiras*: MZUEFS 1263; *Paulo Afonso*: MZUFBA 105, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 126, 137, 366; *Poções*: IBSP 28143, MZUFBA 1556, 1557, 1573; *Rio de Contas*: MNRJ 15102; *Santa Bárbara*: MZUEFS 507; *Tanquinho*: MZUEFS 60; *Várzea da*

Roça: MZUFBA 1936; CEARÁ**:** *Canindé*: CHUFC 2859; *Crateús*: CHUFC 2239; *Fortaleza*: CHUFC 1515; *Independência*: CHUFC 1931; *Itapipoca*: CHUFC 1909; *Limoeiro do Norte*: CHUFC 14, 33, 43, 79, 83, 94, 224, 234, 277, 290, 291, 292, 294, 296, 298, 299, 322, 323, 324, 325, 327, 566, 586, 590, IBSP 12773, 12774; *Milagres*: MNRJ 18494; *Tabuleiro do Norte*: CHUFC 206; MINAS GERAIS: *Jaíba*: FUNED 906, MZUFV 745; PARAÍBA**:** *Boa Vista*: UFPB 1986, 2067; *Cabaceiras*: UFPB 763, 917, 918; *Patos*: IBSP 33401; *Queimadas*: MZUSP 10460, 10775, 10776, 10777, 10778, 10779, 10780, 10781, 10961; *Sousa*: MNRJ 1954, 1955; PERNAMBUCO**:** *Carnaubeira da Penha*: MZUSP 4985; *Exú*: CHUNB 13765, MZUSP 6513, 6870, 7179; *Petrolina*: CHUNB 3840, IBSP 48317, 48320, 48322; PIAUÍ**:** *Piracuruca*: CHUNB 61176, 61177; *Valença do Piauí*: MZUSP 5843, 5844, 5845; RIO GRANDE DO NORTE: *Caraúbas*: CHUFC 326; *Guamaré*: IBSP 44508; *Mossoró*: CHUFC 6, 57, 109, 110, 297; *Serra Negra do Norte*: CHBEZ 1338; SERGIPE**:** *Poço Redondo*: CHUFS 410, 473, 528; *Porto da Folha*: CHUFS 374. *Tropidodryas striaticeps* – BAHIA**:** *Feira de Santana*: MZUEFS 1168; MINAS GERAIS: *Sossego*: IBSP 45930, 45939, 45943. *Xenodon merremi* – ALAGOAS**:** *Mangabeiras*: MZUSP 3517; *Piranhas*: MZUFBA 1159; *Quebrângulo*: MZUFBA 393; *Pedra Talhada*: MZUFBA 618; BAHIA**:** *Abaré*: MNRJ 13143; *Água Fria*: MZUEFS 663; *Alagoinhas*: IBSP 48639, 48640, 48641, 48642, 48643, 48644, 48645, 48646, 48647, 48677, 48678, 48679, 48680, 48681, 48682, 48683, 48684, 48685, 48686, 48687, 48688, 48689, 48690, 48801, 48805, 48817, 48822, 48826, 48827, 48828, 48829, 48830, 48834, 48858, 48859, 48915, 48916, 48917, 48918, 48919, 48920, 48921, 48922, 48923, 48925, 48926, 51739, 51740, 51741, 51742, 51743, 51744, 51745, 51746, 51747, 51819, 51821, 53377, 53378, MZUEFS 557, 636, 658, 1723; *Amélia Rodrigues*: MZUEFS 619, 642; *Andaraí*: MZUSP 10634; *Antônio Cardoso*: MZUEFS 1435; *Barra*: MNRJ 8189; MZUFBA 1763, 1764, 1765, MZUSP 10068, 10069, 10070, 10071, 10072, 3679, 3680; *Barreiras*: IBSP 49758, 49763, 49764, 50235, 50380, 50433, 50434, 50782, MNRJ 2506; *Bom Jesus da Lapa*: MNRJ 2509; *Brumado*: IBSP 32177, 32317, 32321, 33154, 33276, 33277, 34122, 34124, 40284, 42750, 42751, 42753, 42754, 48584, 49863, 51730, 51731; *Caitité*: MNRJ 7540, 8195, 8709, 8710, MZUFBA 725; *Capim Grosso:* MZUEFS 88; *Conde*: MNRJ 8190, 8191, 8192, 8193, 8194, 8196; *Elísio Medrado*: MZUEFS 1194; *Esplanada*: IBSP 48339, 48340, 48344, 48345, 48354, 48355, 48356, 48357, 48360, 48361, 48362, 48365, 49254; *Feira de Santana*: IBSP 37466, 37467, 37468, 37469, 37470, 37559, 37562, 41301, 41303, 41305, 41311, 41312, 41314, 41316, 41318, 41322, 41486, 41488, 41490, 41490, 41492, 41494, 41877, 41881, 41885, MZUEFS 20, 22, 23, 24, 44, 91, 111, 141, 176, 201, 217, 246, 278, 303, 312, 329, 339, 374, 412, 428, 597, 678, 789, 886, 893, 918, 948, 949, 989, 990, 994, 1086, 1202, 1268, 1275, 1314, 1315, 1321, 1335, 1336, 1337, 1368, 1371, 1378, 1383, 1512, 1581, 1582, 1588, 1601, 1615, 1630, 1631, 1632, 1633, 1675, 1709, 1716; *Guanambí*: IBSP 50358, 50359, 50360, 50620, 51318, 51737, 51738, 53380, 64155; *Ibicoara*: MZUFBA 1291; *Ibiquera*: MPEG 18771, MZUEFS 302; *Ipirá*: MZUFBA 560; *Iramaia*: IBSP 43104; *Irará*: MZUFBA 297; *Itaberaba*: IBSP 1449; *Itiúba*: IBSP 1778, 1779; *Jacobina*: MZUSP 7547, 7548, 7549, 7550, 7551, 7552; *Jaguaraí*: IBSP 26666, 26667, 33537, 33538; *Jequié*: IBSP 30399, 30674, 30675; *Juazeiro*: IBSP 48090, MZUEFS 1284, 1457; *Lençóis*: MZUFBA 797; *Macajuba*: MZUEFS 21, 604, 664, 665; *Maracás*: IBSP 26480; *Miguel Calmon*: IBSP 26541; *Mucugê*: IBSP 72602, MZUSP 8024, 8025, 8026; *Mundo Novo*: MZUEFS 36, 139, 153; *Pilão Arcado*: MZUEFS 445; *Poções*: IBSP 27323, 28179, 28180, 28181, 28182, 28183, 28184, 28185, 28186, 28187, 28188, 28189, 67642, MZUFBA 1531, 1550, 1551, 1854, 1924; *Remanso*:

IBSP 29719, 28720; *Riachão de Jacuípe*: MZUEFS 1108; *Rio de Contas*: MZUFBA 1370; *Rodelas*: UFPB 2362; *Ruy Barbosa*: IBSP 26215, 45941; *Santa Bárbara:* MZUEFS 171, 1566, 1568; *Santa Rita de Cássia:* MZUSP 3678; *Santa Teresinha*: MZUEFS 38, 45, 151, 154; *Santo Amaro*: IBSP 75165; *Santo Estevão*: MZUEFS 1610; *São Desidério*: IBSP 54908; *São Gonçalo dos Campos*: MZUEFS 1022, 1024, 33, 247, 248, 249, 250, 267, 368, 890; *Serrinha*: MZUFBA 1666; *Tanquinho*: MZUEFS 56, 59, 473, 1243, 1509, 1522; *Teofilândia*: MZUEFS 158, 324, 1028; *Urandi*: IBSP 27536, 27537; *Vila Nova*: MZUSP 1017; *Xique-xique*: IBSP 40291, 40294, 40298, 40387, 54432; CEARÁ: *Aquiraz*: CHUFC 1594; *Araiçoaba*: CHUFC 1595, 1729, IBSP 30442, 30443; *Barbalha*: MZUSP 7248, 7249, 7250, 7251; *Baturité*: CHUFC 1157; *Beberibe*: MZUSP 5328, 5330, 5331, 5332, 5333, 5334, 5335, 5336, 5340; *Cascavel*: CHUFC 1705; *Caicaia*: CHUFC 1145, 1195, 1613, 1646, 1703, 1723, 1725, 1727, 1728, 2880; *Crato*: IBSP 49146, 49176, 51435; *Fortaleza*: CHUFC 766, 782, 896, 902, 924, 1129, 1726, 1822, 1868, 1874, IBSP 19687, 19816, 20249, 20250, MNRJ 1965; *Guaiúba*: MPEG 17205; *Guaramiranga*: CHUFC 1596, 1700; *Horizonte*: CHUFC 1617; *Ibiapina*: CHUFC 1619, 2494; *Icapuí*: CHUFC 1593; *Icó*: IBSP 20123; *Itapipoca*: CHUFC 2920; *Itatira*: CHUFC 1981; *Juazeiro do Norte*: IBSP 20166, 20168, 48808; *Justiniano Serpa*: MZUSP 5305, 5306, 5312; *Lavras da Mangabeira*: IBSP 20127; *Maranguape*: CHUFC 841, 1598, 2373, 2567, 3313; *Meruoca*: CHUFC 2012; *Milagres*: IBSP 76986; *Mombaça*: CHUFC 63; *Monsenhor Tabosa*: CHUFC 1241; *Mulungú*: CHUFC 2450, 2498, 3235, 3237, 3238, 3240; *Pacajús*: CHUFC 2866, 5296, 5297, 5298; *Pacatuba*: CHUFC 2232; *Pacotí*: CHUFC 2387, 2390, 2584, 2817; *Paracuru*: MPEG 17179; *Paraipaba*: CHUFC 729; *Pentecoste*: CHUFC 3089, 3090; *Quixadá*: CHUFC 1911; *Santana do Cariri*: MZUSP 7446; *São Benedito*: CHUFC 2150, 2277, 2435, 2467, 2485, 2486, 2810, 2812, 2813, 2814, 2816, 3241, 3278, 3279; *São Gonçalo do Amarante*: CHUFC 3353; *Tianguá*: CHUFC 3250, 3251, 3252, 3254, 3255, 3276; *Ubajara*: CHUFC 2116, 2134, 2173, 2456, 2492, 2493, 2496, 2497, 3233, 3234, 3236, 3242, 3243, 3244, 3245, IBSP 77066, 77533, 77534; MINAS GERAIS: *Jaíba*: FUNED 589; *Porteirinha*: FUNED 270, 279, MZUFV 956, 975, 976; PARAÍBA**:** *Alagoa Grande*: MZUSP 8910; *Areia*: CHBEZ 1390, MZUSP 8902, 8903, 8907, UFPB 487, 488, 489; *Bananeiras*: MZUSP 8940; *Caiçara*: MZUSP 9020; *Campina Grande*: IBSP 9059, 30441, 51823; *Coremas*: MZUSP 3518; *Gurinhém*: MZUSP 8951, 9661, 9662, 9663, UFPB 19, 29, 2438, 2485; *Junco do Seridó*: MZUSP 5959, 5960; *Lagoa Seca*: IBSP 53386, 53387, 53388; *Patos*: IBSP 33749, *Prata*: UFPB 149; PERNAMBUCO**:** *Afrânio*: IBSP 28629, 28630, 31219; *Exú*: MZUSP 6572, 6573, 6574, 6871, 6872, 6873, 6874, 6875, 6876, 6877, 6878, 6879, 6880, 6881, 6882, 6883, 6884, 6885, 6886, 6887, 6888, 6889, 6890, 6891, 6892, 6893, 6894, 6895, 6896, 6897, 6898, 6899, 6900, 6935, 6936, 6937, 6938, 7182, 7183, 7184, 7185, 7186, 7187, 7188; *Pesqueira*: IBSP 41511, 42149, 42159; PIAUÍ**:** *Avelino Lopes*: IBSP 42441; *Cristalândia do Piauí*: IBSP 42440; *Floriano*: MPEG 23475; *Parnaguá*: IBSP 284, 2592; *Parnaíba*: IBSP 17230, 49593, 49594, 49658, 49659, 49660, 49661, 49717, 49718, 49814, 51436, 51733; *Piracuruca*: CHUNB 61173, MPEG 22874, 22875, 22876, 22877, 22887; *São Raimundo Nonato*: IBSP 42630, 42631, 42632, ZUEC 1924, 1925; *Terezina*: IBSP 46847, 48748, 48749, 48818, 49815, 49819, 49830, 49831, 51732, 53389; *Valença do Piauí*: MZUSP 5846, 5847, 5848, 5849, 5850, 5851, 5852; RIO GRANDE DO NORTE: *Pedro Velho:* IBSP 48559, 48560, 48562, 48563, 48564, 48565, 48707, 48708; *São Gonçalo do Amarante*: IBSP 20001, 37552, 37568, 37572, 37580; *Serrinha*: UFPB 2760; SERGIPE**:** *Campo do Brito*: MZUSP 11081; *Simão Dias*: MUFAL 1654. *Xenopholis undulatus* –

ALAGOAS: *Coruripe*: MUFAL 6488; CEARÁ**:** *Tianguá*: CHUFC 3031; *Ubajara*: CHUFC 3030; PARAÍBA**:** *Areia*: MZUSP 9100.

VIPERIDAE - *Bothrops erythromelas* – ALAGOAS**:** *Olho D'Água do Casado*: MUFAL 907, 908; *Piranhas*: CHUFS 526, 729, MUFAL 1339, MZUFBA 994, MZUSP 10881; BAHIA: Alagoado: MZUSP 10464, 10539, 14048; *Barra*: MZUFBA 1889, 1890, 1891, MZUSP 10073; *Barreiras*: IBSP 49635, 51554, 51690; *Bom Jesus da Lapa*: MNRJ 3066, 3067, 3068; *Boquira*: IBSP 43947, 44639; *Brotas de Macaúbas*: IBSP 44673; *Brumado*: IBSP 16161, 16162, 16163, 31530, 31612, 31613, 31614, 33153, 33799, 33881, 40315, 40410, 40657, 40909, 40911, 40928, 41103, 41143, 41155, 41372, 42890, 42926, 42956, 42958, 43125, 44405, 44409, 44457, 45078, 45157, 45876, 45880, 45999, 46063, 46087, 46097, 46137, 46370, 46523, 47595, 49474, 50172, 50331, 50397, 50940, 51326, 51464, 51465, 51529, 52023, 52030, 52778, 54503, 55069, MZUFBA 1888; *Caitité*: MNRJ 7527, 7528, 9074; *Curaçá*: IBSP 43878; *Feira de Santana*: IBSP 50173*; Gentio do Ouro*: MZUSP 14047; *Guanambí*: IBSP 49607, 49610, 49633, 50333, 50334, 50335, 50336, 50337, 50484, 50506, 50509, 50526, 50529, 50530, 50575, 50581, 50582, 50598, 50626, 50628, 50629, 50673, 50678, 50681, 50705, 50779, 50836, 50846, 50847, 50907, 50908, 50909, 50939, 50941, 50947, 50948, 50949, 50950, 50951, 50958, 50972, 51122, 51123, 51253, 51316, 51328, 51415, 51521, 51522, 51523, 51524, 51525, 51526, 51527, 51528, 51530, 51691, 51693, 51694, 51935, 51936, 51937, 52035, 52036, 52037, 52157, 52280, 52375, 52420, 52421, 52757, 52795, 52796, 52797, 52798, 52799, 52981, 52985, 53195, 53215, 53216, 53241, 53321, 53337, 53360, 53591, 53614, 53776, 53879, 53880, 53881, 53914, 53915, 53916, 55096, 55540, 55541, 55542, 56553, 59092, 59391; *Itaparica*: IBSP 52034; *Jacobina*: MZUSP 7553; *Jaguararí*: IBSP 26167, 26402, 26473, 26474, 26513, 26676, 26782, 26801, 26893, 26960, 27287, 27444, 27606, 33521, 33598, 34340, 37522, 40025, 40032, 40096, 40110, 40364, 45690, 45693, 45695, 45726, 45726, MPEG 10381; *Juazeiro*: IBSP 40212, 40922, 42653, 45805, 46748, 48936, 48970, 49475, 49527, 49860, 49861, 51336, 51430, 51466, 52156, MZUFBA 1902; *Lagoa Real*: IBSP 51017; *Maracás*: IBSP 60518, 60519, 60520, 60521, 60522, 60523; *Morpara*: MZUSP 15691; *Mucugê*: IBSP 67672; *Palmeiras*: MZUFBA 1822; *Paulo Afonso*: IBSP 46062, MZUFBA 51, 52, 53, 54, 55, 56, 57, 58, 59, 98, 340, 361; *Pilão Arcado*: MZUSP 10550; *Poções*: IBSP 28220, MZUFBA 1581, 1582, 1583, 1584, 1585, 1586; *Rio de Contas*: MZUFBA 1372; *Rodelas*: CHUFC 1564, IVB 884; *Sebastião Laranjeiras*: CHUNB 3986; *Urandí*: IBSP 27119; *Xique-xique*: IBSP 40004, 40340; CEARÁ**:** *Aquiraz*: CHUFC 2614, 2986; *Fortaleza*: IBSP 50892, 51627; *Icapuí*: CHUFC 2945, 2985, IBSP 53833, 53887, 53888, 53900, 55017; *Icó*: IBSP 20183; *Independência*: MPEG 17218; *Jaguaribara*: CHUFC 2734; *Limoeiro do Norte*: CHUFC 17, 56, 93, 196, 200, 231, 241, 242, 243, 260, 261, 262, 364, 684, 685, 687, 688, 689, 690, 704; *Milagres*: MNRJ 18486; *Pacatuba*: CHUFC 725; *Quixadá*: IBSP 1509; *Quixeramobim*: IBSP 20149, 20150, MNRJ 16925; *Solonópole*: IBSP 50519, 51689, 52850, 52853; *Viçosa do Ceará*: CHUFC 2603; PARAÍBA**:** *Boa Vista*: UFPB 4261; *Cabaceiras*: MZUSP 8937; *Campina Grande:* IBSP 9045, 50150, 50151, 50152, 50153, 50154, 50155, 50156, 50157, 50158, 50631, 51687, 51762, 53359; *Coremas*: MZUSP 3550, 3551, 3552; *Patos*: IBSP 33410, 33411, 33412, 33731, 33732, 33733, 33734, 33735, 33736, 33737, 33807, 33808, 33809, MZUSP 7282; *São João do Cariri*: UFPB 2426, 3792, 4299; *São José de Espinharas*: IBSP 33810; *Serra Branca*: IBSP

9044; PERNAMBUCO**:** *Afrânio*: IBSP 31790, 33011, 33028, 33620, 50616, 50729, 51327, 51692; *Petrolândia*: IBSP 51688, 52022, 52829; *Petrolina*: CHUNB 3991, IBSP 28833, 29263, 32488, 46068, 48368, 50527, 50583, 50690, 51624; PIAUÍ: *São Raimundo Nonato*: IBSP 45065, 46070; *Simplício Mende*s: IBSP 44635; RIO GRANDE DO NORTE: *Angicos*: IBSP 50537; *Apodi*: CHUFC 214; *Caicó*: IBSP 50869, 51413, 53016; *Lajes*: IBSP 32409, 32478; *Mossoró*: CHUFC 1, 244, 245, 816, IBSP 50693, 50946, 50964, MNRJ 12583; *Pendências*: IBSP 10133, 10134; *Serra Negra do Norte*: CHBEZ 615, 667, 1175; SERGIPE: *Brejo Grande*: MNRJ 4443; *Poço Redondo*: CHUFS 211. *Bothrops leucurus* - ALAGOAS: *Mangabeiras*: MZUSP 2945, 2946; BAHIA**:** *Alagoinhas*: MZUFBA 897; *Anagé*: MZUFBA 1496; *Jacobina*: MZUFBA 877, 894; *Mucugê*: MZUSP 8599; *Poções*: MZUFBA 1386; PERNAMBUCO**:** *Caruarú*: MZUFBA 1214; SERGIPE**:** *Campo do Brito*: MZUSP 11079. *Bothrops lutzi* – BAHIA: *Barreiras*: IBSP 49634, 51553, 51686; *Jaborandí*: MNRJ 1633, 18634; *São Desidério*: IBSP 55674; CEARÁ**:** *Crateús*: CHUFC 2249, 2250, 2251, 2252, 2268; *Tianguá*: ZUEC 3373, 3374, 3375, 3376; PERNAMBUCO**:** *Petrolina*: IBSP 49804; PIAUÍ**:** *São Raimundo Nonato*: MZUSP 12842; *Uruçuí*: IBSP 59499. *Bothrops moojeni* – BAHIA: *Buritirama*: MZUSP 3662, 3663; *Santa Rita de Cássia*: MZUSP 3661, 3665; CEARÁ: *Crato*: MZUSP 6501. *Bothrops neuwiedi* – BAHIA: *Anagé*: MZUFBA 1927; *Barreiras*: CHUNB 6634, IBSP 51553; *Jaborandí*: CHUNB 51133; *Urandí*: IBSP 25320; MINAS GERAIS: *Porteirinha*: MZUFV 977. *Bothrops* sp. – CEARÁ**:** *Crato*: MNRJ 3942, 3943; *Limoeiro do Norte*: CHUFC 460; *Madalena*: CHUFC 1289; *São Benedito*: CHUFC 2883; *Ubajara*: CHUFC 2917, 2944, 2901. *Crotalus durissus* – ALAGOAS**:** *Piranhas*: MZUFBA 1012, 1529, MUFAL 1340; BAHIA**:** *Abaré*: IBSP 50338, 50503, 50506, 51204, 51219, 52887, 52888; *Alagoinhas*: IBSP 50911; *Barra*: MZUSP 10074, 10075, 10076, 10077, 10078; *Barreiras*: CHUNB 5872, 5873, 5874, 5875, 5876, 5877, 5878, 6063, IBSP 50482, 50736, 54525, 55080, 55153, 55154, 55173, 55174, 55230, 55231, 55232, 55233, 55234; *Bom Jesus da Lapa*: IBSP 50112, 50113, 50494, 51130, 51213, 58765; *Boquira*: IBSP 43668, 50965, 51207; *Brumado*: IBSP 31659, 33064, 34001, 34103, 34166, 40286, 43603, 45890, 46049, 50111, 50115, 51212, 51226, 51763, 51791, 52278; *Caitité*: IBSP 59403; *Casa Nova*: IBSP 29907, 29911, 29912, 30065, 30545, 31620, 31876, 31877, 32384, 32648, 32906, 55016; *Conceição do Coité*: IBSP 28468, 28469; *Curaçá*: IBSP 43193, 48975; *Esplanada*: IBSP 51513, MZUFBA 907; *Feira de Santana*: IBSP 54837, MZUFBA 781, 783; *Gentio do Ouro*: MZUSP 14501; *Glória*: IBSP 52976, 53173, ZUEC 610; *Guanambí*: IBSP 17201, 47327, 48582, 49122, 50108, 50339, 50391, 50577, 50704, 50737, 50977, 50994, 51201, 51512, 51515, 51519, 51538, 52385, 52790, 52869, 53333, 53355, 53692, 56837, 64040, 64041, 64152, 64192, 64788, 64800, 64801; *Ibicoara*: MZUFBA 808; *Ibiquera*: IBSP 54871, 54952, MZUFBA 1013; *Iramaia*: IBSP 42692, 43099, 43203; *Irecê*: IBSP 33762, 33879, 33880; *Itaberaba*: MZUFBA 779; *Jaborandí*: MNRJ 18659, 18775; *Jacarací*: IBSP 22983; *Jaguararí*: IBSP 23400, 26201, 26202; *Juazeiro*: IBSP 46584, 49528, 50110, 51419, 51635, 51794, 52884; *Lajedinho*: IBSP 50639, 50641, IVB 1667, 1669, 1674, 1677, 1678, 1679, 1706, 1763, 1767, MZUFBA 1011; *Lapão*: IBSP 55270, 55271, 55272, 55621; *Mairi*: IBSP 53335; *Maracas*: IBSP 27901, 27902, 30334; *Marcionílio Dias*: IBSP 29880; *Marcionílio Sousa*: IBSP 26185, 26194, 26195; *Miguel Calmon*: IBSP 27530; *Milagres*: IBSP 40084; *Morro do Chapéu*: MZUSP 10457; *Paulo Afonso*: IBSP 44356, 44442, MZUFBA 1, 2, 3, 4, 771, 1015; *Pilão Arcado*: IBSP 6545; *Poções*: MZUFBA 1601; *Remanso*: IBSP 27428, 27605, 30109; *Riachão do Jacuípe*: IBSP 29966; *Ribeira do Pombal*: IBSP 49341, 50637; *Ruy*

Barbosa: IBSP 25310, 26062, 26063, 26064, 26065, 26066, 26067, 26068, 26069, 26292, 29129, 32377; *Santa Teresinha*: MZUFBA 780; *Santo Amaro*: IBSP 51518; *Santo Inácio*: MZUSP 10026, 10456, 10546; *São Desidério*: IBSP 54650, 55114, 55258, 55281; *Urandí*: IBSP 13593, 13594, 13595, 13596, 13597, 13598, 13599, 13600, 13601, 13602, 13603, 13604, 13605, 13606, 13607, 13608, 13609, 13610, 32337; *Xique-xique*: IBSP 40292; CEARÁ**:** *Boa Viagem*: CHUFC 1979; *Crateús*: CHUFC 2259, IBSP 50834, 50995; *Fortaleza*: IBSP 51417; *Jaguaribe*: IBSP 17218; *Quixadá*: IBSP 1468, 1479, 1516, 1520, 1522, 1523, 1531, 1533; *São Luis do Curú*: CHUFC 1384, IBSP 19994; *Solonópole*: IBSP 51205, 51943; MARANHÃO**:** *Parnarama*: IBSP 54540; MINAS GERAIS**:** *Porteirinha*: MCNR 3652; PARAÍBA**:** *Aroeiras*: IBSP 51516, 51942; *Campina Grande*: IBSP 53425, MNRJ 17073; *Passagem*: IBSP 33805; *Patos*: IBSP 33738, 33739, 33740, 33741, 33801, 33806; *São José de Espinharas*: IBSP 33802, 33803, 33804; PERNAMBUCO**:** *Afrânio*: IBSP 28623, 28780, 28787, 28856, 31179, 32328, 50221, 50323, 50328, 50330, 50332, 50351, 50352, 50353, 50402, 50513, 50688, 50694, 50938, 50966, 50993, 51131, 51202, 51210, 51211, 51214, 51215, 51216, 51221, 51225, 51227, 52769, 52770; *Bezerros*: UFPB 3550, 3551*; Carnaubeira da Penha*: MZUSP 4978, 4984, 5003; *Custódia*: IBSP 51129, 51208; *Exú*: MZUSP 6582, 6583, 6908, 6909; *Garanhuns*: IBSP 51778, 51779, 51780; *Pesqueira*: IBSP 1388; *Petrolina*: IBSP 29177, 42732, 50318, 50354, 50404, 50508, 50517, 50579, 50960, 50962, 51218, 51224, 51514, 51792, 51973, 51974, 51975, 51976, 51977, 51978, 51979, 51980, 51981, 51982, 51983, 52040, 52833, 53159, 53225, 53439; *Santa Maria da Boa Vista*: IBSP 53353, 53428; *Serra Talhada*: IBSP 31762; PIAUÍ: *Canto do Burití*: ZUEC 644, 645; *Floriano*: MPEG 23845; *Piracuruca*: CHUNB 61132, MPEG 22854, 22855, 22856, 22857; *São Raimundo Nonato*: IBSP 40246, 42678, 42706, 42713, 42733, 45082, 45170, ZUEC 1923, 3064; *Teresina*: IBSP 32392, 50638, 52880, 54690; RIO GRANDE DO NORTE: *Assú*: IBSP 52894, 52895; *Mossoró*: IBSP 52041; *São Thomé*: IBSP 44532, MZUSP 9026; SERGIPE**:** *Poço Redondo*: CHUFS 212. *Lachesis muta* – BAHIA**:** *Laje*: FUNED 1469; CEARÁ**:** *Pacotí*: CHUFC 2064, 2065, 3281; PERNAMBUCO**:** *Agrestina*: MZUSP 4977.

ELAPIDAE - *Micrurus* aff. *leminiscatus* – BAHIA**:** *Brumado*: IBSP 40173, 40321, 40925, 41050, 43621, 46583; *Esplanada*: IBSP 48952; *Livramento do Brumado*: IBSP 28527; *Poções*: 28217, 28218, 28219, 67647; *Remanso*: IBSP 28707, 28708; *Urandí*: IBSP 28316; CEARÁ**:** *Crato*: IBSP 1311; *Fortaleza*: IBSP 20023; *Icó*: 12100; PERNAMBUCO**:** *Afrânio*: IBSP 28099; PIAUÍ: *Teresina*: IBSP 1281. *Micrurus brasiliensis* – BAHIA**:** *Barreiras*: MNRJ 2495, 2496, 2497; MINAS GERAIS: *Porteirinha*: MZUFV 995, 843, 825, 972. *Micrurus frontalis* – BAHIA**:** *Barreiras*: CHUNB 3915. *Micrurus* sp. - ALAGOAS**:** *Coruripe*: MUFAL 6489, 6490; *Passo de Camaragibe*: MZUSP 17727, 17728; *Piranhas*: MZUFBA 858, 859, 860, 861, 862, 863, 1160, 1162, 1164; *Teotônio Vilela*: MUFAL 6707, 7199, 7221; BAHIA**:** *Alagoado*: MZUSP 10035, 10463; *Andaraí*: IBSP 70114; *Barreiras*: IBSP 50141; *Bom Jesus da Lapa*: IBSP 51593; *Brumado*: IBSP 40143, 42104, 42254, 43942, 45513, 45546, 50140, 51026, MZUFBA 2094, 2095, 2096, 2097, 2118, 2119; *Glória*: IBSP 53126, ZUEC 602, 603, 608; *Guanambí*: IBSP 50516, 51541, 51756; *Ibipeba*: CHUNB 3925; *Ituaçú*: MZUFBA 431; *Lençóis*: MZUFBA 792, 793, 801, 981, 983; *Nova Redenção*: IBSP 60078; *Palmeiras*: MZUFBA 1014; *Paulo Afonso:* MZUFBA 99, 142, 143, 144, 145, 146, 148, 149, 150, 151, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167,

168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 999, 2110; *Poções*: MZUFBA 1563; *Ruy Barbosa*: MZUSP 7801*; Santo Inácio*: MZUSP 13959; *Serrinha*: ZUEC 27; CEARÁ: *Aquiraz*: CHUFC 2282; *Araiçoaba*: CHUFC 1922; *Barbalha*: MZUSP 7252, 7253, 7255; *Baturité*: MZUSP 3628; *Beberibe*: CHUFC 3044, MPEG 17211; *Caucaia*: CHUFC 1117, 1910; *Crateús*: CHUFC 2242, 2243; *Crato*: CHUFC 2368, IBSP 53070; *Eusébio*: CHUFC 1640, MPEG 17180; *Fortaleza*: CHUFC 752, 787, 1225, 1639, 1644, 1731, 1945, 2291, IBSP 46332; *Itaitinga*: CHUFC 1408; *Itapipoca*: CHUFC 2860; *Limoeiro do Norte*: CHUFC 3, 48, 53, 108, 228, 229, 230, 232, 236, 246, 249, 250, 255, 257, 258, 259, 262, 263, 265, 266, 267, 268, 269, 272, 273, 635; *Maranguape*: CHUFC 2100, 2357; *Pacotí*: CHUFC 2564; *Pentecoste*: CHUFC 3092, 3093, 3094, 3133, 3199, 3342, 3347; *Quixelô*: CHUFC 1642; *Quixeramobim*: MNRJ 16924; *Santana do Acaraú*: CHUFC 1607; *São Benedito*: CHUFC 2359, 2396; *Tianguá*: CHUFC 1645; *Ubajara*: CHUFC 2112, 2131, 2132, 2163, 2367, 2380, 2382, 2391, 2397; *Umirim*: CHUFC 2386; PARAÍBA**:** *Arara*: UFPB 75; *Caiçara*: MZUSP 9021, UFPB 2503; *Campina Grande*: IBSP 57226; *Gurinhém*: MZUSP 8952, 8953; *Mogeiro*: UFPB 268; *Patos*: IBSP 33606; *São João do Cariri*: UFPB 4392; PERNAMBUCO**:** *Brejo da Madre de Deus:* MPEG 19165; *Exú*: MZUSP 6502, 6503, 6561, 6562, 6563, 6564, 6901, 6902, 6903, 6904, 6905, 6906, 6907, 6932, 6933, 6934, 7189, 7190, 7191, 7192, 7193; *Garanhuns*: IBSP 49996. *Petrolândia*: IBSP 52154, 52360, 52380, 52729, 52730, 52970, 52971, 53156, 53300, 53301, 53366, 53415, 53458; PIAUÍ: *Parnaguá*: IBSP 42525, 42581; *Parnaíba*: IBSP 49236, 51602; *Piracuruca*: CHUNB 61174, 61175; *São Raimundo Nonato*: IBSP 42536; *Teresina*: IBSP 49909, 50990; *Valença do Piauí*: MZUSP 5853; RIO GRANDE DO NORTE: *Assú*: IBSP 53582; *Mossoró*: CHUFC 2, 32, 185, 270; *Serra Negra do Norte*: CHBEZ 635, 678, 1109, 1130, 1185, 1310; SERGIPE**:** *Itabaiana*: CHUFS 418; *Poço Redondo*: IBSP 77892.

Appendix 2.

LEPTOTYPHLOPIDAE - *Epictia borapeliotes* – Vanzolini (1996): ALAGOAS: *Piranhas*: MZUSP 10948, 10949; PARAÍBA**:** *Conde*: MZUSP 7973. *Trilepida brasiliensis* - Borges-Nojosa et al. (2009): CEARÁ: *Crato*: CHUFC 3122. *Trilepida koppesi* - Freitas et al. (2012): BAHIA**:** *Mucugê*: MZUESC 6257.

TYPHLOPIDAE **-** *Typhlops amoipira* - Fernandes et al. (2010): MINAS GERAIS: *Bonito de Minas:* MZUFV 1644, 1645, 1646, 1647, 1648, 1649, 1650, 1651. *Typhlops reticulatus* - Dixon and Hendricks (1979): CEARÁ**:** *Limoeiro do Norte*: IBSP 20336.

BOIDAE **-** *Corallus hortulanus* - Henderson (1997): BAHIA**:** *Barra*: MZUSP 10036, 10037. *Epicrates assisi* - Passos and Fernandes (2008): BAHIA**:** *Barreiras*: MNRJ 3072, 3073, 3074, 48154; *Brumado*: IBSP 40379, 48584; CEARÁ**:** *Caririaçú*: IBSP 20296, 20297; *Coreú*: IBSP 1483; *Fortaleza*: MNRJ 9941; *Icó*: IBSP 1483, 12101, 13078, 13079, 13080; PARAÍBA: *Junco do Seridó:* IBSP 55463; PERNAMBUCO**:** *Alagoinha*: IBSP 57844; *Glória do Goitá*: IBSP 46973; *Rio Branco*: IBSP 9252; PIAUÍ**:** *São Raimundo Nonato*: MNRJ 4801, 7598; *Teresina*: IBSP 49930, 51085.

COLUBRIDAE **-** *Chironius bicarinatus* - Dixon et al. (1993): BAHIA**:** *Andaraí*: NMB 1303, 1304. *Chironius carinatus* - Dixon et al. (1993): BAHIA: *Cipó*: ZMA 13553G. *Chironius flavolineatus* - Dixon et al. (1993): BAHIA**:** *Barreiras*: UMMZ 103081. *Drymoluber brazili* - Costa (2010): BAHIA**:** *Gentil do Ouro*: MZUSP 9596; *Jacobina*: MZUSP 7544; *João Dourado*: MZUESC 3815; CEARÁ**:** *Milagres*: IBSP 76968; PARAÍBA: *Teixeira*: MZUSP 7562. Silva et al. (2007): PIAUÍ**:** *São Raimundo Nonato*: LZ-UFPI 111. *Drymoluber dichrous* - Costa (2010): CEARÁ**:** *Maranguape*: CHUFC 2081, 2083, 2101, 2104, 2128, 2201, 2204, 2205, 2211, 2220, 2712, 2730; *Pacatuba*: CHUFC 2233; *Pacotí*: CHUFC 2221; *Ubajara*: CHUFC 2177. *Leptophis ahaetulla* - Albuquerque (2008): CEARÁ**:** *Aquiraz*: CHUFC 1881, 1602; *Baturité*: CHUFC 2868; *Iguatú*: MCP 17835; *Maranguape*: CHUFC 1172, 1722, 1611, 1244; Filho and Montingelli (2011): PARAÍBA**:** *Arara*: UFPB 77. *Tantilla marcovani* – Lema (2004): PARAÍBA**:** Maturéia: MCN 5819, 5820, MNRJ 6525; Filho and Montingelli (2011): UFPB 4886.

DIPSADIDAE **-** *Apostolepis assimilis* - Lema (2002): BAHIA: *Barreiras*: UMMZ 204112; *Central*: MNRJ 6523. *Apostolepis cearensis*: Ferrarezzi et al. (2005): BAHIA: *Feira de Santana*: IBSP 53700; *Jaguarari*: IBSP 26203; *Santo Inácio*: MZUSP s/n°; CEARÁ**:** *Fortaleza*: IBSP 2106; *Icó*: IBSP 20190. *Atractus postchi* - Passos et al. (2010): SERGIPE: *Salgado*: MZUSP 7001, 7195, 7196, 7197, 7275, 7276, 7277, 7278, 7279, 7280, 7281. *Atractus ronnie* - Loebmann et al. 2009: CEARÁ**:** *Crato*: LZ-URCA 460,

461, 462, 463, 465, 489, 490, 491. *Boiruna sertaneja* - Zaher (1996): BAHIA**:** *Brumado*: IBSP 42651, 49388; *Itaparica*: IBSP 52106; *Vitória da Conquista*: IBSP 20456, 21097; CEARÁ**:** *Limoeiro do Norte*: CHUFC 106, 491, 496; MINAS GERAIS**:** *Jaíba*: IBSP 42717, MNRJ 4001, 4004; PERNAMBUCO**:** *Exú*: MZUSP 7031. *Dipsas sazimai* - Fernandes et al. (2010): BAHIA: *Miguel Calmon*: MZUFBA 1800. *Erythrolamprus maryellenae* - Freitas et al. (2012): BAHIA**:** *Mucugê*: CZGB 568; *Helicops angulatus* - Roberto et al. (2009): CEARÁ**:** *Crato*: LZ-URCA 492. *Helicops leopardinus* - Ribeiro et al. (2008): CEARÁ**:** *Crato*: N° de voucher not mentioned. Scartozzoni (2009): PERNAMBUCO**:** *Floresta*: ZUEC 623. *Helicops modestus* - Freitas and Silva (2011): BAHIA**:** *Caitité*: MZUESC 7515. *Lioheterophis iheringi*: Amaral (1934): PARAÍBA**:** *Campina Grande*: IBSP 8362 (voucher lost). *Lygophis dilepis* - Michaud and Dixon (1987): BAHIA**.** *Barreiras*: UMMZ 108745, 108746, 108747, 108748, 108749, 108750, 108751, 108752, 108753, 108754, 108755, 108756, 108757, 108758, 108759; *Bom Jesus da Lapa*: UMMZ 108742; CEARÁ**:** *Arajara*: MZUSP 7213; *Fortaleza*: UMMZ 80767; *Iguatú*: FMNH 5702; *Icó*: USNM 146612; *Maranguape*: UMMZ 84267; PERNAMBUCO**:** *Exú*: UMMZ 149015; RIO GRANDE DO NORTE: *Cearamirim*: FMNH 64405. *Oxyrhopus rhombifer* - Freitas et al. (2012): BAHIA**:** *Mucugê*: CZGB 8853; Hamdan and Lira-da-Silva (2008): *Paulo Afonso*: MZUFBA 182, 187, 196, 199, 214. *Philodryas aestiva* - Freitas et al. (2012): BAHIA: *Mucugê*: MZUESC 5328; *Philodryas agassizii* – Hamdan and Lira-da-Silva (2012): BAHIA: Caitité: MZUFBA 2043. *Philodryas patagoniensis* – Medeiros et al. (2010): BAHIA**:** *Alagoinhas*: IBSP 51748; *Camaçarí*: ZUEC 2240, IBSP 49155, 49551; *Caravelas*: IBSP 44568; *Esplanada*: IBSP 49351; *Feira de Santana*: IBSP 37351; *Mucurí*: MBML 1874; *Teixeira de Freitas:* IBSP 43454; *Valença*: IBSP 54740. *Psomophis joberti* - Myers and Cadle (1994): PERNAMBUCO**:** *Goiana*: MZUSP 5178. *Taeniophallus occipitalis* - Filho and Montingelli (2011): PERNAMBUCO**:** *Brejo Madre de Deus*: UFPB 3713. *Thamnodynastes almae* - Franco and Ferreira (2002): BAHIA**:** *Rodelas*: IBSP 52135, 52136; PERNAMBUCO**:** *Petrolândia*: IBSP 52134. *Thamnodynastes sertanejo* - Franco and Ferreira (2002): BAHIA**:** *Curaçá*: IBSP 43052; *Jaguararí*: IBSP 26401, 28159; *Poções*: IBSP 28160, 28161, 28162, MZUFBA 1568; *Rodelas*: IBSP 52088, 52120, 52122, 52124, 52125, 52126, 52128, 52129, 52130, 52131, 52132, 52133, 52136, 53735, 53764. *Thamnodynates* sp. - Franco and Ferreira (2002): BAHIA: *Barreiras*: IBSP 50432; *Caraíbas*: IBSP 52350; *Curaçá*: IBSP 43055; *Guanambí*: IBSP 50238, 50618, 54904, 54905, 54938; *Juazeiro*: IBSP 51718, 51834; *Maracás*: IBSP 58370; *Paulo Afonso:* IBSP 44444, 44446; *Poções*: IBSP 28190, 28191, 28192, 28194. PERNAMBUCO**:** *Petrolândia*: IBSP 52113, 52114, 52115, 52116, 52117, 52118, 52127; *Petrolina*: IBSP 48318, 48319, 48321; PIAUÍ**:** *São Raimundo Nonato*: IBSP 41291; RIO GRANDE DO NORTE: *Lajes*: IBSP 30587. *Xenodon merremi* - Filho and Montingelli (2011): PARAÍBA**:** *Bananeiras*: MZUSP 8941, 8942; PERNAMBUCO**:** *São Caitano*: UFPB 2496. *Xenodon nattereri* – Argôlo (2002): BAHIA: Rio de Contas: MZUESC 1172.

VIPERIDAE **-** *Bothrops jararaca*: Hamdan et al. (2007): BAHIA: *Ibicoara* MZUFBA 1295; *Palmeiras*: MZUFBA 1822; *Miguel Calmon*: MZUFBA 1658, 1774, 1775, 1776; Freitas et al. (2012): *Mucugê*: MZUESC 5133, 6270, 6326, 7129, 7145. *Bothrops leucurus*: Freitas et al. (2012): BAHIA: *Mucugê*: MZUESC 5096, 6259; Filho and Montingelli (2011): PERNAMBUCO: *Caruaru*: UFPB 2412, UFPB

2712; *Brejo Madre de Deus*: UFPB 3706, 3710, 3711, 3712. *Bothrops neuwiedi* - Silva and Rodrigues (2008): BAHIA**:** *Itiúba*: IBSP 3012; *Vitória da Conquista*: CZGB 3794, 3910, 6531, 8073, 8509.

ELAPIDAE **-** *Micrurus ibiboboca* - Filho and Montingelli (2011): PARAÍBA**:** *Areia*: UFPB 492.

Capítulo 2

BIOGEOGRAPHY AND DISTRIBUTION PATTERNS OF THE SNAKE FAUNA FROM THE CAATINGA REGION, NORTHEASTERN BRAZIL*

Biogeografia e padrões de distribuição da fauna de serpentes da região da Caatinga, nordeste do Brasil

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Biogeography and distribution patterns of the snake fauna from the Caatinga region, northeastern Brazil

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Running Head: Biogeography of Caatinga snakes

ABSTRACT

Aim. To recognize biogeographic patterns and to define basic biogeographical units for snakes of the Caatinga region, using biotic element analysis. To compare the distribution patterns found in snakes with previous biogeographical hypotheses for the Caatinga, and to discuss the conservation of biogeographic patterns by comparing our results with previously defined conservation priorities and protected areas.

Location. Caatinga region, northeast Brazil.

Methods. We compiled and georefereced point-locality occurrence records for snakes in the Caatinga by the extensive revision of voucher specimens housed in zoological collections and literature data. We tested predictions of the vicariance model using biotic element analysis, searching for non-random clusters of species ranges, using two datasets (all taxa and endemics only) mapped on a 1° x 1° square grid across the Caatinga. Spatial congruence of resulting biotic elements was compared between the two analyzed datasets. We then compared resulting biotic elements in each dataset with existing protected areas and priority areas for conservation.

Results. We recorded 112 snakes from the Caatinga, of which 22 (20%) are endemics. Biogeographic patterns corroborated the predictions of the vicariance model, uncovering groups of species with significantly clustered ranges. The analyses with the full dataset detected eight biotic elements that are largely coincident with nine previously detected areas of endemism (Ceará State, Borborema plateau, Caatinga region, Campo maior complex, Diamantina plateau complex, Ibiapaba-Araripe complex, Jequitinhonha valley, Jibóia range, and São Francisco dunes). Results using the endemic dataset recovered three endemic biotic elements (Caatinga region, Ibiapaba-Araripe complex, and São Francisco Dunes) which correspond to core areas of biotic elements detected with the full dataset. Distribution patterns corroborated the major topographical, pedological and vegetational subdivisions of the Caatinga.

Main conclusions. This is the first test of significant regionalization patterns in the Caatinga. In contrast to earlier studies emphasizing faunal interchange and low endemism, our results indicate that vicariant speciation has strongly shaped Caatinga snake diversity. Levels of snake endemism are higher than in any other Caatinga vertebrate group. Our results corroborate previous studies that indicate that the Caatinga region is not homogeneous, providing support for a prominent role of vicariant patterns in shaping snake distributions. Most core ranges of biotic elements are coincident with priority areas for conservation, but

few intersect protected areas, indicating that there are still many gaps in the conservation of biodiversity patterns and processes in the Caatinga region.

Keywords. Biodiversity, Snakes, Biogeography, Biotic elements, Distribution patterns, Open areas, Conservation.

INTRODUCTION

The critical step for biogeography studies is to define and delineate basic distributional patterns that will inform on the smallest, fundamental analytical units that will form the backbone of hypotheses on the formation of regional biotas (Carvalho, 2010). Moreover, biogeographic units are the most valuable source of information on what spatial portions of biodiversity should be conserved (Crisci, 2000; Whittaker *et al.*, 2005) and identification of these areas plays a central role in efforts to conserve biodiversity and diversification processes (Cracraft, 1994; Carvalho *et al.,* 2011). Among the criteria for the detection of areas relevant for conservation diversity and endemism are of central relevance, and are questions of biogeographic authority (Pullin, 2002). On the other hand, the major obstacle in biogeography is to find the adequate methods for detecting the units for biogeographical analysis (Harold & Mooi, 1994) and to delimit boundaries between these areas (Rosen, 1988; Morrone, 1994).

The history of biotas can only be understood from the perspective vicariance biogeography (Nelson & Platnick, 1981; Humphries & Parenti, 1999), which seeks to discover congruence in the spatial histories of clades whose constituent taxa share common patterns of distribution (Cracraft, 1994). The majority of species are non-randomly distributed and clustered into areas (Morrone, 1994; Hausdorf, 2002). Clustering of these distributional areas is one of the most prominent biogeographic patterns and one mechanism that might cause this pattern is vicariance (Hausdorf & Hennig, 2006).

The vicariance model (Croizat *et al*., 1974; Rosen, 1978; Platnick & Nelson, 1978; Nelson & Platnick, 1981; Wiley, 1988; Humphries & Parenti, 1999; Hausdorf & Hennig, 2003; Hausdorf & Hennig, 2006) postulates that diversification is the result of fragmentation of an ancestral biota by

emerging barriers. This barrier stops or hinders contact between populations on either side of the barrier, and over time the isolation results in allopatric speciation, giving rise to two new biotas. When this pattern is repeated for many taxa, we can read that the same vicariance event acted on two or more taxa delimiting an endemism area. By repetition of this process, areas of endemism with distinct biotas emerge (Hausdorf & Hennig, 2003).

Although the concept of vicariant speciation is clear and well defined, the detection and delimitation of areas of endemism is problematic in natural conditions. The barriers can be lost or their effects blurred or mitigated through time, allowing populations from previously isolated biotas to disperse along the landscape, according to geography, climate and the autoecological requirements of the species (Cracraft, 1994). Thus, usually there is stochastic dispersal of species across barriers with time, resulting in an overlap of ranges of species which originated in different areas of endemism. Additionally, the size and the different configurations of ancestral ranges before the vicariant event can also obfuscate the patterns of segregation between areas of endemism (Cracraft, 1994; Anderson, 1994). Under these conditions of imperfect sympatry, biogeographical units are hard to be recognized and distributional data alone are often unable for delimiting perfectly allopatric areas of endemism (Hausdorf, 2002).

Given the limitations imposed by dispersal and imperfect allopatry, biotic element analysis (Hausdorf & Hennig, 2003; Hausdorf & Hennig, 2006) emerged as an alternative method for detecting biogeographic units (Hausdorf & Hennig, 2003). One of the corollaries of vicariance is that the ranges of taxa that have originated in the same area will be more similar to each other than to ranges of taxa that have originated in other areas (Hausdorf & Hennig, 2003; Hausdorf & Hennig, 2006). Thus, the vicariance model predicts a significant clustering of species ranges, and these clustered ranges define a biotic element, or a group of taxa whose ranges are more similar to each other than to those of other such groups (Hausdorf, 2002; Hausdorf & Hennig, 2003; Hausdorf & Hennig, 2006). Biotic element analysis tests patterns of vicariance without requiring strict allopatry of species ranges, and are based on the assumption that, under a vicariant scenario, groups of significantly clustered and non-random species ranges should emerge and be detectable (Hausdorf, 2002). Thus, on the contrary of areas of endemism, biotic elements can be recognized even if some of the species that originated by vicariance dispersed across barriers. Hence, they are suitable as biogeographic units in tests of the vicariance model in historical biogeography (Hausdorf & Hennig, 2006) and can test former diversification processes based on distribution data alone. As in other analytical methods aiming to provide fundamental biogeographical

107 units (see Morrone, 1994; Morrone & Marques, 2001; Szumik *et al*., 2002; Vasconcelos *et al*., 2011), the
108 baseline data for biotic element analysis raw species occurrences along an arbitrary square grid, and not
109 previously defined biogeographic subdivisions (Hausdorf & Hennig, 2006).

110 Despite several similarities detected between the subunits of the South American diagonal open
111 areas (see Prado, 2000; Veloso *et al*., 2002; Colli, 2005; Werneck & Colli, 2006; Zanella, 2010), the
112 Caatinga is a natural region that has a significant species richness and endemism and is recognized as a
113 unique floristic province, treated as a biogeographical unit in most previous studies (Prado & Gibbs,
114 1993; Prado, 2000; Pennington *et al*., 2000; Zanella & Martins, 2005; Queiroz, 2006; Cardoso & Queiroz,
115 2010; Zanella, 2010).

116 Biogeographical studies in Neotropical open landscapes (*e.g.* Prado & Gibbs, 1993; Zanella,
117 2000; 2002; Queiroz, 2006; Werneck & Colli, 2006; Nogueira *et al*., 2011; Camardelli & Napoli, 2012)
118 are far less abundant than similar studies in Neotropical rainforests (*e.g.* Müller, 1973; Prance, 1982;
119 Silva & Sites, 1995; Amorim & Pires, 1996; Haffer, 1997; Costa *et al*., 2000; Carnaval, 2002; Silva *et al*.,
120 2004; DaSilva & Pinto-da-Rocha, 2010; Barbo, 2012). As expected, biogeographical analyses and raw
121 data in the Caatinga remain scarce for most of the taxonomic groups. Available studies show that the flora
122 (Queiroz, 2006) and fauna of the Caatinga have complex histories, and seem to be formed by elements of
123 different origins (Hingst *et al*., 1997; Borges-Nojosa & Caramaschi, 2005; Olmos *et al*., 2005; Zanella &
124 Martins, 2005; Gregorin *et al*., 2008; Pereira & Geise, 2009; Loebmann & Haddad, 2010; Guedes *et al*.,
125 2012). Thus, studies on distribution patterns in Neotropical open areas and in the Caatinga are required as
126 a fundamental step for understanding the history of Neotropical biotas.

127 The Caatinga is still considered poorly known regarding composition and diversity of avian and
128 mammalian faunas (Olmos *et al*., 2005; Olmos & Brito, 2007; Gregorin *et al*., 2008; Pereira & Geise,
129 2009). Perhaps due to lack of basic knowledge, endemism levels in birds and mammals is considered low
130 (Willig, 1983; Mares *et al*., 1985; Olmos *et al*., 2005). A recent biogeographical study with amphibians of
131 the Caatinga using Parsimony Analysis of Endemicity recovered eight areas of endemism (Camardelli &
132 Napoli, 2012), using two distinct limits for this region. Most detected areas comprise mountain ranges,
133 interpreted as centers of speciation and biotic refuges in previous phylogeographic studies that considered
134 these highlands as Atlantic Forest relicts within the semi-arid Caatinga (Carnaval, 2002; Carnaval &
135 Moritz, 2008).

136 The single zoogeographical study on the Caatinga reptilian fauna recognized four major
137 geographic distribution patterns (Rodrigues, 2005). Most data used in this study were for lizards, and
138 distribution data on snakes or amphibians were considered insufficient to define biogeographic patterns
139 (Rodrigues, 2005), a common problem in studies on Neotropical biotas (the so called "Wallacean" and
140 "Linnean" shortfalls; see Brown & Lomolino, 1998; Whittaker *et al*., 2005). This lizard dataset was the
141 most valuable source to indicate that the endemism is associated to sandy soils, and for highlighting
142 priority areas for conservation in the Caatinga (see Rodrigues, 1986; 1991a; 1991b; 1991c; 2004; 2005).

143 Given the complex nature of the region, Velloso *et al*. (2002) divided the Caatinga in eight major
144 units (or ecoregions, *sensu* Bailey 1998) that were recognized based on biotic and abiotic factors. Using
145 data of the Leguminosae plant family, Queiroz (2006) and Cardoso & Queiroz (2010) recognized seven
146 of eight ecoregions proposed by Velloso *et al*. (2002) as areas of endemism, and only one of them was not
147 justified as an independent biogeographical unit (Queiroz, 2006). Additionally, these support the view
148 that the Caatinga comprises two separate biotas, one associated with soils derived from the crystalline
149 basement surfaces, and the other with sandy sedimentary surfaces on lower areas (Queiroz, 2006).

150 Based on the information provided above, the Caatinga has biotic (Camardelli & Napoli, 2012;
151 Velloso *et al*., 2002; Queiroz, 2006; Cardoso & Queiroz, 2010) and abiotic factors (*e.g.* topographical,
152 geomorphological, pedological. Velloso *et al*., 2002) that suggest significant biological regionalization.
153 However, no previous study has tested the predictions of the vicariant model of diversity on distribution
154 patterns in the Caatinga. Based on an extensive snake distribution dataset, we will search for significant
155 patterns of co-distribution, testing the predictions of the vicariant model of diversification within this
156 complex and relatively poorly studied Neotropical natural region.

157 Herein we provide the first detailed analysis on distribution and biogeographic patterns of
158 Caatinga snakes, after a recent careful and exhaustive compilation and revision of snake composition and
159 distribution data in the region, provided by Guedes *et al.* (2012). The aim of our biogeographic study is:
160 (1) identify biogeographic units for snakes of the Caatinga by identification of clusters of co-distributed
161 species (biotic elements); (2) to compare the distribution pattern found here with the biogeographic
162 studies performed with other taxa; and (3) to discuss the conservation of this group by coincidence
163 between the areas here found and those priority areas for conservation previously defined (Rodrigues,
164 2004; 2005).

MATERIAL AND METHODS

Study area

Open landscapes dominated by dry forests and savannas are estimated to cover around 67% of the area of the world, with 54.2% of these remaining located in South America (Miles *et al*., 2006). On South America, these landscapes occur across a great variety of environmental conditions. The Caatinga is an open landscape, and it is considered a unique floristic region in Brazil (Ab'Saber, 1974; 2003; Prado, 2005). Its distribution extends from 2°54' to 17°21'of southern latitude (Andrade-Lima, 1981; Ab'Saber, 1974) and covers about of 800.000 km² to 1.000.000 km². It is largely distributed throughout the northeastern region of Brazil in the states of Piauí, Ceará, Rio Grande do Norte, Paraíba, Pernambuco, Alagoas, Sergipe, Bahia, with a small portion in Maranhão and the northern part of Minas Gerais (IBGE, 1993; 2001; 2004; Prado, 2005). Most of the Caatinga develops in interplateau depressions (Ab'Saber, 1974), in areas generally below 500 m above sea level, characterized by high mean annual temperatures, scarce and irregular rainfall (both annually and inter-annually), low relative humidity and high solar radiation (Ab'Saber, 1974; Prado, 2005; Velloso *et al*., 2002), dominated by open vegetation forms (Andrade-Lima, 1975; Rizzini, 1997; Velloso *et al*., 2002; Prado, 2005), and drained by largely intermittent and seasonal rivers.

The Caatinga is considered as a floristic or natural regional unit in several studies (Prado & Gibbs, 1993; Prado, 2000; Pennington *et al*., 2000; Zanella & Martins, 2005; Queiroz, 2006; Cardoso & Queiroz, 2010; Zanella, 2010), but is not physically homogeneous (Velloso *et al*., 2002). Velloso *et al*. (2002) recognized, based on biotic and abiotic factors, the following subunits inside Caatinga: campo maior complex, ibiapaba-araripe complex, northern sertaneja depression, borborema plateau, southern sertaneja depression, São Francisco dunes, diamantina plateau complex and raso da catarina.

Generally, the vegetation of the Caatinga shows xerophytic characteristics, trichomes, thorns, microfilia and deciduousness (Rizzini, 1997; Velloso *et al*., 2002; Maia, 2004; Prado, 2005). All these characters are interpreted as adaptive strategies to resist water stress in the face of low and erratic annual rainfall that defines the character of this semi-arid region (Ab'Saber, 1974; Rodrigues, 1986; Velloso *et al*., 2002; Prado, 2005). The Caatinga shows considerable variation in vegetation structure, presenting

193 phytophysiognomies that include the bush caatinga (*caatinga arbustiva*), arboreal caatinga (*caatinga*
194 *arbórea*) and herbaceous caatinga (*caatinga herbácea*) (Andrade-Lima, 1975). These plant forms are
195 dominated by species of Cactaceae, Bromeliaceae, and trees and herbs of the Leguminosae (Andrade-
196 Lima, 1975, 1981; Rizzini, 1997; Velloso *et al.,* 2002; Queiroz, 2006).

197 Another important area of the Caatinga are the Quaternary sand dunes of the São Francisco
198 River, situated in Bahia State, on depressions ranging from 250 to 500 m above sea level (Rodrigues,
199 1991a). This area comprises a strip of depositional sandy terrains along the middle course São Francisco
200 River, and is covered by open areas with same overall climatic conditions of semi-arid caatinga. The right
201 bank of the river is covered by xerophytic vegetation than include bush caatinga, arboreal caatinga and
202 herbaceous caatinga. The soil is stony and sandy soil with inselbergs and rocky outcrops (Rodrigues,
203 1991a). The left bank is dominated by a dune field fixed by pioneer vegetation. The vegetation is bush
204 and herbaceous caatinga, the plants are sparse and green throughout the year. The soil formed by high
205 sandy with dunes, from 50 to 100 m in high (Rodrigues, 1991a).

206 Although the most common landscape in Caatinga is open vegetation forms, this region also
207 harbours forested or savanna enclaves considered as "exception landscapes" (Ab'Saber, 2003). These
208 areas are located in mountain massifs that reach at least 600 m, scattered within the Caatinga (Ab'Saber,
209 1977). These isolated areas receive more than 1200 mm annual rainfall and are subject to lower mean
210 temperatures (Tabarelli & Santos, 2004). Vegetation cover in these elevated areas is very complex and
211 include caatinga vegetation, elements of cerrado savannas (like *campo rupestre* and *carrasco*, *e.g*. Araripe
212 and Diamantina Plateau, Campelo *et al*., 2000; Ribeiro *et al*., 2008) and relictual forests. Such
213 heterogeneous vegetation mosaic seems to be explained by the interplay of varying topography, rainfall
214 patterns, and soil types, as a result of the geological and geomorphological history of the Caatinga (Cole,
215 1960; Ab'Saber, 1967; 1974; Andrade-Lima, 1975; Prado, 2005).

216 The area of the Caatinga considered in this study (Fig. 1) is the union of Caatinga limits provided
217 by Instituto Brasileiro de Geografia e Estatística (IBGE, 1993; 2001; 2004) and the Caatinga limits
218 considered in Velloso *et al.* (2002). As it is impossible to define linear cartographic limits between large
219 biomes or natural regions (Ab'Saber, 1967), discrepant limits of the Caatinga are available, according to
220 different authors and maps (see Ab'Saber, 1967). Thus, we considered as our study region all areas
221 included in at least one of these defined limit of the Caatinga. Although some earlier biogeographical and

222 phylogeographycal studies excluded mountain areas from the Caatinga definition (Zanella & Martins,
223 2005) or included these areas as Atlantic Forest enclaves (Carnaval, 2002; Carnaval & Moritz, 2008), we
224 agree with Velloso *et al*. (2002) and Camardelli & Napoli (2012) and consider these highlands as part of
225 Caatinga region. The concept herein adopted excludes the Amazonian Caatinga because it is not
226 historically related with Caatinga of northeastern Brazil (Anderson, 1981). Insular areas, as the Caatinga
227 of the Fernando de Noronha Island, are also not considered.

228 **Data sources**

229 We obtained data from the revision of 7,102 voucher specimens housed in 17 zoological
230 collections, plus the compilation of 250 records obtained from literature data, resulting in a total of 7,325
231 analyzed records. All records used in this study are based on voucher specimens, all carefully examined
232 by one or more authors and identified based on current taxonomic literature. The scientific papers used in
233 the bibliographic data search were also selected according to criteria of geographic and taxonomic
234 reliability, and the presence of voucher lists (see Guedes *et al.*, 2012 for additional information). Records
235 available in electronic databases, including unchecked, error-prone raw museum data, were not used in
236 this study, as previously discussed in Zaher *et al.* (2011), Nogueira *et al.* (2011) and Guedes *et al*. (2012).
237 Snake systematics follows Zaher *et al.* (2009). We follow recent taxonomic changes proposed by
238 Grazziotin *et al.* (2012) for the genus *Liophis* and *Phimophis,* now named *Erythrolamprus*/*Lygophis* and
239 *Rodriguesophis*, respectively.

240 We mapped point-locality records for each specimen by georeferencing locality data associated
241 with verified museum specimens (retrospective georeferencing, see Hill *et al*., 2009). We included in our
242 analysis every species with at least one vouchered record within the Caatinga region (Fig. 1). Geographic
243 coordinates were obtained in electronic *gazzetters* (USBGN and CidVil, 1998), scientific literature, or
244 based on direct visual inspection of georeferenced layers in ArcView (ESRI, 1999) and Google Earth, or,
245 whenever possible, contacting the collectors for precise GPS coordinates. In the absence of accurate
246 information on geographic coordinates we used municipality centroids. Although these represent only
247 approximate locations, we understand that uncertain localities should not be discarded in studies aiming
248 to detect large-scale biogeographic patterns.

249 Species were classified as endemic or non-endemic to the Caatinga. Following previous studies
250 in Nogueira *et al*. (2011), endemic species were those with locality records fully or largely coincident

with the approximate limits of Caatinga area defined here, which includes transitional areas within neighboring morphoclimatic domains (Ab'Saber, 1977). Thus, due to inadequacies of scale in continental vegetation maps, which are not intended to provide detailed descriptions of complex limits between adjacent vegetation types, species with most records within the Caatinga but with marginal records in transitional adjacent areas were considered as Caatinga endemics (Nogueira *et al.*, 2011). According to Nogueira *et al.* (2011), the adherence to a strict definition of endemism, following artificial, linear regional boundaries, could lead to the omission of species whose evolutionary and biogeographical affinities are closely tied to the Caatinga region, despite occurring marginally outside the uncertain limits of a continuous Caatinga area.

Analyses

The predictions of vicariance model were tested using biotic element analysis (Hausdorf, 2002; Hausdorf & Hennig, 2003; Hausdorf & Hennig, 2006), based on presence/absence matrix resulting from species records mapped in 1° latitude x 1° longitude cell grids, superimposed on the Caatinga map (Fig. 2). Biotic element analysis was implemented in *prabclus* (Hausdorf & Hennig, 2003), add-on package for the statistical software R, available at http://cran.r-project.org. We performed biotic element analysis in two datasets: the first included 112 grid-mapped species including endemic and non-endemic species; the second was a subset of 22 grid-mapped including only endemic species.

Test for clustering of distribution areas – The first step in biotic element analysis is to investigate the presence of significantly clustered species ranges. This test is based on distances between the ranges of the examined taxa and three specifications must be made for this test: a distance measure between species ranges, a test statistic and a null model for the generation of sets of ranges. As the vicariance model does not require similar ranges sizes in taxa belonging to the same biota after the emergence of a dispersal barrier (Hausdorf & Hennig, 2004), we used the Kulczynski distance as distance measure, because it does not overestimate values of range distances between sympatric taxa with differing range sizes (Hausdorf & Hennig, 2003). The test statistic T is based on the assumption that, given a significant clustering of ranges, distances are small between ranges of the same cluster, and large between ranges of distinct clusters (Hausdorf & Hennig, 2003). The distribution of test statistics under the null model is approximated by Monte Carlo simulation, in which artificial ranges are produced so that their cell number distribution approximates the actual distribution of the number of cell per range,

richness distribution of cells approximates the actual richness of cells, and the tendency to form discontinuous areas is governed by a parameter that is estimated from the real data set (Hausdorf & Hennig, 2003; Hausdorf & Hennig, 2006). Thus, this analysis compares the real distributions with a null model, testing if the degree of clustering of species ranges can be explained by varying number of taxa per cell and the spatial autocorrelation of the occurrence dataset alone (Hausdorf & Hennig, 2003).

Determination of biotic elements – For the determination of biotic elements, we used model-based Gaussian clustering (MBGC) as implemented in the software MCLUST, as proposed by Hausdorf & Hennig (2003). This method provides a decision about the number of meaningful clusters and about ranges that cannot be assigned adequately to any biotic elements (noise component: Hausdorf & Hennig, 2003; Hausdorf & Hennig, 2006). MBGC operates on a data set where the cases are defined by variables of metric scale. Therefore, we performed nonmetric multidimensional scalling (NMDS) on the matrix of Kulczynski distances and four NDMS dimensions. MCLUST needs an initial estimate of noise, which was performed by the software NNCLEAN and as suggested by Hausdorf & Hennig (2003; 2006), we used as NNCLEAN constant k = number of species/40 (three for the larger dataset, and one for the endemic dataset).

RESULTS

Species richness and endemism

We recorded 112 snake species of the Caatinga, belonging to nine families (Anomalepididae, Leptotyphlopidae, Typhlopidae, Aniliidae, Boidae, Viperidae, Elapidae, Colubridae and Dipsadidae). These results were obtained after revising, georeferencing and mapping of 7,352 non-redundant vouchered records (see Guedes *et al*., 2012 for details). Information about new records for Caatinga, distribution extension and distribution maps are available in Guedes (2010), Guedes & Marques (2011), Guedes *et al.* (2011) and Guedes *et al.* (2012).

We identified 22 species as endemic, representing 20% of the regional richness. Endemism levels were higher in Dipsadidae (68.2%) and Typhlopidae (9.1%). Other families reach 4.5% of

endemism each. Half of the endemic species show restricted distributions with occurrence area less than 10,000 km^2 (see Nogueira *et al.,* 2010) (*Typhlops amoipira, T. yonenagae, Tantilla marcovani, Apostolepis arenaria, A. gaboi, Apostolepis* sp., *Atractus ronnie*, *Lioheterophis iheringi, Oxyrhophus* sp., *Rodriguesophis chui, R. scriptocirbatus)* with the other half (*Epictia borapeliotes, Epicrates assisi, Bothrops erythromelas*, *Micrurus* sp., *Apostolepis cearensis, Boiruna sertaneja*, *Erythrolamprus mossoroensis, E. viridis, Thamnodynasteas almae, T. sertanejo* and *Thamnodynastes* sp.) showing wide distribution in the Caatinga.

Test for clustering of distribution data

Biotic element analysis on the full dataset (112 snake species including endemic and non-endemics) corroborated major predictions of the vicariance model: ranges were significantly clustered, forming localized biotas across the Caatinga. The *T* statistic (Hausdorf & Hennig, 2003) was 0.436, significantly smaller (P = 0.0001) than expected by chance (for 1000 artificial populations, *T* varied between 0.444 to 0.582, mean 0.501).

To test if these results were not a direct effect of species interchange with adjacent regions, we repeated the analyses with the endemic dataset (22 species). For this analysis the *T* statistic was 0.386, again significantly smaller (P = 0.003) than expected by chance (for 1000 artificial population, *T* varied between 0.375 to 0.651, mean 0.461).

Determination of biotic elements

As the all tests performed indicated that the Caatinga snake fauna is divided into species groups with significantly regionalized ranges, the next step was to determine the biotic elements according to these significant range clusters. For this purpose we used species clusters in the first two dimensions of NDMS, using MCLUST (Hausdorf & Hennig, 2003).

In the analysis with the full dataset of 112 species, 40 species (36%) contributed to detection of eight biotic elements, while 72 species were included in the noise component (Fig. 3). Biotic element 1 was formed by 11 species, and has its core area in highlands of the Diamantina Plateau complex, with occurrences also in the Ibiapaba-Araripe complex and Borborema Plateau (Fig. 4). BE 2 grouped seven species ranging mostly in the São Francisco Dunes, and also in Jequitinhonha valley (Fig. 4). BE 3 was formed by six species that ranged mosltly along the Ibiapaba-Araripe complex plus some isolated ranges

in Ceará State (Baturite, Aratanha and Maranguape ranges) and Jibóia range in Bahia State (Fig. 4). Biotic element 4 grouped four species with ranges along the Jequitinhonha valley, Jibóia range (Bahia State) and Jabre peak (Paraíba State) (Fig. 4). BE 5 and BE 6 were formed by four and three species each, respectively, all widespread on a large Caatinga region (Fig. 4). BE 7 was formed by three species ranging in Campo maior complex in Piauí State, and Alagoas-Sergipe region (Fig. 4). Finally, biotic element 8 (BE 8) was formed by two species also widespread in large Caatinga region, but with core area in Ibiapaba-Araripe complex and Alagoas-Sergipe region (Fig. 4).

In the analysis with endemic dataset (22 species) only three biotic elements were found, based on nine (40%) species in significant range clusters, while 13 species were included in the noise component (Fig. 5). The endemic biotic elements were generally coincident with results of the full dataset, and seem to form a subset of biotic elements detected with the full dataset. The five species that form endemic biotic element (EE 1) were detected in BE 2 (see Table 1 and Fig. 6), São Francisco Dunes and Jequitinhonha valley. EE 2 was formed by two species that were also detected in BE 3 (see Table 1 and Fig. 6), that correspond to Ibiapaba-Araripe complex plus Baturité, Maranguape and Aratanha ranges. Finally, EE 3 grouped two species previously included as part of BE 5, widespread along the Caatinga region (see Table 1 and Fig. 6).

DISCUSSION

This is the first study on biogeography and distributional patterns of snakes of the Caatinga region, and the first formal test on vicariant patterns for the region. Early interpretations about herpetofauna of the Caatinga considered it as a subset of the Cerrado and Atlantic Forest Coastal faunas (Vanzolini, 1974; 1976; Vanzolini *et al*., 1980). Our results show a rich and complex snake fauna, including species of different regions and 22 endemic species, about 20% of the total richness. Our results corroborate previous studies that indicate that the Caatinga region is not homogeneous, and corroborate central predictions of vicariance model (Hausdorf & Hennig, 2003). The areas where the biotic element occurs were generally coincident with areas of endemism proposed in previous studies of regionalization of plants (Velloso *et al*., 2002; Queiroz, 2006; Cardoso & Queirz, 2010) and vertebrates (Müller, 1973; Kinzey, 1982; Mares *et al*., 1985; Cracraft, 1985; Costa *et al*., 2000; Porzencanski & Cracraft, 2005; Goldani *et al*., 2006; Camardelli & Napoli, 2012) (see Table 2).

364 The Diamantina Plateau is the largest mountain range in northeastern Brazil, situated in Bahia
365 State, occupying an area of c. 50,000 km^2, with peaks between 200 to 2,033 m asl. This area is usually
366 more humid than those found in surrounding Caatinga region. It hosts a mosaic of different vegetation
367 types associated with a large array of soil types, topography and hydrological conditions. The most
368 characteristic types of vegetation found in this region are rocky fields (*campos rupestres*) and open forms
369 of Cerrado, with Caatinga vegetation occurring mainly on valleys on the western slopes (Velloso *et al.,*
370 2002; Queiroz, 2006). Diamantina Plateau complex is considered a refuge for birds, amphibians,
371 mammals and the flora (Rodrigues-Filho *et al*., 2002). In this study, no snake species was considered
372 endemic of this region, and the snake fauna comprised species that occur mainly in the adjacent Cerrado
373 (e.g. *C. quadricarinatus*, *E. maryellenae*, *L. nattereri*, *P. aestiva*, *P. agassizi*, *S. rhinostoma*, *S.*
374 *leucocephalus* and *T. koppesii*). We believe this area was not sufficiently sampled and the literature about
375 snake of this area is represent by casual records (Argôlo & Freitas, 2000; Argôlo, 2002; Argôlo & Freitas,
376 2002; Juncá, 2005; Freitas *et al*., 2012) over the long-term studies. Thus, long-term studies with more
377 intensive sampling, followed by taxonomic studies, will aid in detecting endemic snakes from this region
378 in the future.

379 The Ibiapaba-Araripe complex extends to west and south of Ceará State and northeastern of
380 Piauí and encompasses three landscape features: the Ibiapaba Plateau (a north-south mountain massif at
381 the borders between the states of Ceará and Piauí), corridor area between Capivara and Confusões ranges
382 (a set of low mountains and tablelands in central-southern Piauí), and Araripe Plateau (running east-west
383 at the border between the states of Ceará and Pernambuco) (Velloso *et al*., 2002; Queiroz, 2006). The
384 Ibiapaba complex has sandy soils of low fertility and the vegetation is mainly composed of a dense scrub
385 or a low forest type named *carrasco* (Araújo & Martins, 1999). The Araripe Plateau hosts a mosaic of
386 areas of *carrasco*, on deep sandy soils, as well as cerrado (Velloso *et al*., 2002; Queiroz, 2006). The
387 corridor area between Capivara and Confusões ranges comprise *carrasco* vegetation and Cerrado-
388 Caatinga vegetation integrated to Ibiapaba and Araripe Plateau (Velloso *et al*., 2002). This area host an
389 endemic biota (see Table 2), but there is no endemic snake species exclusive of the Ibiapaba-Araripe
390 complex recorded here, but is important to note that three snake species (see Table 2) were considered
391 endemic of the highland of the Ceará State (Guedes *et al*., 2012) that include Ibiapaba and Araripe
392 Plateaus, and Baturité, Maranguape and Aratanha ranges. Our data are scarce for Capivara range and we
393 have no data from Confusões range.

394 The Baturité, Maranguape and Aratanha ranges show floristic links with the Atlantic and
395 Amazon forests (Velloso *et al*., 2002; Tabarelli & Silva, 2004; Queiroz, 2006) and are named *brejo*
396 forests. Guedes *et al*. (2012) discuss the lack of a detailed description of these areas that are usually
397 treated as forested areas, but also have strong influences of Caatinga and Cerrado vegetation and host
398 typical open area snake species (*e.g.* including species also widespread in the Cerrado: *Trilepida*
399 *brasiliensis*, *Bothrops lutzi* and *Xenopholis undulatus;* and Caatinga endemics: *Micrurus* sp., *Boiruna*
400 *sertaneja* and *Epicrates assisi*). According to Velloso *et al*. (2002), besides floristic links with forested
401 areas, these ranges are in Caatinga region and are largely influenced by the Caatinga biota.

402 The Jibóia range is also a *brejo* forest located on eastern Bahia State (Velloso *et al*., 2002). It
403 covers an area of 0.23 km^2 and its altitude is 600 to 839 m (Freitas & Moraes, 2009). The predominant
404 vegetation is moist forest, but in higher areas harbor cerrado vegetation like *campos rupestres*, and
405 altitude Caatinga vegetation. This area was previously recognized as area of endemism of amphibians for
406 semi-arid region (Camardelli & Napoli, 2012), there are no endemic species in Jibóia range, and as in
407 other *brejo* forests in Paraíba, Pernambuco (see Borborema Plateau).

408 Borborema Plateau is located on the eastern portion of the Caatinga, forming an arc in part of the
409 states of Rio Grande do Norte, Paraíba, Pernambuco and Alagoas (Velloso *et al*., 2002). The climate is
410 dry, hot and semi-arid, and the vegetation is complex including bush and arboreal Caatinga, as well as dry
411 and moist forests. The altitude ranges from 150 to 650 m, with peaks of 650 to 1,000 m. These peaks
412 represent *brejo* forests like Jabre peak (Paraíba State), Cavalos range, Brejo da Madre de Deus
413 (Pernambuco State), and Brejo Paraibano (municipalities of Areia, Arara, Bananeiras in Paraíba State).
414 This area is considered an ecorregion by Velloso *et al.* (2002), but floristic data does not justify this area
415 as an independent area of endemism (Queiroz, 2006). According to Guedes *et al*. (2012) and our data, at
416 least two snake species are endemic of this area (see Table 2).

417 São Francisco Dunes include an area of 36,170 km^2 in the mid São Francisco river valley. This
418 region is characterized by extensive deposits of dystrophic quartzitic sands, and the vegetation is mainly
419 shrubby with patches of low trees and shrubs. This area is considered important because the high
420 endemism (Velloso *et al*., 2002; Rodrigues, 1996; Rodrigues, 2005), but this is the first formal test of the
421 zoogeographical relevance of the area in the context of the Caatinga.

422 The area called large Caatinga region is defined by a biotic element widespread in Caatinga
423 region, found in all kinds of landscapes described in this study. The distribution patterns of the species
424 that compose these biotic elements seems to be similar those found in other terrestrial vertebrates (Müller,
425 1973; Kinzey, 1982; Mares *et al*., 1985; Cracraft, 1985; Costa *et al*., 2000; Porzencanski & Cracraft,
426 2005; Goldani *et al*., 2006) that recognized the Caatinga as a unique, homogeneous large area, usually
427 associated with aridlands. This distribution pattern is faithfully followed by endemic snakes species of the
428 Caatinga (see Table 2), but lends no support to the division of the Caatinga interplateau areas in northern
429 sertaneja depression and southern sertaneja depression, as suggested by Velloso *et al*. (2002).

430 Several areas were identified mainly by interchange of fauna between Caatinga-Cerrado and
431 Caatinga-Atlantic Forest. The Campo Maior complex, Jequitinhonha valley, and the Caatinga west of the
432 São Francisco drainage, on Bahia State (detected in BE4 and BE7) show no endemic species, including
433 snakes. Perhaps these areas have been recognized as an area of endemism (Velloso *et al*., 2002;
434 Camardelli & Napoli, 2012) because of the proximity with Cerrado. Regarding the snake fauna, some
435 species were only found in this area inside Caatinga. The Alagoas-Sergipe region on eastern portion of
436 the Caatinga is a case of faunal interchange between Caatinga and Atlantic Forest and has congruent
437 limits with those detected in previous biogeographical studies with animals (arthropoda, amphibians,
438 reptiles including snakes, birds and mammals) and woody plants in Atlantic Forest (Müller, 1973; Prance,
439 1982; Amorim & Pires, 1996; Silva *et al*., 2004; DaSilva & Pinto-da-Rocha, 2010; Barbo, 2012).
440 Perhaps, these areas can be verified as biogeographic units only after large biogeographic studies in South
441 America.

442 The Raso da Catarina region, previously detected as an ecoregion of the Caatinga (Velloso *et al.*,
443 2002) and a center of endemism based on Leguminosae (Queiroz, 2006), was not detected here as an
444 independent unit, showing a snake fauna similar to that in the large Caatinga region. We also have not
445 recognized regionalized snake biotas related to two kinds of soils as recovered by Queiroz (2006).

446 **Implications for conservation**

447 Recent studies highlight the validity of biotic elements as surrogates for evolutionary process in
448 conservation planning exercises (Carvalho *et al*., 2011). Given the widespread paucity of detailed
449 phylogenetic or phylogeographical data (Carvalho *et al.*, 2011), coupled with the urgent need for setting

450 spatial priorities in highly threatened regions, incorporating biotic elements in conservation
451 biogeographical analysis should be seen as a top research priority to safeguard the evolutionary
452 significance of biodiversity (Nogueira *et al*., 2011; Carvalho *et al.*, 2011). Despite previous claims of lack
453 of adequate data, our results showed that snakes are great models to determine important areas to
454 conservation, given detailed syntheses and data collection efforts are provided. The areas where the biotic
455 elements occur were coincident with previously studies to determine areas of endemism, and natural
456 regions inside Caatinga using plant and other animals as biodiversity targets (Mares *et al*., 1985; Velloso
457 *et al*., 2002; Queiroz, 2006; Porzencanski & Cracraft, 2005; Camardelli & Napoli, 2012). Our results also
458 were coincident with the priority areas for herpetofauna conservation in the Caatinga region (Rodrigues,
459 2004; 2005), but some aspects deserve attention because the degree of conservation in each area is not
460 equal. Thus, as distribution patterns are highly heterogeneous, conservation efforts and human
461 disturbance are also highly heterogeneous in the Caatinga.

462 Although the Caatinga is the single large exclusively Brazilian natural region, little attention has
463 been given to the conservation of the varied and complex biotas of the Caatinga, and its contribution to
464 Brazilian biodiversity has been underestimated (Silva *et al*., 2004). Habitat loss due to human activities
465 varies between of 223,100 km^2 to 379,565 km^2, which corresponds to 30.4% to 51.7% of the area the
466 Caatinga, according to different estimates (*e.g.* including or not the road construction, and presence or not
467 of cities and villages. Leal et al., 2005a; Castelletti et al., 2004). This places the Caatinga as the third most
468 degraded ecosystems in Brazil, behind the Atlantic Forest and Cerrado (Leal *et al*., 2005a). Additionally,
469 28 Caatinga species are nationally or globally endangered (Leal *et al*., 2005a).

470 Among Brazilian natural regions, the Caatinga shows the smaller extent of legally protected
471 areas, and the existing reserve network fails to represent the biodiversity and biogeography of the
472 Caatinga (Leal *et al*., 2005a). Nowadays, the Caatinga region harbours 47 conservation units with
473 different management regimes (16 are federal, seven are state, and 24 private), which cover an area of 4,
474 956 km^2 (6.4% of the Caatinga), but only 11 of these areas are of Integral Protection (*e.g.* National Parks,
475 Ecological Station and Biological Reserves), and these cover less than 1% of the total area of the
476 Caatinga (Leal *et al*., 2005a).

477 The priority areas for herpetofaunal conservation in the Caatinga region were determined by
478 combined high richness, endemism and presence of threatened/rare species (see Rodrigues, 2004; 2005).

A total of 19 areas were listed as priority and recommended the creation of eight protection areas (Rodrigues, 2004). However, due the lack of information about snakes, the snake species considered were only those restricted distribution to the sandy dunes of São Francisco River (Rodrigues, 2004).

Most core ranges of biotic elements are coincident with priority areas determined by Rodrigues (2004). The of areas Diamantina Plateau, Borborema Plateau, São Francisco dunes, Ibiapaba-Araripe complex and Ranges on Ceará State, Campo maior complex and Alagoas-Sergipe region occuping a restricted area less than 70.000 km^2 inside Caatinga. These areas are protected by nine conservation units of integral protection. Of these areas only Parque Nacional da Chapada Diamantina and Parque Nacional da Serra da Capivara are parks with significant size (Leal *et al*., 2005a).

The area named Caatinga region comprise the largest area of occurrence of biotic elements and host at least six snake endemic species (Guedes *et al*., 2012). This area has only one conservation unit of integral protection with restricted area and with only 13 snake species detected after long-term study, including five endemics (Guedes, 2006). Thus, we agree with Camardelli & Napoli (2012) and recommend this area as priority for conservation and creation of conservation units of integral protection.

Our results corroborate previous studies that indicate that the Caatinga region is not homogeneous (Velloso et al., 2002; Queiroz, 2006; Cardoso & Queiroz, 2010; Camardelli & Napoli, 2012), providing support for a prominent role of vicariant patterns in shaping snake distributions. Most core ranges of biotic elements are coincident with priority areas for conservation, but few intersect protected areas, indicating that there are still many gaps in the conservation of biodiversity patterns and processes in the Caatinga region.

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TABLE CAPTIONS

Table 1 Number of biotic elements and endemic biotic elements shared between the main areas of the Caatinga detected in biotic element analyzes.

889

890 **Table 2** Congruence about the Caatinga areas detected in this study and other studies conduzed in the
891 Caatinga, with additional information about endemismo in each considered area.

892

893 **Table 3** Conservation units of integral protection found in the mains areas of the Caatinga detected in
894 biotic element analyzes.

895

896 FIGURE CAPTIONS

897 **Figure 1** Map showing the limits of the Caatinga region considered in this study by union of the shapes
898 provided by Instituto Brasileiro de Geografia e Estatística (IBGE, 1993; 2001; 2004) and with limits
899 adjusted according to Velloso *et al.* (2002).

900

901 **Figure 2** Distribution map of the 110 cells of 1° latitude x 1° longitude of size considered for biotic
902 element analysis within limits of the Caatinga region.

903

904 **Figure 3** Species clusters in the first two dimensions of a non-metric multidimensional scaling analysis,
905 obtained according to the ranges of all 112 mapped on 1° x 1° cell grid Caatinga snakes (endemic and
906 not-endemic) analyzed in MCLUST (Hausdorf & Hennig, 2003). Characters indicate model-based
907 clustering with noise (N).

908

909 **Figure 4** Distribution of biotic elements (BE 1-8) recovered according to the range of 112 Caatinga
910 snakes. Shadings indicate the areas where >70%, >30% and >0% of the species of an element are present.

911

912 **Figure 5** Species clusters in the first two dimensions of a non-metric multidimensional scaling analysis,
913 obtained according to the ranges of all 22 mapped on 1° x 1° cell grid Caatinga snakes (endemic)
914 analyzed in MCLUST (Haudorf & Hennig, 2003). Characters indicate model-based clustering with noise
915 (N).

916

917 **Figure 6** Distribution of endemic biotic elements (EE 1-3) recovered according to the range of 22
918 Caatinga snakes. Shadings indicate the areas where >70%, >30% and >0% of the species of an element
919 are present.

920

921 **Figure 7** Congruence about distribution of biotic elements and conservation units of integral protection in
922 the Caatinga. Numbers: 1- Parque Nacional das Sete Cidades; 2- Parque Nacional de Ubajara; 3- Estação
923 Ecológica do Castanhão; 4- Estação Ecológica de Aiuaba; 5- Estação Ecológica do Seridó; 6-Parque
924 Nacional Serra da Capivara; 7- Parque Nacional Serra das Confusões; 8- Parque Nacional da Chapada
925 Diamantina; 9- Parque Nacional Cavernas do Peruaçú.

Table 1

Main areas of the Caatinga detected in biotic element analyzes	Biotic element								Endemic Biotic Element		
	BE1	BE2	BE3	BE4	BE5	BE6	BE7	BE8	EE1	EE2	EE3
Alagoas-Sergipe region	-	-	-	-	-	-	1	2	-	-	-
Aratanha, Maranguape and Baturité ranges	-	-	4	-	-	-	-	-	-	2	-
Borborema Plateau	1	-	-	1	-	-	-	-	-	-	-
Caatinga region	-	-	-	-	4	3	-	2	-	-	2
Campo maior complex	-	-	-	-	-	-	1	-	-	-	-
Diamantina Plateau complex	10	-	-	-	-	-	-	-	-	-	-
Ibiapaba – Araripe complex	1	-	5	-	-	-	-	2	-	2	-
Jequitinhonha valley	-	-	-	3	-	-	-	-	-	-	-
Jibóia range	-	-	1	1	-	-	-	-	-	-	-
São Francisco Dunes	-	7	-	-	-	-	-	-	5	-	-

Table 2

Caatinga areas detected in this study	Corresponding biotic elements	Some endemic species	Also detected by
Alagoas-Sergipe region	BE3, BE7 and BE8	Snakes: *Dendrophidion atlantica* and *Atractus maculatus*	Müller (1973), Prance (1982), Amorim & Pires (1996) Silva *et al*. (2004), DaSilva & Pinto-da-Rocha, (2010), and Barbo (2012)
Aratanha, Maranguape and Baturité ranges	BE3 and EE2	Amphibian: *Adelophryne maranguapensis.* Snakes: *Apostolepis* sp.1, *Oxyrhopus* sp., and *Atractus ronnie*	Queiroz (2006), Cardoso & Queiroz (2010) and Camardelli & Napoli (2012)
Borborema Plateau	BE1	Genera plant: *Ameroglossum*. Plant: *Mimosa borboremae*. Snakes: *Tantilla marcovani* and *Lioheterophis iheringi*	Velloso *et al*. (2012)
Caatinga region	BE5, BE6, BE8 and EE3	Snakes: *Bothrops erythromelas*, *Erythrolamprus viridis*, *A. cearensis*, *Epictia borapeliotes* and *Micrurus* sp.	Müller (1973), Kinzey (1982), Mares *et al*. (1985), Cracraft (1985), Costa *et al*. (2000), Porzencanski & Cracraft (2005), and Goldani *et al*. (2006)
Campo Maior complex	BE7	None endemic species detected	Velloso et al. (2002), Queiroz (2006), and Cardoso & Queiroz (2010)
Diamantina Plateau complex Velloso *et al*. (2002)	BE 1 and BE 2	Plant genera: *Raylea* (Sterculiaceae), *Mysanthus* (Leguminosae), *Holoregmia* (Scrophulariaceae). Plants: *Mimosa irrigua*, *Chamaecrista eitenorum*, *Portulaca werdermanii*, *Melocactus glaucences*, *Arrojoadoa bahiensis*. Amphibians: *Bokermanohyla juiju*, *B. itapoty*, *Rupirana cardosoi* and *Strabomantis aramunha*	Velloso et al. (2002), Queiroz (2006), Cardoso & Queiroz (2010) and Camardelli & Napoli (2012)
Ibiapaba-Araripe Plateau	BE1, BE3, BE8 and EE2	Plant: *Hyptidendron ametystoide*. Bird: *Antilophus bokermanii.* Mammal: *Chiroderma vizzotoi.* Snakes: *Apostolepis* sp.1, *Oxyrhopus* sp., and *Atractus ronnie*.	Velloso et al. (2002), Queiroz (2006) and Cardoso & Queiroz (2010)
Jequitinhonha valley	BE4	None endemic species detected	Camardelli & Napoli (2012)
Jibóia range	BE3 and BE4	Amphibian: *Allobates ofersioides* and *Gastroteca flamma*	Camardelli & Napoli (2012)
São Francisco Dunes	BE2 and EE1	Plants: *Pterocarpus monophyllus*, *Dioclea marginata* and *Eugenia* sp. nov. Arthropoda: *Remummucia mauryi.* Mammal: *Prochimys yonenagae*. Amphisbaenian: *Amphisbaena hastata*, *A. ignatiana, A. frontalis* and *A. arda.* Lizards: *Calyptomatus leiolepis, C. nicterus, C. sinebrachiatus, Eulophosaurus amathites, E. divaricatus, Tropidurus psamonastes,* and *T. pinima*. Snakes: *A. gaboi*, *A. arenaria*, *Rodriguesophis chui*, *R. scriptocirbatus*, *Typhlops amoipira* and *T. yonenagae.*	Velloso et al. (2002), Queiroz (2006), and Cardoso & Queiroz (2010)

Table 3

Caatinga areas detected in biotic element analyzes	Total of protected area (ha)	Conservation Unit of Integral Protection
Aratanha, Maranguape and Baturité ranges	24,104	Estação Ecológica de Aiuaba, Estação Ecológica do Castanhão
Borborema Plateau	-	None protected area
Caatinga region	1,163.00	Estação Ecológica do Seridó
Campo Maior complex	-	None protected area
Diamantina Plateau complex	152,000	Parque Nacional da Chapada Diamantina
Ibiapaba – Araripe complex	610,674	Parque Nacional de Ubajara, Parque Nacional das Sete Cidades, Parque Nacional da Serra das Confusões, Parque Nacional Serra da Capivara
Jequitinhonha valley	56,800	Parque Nacional Cavernas do Peruaçu
Jibóia range	-	None protected area
São Francisco Dunes	-	None protected area

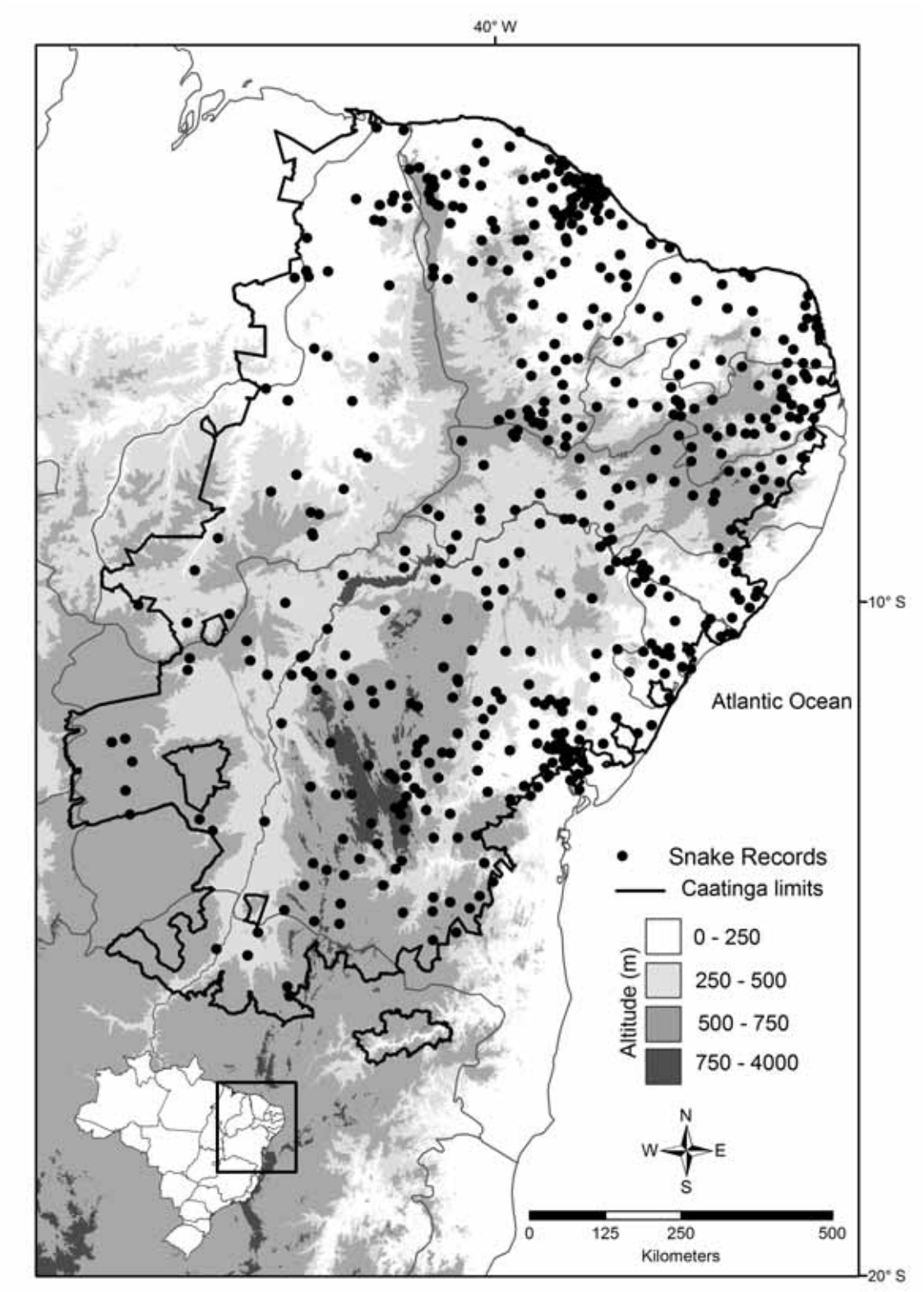
40° W
10° S
20° S
Atlantic Ocean
Snake Records
Caatinga limits
Altitude (m)
0 - 250
250 - 500
500 - 750
750 - 4000
N
W
E
S
0
125
250
500
Kilometers

Figure 1.....

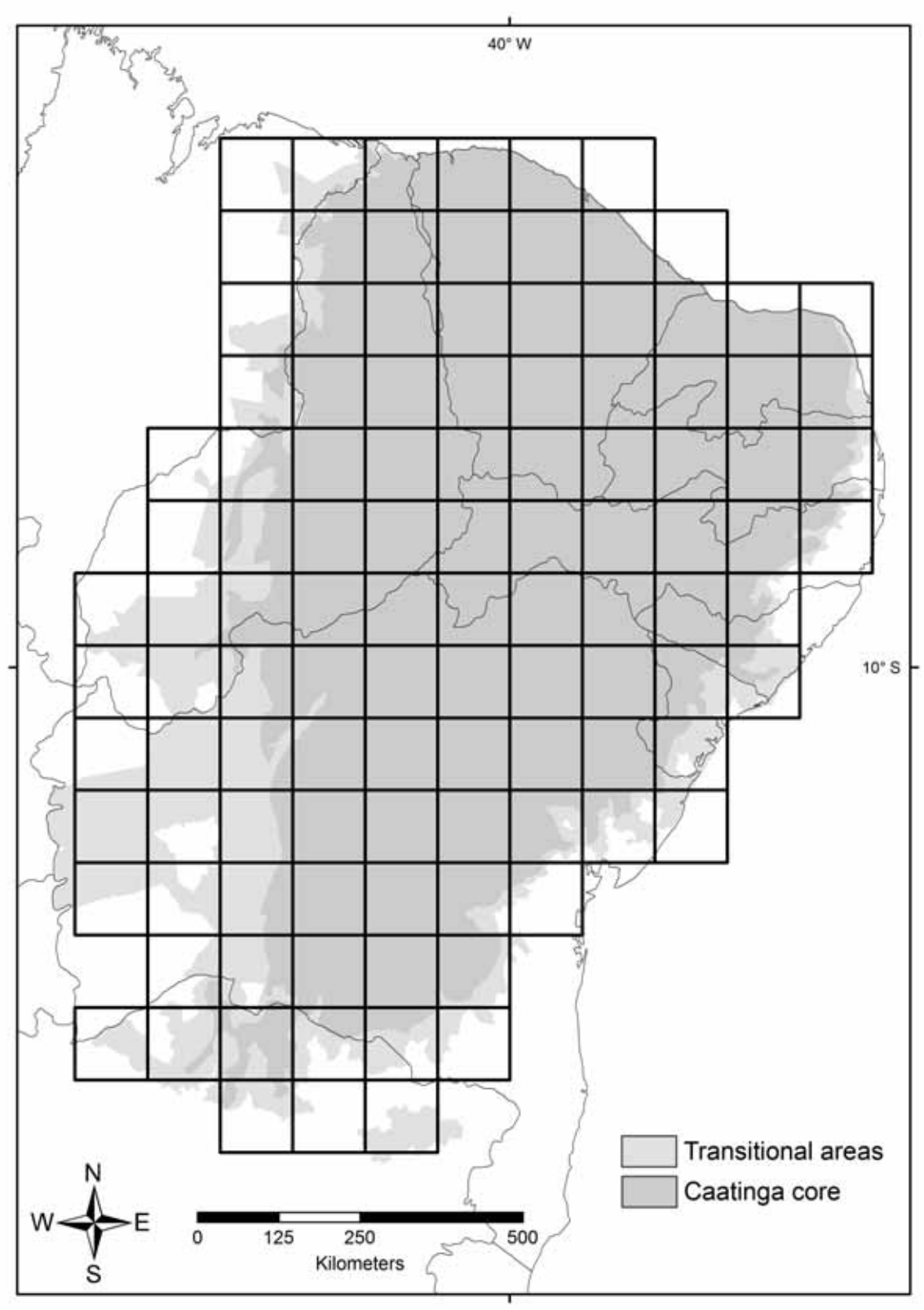
40° W
10° S
Transitional areas
Caatinga core
N
W
E
S
0
125
250
500
Kilometers

Figure 2.....

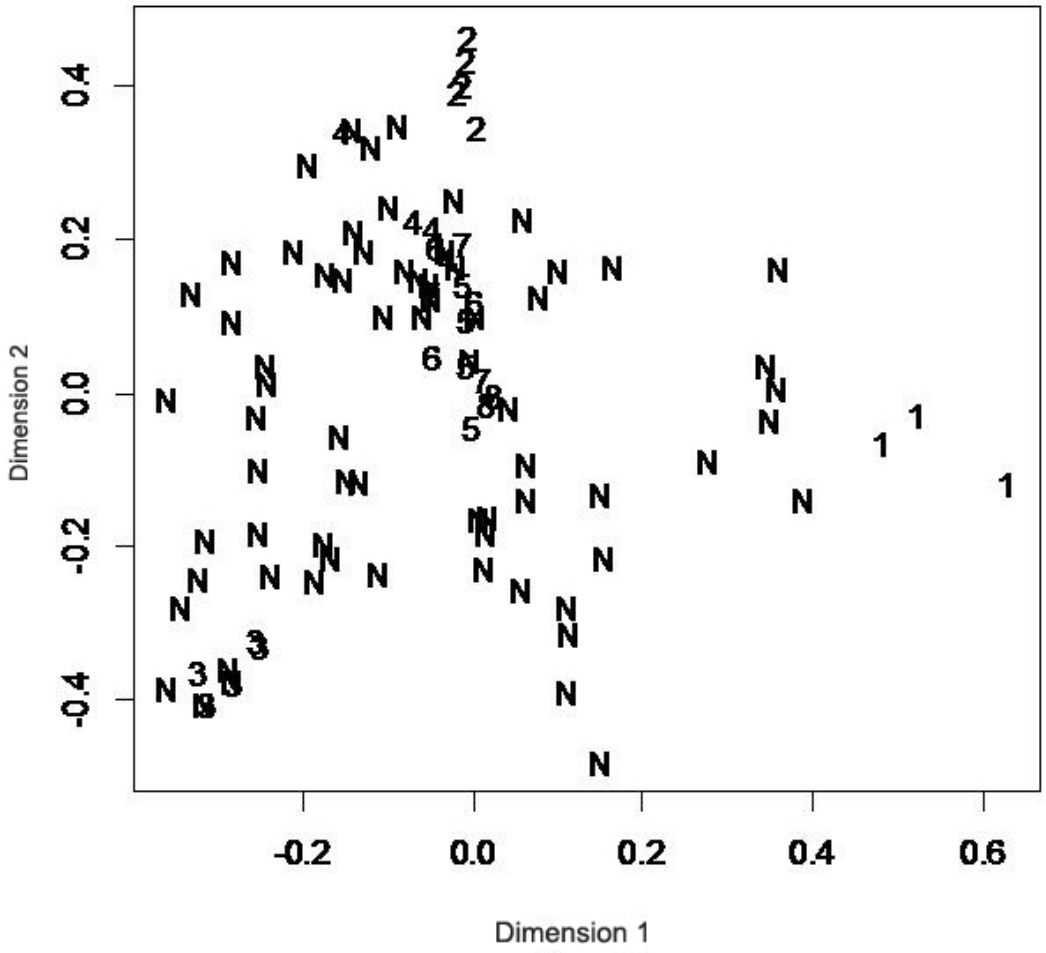

Figure 3.....

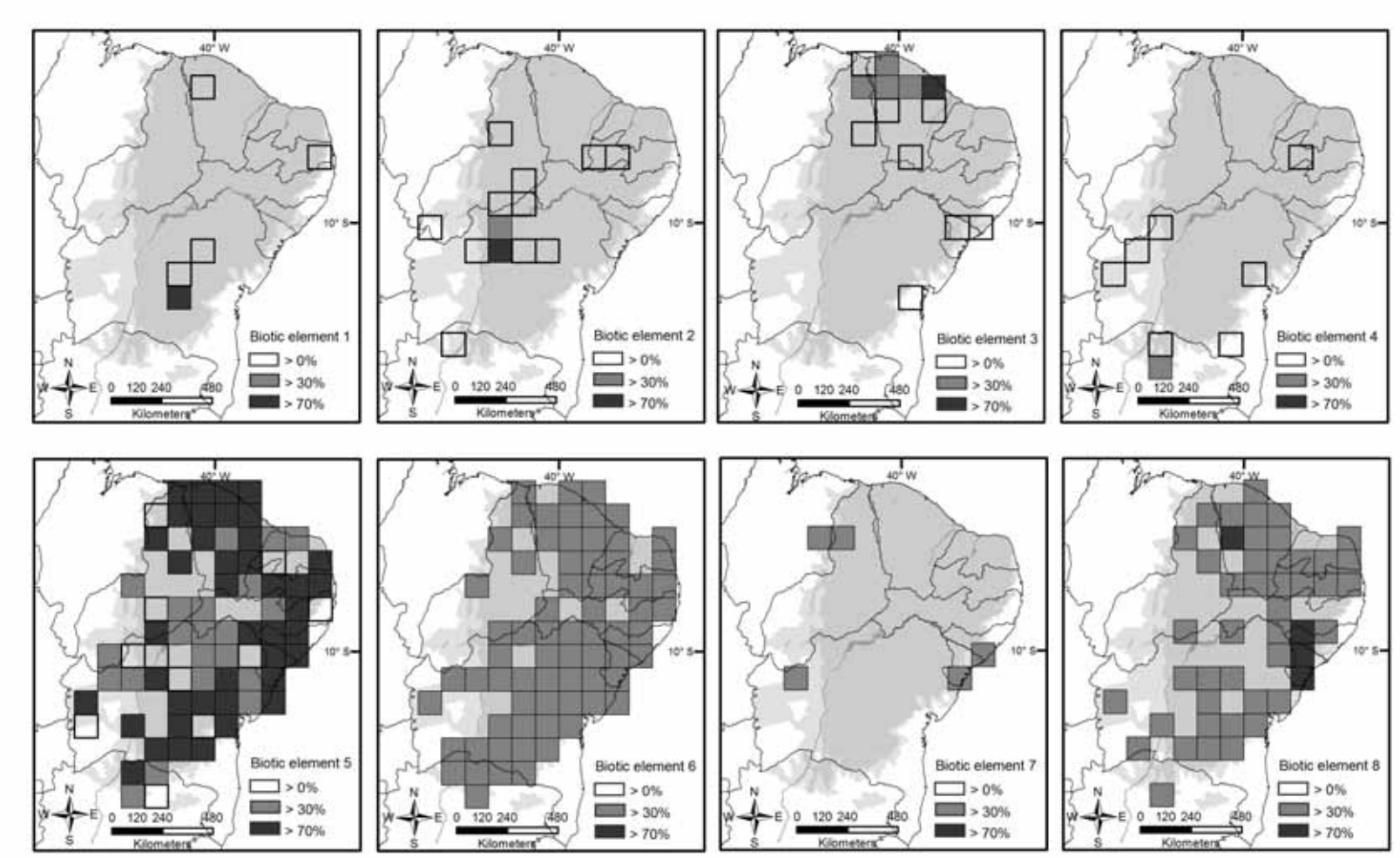
40° W
10° S
Biotic element 1
> 0%
> 30%
> 70%
N
W
E
S
0 120 240 480
Kilometers
Biotic element 2
Biotic element 3
Biotic element 4
Biotic element 5
Biotic element 6
Biotic element 7
Biotic element 8

Figure 4.....

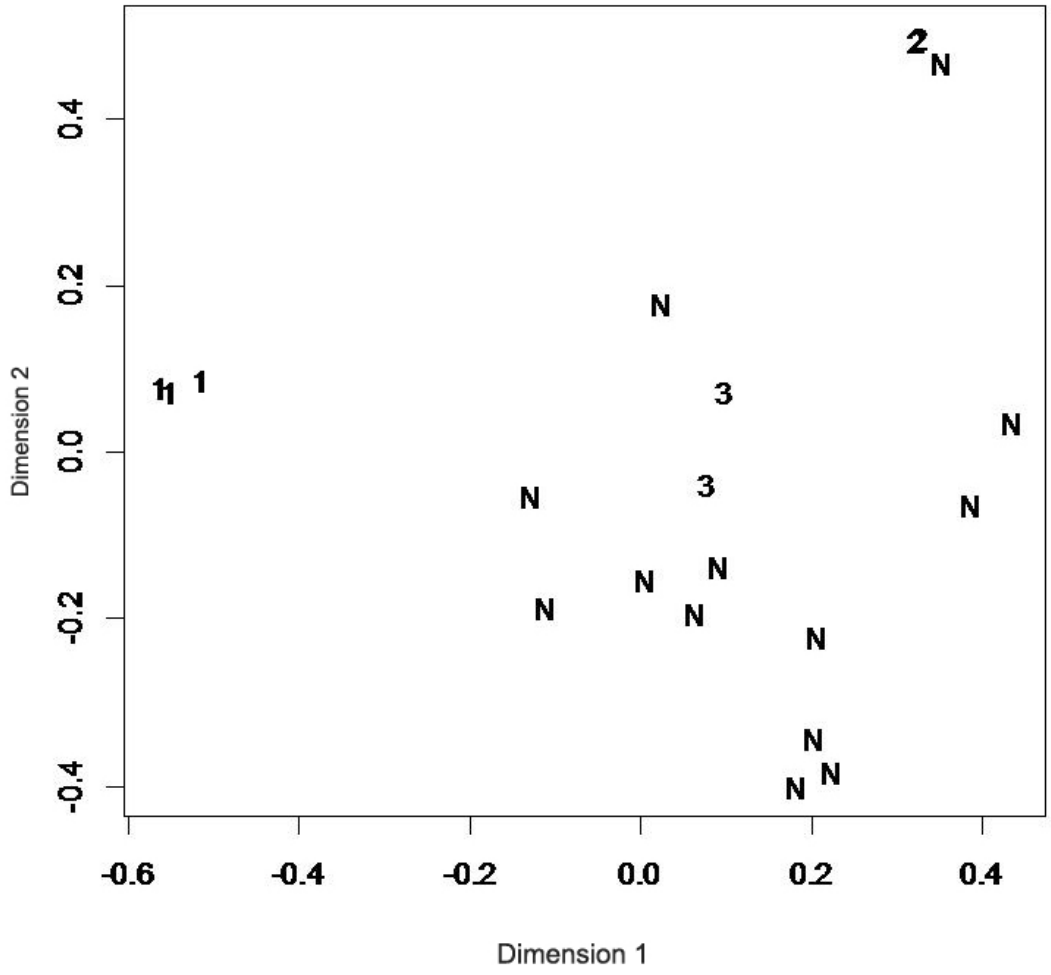

Figure 5.....

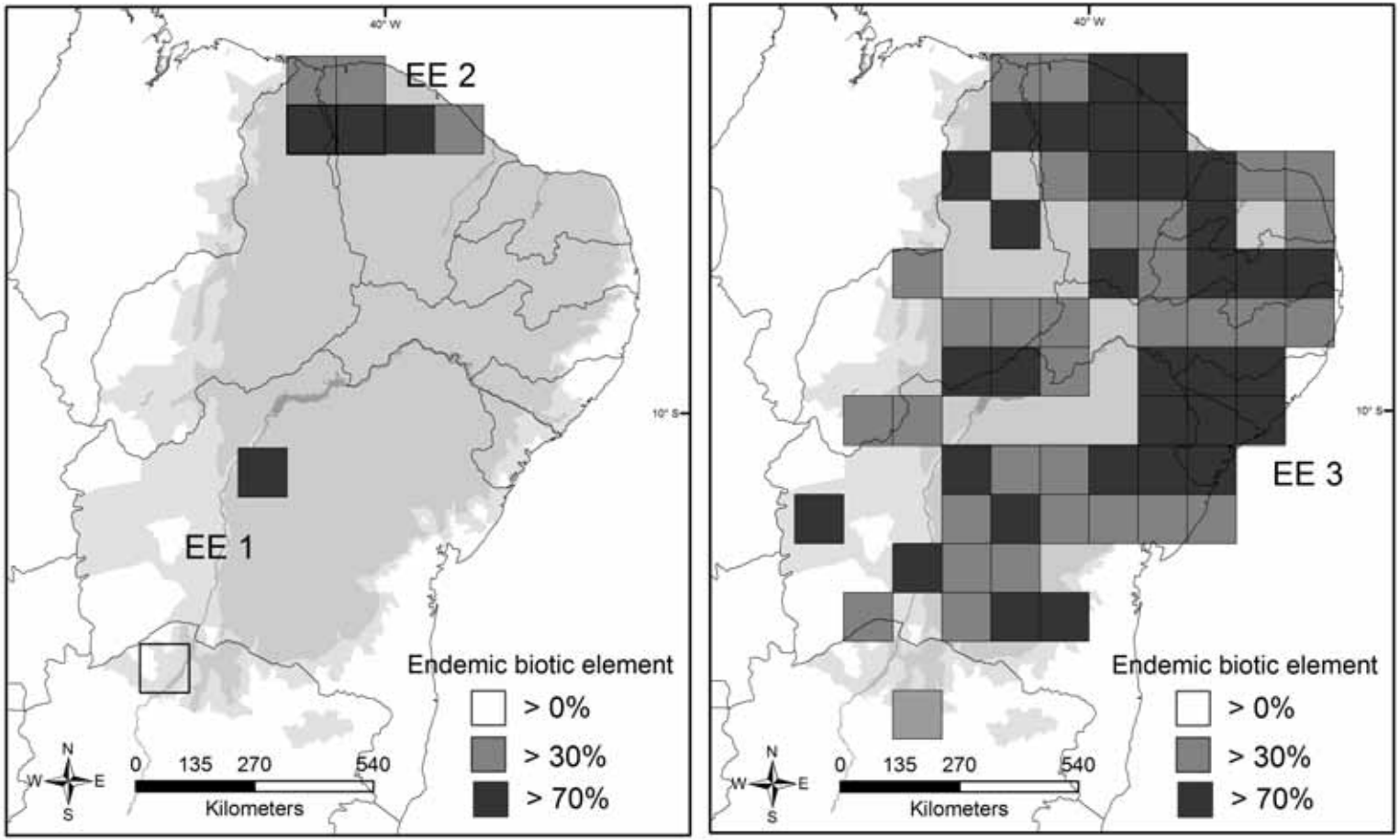
40° W
EE 2
EE 1
10° S
Endemic biotic element
> 0%
> 30%
> 70%
N
W
E
S
0 135 270 540
Kilometers
40° W
EE 3
10° S
Endemic biotic element
> 0%
> 30%
> 70%
N
W
E
S
0 135 270 540
Kilometers

Figure 6.....

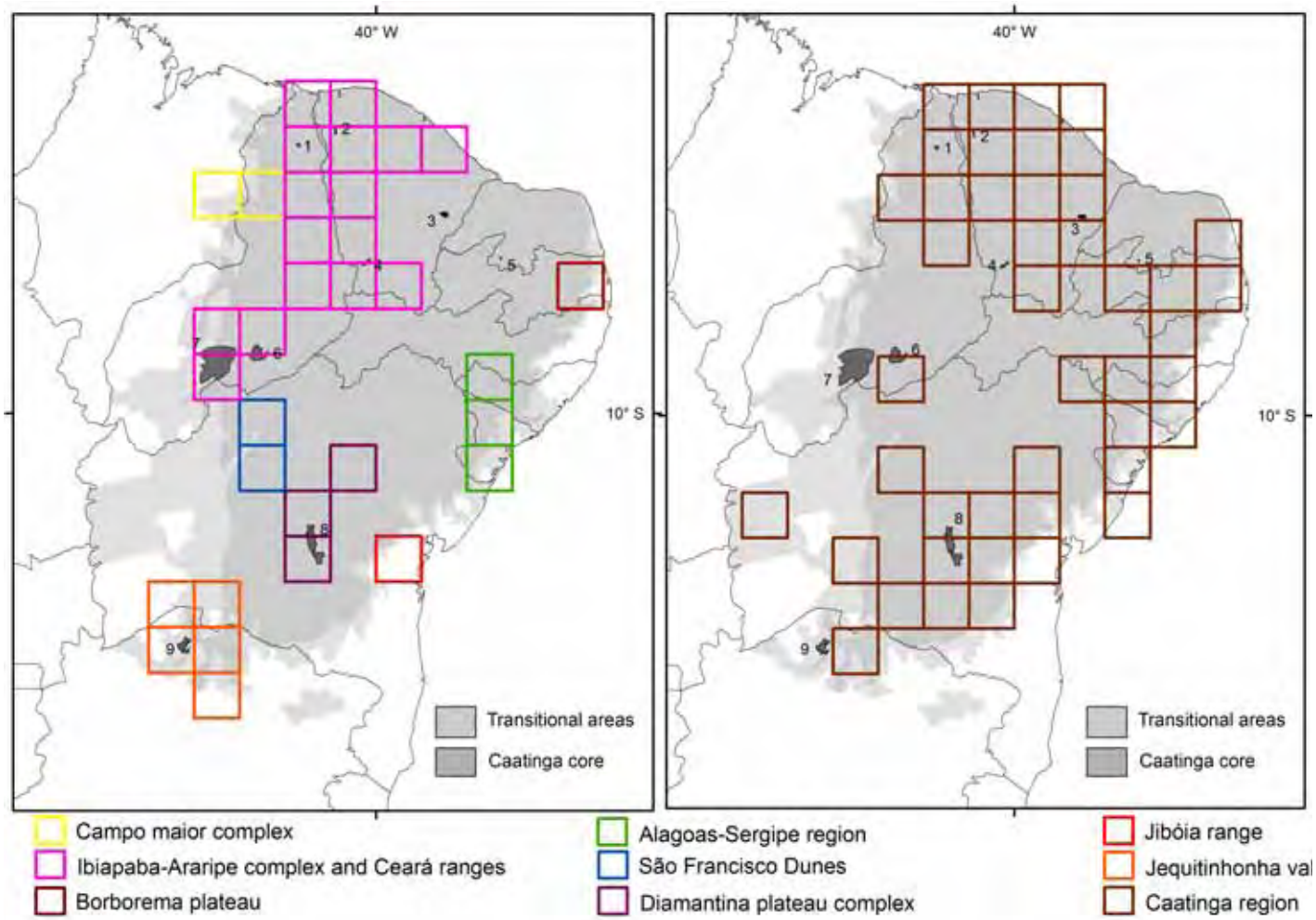
40° W
10° S
Transitional areas
Caatinga core
Campo maior complex
Ibiapaba-Araripe complex and Ceará ranges
Borborema plateau
Alagoas-Sergipe region
São Francisco Dunes
Diamantina plateau complex
Jibóia range
Caatinga region

Figure 7.....

Conclusões

-A visão que a herpetofauna da Caatinga apresenta baixa diversidade e endemismo não se aplica às serpentes.

-A fauna de serpentes da Caatinga é complexa e, além das endêmicas, compartilha espécies que também ocorrem em outras regiões naturais do Brasil, incluindo elevado número de espécies de áreas florestadas.

-Os dados de diversidade e história natural das serpentes da Caatinga disponíveis na literatura (geralmente oriundos de amostragem em única localidade) não refletem a realidade. O presente estudo que registrou diversas novas ocorrências mostra a existência de elevado número de espécies arborícolas e fossoriais, que se alimentam de invertebrados.

-A maior riqueza de serpentes da Caatinga está situada em áreas de elevada altitude (acima de 500 m), e o maior endemismo nas dunas do Rio São Francisco. Porém, deve ser ressaltado que a Caatinga semi-árida também abriga elevada riqueza e endemismos exclusivos desta região. Portanto, estas áreas devem ser melhor avaliadas em planejamentos de conservação.

-As serpentes da Caatinga não se distribuem ao acaso e podem ser reconhecidos padrões de agrupamento em determinadas áreas. Esses padrões parecem responder a eventos de vicariância passados.

-Um total de oito áreas com biota única pode ser reconhecido. Existe correspondência de tais áreas com as maiores divisões topográficas, geomorfológicas, pedológicas e vegetacionais para a Caatinga.

-As áreas com elevada riqueza, endemismo e biota única ainda precisam ser melhor avaliadas quanto ao seu grau de conservação. Para estratégias de conservação, deve ser levado em consideração áreas capazes de proteger os padrões da biodiversidade de serpentes da Caatinga.