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Reptiles From an Urban Park in the Cerrado of Central Brazil

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Abstract.—**We surveyed an urban park in the core area of the Cerrado of central Brazil for reptiles. We used active searches and pit-fall traps in seven distinct environments to assess the representativeness in species composition of the study area, between March 2007 and February 2008. We recorded 27 reptile species represented by 11 snakes, 11 lizards, two amphisbaenas, and three chelonians. Most species were recorded in more than one environment and in both dry and wet seasons. The study area is regionally representative in reptile composition. This suggests the importance of urban parks for the conservation of reptiles from Cerrado of central Brazil. We recommend the inclusion of the study area in the protect network of the municipality of Goiânia.**

Key Words.—Cerrado; conservation; reptiles; urban parks

Resumo.—**Nós amostramos répteis num parque urbano na área core do Cerrado do Brasil central. Nós utilizamos buscas visuais e armadilhas de queda em sete ambientes distintos para avaliar a representatividade da área de estudo em composição de espécies, entre março de 2007 e fevereiro de 2008. Nós registramos 27 espécies de répteis representadas por 11 serpentes, 11 lagartos, duas anfisbênias e três quelônios. A maioria das espécies foi registrada em mais de um ambiente e em ambas estações, seca e chuvosa. A área de estudo é regionalmente representativa em composição de répteis. Isso sugere a importância de parques urbanos para a conservação de répteis do Cerrado do Brasil central. Nós recomendamos a inclusão da área de estudo na rede de área protegidas do município de Goiânia.**

Palavras Chaves.—Cerrado, conservação, parques urbanos, répteis

Introduction

The phytogeographical domain of the Cerrado of South America is composed of three biomes (i.e., Tropical Grassland, Savanna, and Seasonal Forests) widely distributed in central Brazil (Batalha 2011). The Cerrado of central Brazil (CCB) harbors a very rich and endemic reptilian fauna including 145 snakes, 68 lizards, 24 amphisbaenas (Costa et al. 2007), 11 testudines, and five caimans (Colli et al. 2002), of which 103 are endemic (Nogueira et al. 2011). Despite its valuable biodiversity, high levels of habitat loss threat the reptilian fauna of Cerrado (Rodrigues 2005) and the creation of protected areas is recommended as the best conservation strategy for the area (Sano et al. 2019).

Studies have described the reptile composition of different protected areas in rural landscapes in the CCB and discussed their importance for reptile conservation (Valdujo et al. 2009; Recoder et al. 2011; Morais et al. 2012; Ramalho et al. 2018, 2019); however, large rural areas suitable for conservation purposes are now scarce in the CCB (Ganem et al. 2013). Therefore, remnants of native vegetation in urban areas may be suitable targets for reptile conservation through their inclusion in a protected areas network. To accomplish this conservation goal, the first step is to identify the reptilian fauna associated with urban landscapes. To date, there is still little information on reptilian fauna of urban parks in the CCB, (e.g., snakes: Brites and Bauab 1988; Carvalho and Nogueira 1998), or even for other regions of Brazil such as southern (Santos et al. 2005) and northern Brazil (Carvalho et al. 2007; Almeida-Corrêa et al. 2020).

The city of Goiânia, capital of Goiás state, is located in the core area of the CCB and is considered one of the most ecologically sustainable cities in Brazil (https://cidades.ibge.gov.br/brasil/go/Goiânia/panorama). In this study, we aimed to investigate the reptile composition of a region in northern Goiânia, the Bioparque Jaó (BioJao hereafter). We chose an environmentally heterogeneous area to comprehensively sample as many species as possible to assess its regional representativeness comparing to larger protected areas (PA) in rural landscapes with available data on reptile

composition and relatively close to the BioJao. We also sought to identify venomous snakes for park users. Our major objective was to contribute to the knowledge of reptilian fauna associated with urban areas in the CCB and determine the importance of the inclusion of green areas in urban landscapes in the protected areas regional network.

Materials and Methods

Study area.—The BioJao is categorized as a Civil Society Organization of Public Interest (free translation for Organização da Sociedade Civil de Interesse Público). The area was named after a stream that has its headwater within the study area and is located in northern Goiânia city, Goiás state, central Brazil. BioJao (16°37'12" S, 49°12'36" W; 27,800 m²) is a flat area (702–729 m elevation) surrounded by open fields, agricultural lands, and urban areas (Fig. 1). Although BioJao is not formally considered a protected area, it is used by the general public and by children from nearby schools receiving environmental education. Visitors use a net of trails that connect its different environments. The area is in the core of the CCB, which has tropical seasonal climate with a rainy spring and summer (October to March) and a dry autumn and winter (April to September). The annual mean rainfall ranges from 1,200–1,800 mm and the temperature ranges between 22° C and 23° C.

Study sites.—We surveyed for reptiles in seven study sites to represent the environmental heterogeneity of BioJao (Fig. 2). The sites were characterized as follows: (1) Site 1 - a developed riparian zone along a small stream (70-cm wide and 20-cm deep) composed of backwoods, sugarcane, bushes, and sparse Mango

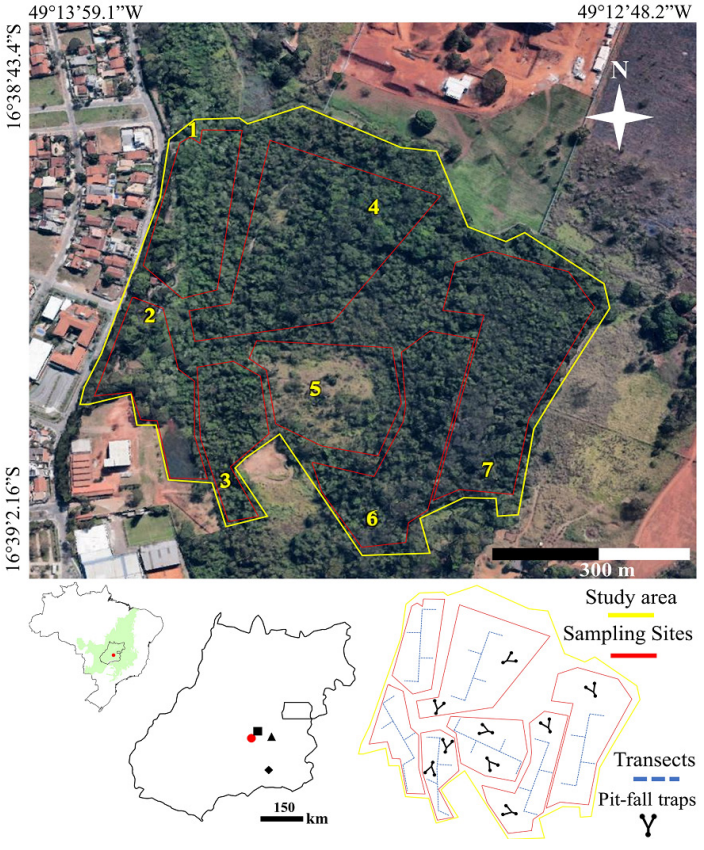

Figure 1. Study area (yellow polygon) and seven sampled environments (red polygons) are: (1) – anthropized riparian zone; (2) anthropized marsh surrounded by a lake; (3) dry forest; (4) guava orchard; (5) *Capoeira*; (6) riparian zone; (7) Semi-deciduous Seasonal Forest, surrounded by an urban matrix as depicted by the satellite imagery (Image from Google Earth Pro). (Below - left) The map of Brazil shows the extension of the Cerrado phytogeographical domain in central Brazil (green shadow), the limits of Goiás state (black polygon inside), and the study area (red square). (Below - middle) A map of Goiás shows the study area (red circle) and three rural protected areas (black symbols; used for comparison) as follows: square - Floresta Nacional de Silvânia; triangle - Parque Altamiro de Moura Pacheco; and diamond - Parque Estadual da Serra de Caldas Novas). (Below - right) The spatial distribution and arrangement of sampling methods. Blue dashed lines indicate transects and black Y symbols with circles at their tips represent pit-fall traps.

Figure 2. Different environment types included in the survey at Bioparque Jaó, northern Goiânia, Goiás state, Brazil. (A) Anthropic riparian zone of (B) a small stream. (C) Anthropized marsh surrounded by (D) a lake. (E) Dry forest. (F) Guava orchard. (G) *Capoeira*. (H) Riparian zone. (I) Semi-deciduous Seasonal Forest. (Photographed by Rafael F. Jorge).

Trees (*Mangifera indica*; 16°38'42" S, 49°13'19.2" W; 2,394 m²); (2) Site 2 - a developed marsh dominated by liana on a wetland covered by creeping vegetation surrounding a lake (16°38'49.2" S, 49°13'22.8" W; 2,500 m²); (3) Site 3 - a preserved dry forest with thin litter leaf layer and 3-m high non-continuous canopy (16°38'56.4" S, 49°13'19.2" W; 1,970 m²); (4) Site 4 - a Guava (*Psidium guajava*) orchard with a deep leaf litter layer (16°38'34.8" S, 49°13'12" W; 6,400 m²); (5) Site 5 - a *capoeira* (i.e., recovering native vegetation) with sparse young and old native trees in a *Brachiaria* field (16°38'52.8" S, 49°13'15.6" W; 3,400 m²); (6) Site 6 - a preserved riparian zone along a medium-size stream (2-m wide and 50-cm deep) with a thin leaf litter layer and 5-m tall trees with close canopy (16°38'56.4" S, 49°13'12" W; 3,825 m²); and (7) Site 7 - a preserved Semi-deciduous Seasonal Forest (SDSF), with middle-deep leaf litter layer and 7-m close canopy (16°38'52.8" S, 49°13'8.4" W; 5,840 m²).

Reptile sampling.—We conducted field work from March 2007 to February 2008. We sampled the study sites every month during morning (0800–0930), afternoon (1530–1700) and night (2000–2200) using Active Searches (AS) by the same researcher along 200-m transects in each environment. We established transects using pre-existing trails, and searches we made into the environments were evenly spaced at every 50 m along the transect. At these points, the researcher entered into the environments alternating left and right sides from the transect line. Active searches lasted 90 min per environment/search time/sampling occasion. We complemented AS with pit-fall traps (PT) stations in all but two environments (Site 1, anthropized riparian zone; and Site 2, marsh, which are seasonally overflooded by nearby streams), one in SDSF (Site 7), and two stations in the dry forest, Guava orchard, *capoeira* and preserved riparian zone (Sites 3–6). Pit-fall traps consisted of four 20-L buckets (total = 36 buckets) arranged in a Y-shape and connected by 4-m long and 50-cm high drift-fences (Fig. 1). We kept PTs actives for 7 d during sampling periods and checked them at 0730 and 1730. We sacrificed specimens not identified in field work by injecting pentobarbital into the peritoneal cavity, fixed them in formalin 10% for 48 h, and then preserved them in 70% alcohol for future identification. We deposited vouchers in the Herpetological section of the Zoological collection of the Centro de Estudos e Pesquisas Biológicas da Pontifícia Universidade Católica de Goiás.

Data analysis.—We estimated the expected number of species and the standard deviation using Chao Richness Estimator (Chao 1984). We used EstimateS software v. 9.1 (Colwell and Elsensohn 2014) for our analysis. We built plots using the R package ggplot2 (Wickham 2016; R Core Team 2018).

Figure 3. Snake species recorded at Bioparque Jaó, northern Goiânia, Goiás state, Brazil. (A) Boettger's Sipo (*Chironius flavolineatus*), (B) *Dormideira* (*Dipsas mikanii*), (C) False Coral Snake (*Oxyrhopus trigeminus*), (D) Wagler's Snake (*Xenodon merremii*), (E) Brazilian Lancehead (*Bothrops moojeni*), (F) South American Coral Snake (*Micrurus lemniscatus*). (Photographed by Rafael F. Jorge).

Results

We recorded 11 snakes (four families), 11 lizards (seven families), two amphisbaenians (one family) and three chelonians (three families) during 378 h of AS and 18,144 h of open PTs (Figs. 3–5). Our surveys reached the asymptote of species accumulation in October (eight sampling months), when no more than 27 species were recorded (Fig. 6). We recorded the lizards *Bahia colobosaura* (*Colobosaura modesta*), the Long-tailed Little Lizard (*Cercosaura schreibersii*), and the amphisbaena Neglected Worm Lizard (*Amphisbaena neglecta*) exclusively by PT and all snakes, chelonians, and one species of amphisbaena exclusively by AS. We recorded four lizards by both methods (Appendix Table).

In the rainy season, we recorded 24 species (83 individuals) and 23 in the dry (58 individuals) season (Fig. 7). In April (transition between rainy and dry seasons) we recorded the most species (17) and individuals (33), and we recorded the fewest number of species (three) in May (Fig. 7). We recorded 11 and three species exclusively in the rainy or dry season, respectively. We recorded 14 species in the swamp (43 individuals) and 11 in the anthropized riparian zone (54 individuals), whereas we found only three species in the SDSF (four individuals) and two (three individuals) in the preserved riparian zone. Four snakes, six lizards, and all chelonian species were limited to one environment, the latter to the lake area and surrounding swamp (Fig. 8). We recorded three lizards, two amphisbaenas, and two snakes in three or more environments. We did not record crocodilians in the study area.

The most abundant snake was the *Dormideira* (*Dipsas mikanii*; n = 23) and the least abundant were the South America Coral Snake (*Micrurus lemniscatus*) and the Banded Cat-eyed Snake (*Leptodeira annulata*; Fig. 6), for which we found only one of each. Most snakes were found twice or three times. The most abundant lizards were the Neotropical Ameiva (*Ameiva ameiva*; n = 21) and the Amazon Lava Lizard (*Tropidurus torquatus*; n =

Figure 4. Snakes and lizards recorded at Bioparque Jaó, northern Goiânia, Goiás state, Brazil. (G) Royal Ground Snake (*Erythrolampus reginae*), (H) Striped Worm Lizard (*Ophiodes striatus*), (I) Cope's Mabuya (*Notomabuya frenata*), (J) Black-Spotted Skink (*Copeoglossum nigropunctatum*), (K) Amazon Lava Lizard (*Tropidurus oreadicus*), (L) *Calango-do-Cerrado* (*Tropidurus torquatus*). (Photographed by Rafael F. Jorge).

18), and the least abundant (one each) were the lizards *Briba* (*Gymnodactylus carvalhoi*), the Long-tailed Little Lizard (*Cercosaura schreibersii*), and the Striped Worm Lizard (*Ophiodes striatus*). We recorded the Boettger's Sipo Snake *Chironius flavolineatus* (Fig. 6) and the exotic House Gecko (*Hemidactylus mabouia*) 13 and 12 times, respectively. We recorded both species of amphisbaena four times each and chelonians between one and five times, with the Yellow-spotted Amazon River Turtle (*Podocnemis unifilis*) as the most recorded.

Discussion

We demonstrated that a green park/green area immersed in an urban matrix in the core area of the CCB harbors at least 50% of species of reptiles sampled in larger and more preserved PAs located in rural landscapes nearby (e.g., Morais et al. 2012; Ramalho et al. 2018, 2019), with most individuals recorded during the transitions between seasons. The partial maintenance of native vegetation in BioJao may explain this finding. Our results contribute to evidence of the importance of protecting natural areas in urban landscapes for the conservation of reptile species.

We documented both disturbance-tolerant species and those that require intact, undisturbed habitats. Several species were of particular interest, including two species of snakes associated with reports of severe snake bites (pers. obs.), one of which (the South American Coral Snake) has not been recorded in nearby protected areas. Our observations did not include large reptiles commonly seen in disturbed areas.

We did not record some species present in those more preserved PAs in rural landscapes relatively close to the studied area (e.g., Morais et al. 2012; Ramalho et al. 2018, 2019). They may have been locally extinct due to the modification of local environments. Hence, preserving or restoring original vegetation of remnants of the CCB

Figure 5. Lizard and turtles recorded at Bioparque Jaó, northern Goiânia, Goiás state, Brazil. (M) Bahia Colobosaura (*Colobosaura modesta*), (N) Neotropical Ameiva (*Ameiva ameiva*), (O) Red Worm Lizard (*Amphisbaenia alba*), (P) Neglected Worm Lizard (*Amphisbaenia neglecta*), (Q) Geoffroy's Toadhead Turtle (*Phrynops geoffroanus*), (R) Black-bellied Slider (*Trachemys dorbigni*). (Photographed by Rafael F. Jorge).

in urban landscapes is also of relevant concern. This may prevent the local extinction of habitat-specialist species, such as the *Briba* and also those that rely on different environments to persist in an area, such as the *Bahia Colobosaura* (*Colobosaura modesta*) and the False Coral Snake (*Oxyrhopus trigeminus*).

Studies have been conducted examining the reptile composition in urban areas, including in the CCB (e.g., Brites and Bauab 1988; Carvalho and Nogueira 1998), southern Brazil (Santos et al. 2005), and northern Brazil (Carvalho et al. 2007; Almeida-Corrêa et al. 2020). The *Dormideira*, the Boettger's Sipo, the Brazilian Lancehead (*Bothrops moojeni*), the Neotropical Ameiva, the Black-spotted Skink (*Copeoglossum nigropunctatum*), and the Amazon Lava Lizard were the most common species in anthropized environments in our study system. These same generalist species or ecologically related species from the same genera recorded in the CCB or other regions of Brazil seem more resistant to environmental modification. The study area also shares these species with geographically close PAs, which is related to the presence of disturbed habitats near the study sites where opportunistic and generalist species are occasionally recorded (Morais et al. 2012; Ramalho et al. 2018, 2019).

Other lizard and snake species may be eliminated from anthropized areas when the local microclimate reaches maximum or minimum extremes or sources of food are scarce (Goode et al. 1998; Gibbons et al. 2000). Some species recorded in PAs previously mentioned, such as the massive snakes Red-tailed Boa (*Boa constrictor*), Rainbow Boa (*Epicatres cenchria*), and the Tropical Rattle Snake (*Crotalus durissus*) or lizards with reduced body size, such as the blue-tailed *bribas* (*Micrablephalus maximiliani* and *M. atticolus*), may be absent from the study area due to local-scale environmental change (i.e., suppression of native vegetation/habitat loss). The occurrence of some

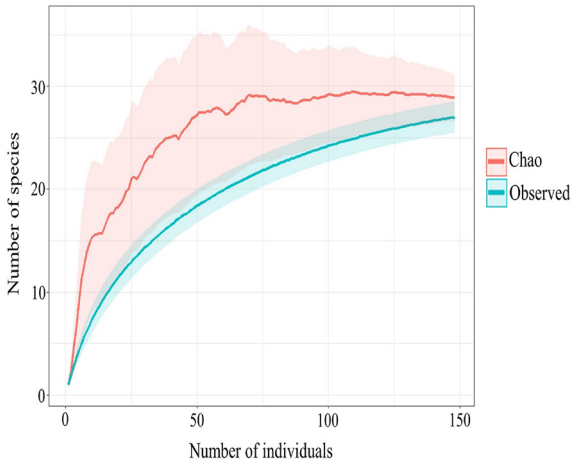

Figure 6. Rarefied (red line) and observed (blue line) species richness for reptiles documented in Bioparque Jaó, Brazil, using pitfall traps and active search.

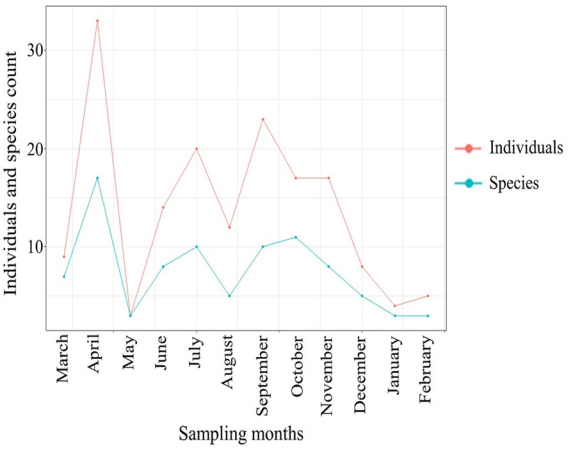

Figure 7. Temporal distribution of species (blue symbols and line) and abundance of individuals (red symbols and line) throughout 12 months of sampling in Bioparque Jaó, Brazil.

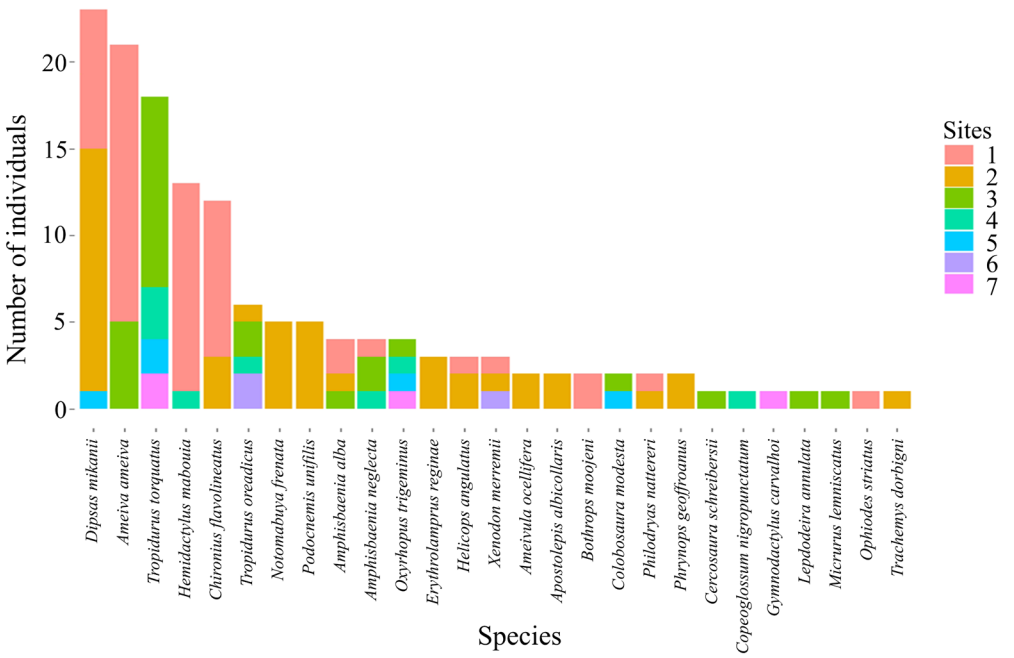

Figure 8. Number of individuals per species by environment (see Fig. 2) in Bioparque Jaó, Brazil. Species are *Dormideira* (*Dipsas mikanii*), Neotropical Ameiva (*Ameiva ameiva*), Amazon Lava Lizard (*Tropidurus torquatus*), African House Gecko (*Hemidactylus mabouia*), Boettger's Sipo (*Chironius flavolineatus*), *Calango-do-Cerrado* (*Tropidurus oreadicus*), Cope's Mabuya (*Notomabuya frenata*), Yellow-spotted Amazon River Turtle (*Podocnemis unifilis*), Red Worm Lizard (*Amphisbaenia alba*), Neglected Worm Lizard (*Amphisbaenia neglecta*), False Coral Snake (*Oxyrhopus trigeminus*), Royal Ground Snake (*Erythrolampus reginae*), Brown-banded Water Snake (*Helicops angulatus*), Wagler's Snake (*Xenodon merremii*), Spix's Whiptail (*Ameivula ocellifera*), False Coral Snake (*Apostolepis albicollaris*), Brazilian Lancehead (*Bothrops moojeni*), *Bahia Colobosaura* (*Colobosaura modesta*), Paraguay Green Racer (*Philodryas nattereri*), Geoffroy's Toadhead Turtle (*Phrynops geoffroanus*), Long-tailed Little Lizard (*Cercosaura schreibersii*), Black-spotted Skink (*Copeoglossum nigropunctatum*), *Briba* (*Gymnodactylus carvalhoi*), Banded Cat-eyed Snake (*Leptodeira annulata*), South America Coral Snake (*Micrurus lemniscatus*), Striped Worm Lizard (*Ophiodes striatus*), and Black-bellied Slider (*Trachemys dorbigni*).

species in BioJao that were not recorded in close PAs may be explained by their secretive habits. This is likely the case for the fossorial South America Coral Snake and the arboreal Banded Cat-eyed Snake. Another impediment to conservation is the introduction of exotic species, which changes the natural distribution of native species through local extinction caused by negative direct (i.e., predation) or indirect (i.e., reduction of food sources) biotic interactions (Krebs 2009). We recorded three exotic species in the study area: the Black-bellied Slider (*Trachemys dorbigni*) from southern Brazil, the Yellow-spotted Amazon River Turtle from northern Goiás ranging further into northern Brazil, and the African House Gecko.

The BioJao is regionally representative in species composition, and its protection and of other remnants of CCB in urban landscapes (i.e., in Goiânia City) might contribute to the conservation of reptilian fauna by avoiding the isolation of larger protected areas in nearby rural landscapes: Parque Estadual Altamiro de Moura Pacheco (PEAMP), 16 km from the study area; Floresta Nacional de Silvânia (FLOSIL), 68 km from the study area; and Parque Estadual da Serra de Caldas Novas (PESCAN), 150 km from study area. Larger and more preserved protected areas in rural landscapes in the CCB are isolated from each other by large pasture and agricultural fields, dams, roads, and cities. Protecting urban remnants of native vegetation in the CCB can enhance connectivity between them through natural corridors (i.e., gallery and riparian forests) or support the planning of corridors between PAs.

We recommend the formal inclusion of BioJao in the protected area network of the Goiânia municipality, aiming to promote proper management and protection of its reptilian assemblage. BioJao accounts for about 10% of all reptile species of CCB and the size of the study area comprises only < 0.001% of the entire CCB. BioJao is privately owned and should be suitable to become a Private Reserve of Natural Heritage (free translation from the Portuguese Reserva Particular de Patrimônio Natural - RPPN). Preserving natural areas in urban landscapes provides additional benefits beyond the conservation of species in these areas. Natural areas help to maintain local climate and to protect river basins. The inclusion of BioJao as a PA may facilitate the inclusion of other natural areas in the CCB in the protected network as Goiânia expands over unprotected areas of native vegetation in the CCB.

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Rafael F. Jorge began studying biology in 2004 at Pontificia Universidade Católica de Goiás, Brazil (2007). He worked as a Technical Consultant conducting short-term biodiversity assessments in different Brazilian biomes: Cerrado, Caatinga, and the Atlantic and Amazon rainforests. He has an MBA in Environmental Management (Faculdade Oswaldo Cruz, 2009) and M.S. and a Ph.D. in Ecology from the National Institute of Amazonian Research (free translation for Instituto Nacional de Pesquisas da Amazônia), Manaus City, Amazonas State, Brazil ((2014, 2020). His doctoral project aimed to understand the role of environmental heterogeneity in the distribution of phenotypes and genotypes of the Harlequin Toad, *Atelopus manauensis* (Anura: Bufonidae), in central Amazon, Amazonas state, Brazil. He is interested in topics related to animal ecology, behavior, and evolution applied to conservation. (Photographed by A. A. Sampaio).

Alfredo P. Peña (in *memoriam*) earned degrees in Biology (1995) and Archaeology (2012) from the Pontificia Universidade Católica de Goiás, Brazil. He had an M.S. in Biology from the Universidade Federal de Goiás, Brazil (2000). He coordinated the Brazilian Association for Turtle Conservation. He worked as a consultant for Amphibians and Reptiles at Instituto Brasileiro de Conservação da Biodiversidade and as Executive Director of Arqueologia Brasil Ltda company. He was an Invited Professor at União dos Goyazes University, Brazil. He had experience in ecology with emphases on the geographical distribution of animals, field surveys, and the structure of biological communities. (Photographer unknown).

Appendix Table. List of species recorded in Bioparque Jaó, Brazil, sampling method, season of recording, and presence of the species recorded in the study area and in rural protected areas used for comparison in the present study. Abbreviations are AS = active search, PT = pit-fall trap, and PA = protected areas from where the species has been recorded, as follows: 1 - Parque Estadual da Serra de Caldas Novas (PESCAN); 2 - Floresta Nacional de Silvânia (FLOSIL); 3 - Parque Estadual Altamiro de Moura Pacheco (PEAMP); and 4 - recorded only in Bioparque Jaó (BioJao).

Taxon	Method	Season		PAs
		Dry	Rainy	
SQUAMATA				
SNAKES				
Colubridae				
Boettger's Sipo (*Chironius flavolineatus*)	AS	5	8	1;2
Dipsadidae				
False Coral Snake (*Apostolepis albicollaris*)	AS	–	1	3
Brown-banded Water Snake (*Helicops angulatus*)	AS	–	3	4
Banded Cat-eyed Snake (*Leptodeira annulata*)	AS	–	1	4
Royal Ground Snake (*Erythrolampus reginae*)	AS	1	2	2;3
False Coral Snake (*Oxyrhopus trigeminus*)	AS	2	1	1;2
Paraguay Green Racer (*Philodryas nattereri*)	AS	–	1	4
Dormideira (*Dipsas mikanii*)	AS	10	13	1;3
Wagler's Snake (*Xenodon merremii*)	AS	2	–	2;3
Elapidae				
South American Coral Snake (*Micrurus lemniscatus*)	AS	–	1	4
Viperidae				
Brazilian Lancehead (*Bothrops moojeni*)	AS	1	1	1;2;3
LIZARDS				
Tropiduridae				
Amazon Lava Lizard (*Tropidurus torquatus*)	AS	6	12	2;3
Calango-do-Cerrado (*Tropidurus oreadicus*)	AS/PT	2	5	3
Gekkonidae				
African House Gecko (*Hemidactylus mabouia*)	AS	8	6	1;3
Phyllodactylidae				
Briba (*Gymnodactylus carvalhoi*)	AS	–	1	4
Gymnophthalmidae				
Bahia Colobosaura (*Colobosaura modesta*)	PT	1	1	1;2
Long-tailed Little Lizard (*Cercosaura schreibersii*)	PT	–	1	1;2
Teiidae				
Neotropical Ameiva (*Ameiva ameiva*)	AS/PT	14	7	1;2;3
Spix's Whiptail (*Ameivula ocellifera*)	AS	–	2	1
Mabuyidae				
Cope's Mabuya (*Notomabuya frenata*)	AS/PT	1	4	1;2;3
Black-Spotted Skink (*Copeoglossum nigropunctatum*)	AS/PT	–	2	1;2;3
Anguidae				
Striped Worm Lizard (*Ophiodes striatus*)	AS	–	1	1;2;3
AMPHISBAENIANS				
Amphisbaenidae				
Red Worm Lizard (*Amphisbaenia alba*)	AS	–	4	1;3
Neglected Worm Lizard (*Amphisbaenia neglecta*)	PT	1	4	4
TESTUDINES				
Chelidae				
Geoffroy's Toadhead Turtle (*Phrynops geoffroanus*)	AS	2	–	3
Podocnemididae				
Yellow-spotted Amazon River Turtle (*Podocnemis unifilis*)	AS	1	4	4
Emydidae				
Black-bellied Slider (*Trachemys dorbigni*)	AS	1	–	4