

# A refuge between houses and buildings: reptiles in a peri-urban Atlantic Forest fragment in northeastern Brazil

Un refugio entre casas y edificios: reptiles en uno fragmento periurbano de Mata Atlántica en el noreste de Brasil

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## ABSTRACT

The Atlantic Forest is recognized as a global biodiversity hotspot, but despite the comparatively large number of published reptile inventories already available for this region, large geographic gaps remain unfilled. The purpose of this paper is to provide a list of reptile species recorded in the Área de Proteção Ambiental do Catolé e Fernão Velho (APACFV), a 37 km<sup>2</sup> peri-urban protected area in the northern Atlantic Forest in the Brazilian state of Alagoas. Based on a review of reptile specimens and photographs collected over 27 years, a total of 65 species belonging to three orders and 22 families occur in the APACFV: three turtle families (4 spp.), one alligator family (2 spp.), 12 non-snake lizard families (24 spp.), and six snake families (35 spp.). Despite the imperilment of the biota of this region, only one of the recorded species is included on the endangered species list of the Brazilian government (*Amerotyphlops paucisquamus*, Vulnerable), and none are categorized as threatened under the Red List of Threatened Species of the International Union for Conservation of Nature. The reptile assemblage in the APACFV is among the most diverse documented for Alagoas, and this list is an important step to inform management strategies in this protected area.

**Keywords.** Alagoas State, Área de Proteção Ambiental do Catolé e Fernão Velho, Conservation, Hot-spot, Inventory, Neotropical region.

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## RESUMEN

La Mata Atlántica es reconocida como un punto crítico de biodiversidad global, pero a pesar de la cantidad comparativamente grande de inventarios de reptiles publicados que ya están disponibles para esta región, aún quedan grandes vacíos geográficos por llenar. El propósito de este trabajo es proporcionar una lista de especies de reptiles registrados en el Área de Protección Ambiental do Catolé e Fernão Velho (APACFV), un área protegida periurbana de 37 km<sup>2</sup> en la parte norte de la Mata Atlántica en el estado brasileño de Alagoas. Con base en una revisión de especímenes y fotografías de reptiles recolectados durante un período de 27 años, un total de 65 especies pertenecientes a tres órdenes y 22 familias ocurren en el APACFV: tres familias de tortugas (4 spp.), una familia de cocodrilos (2 spp.), 12 familias de lagartos que no son serpientes (24 spp.) y seis familias de serpientes (35 spp.). A pesar del peligro de la biota de esta región, solo una de las especies registradas está categorizada como amenazada en la lista de especies en peligro de extinción de Brasil (*Amerotyphlops paucisquamus*, Vulnerable), y ninguno está clasificado como amenazada en la Lista Roja de Especies Amenazadas de la Unión Internacional para la Conservación de la Naturaleza. El conjunto de reptiles en el APACFV se encuentra entre los más diversos documentados para Alagoas, y esta lista es un paso importante para informar las estrategias de manejo en esta área protegida.

**Palabras clave.** Área de Protección Ambiental do Catolé e Fernão Velho, Conservación, Estado de Alagoas, *Hotspot*, Inventario, Región Neotropical.

## INTRODUCTION

Historical and contemporary biotic and abiotic factors have generated unequal diversity in different ecoregions globally (e. g. Moura *et al.* 2016, Roll *et al.* 2017). The American Tropics stand out on the world stage for its high biodiversity and endemism (Myers *et al.* 2000, Ceballos and Ehrlich 2006, Roll *et al.* 2017). Of the 36 biodiversity hotspots recognized worldwide (*sensu* Mittermeier *et al.* 2004 and Conservation International 2022), eight occur in the American Tropics, at least in part. Among the most imperiled of these hotspots is the Atlantic Forest of Brazil, Paraguay, and Argentina (Mittermeier *et al.* 2004). This hotspot originally covered around 150 million ha, but currently contains only an estimated 11–16% of its original vegetation coverage, with small and isolated forest fragments surrounded by large areas of monoculture and pasture (Ribeiro *et al.* 2009).

The Atlantic Forest is home to approximately 300 species of reptiles (Tozetti *et al.* 2017), out of the more than 11 500 species currently described globally (Uetz *et al.* 2022). Due to the broad climatic, topographic and vegetational variation of the Atlantic Forest (Ribeiro *et al.* 2009), species assemblages can vary dramatically over

short distances (Costa and Bérnils 2018, Nogueira *et al.* 2019, Prates *et al.* 2020). Furthermore, despite the comparatively large number of reptile surveys already available for the Atlantic Forest (e. g. Costa and Bérnils 2018, Nogueira *et al.* 2019, Prates *et al.* 2020, Filho *et al.* 2020, 2021, França *et al.* 2020, Dubeux *et al.* 2022; See Discussion section for other examples), large geographic gaps still exist. The high probability of discovering new species (Moura and Jetz 2021), coupled with new distribution records published each year for this hotspot, reinforce the need for additional reptile inventories in the Atlantic Forest (Rodrigues 2005, Andrade *et al.* 2019, Albuquerque *et al.* 2019, Lourenço-de-Morais 2019, Rosario *et al.* 2019, Prates *et al.* 2020).

The northern portion of the Atlantic Forest, which is defined as the area north of Brazil's São Francisco River, has the most poorly-known biodiversity within the broader hotspot (Silva and Casteleri 2003, Tabarelli *et al.* 2006, Ribeiro *et al.* 2009). This uneven biodiversity knowledge across the Atlantic Forest exemplifies the Wallacean shortfall: lack of knowledge of the geographic distribution of species (Nogueira *et al.* 2019). Given the large area of over 3 700 km<sup>2</sup> of forest cover remaining in the northern Atlantic Forest (Ribeiro *et al.* 2009), comparatively few

published reptile lists exist for this region (Santana *et al.* 2008, Roberto *et al.* 2015, Roberto *et al.* 2017, Mesquita *et al.* 2018, Melo *et al.* 2018, Barbosa *et al.* 2019, Filho *et al.* 2020, 2021, França *et al.* 2020, Lima *et al.* 2021, Oliveira *et al.* 2021, Dubeux *et al.* 2022). Even so, approximately 180 species of reptiles are currently reported from the northern Atlantic Forest, representing about 60% of the total reptile diversity documented in this hotspot (Costa and Bérnils 2018). Of these species, 16 are endemic to the northern Atlantic Forest and eight are considered threatened under the International Union for Conservation of Nature (IUCN) Red List of Threatened Species and/or under the Brazilian government's list of endangered species, the Livro Vermelho da Fauna Brasileira Ameaçada de Extinção (Costa and Bérnils 2018, ICMBio 2018, IUCN c2022).

For the Atlantic Forest remnants in the state of Alagoas, Brazil, an outdated list of reptile species by ecoregions (Silva *et al.* 2006), and long-term surveys in the Reserva Biológica de Pedra Talhada (Roberto *et al.* 2015) and Área de Proteção Ambiental and Estação Ecológica de Murici (Dubeux *et al.* 2022), are the only available reptile lists. Only the last one was published in a scientific journal, the other studies were published in books written in Portuguese, and only the former is easily available for consultation. Herein, we add to this regional documentation by presenting a list of reptile species documented during 27 years of fieldwork in the Área de Proteção Ambiental do Catolé e Fernão Velho, a partly urbanized protected area in the northern Atlantic Forest of Alagoas, Brazil. The conservation relevance of this novel inventory data is also briefly discussed.

## MATERIAL AND METHODS

**Study area:** The Área de Proteção Ambiental (Environmental Protection Area) do Catolé e Fernão Velho (APACFV; Figs. 1 and 2) is one of the largest peri-urban protected areas in the state of Alagoas and partially encompasses the municipalities of Coqueiro Seco, Maceió, Rio Largo, Santa Luzia do Norte and Satuba. It has a total area of 37 km<sup>2</sup> roughly centered at the coordinates -9.58° and -35.80° and supports dense ombrophylous forest, secondary and regenerating forests, savanna-like vegetation (*Cerrado* enclave), mangroves, coconut trees, sugarcane fields and pastures (Assis 2000, Oliveira *et al.* 2014). This protected area also encompasses, and is partially surrounded by, large urban centers and residential complexes, mainly on its east flank which includes part of

the state capital Maceió. Because the APACFV is categorized as a sustainable-use conservation unit, the existence of urban areas within its limits is allowed. Approximately 118 000 people are estimated to reside within the limits of APACFV, and many communities both within and outside the reserve make use of its resources (Oliveira *et al.* 2014). The APACFV has a rich hydrography, including one of the largest lagoons in the state (Mundaú Lagoon; Oliveira *et al.* 2014). The climate is classified as tropical with a dry summer, with an average annual rainfall of 1300–1600 mm and temperatures ranging from 22–26° C (Alvares *et al.* 2013).

**Data collection and analysis:** Reptile specimens cataloged in the *Coleção Herpetológica do Museu de História Natural da Universidade Federal de Alagoas* (MHN-UFAL) were surveyed to identify those collected within the APACFV between 1993 and 2020. Photographic records for reptile species observed in the APACFV but not represented in the MHN-UFAL collection were also used to supplement the specimen-based records. Additionally, the GBIF (available at <https://www.gbif.org/>), VertNet (available at <http://portal.vertnet.org/>), and iNaturalist (available at <https://www.inaturalist.org>) platforms were reviewed in March 2022 for any records pertinent to the study area, but only iNaturalist contained relevant records (n = 3) and the species represented therein were duplicative concerning previously-documented species in the MHN-UFAL. Species identification was based on diagnostic morphology as specified in the scientific literature. Taxonomic nomenclature followed by Uetz *et al.* (c2022) (except Dipsadidae followed Zaher *et al.* [2019]). Species accumulation and collection density curves were elaborated based on the collection dates of MHN-UFAL specimens and photographs taken between 1993 and 2020. The conservation status of each species was assessed using the IUCN Red List of Threatened Species (IUCN c2022) and the Brazilian government's list of endangered species, the *Livro Vermelho da Fauna Brasileira Ameaçada de Extinção* (ICMBio 2018).

## RESULTS

A total of 500 MHN-UFAL reptile specimens collected from 1993–2020 originated in the APACFV. At least one specimen was collected annually in the reserve during that period, except for five years with no specimens (1999, 2001, 2006, 2008, and 2010; Fig. 3). Over half of the

**Table 1.** Reptiles of the Área de Proteção Ambiental do Catolé e Fernão Velho (APACFV), Alagoas State, northeastern Brazil. Vouchers refer to a specimen number in the *Coleção Herpetológica do Museu de História Natural da Universidade Federal de Alagoas* (MHN-UFAL) or to a photograph available in Figs. 4 or 5 of the present study. Conservation status of species followed by IUCN (c2022) and ICMBio (2018), respectively: NE = Not Evaluated; LC = Least Concern; NT = Near Threatened; VU = Vulnerable; DD = Data Deficient.

Species	Voucher	Conservation Status	
		IUCN	ICMBio
TESTUDINATA			
Chelidae			
<i>Mesoclemmys tuberculata</i> (Luederwaldt, 1926)	Fig. 4A	NE	LC
<i>Phrynops geoffroanus</i> (Schweigger, 1812)	Fig. 4B	NE	LC
Kinosternidae			
<i>Kinosternon scorpioides</i> (Linnaeus, 1766)	Fig. 4C	NE	LC
Testudinidae			
<i>Chelonoidis carbonarius</i> (Spix, 1824)	Fig. 4D	NE	LC
CROCODYLIA			
Alligatoridae			
<i>Caiman latirostris</i> (Daudin, 1801)	4677	LC	LC
<i>Paleosuchus palpebrosus</i> (Cuvier, 1807)	16189	LC	LC
SQUAMATA			
Amphisbaenidae			
<i>Amphisbaena alba</i> Linnaeus, 1758	2795	LC	LC
<i>Amphisbaena pretrei</i> Duméril & Bibron, 1839	10844	LC	LC
Dactyloidae			
<i>Anolis punctatus</i> Daudin, 1802	9635	LC	LC
<i>Anolis fuscoauratus</i> D'Orbigny, 1837	505	LC	LC
<i>Anolis ortonii</i> Cope, 1868	1619	NE	LC
Gekkonidae			
<i>Hemidactylus mabouia</i> (Jonnès, 1818)	11659	LC	NE
Gymnophthalmidae			
<i>Acratosaura mentalis</i> (Amaral, 1933)	Fig. 4K	LC	LC
<i>Dryadosaura nordestina</i> Rodrigues, Freire, Pellegrino & Sites, 2005	4005	LC	LC
<i>Stenolepis ridleyi</i> Boulenger, 1887	952719	LC	LC
Iguanidae			
<i>Iguana iguana</i> (Linnaeus, 1758)	4678	LC	LC

(Continúa)



Species	Voucher	Conservation Status	
		IUCN	ICMBio
Leiosauridae			
<i>Enyalius</i> aff. <i>catenatus</i> (Wied, 1821) [see Discussion]	1604	-	-
Phyllodactylidae			
<i>Gymnodactylus darwini</i> (Gray, 1845)	7568	LC	LC
<i>Phyllopezus lutzae</i> (Loveridge, 1941)	2951	LC	LC
Polychrotidae			
<i>Polychrus acutirostris</i> Spix, 1825	1591	LC	LC
<i>Polychrus marmoratus</i> (Linnaeus, 1758)	Fig. 4P	LC	LC
Sphaerodactylidae			
<i>Coleodactylus meridionalis</i> (Boulenger, 1888)	531	LC	LC
Scincidae			
<i>Copeoglossum nigropunctatum</i> (Spix, 1825)	13572	LC	LC
<i>Psychosaura macrorhyncha</i> (Hoge, 1947)	1580	LC	LC
Teiidae			
<i>Ameiva ameiva</i> (Linnaeus, 1758)	3030	LC	LC
<i>Ameivula ocellifera</i> (Spix, 1825)	3035	LC	LC
<i>Kentropyx calcarata</i> Spix, 1825	1645	LC	LC
<i>Salvator merianae</i> (Duméril & Bibron, 1839)	10802	LC	LC
Tropiduridae			
<i>Strobilurus torquatus</i> Wiegmann, 1834	Fig. 5D	LC	LC
<i>Tropidurus hispidus</i> (Spix, 1825)	4006	LC	LC
Boidae			
<i>Boa constrictor</i> Linnaeus, 1758	11852	LC	LC
<i>Epicrates assisi</i> Machado, 1945	16190	NE	LC
<i>Epicrates cenchria</i> (Linnaeus, 1758)	13973	NE	LC
Colubridae			
<i>Chironius flavolineatus</i> (Jan, 1863)	2064	LC	LC
<i>Dendrophidion atlantica</i> Freire, Caramaschi & Gonçalves, 2010	13444	NE	DD
<i>Drymoluber dichrous</i> (Peters, 1863)	14054	LC	LC
<i>Leptophis ahaetulla</i> (Linnaeus, 1758)	5307	LC	LC

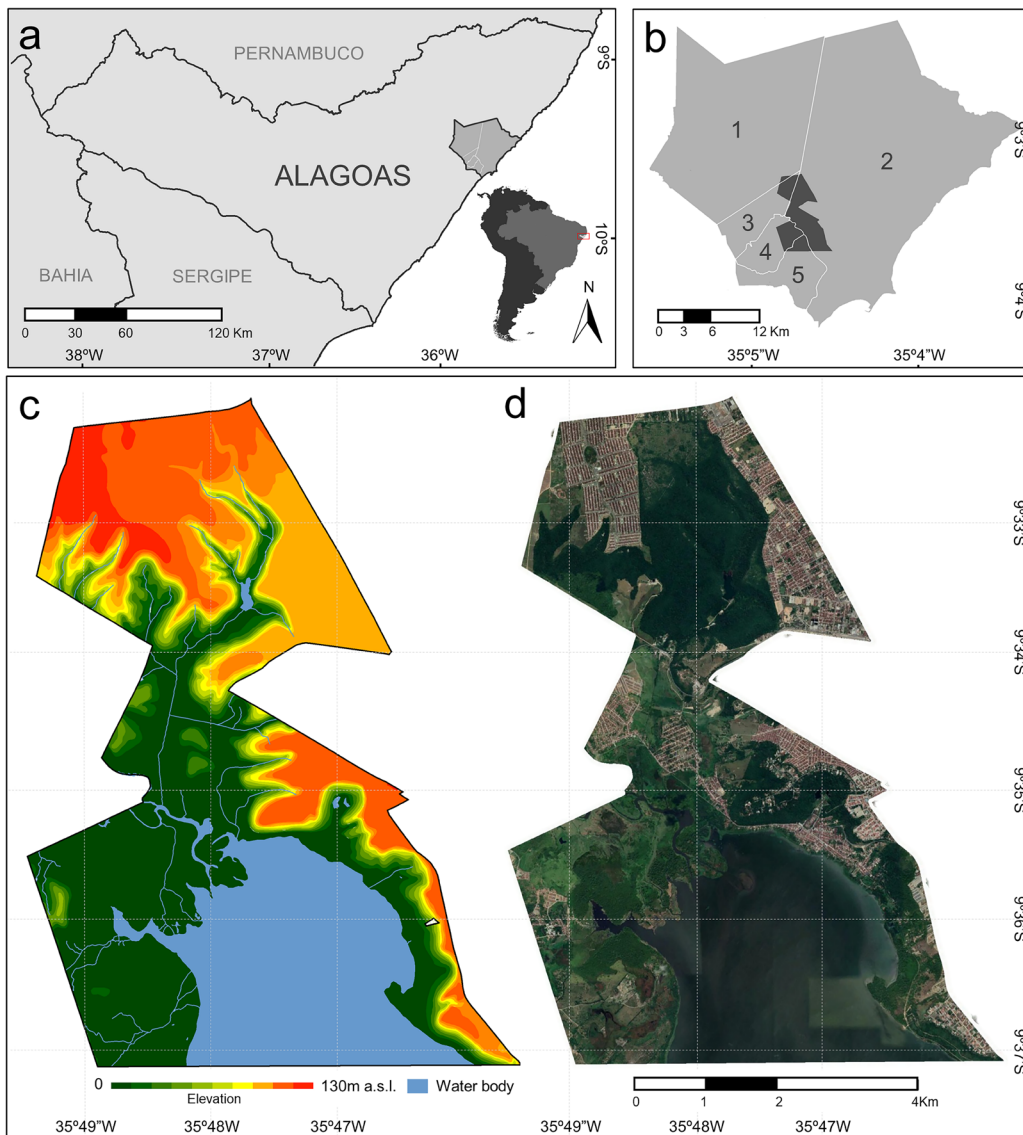
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Species	Voucher	Conservation Status	
		IUCN	ICMBio
<i>Oxybelis aeneus</i> (Wagler in Spix, 1824)	11603	LC	LC
<i>Tantilla melanocephala</i> (Linnaeus, 1758)	11566	LC	LC
Dipsadidae			
<i>Atractus maculatus</i> (Günther, 1858)	11860	LC	DD
<i>Dipsas mikanii</i> (Schlegel, 1837)	11855	LC	LC
<i>Dipsas neuwiedi</i> (Ihering, 1911)	15780	LC	LC
<i>Erythrolamprus miliaris</i> (Wied, 1821)	15760	LC	LC
<i>Erythrolamprus poecilogyrus</i> (Wied, 1824)	Fig. 5L	LC	LC
<i>Erythrolamprus taeniogaster</i> (Jan, 1863)	Fig. 5M	LC	LC
<i>Erythrolamprus viridis</i> Günther, 1862	2462	LC	LC
<i>Helicops angulatus</i> (Linnaeus, 1758)	15957	LC	LC
<i>Oxyrhopus guibei</i> Hoge & Romano, 1977	9944	LC	LC
<i>Oxyrhopus petolaris</i> (Reuss, 1834)	11859	LC	LC
<i>Oxyrhopus trigeminus</i> Duméril, Bibron & Duméril, 1854	9833	LC	LC
<i>Philodryas nattereri</i> Steindachner, 1870	15781	LC	LC
<i>Philodryas olfersii</i> (Lichtenstein, 1823)	15757	LC	LC
<i>Phimophis guerini</i> (Duméril, Bibron & Duméril, 1854)	3665	LC	LC
<i>Pseudoboa nigra</i> (Duméril, Bibron & Duméril, 1854)	2065	LC	LC
<i>Sibon nebulatus</i> (Linnaeus, 1758)	11760	LC	LC
<i>Siphlophis compressus</i> (Daudin, 1803)	8429	LC	LC
<i>Taeniophallus occipitalis</i> (Jan, 1863)	11092	LC	LC
<i>Thamnodynastes pallidus</i> (Linnaeus, 1758)	16131	LC	LC
<i>Xenodon merremii</i> (Wagler in Spix, 1824)	425	NE	LC
Elapidae			
<i>Micrurus ibiboboca</i> (Merrem, 1820)	10788	NE	DD
<i>Micrurus</i> sp. [see Discussion]	6110	-	-
Typhlopidae			
<i>Amerotyphlops brongersmianus</i> (Vanzolini, 1976)	3037	LC	LC
<i>Amerotyphlops paucisquamus</i> (Dixon & Hendricks, 1979)	4592	LC	VU
Viperidae			
<i>Bothrops leucurus</i> Wagler in Spix, 1824	10790	NE	LC

cumulative number of specimens were collected in 1995, 1996 and 2004 (Fig. 3). These collection peaks occurred due to monthly expeditions as part of doctoral (1995 and 1996) and undergraduate (2004) projects focused on the squamate community structure and ecology of teiid lizards, respectively.

In all, representatives of 65 species belonging to three orders and 22 families were recorded from the APACFV. Of these, nine species from seven families were vouchered only through photographs; the remainder were vouchered as specimens in the MHN-UFAL collection. The documented assemblage included three turtle families: Chelidae (two spp.), Kinosternidae (one sp.), and Testudinidae

(one sp.); one alligator family: Alligatoridae (two spp.); 12 non-snake lizard families: Teiidae (four spp.), Dactyloidae (three spp.), Gymnophthalmidae (three spp.), Amphisbaenidae (two spp.), Phyllodactylidae (two spp.), Polychrotidae (two spp.), Scincidae (two spp.), Tropiduridae (two spp.), Gekkonidae (one sp.), Iguanidae (one sp.), Leiosauridae (one sp.), and Sphaerodactylidae (one sp.); and six snake families: Dipsadidae (21 spp.), Colubridae (six spp.), Boidae (three spp.), Elapidae (two spp.), Typhlopidae (two spp.), and Viperidae (one sp.) (Figs. 4–5, Table 1). The complete species list, including voucher information and conservation status for each species, is available in Table 1.



**Figure 1.** Geographic setting of the Área de Proteção Ambiental do Catolé e Fernão Velho (APACFV), Alagoas State, northeastern Brazil. A = Location of Alagoas State within South America and Brazil, with dark gray area highlighting the Alagoas municipalities included in the APACFV; B = Location of the APACFV (in dark gray) relative to municipality limits wherein 1 = Rio Largo, 2 = Maceió, 3 = Satuba, 4 = Coqueiro Seco, 5 = Santa Luzia do Norte; C = APACFV topography and hydrography; D = APACFV satellite image.

## DISCUSSION

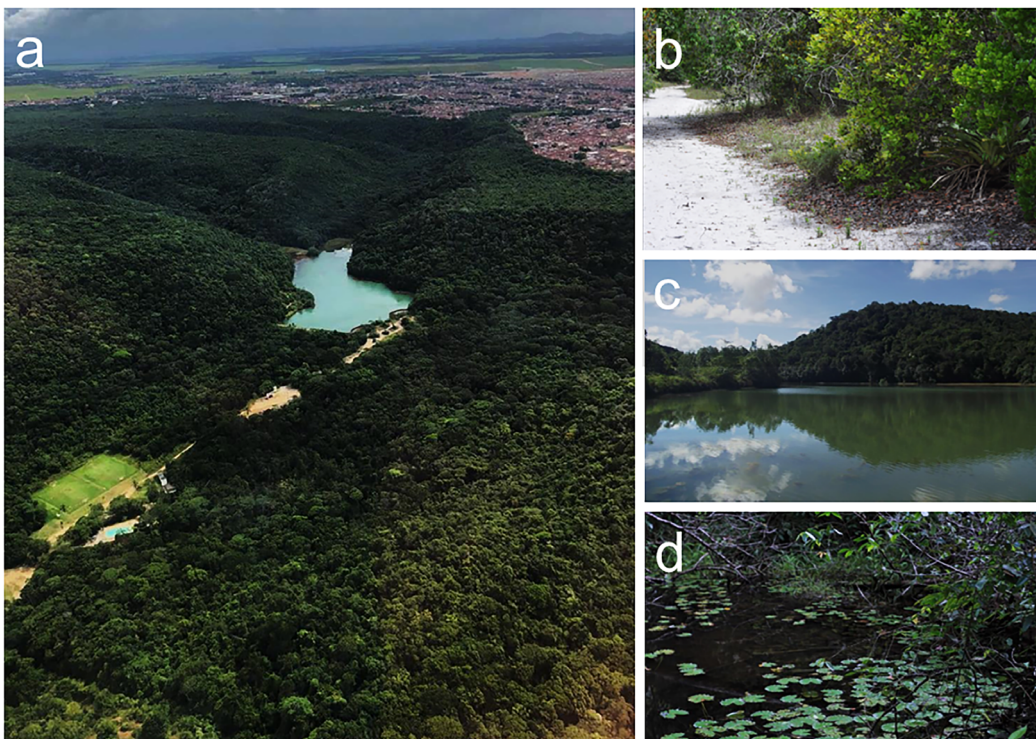
Sixty-five reptile species were recorded in the APACFV. This assemblage comprises approximately 22 % of the reptile species diversity already known for the Atlantic Forest (Tozetti *et al.* 2017). This assemblage also comprises 79 % of the reptile fauna cataloged for the Atlantic Forest in the state of Alagoas, and 69 % of that recorded for the entire state (Silva *et al.* 2006).

There are no known reptile species endemic to the APACFV, and most species that occur within the reserve have broad geographic distributions (Costa and Bérnils 2018). However, some species found in the APACFV are restricted to the northern Atlantic Forest (north of the São Francisco River), such as *Stenolepis ridleyi*, *Amerotyphlops paucisquamus*, *Atractus maculatus* and *Dendrophidion atlantica* (Costa and Bérnils 2018, Uetz *et al.* 2022). Two taxonomically uncertain species are also known from the reserve: *Enyalius* aff. *catenatus*, which is a distinct but as-yet unnamed lineage as demonstrated by Rodrigues *et al.* (2014); and a *Micrurus* sp. that is both morphologically and genetically distinct from the species hitherto known for the genus (MJMD unpublished data).

Only one species in the APACFV is considered threatened under the endangered species list of the Brazilian gov-

ernment (*Amerotyphlops paucisquamus*, Vulnerable). This snake has only been found in the *Cerrado* enclave, in the northern portion of the APACFV. This area is one of the most severely affected by construction and indiscriminate resource use, such as logging and sand extraction. Although no other reptile species documented in the APACFV is considered threatened by the IUCN Red List of Threatened Species or by the Brazilian government, some species do have specific environmental requirements that make them vulnerable to human impacts. For example, the lizard *Ameivula ocellifera* is a sand dweller recorded only in the *Cerrado* enclave in the APACFV. Loss of vegetation coverage and habitat destruction due to real estate development appears to have caused a sharp decline in the local population of this species, with no individuals having been found during recent expeditions (UG and MJMD unpublished data).

Based on MHN-UFAL material collected in the state of Alagoas, some of the species recorded in the APACFV are rarely documented in the state and are known from a few individuals and a few locations. Only three individuals of the lizard *Stenolepis ridleyi* are recorded from Alagoas: one from Catolé forest in the APACFV, one from the Reserva Biológica de Pedra Talhada in the Municipality of Quebrangulo (Roberto *et al.* 2015) and one from the Área de Proteção Ambiental and Estação Ecológica de Murici in



**Figure 2.** Landscape and habitats of the Área de Proteção Ambiental do Catolé e Fernão Velho (APACFV), Alagoas State, northeastern Brazil. A = Aerial view of Catolé forest and Catolé reservoir; B = *Cerrado* enclave soil and vegetation; C = Catolé reservoir; and D = Permanent water body inside the Catolé forest. Photos: A (Lahert Lobo); B, C, D (Marcos Dubeux).



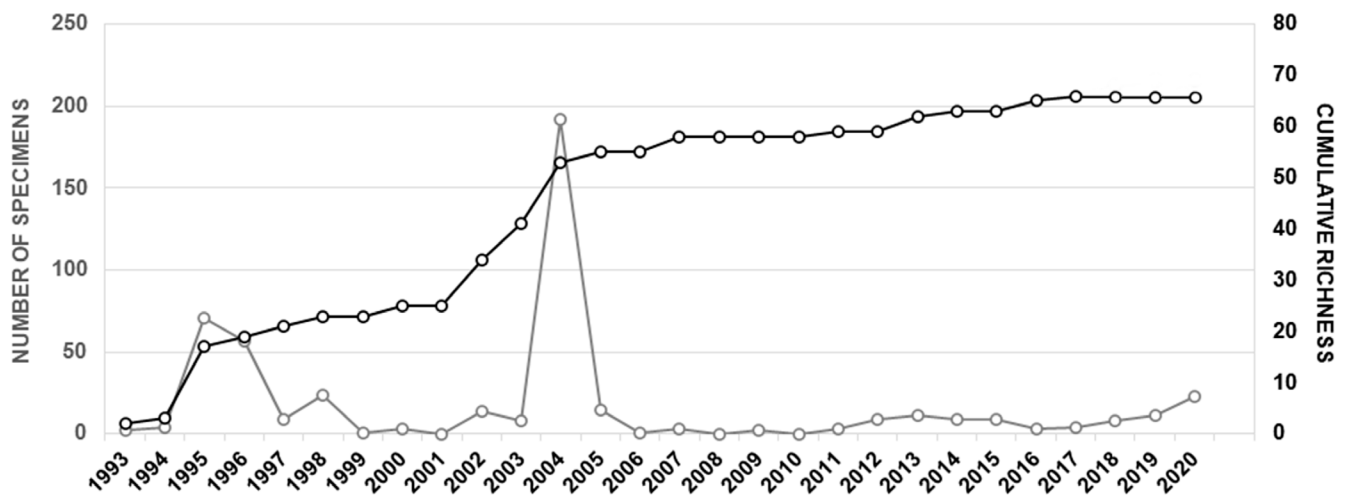
the Municipality of Murici (Dubeux et al. 2022). For the wide-ranging snake *Phimophis guerini*, the only individual known from Alagoas came from the *Cerrado* enclave of the APACFV (Lisboa et al. 2011).

When comparing the reptile assemblage found in the APACFV to those recorded in nearby protected areas in the northern Atlantic Forest (See Table 2 for the richness recorded for each reptile group in each protected area), the number of recorded species is exceeded only by three reserves, a the Área de Proteção Ambiental and Estação Ecológica de Murici in the state of Alagoas with 89 species recorded (Dubeux et al. 2022), and the Reserva Biológica de Pedra Talhada in the states of Alagoas and Pernambuco (Roberto et al. 2015), and Reserva Biológica Guaribas in the state of Paraíba (Mesquita et al. 2018), both with 72 species recorded. The reptile species richness found in the APACFV was over twice that of two other conservation units in the northern Atlantic Forest, although those two reserves have much smaller areas (Table 2).

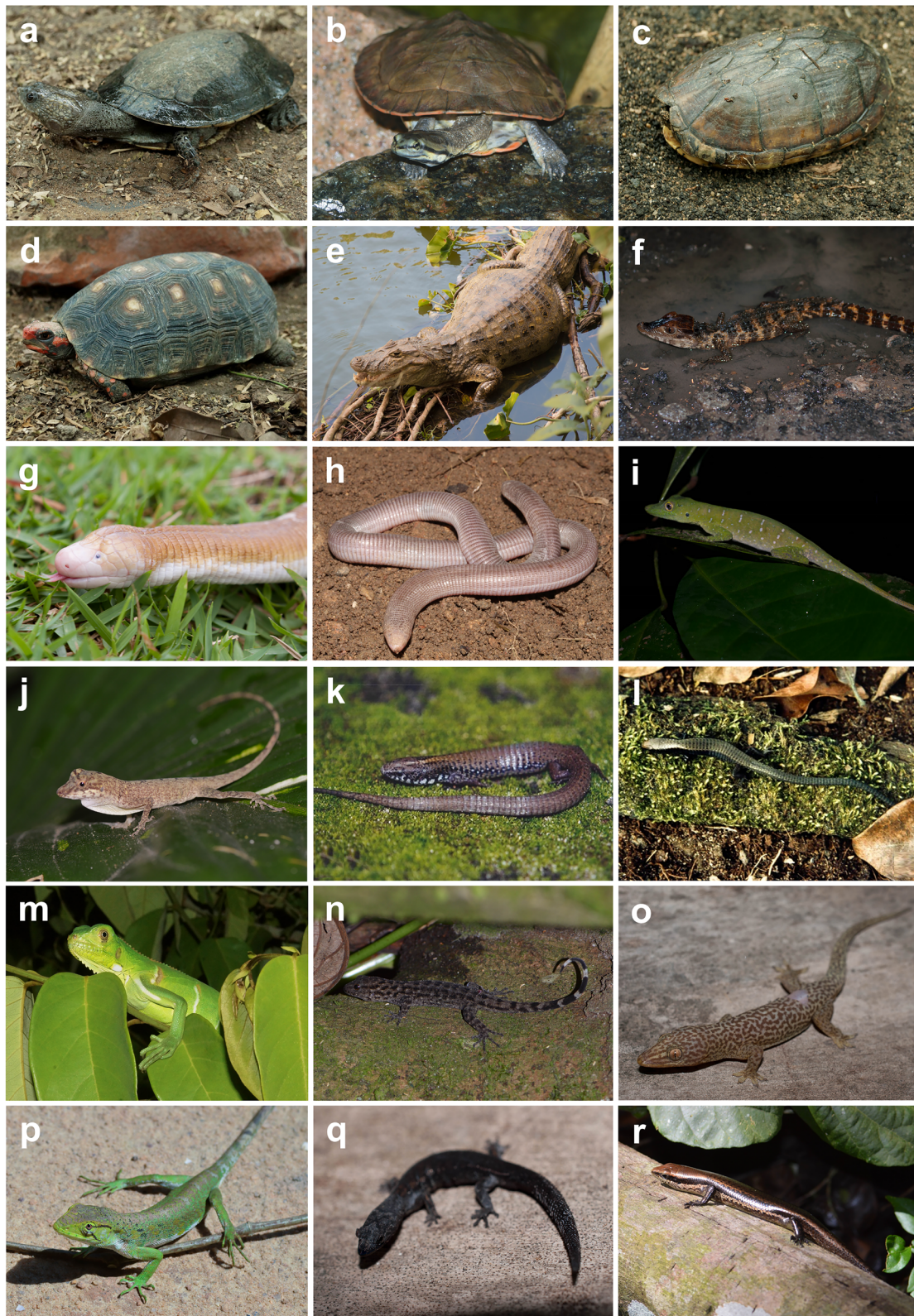
Additionally, despite collecting efforts spanning 27 years, the reptile species richness of the APACFV remains underestimated. Six species not listed in this study (due to the lack of specimen or photographic vouchers) have been seen in the APACFV by experienced herpetologists: *Chironius exoletus* (Linnaeus, 1758), *Spilotes pullatus* (Linnaeus, 1758), *Erythrolamprus aesculapii* (Wied, 1821), *E. reginae* (Amaral, 1935), *Leptodeira annulata* (Linnaeus, 1758), and *Crotalus durissus* Linnaeus, 1758 (UG and ST

personal observation). Furthermore, the widely distributed species *Cercosaura olivacea* (Gray, 1845) has been collected within 600 m of the APACFV border (Dubeux et al. 2021), and thus likely also occurs within this protected area. Future confirmation of the presence of these seven species within the APACFV would elevate its reptile species assemblage to 72 species, placing the area in a three-way tie for the reserve with the second greatest reptile richness in the northern Atlantic Forest (Table 2).

Globally, a core goal of protected areas is the preservation of biodiversity, and these protected areas vary regarding the allowed usage of natural resources. In Brazil, this level of protection ranges from fully protected areas (where human residents and extractive resource use are disallowed) to areas of sustainable use (which only aim to moderate human occupation and resource use; Brasil 2000c, CNUC/MMA 2022c). Certain sustainable resource usage is allowed within the APACFV, and although this protected area was created almost four decades ago (Alagoas 1992c), many ongoing anthropic actions still threaten the reserve's biodiversity (e. g., deforestation, hunting, fishing, sand removal, siltation of water bodies, and real estate speculation). These activities continue apace in large part because the APACFV represents a peri-urban forest remnant, with its eastern border formed by the state capital of Maceió, which is the largest and most populated city in the state (Assis 2000, Oliveira et al. 2014, Dubeux et al. 2020).



**Figure 3.** Number of reptile specimens (N = 500; gray line) and cumulative richness curve of reptile species (N = 65; black line) for the Área de Proteção Ambiental do Catolé e Fernão Velho (APACFV), Alagoas State, northeastern Brazil, based on material either collected and cataloged in the *Coleção Herpetológica do Museu de História Natural da Universidade Federal de Alagoas* (MHN-UFAL) or photo-vouchered between 1993 and 2020.



**Figure 4.** Turtles, crocodylians, and selected squamates of the Área de Proteção Ambiental do Catolé e Fernão Velho (APACFV), Alagoas State, northeastern Brazil. A- *Mesoclemmys tuberculata*, B- *Phrynops geoffroanus*, C- *Kinosternon scorpioides*, D- *Chelonoidis carbonarius*, E- *Caiman latirostris*, F- *Paleosuchus palpebrosus*, G- *Amphisbaena alba*, H- *Amphisbaena pretrei*, I- *Anolis punctatus*, J- *Anolis ortonii*, K- *Acratosaura mentalis*, L- *Stenolepis ridleyi*, M- *Iguana iguana*, N- *Gymnodactylus darwini*, O- *Phyllopezus lutzae*, P- *Polychrus marmoratus*, Q- *Coleodactylus meridionalis*, R- *Psychosaura macrorhyncha*. All photos show individuals found in or within 1 km of the APACFV. Photos: F, G, H, I, O, Q (Marcos Dubeux); A, C, D, M, N (Ubiratan Gonçalves); B, E, J, P, R (Marcio Campelo); and K, L (Edelmo Gonçalves).





**Figure 5.** Selected squamates of the Área de Proteção Ambiental do Catolé e Fernão Velho (APACFV), Alagoas State, northeastern Brazil. A- *Ameiva ameiva*, B- *Ameivula ocellifera*, C- *Salvator merianae*, D- *Strobilurus torquatus*, E- *Tropidurus hispidus*, F- *Boa constrictor*, G- *Chironius flavolineatus*, H- *Leptophis ahaetulla*, I- *Oxybelis aeneus*, J- *Dipsas newwiedi*, K- *Erythrolamprus miliaris*, L- *Erythrolamprus poecilogyrus*, M- *Erythrolamprus taeniogaster*, N- *Oxyrhopus petolarius*, O- *Oxyrhopus trigeminus*, P- *Phimophis guerini*, Q- *Micrurus ibiboboca*, R- *Bothrops leucurus*. All photos show individuals found in or within 1 km of the APACFV. Photos: A, J, K, M, N, O, P, Q (Marcos Dubeux); B, D, R (Ubiratan Gonçalves); C, E, F, G, I, L (Marcio Campelo); and H (Edelmo Gonçalves).



**Table 2.** Protected areas with available reptile lists in the northern Atlantic Forest of northeastern Brazil. Li = non-snake lizards, Sn = snakes, Tu = turtles, and Cr = crocodylians. Locations are listed in ascending order of richness (in bold).

Protected Area	State	Area (ha)	Recorded richness					Source
			Li	Sn	Tu	Cr	Total	
Área de Proteção Ambiental and Estação Ecológica de Murici	Alagoas	133100	29	54	3	2	<b>89</b>	Dubeux <i>et al.</i> 2022
Reserva Biológica de Pedra Talhada,	Alagoas and Pernambuco	4500	27	42	2	1	<b>72</b>	Roberto <i>et al.</i> 2015
Reserva Biológica Guaribas	Paraíba	4321	27	42	1	2	<b>72</b>	Mesquita <i>et al.</i> 2018
Área de Proteção Ambiental do Catolé e Fernão Velho	Alagoas	3700	24	35	4	2	<b>65</b>	<i>Present study</i>
Refúgio de Vida Silvestre Matas do Siriji	Pernambuco	600	18	25	0	0	<b>43</b>	Lima <i>et al.</i> 2021
Refúgio de Vida Silvestre Matas de Água Azul	Pernambuco	3800	18	21	1	0	<b>40</b>	Oliveira <i>et al.</i> 2021
Jardim Botânico Benjamim Maranhão	Paraíba	515	15	18	2	2	<b>37</b>	Santana <i>et al.</i> 2008
Parque Estadual Dois Irmãos	Pernambuco	372	20	12	2	2	<b>36</b>	Melo <i>et al.</i> 2018
Reserva Particular do Patrimônio Natural Pedra D'Antas	Pernambuco	330	14	19	0	0	<b>31</b>	Roberto <i>et al.</i> 2017
Parque Estadual Cachoeira do Urubu	Pernambuco	30	6	11	1	0	<b>18</b>	Barbosa <i>et al.</i> 2019

Studies on local fauna are important for understanding factors that determine species distribution and community composition (Whittaker *et al.* 2005, Nogueira *et al.* 2019). These baseline studies serve as a foundation for defining conservation priority areas and for developing management strategies (Galetti *et al.* 2009, Mello *et al.* 2016). This study provides a reptile list for the APACFV and emphasizes that a remarkable diversity of reptile species can persist even in a peri-urban habitat fragment in the northern Atlantic Forest. Our work represents a small step in the long journey to better understanding the biodiversity of this least known portion of the Atlantic Forest.

## PARTICIPATION OF AUTHORS

MJMD, UG, ST, TM: Contribution to the conception and design of the work, data acquisition, data analysis, and interpretation; writing and critical review of the manuscript, adding intellectual content.

## INTEREST CONFLICT

The authors declare no conflict of interest

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