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Diet of *Boiruna sertaneja* Zaher, 1996: a comprehensive review integrating literature, digital media, and new records

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ABSTRACT

Boiruna sertaneja is a large snake primarily associated with the Caatinga and recognized for its pronounced ophiophagy. Nevertheless, information on its diet remains scattered across a limited number of publications and isolated records. Here, we compiled available dietary information from scientific literature, photographs and videos published on digital platforms, and unpublished observations by the authors. Only prey identified to species level were included, whereas records predating the formal description of *B. sertaneja* were assessed separately because of historical taxonomic uncertainties. We documented 18 prey species belonging to 11 families and four major vertebrate groups. Snakes accounted for 50.0% of prey species richness, followed by lizards (27.8%), birds (16.7%), and amphisbaenians (5.6%). When historical records potentially attributable to the species are considered separately, the list reaches 22 species and also includes mammals. The diet was predominantly reptivorous and strongly characterized by ophiophagy, but was not exclusive, indicating sufficient trophic plasticity to include birds and potentially mammals. Audiovisual records added new prey species, including Amphisbaena alba, documented for the first time as prey of *B. sertaneja*. The authors' observations also documented active predation on live birds, while audiovisual records revealed behaviors including pursuit, restraint, constriction, prey manipulation, and ingestion. Integrating conventional and digital sources expanded our knowledge of the diet and feeding behavior of *B. sertaneja*, highlighting the value of complementary approaches for studying the natural history of elusive and poorly sampled snakes.

Keywords: Caatinga; digital media; mussurana; ophiophagy; Pseudoboini.

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SIGNIFICANCE STATEMENT

Boiruna sertaneja is a large ophiophagous snake widely distributed in the Brazilian Caatinga, yet its diet remains poorly documented and scattered across isolated records. We provide the first comprehensive compilation specifically focused on the species' prey, integrating published literature, unpublished field observations, and publicly available audiovisual records. We document 18 confirmed prey species representing four major vertebrate groups and identify *Amphisbaena alba* as a previously unrecorded prey species. Our audiovisual records also provide behavioral observations rarely captured by conventional dietary studies, including active predation on live birds and the capture and handling of venomous snakes. By combining conventional and emerging sources of natural-history evidence, this study expands knowledge of the trophic ecology of *B. sertaneja* and demonstrates the value of validated digital records for studying elusive and poorly sampled predators.

INTRODUCTION

The tribe Pseudoboini comprises a diverse assemblage of Neotropical snakes exhibiting substantial variation in morphology, ecology, and diet (Gaiarsa et al. 2013). Lizards and small mammals are among the prey most frequently recorded for the tribe, whereas snakes are consumed by several species, and birds, amphibians, and eggs occur less frequently in their diet (Alencar et al. 2013). Although ophiophagy is relatively widespread within the tribe, specialization on snake prey has been documented primarily in *Boiruna sertaneja* Zaher, 1996 and *Clelia plumbea* (Wied-Neuwied 1820). Other species for which sufficiently large dietary samples are available have generally been characterized as generalists or as specialists on lizards, small mammals, or eggs (Alencar et al. 2013; Gaiarsa et al. 2013).

The black snake *Boiruna sertaneja* (mussurana-do-sertão, in Portuguese), is a large-bodied snake primarily associated with the open and seasonally dry formations of the Caatinga and adjacent areas of northeastern Brazil (Zaher 1996). Despite its relatively broad distribution within this domain, its natural history remains poorly documented, largely because of the scarcity of field observations and the limited number of specimens examined (Zaher 1996; Gaiarsa et al. 2013; Guedes and Guedes 2020). Available dietary syntheses indicate a strong predominance of snakes among recorded preys, although lizards also constitute part of their diet (Gaiarsa et al. 2013).

Gaiarsa et al. (2013) compiled ten records of snakes and four records of lizards consumed by *B. sertaneja*, combining previously published data with their own observations. Subsequent studies expanded the known diet by documenting the consumption of *Boa constrictor* Linnaeus, 1758, a bird carcass, and *Philodryas nattereri* (Steindachner, 1870), the latter captured on an elevated substrate (Leite et al. 2017; Sales et al. 2019; Andrade-Oliveira et al. 2022). Despite these additions, knowledge of the species' diet remains scattered across different sources.

Publicly available photographs and videos represents an increasingly important complementary source of natural history information. When evaluated using explicit criteria for taxonomic identification, provenance, and record validation, digital media can provide reliable evidence of rare interactions that might otherwise remain undocumented (Edwards et al. 2021; Souza et al. 2022; Vardi et al. 2024). Audiovisual records may be especially informative because they can preserve entire or partial behavioral sequences, revealing aspects of prey detection, pursuit, capture, restraint, manipulation, and ingestion that cannot generally be reconstructed from stomach-contents or occasional field observations. As discussed by Nelson and Fijn (2013), visual media therefore have considerable potential to complement traditional sources of natural history data and contribute to a more complete characterization of animal behavior and species ecology.

However, interpretation of historical dietary records requires careful consideration of the taxonomic history of mussuranas. Before the formal description of *Boiruna sertaneja*, large black mussuranas from the Caatinga were frequently identified as *Clelia occipitolutea*. Vitt & Vangilder (1983), for example, applied this name for specimens from Exu, Pernambuco. These records cannot, however, be reassigned to *B. sertaneja* simply by replacing the former name with the currently recognized species name, because *C. occipitolutea* is not a junior synonym of *B. sertaneja*. In Zaher's (1996) revision, the name *Brachyruton occipitoluteum* Duméril, Bibron & Duméril, 1854 was placed in the synonymy of *Pseudoboa coronata* Schneider, 1801, whereas *Oxyrhopus maculatus* Boulenger, 1896 was recognized as the valid name for populations previously referred to *C. occipitolutea* in other regions of South America. Nevertheless, the specimens

reported by Vitt and Vangilder (1983) originated from Exu, within the Caatinga and within the geographic range currently attributed to *B. sertaneja*. Their identification as *B. sertaneja* is therefore geographically plausible, but should be regarded as a retrospective taxonomic interpretation based on geographic provenance rather than as a direct consequence of nomenclatural synonymy. Further retrospective attribution of dietary records from large black mussuranas occurring outside the northeastern Brazilian Caatinga, including the Cerrado biome and their ecotonic regions along Northeastern Brazil, should be avoided, as preliminary genomic analyses suggest that populations currently assigned to *Boiruna maculata* from these regions may represent multiple distinct cryptic lineages (Zaher, pers. obs.).

In this study, we provide the first compilation specifically focused on the diet of *B. sertaneja*, integrating records from the scientific literature, publicly available audiovisual material, and previously unpublished observations by the authors. Our objectives were to update the list of prey identified to species level, characterize the taxonomic composition of the diet and the predominance of ophiophagy, evaluate historical records potentially attributable to the species, and compile new dietary and behavioral information.

MATERIAL AND METHODS

Compilation and selection of records

Dietary records of *B. sertaneja* were compiled from three main sources of evidence: (1) the scientific literature, (2) publicly available audiovisual material published on digital platforms, and (3) previously unpublished observations by the authors. The literature search and selection process were documented following the applicable recommendations of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA 2020) recommendations (Moher et al. 2010; Page et al. 2021). The successive stages of record identification, duplicate removal, screening, eligibility assessment, and inclusion of records were documented to ensure transparency and reproducibility (Figure 1).

The literature search combined the scientific name and common names of *B. sertaneja* with terms related to diet, feeding, prey, predation, and natural history, including "diet", "feeding", "food", "prey", "predation", "ophiophagy", "natural history", "alimentação", and "predação". Searches were conducted in Google Scholar (`https://scholar.google.com`), Web of Science (`www.webofknowledge.com`), and Scopus (`www.scopus.com`), covering records published at any time. Reference lists of relevant publications were also examined to identify additional records not retrieved through the database searches.

The searches retrieved 153 records. After removal of duplicates, 144 records remained for title and abstract screening. Potentially relevant records were then assessed in full text, and those satisfying the predefined eligibility criteria were included in the dietary compilation (Figure 1). Eligible sources comprised scientific articles, natural history notes, reviews, and other documents containing primary or secondary information on the diet or feeding behavior of *B. sertaneja*. Whenever possible, the original source of each dietary record was consulted to verify prey identification, locality, and the nature of the feeding event. Secondary records were retained only when the original source could not be accessed and sufficient information was available to evaluate the record reliably. After application of the inclusion criteria, seven publications were retained in the final literature dataset (Table 1; Additional File 1).

For each dietary record, we recorded, whenever available, prey identity, locality, date, type of evidence, source, and associated behavioral information. Records were classified according to the certainty of prey identification. The primary dietary dataset included only records in which prey could be identified unequivocally to species level. Records involving incomplete or uncertain taxonomic identifications, including those designated as *cf.* or *aff.*, were retained as complementary evidence but were analyzed separately and excluded from estimates of prey species richness and the proportional representation of prey categories.

Records predating the formal description of *B. sertaneja* were evaluated separately because of uncertainties arising from the historical taxonomy of large black mussuranas. Such records were attributed to *B. sertaneja* only when geographic provenance, specimen information, and/or subsequent taxonomic reassessments provided sufficient support for the association. Records lacking adequate evidence for reliable retrospective identification were excluded from the primary dataset or retained as uncertain historical records, as appropriate.

Audiovisual records and unpublished observations

Photographs and videos published on YouTube, Instagram, and Facebook were identified through direct searches using the scientific and common names of *B. sertaneja* alone and in combination with terms referring to potential prey. Additional records were located through related content suggested by the platforms and through material brought to the authors' attention by collaborators. A total of ten audiovisual

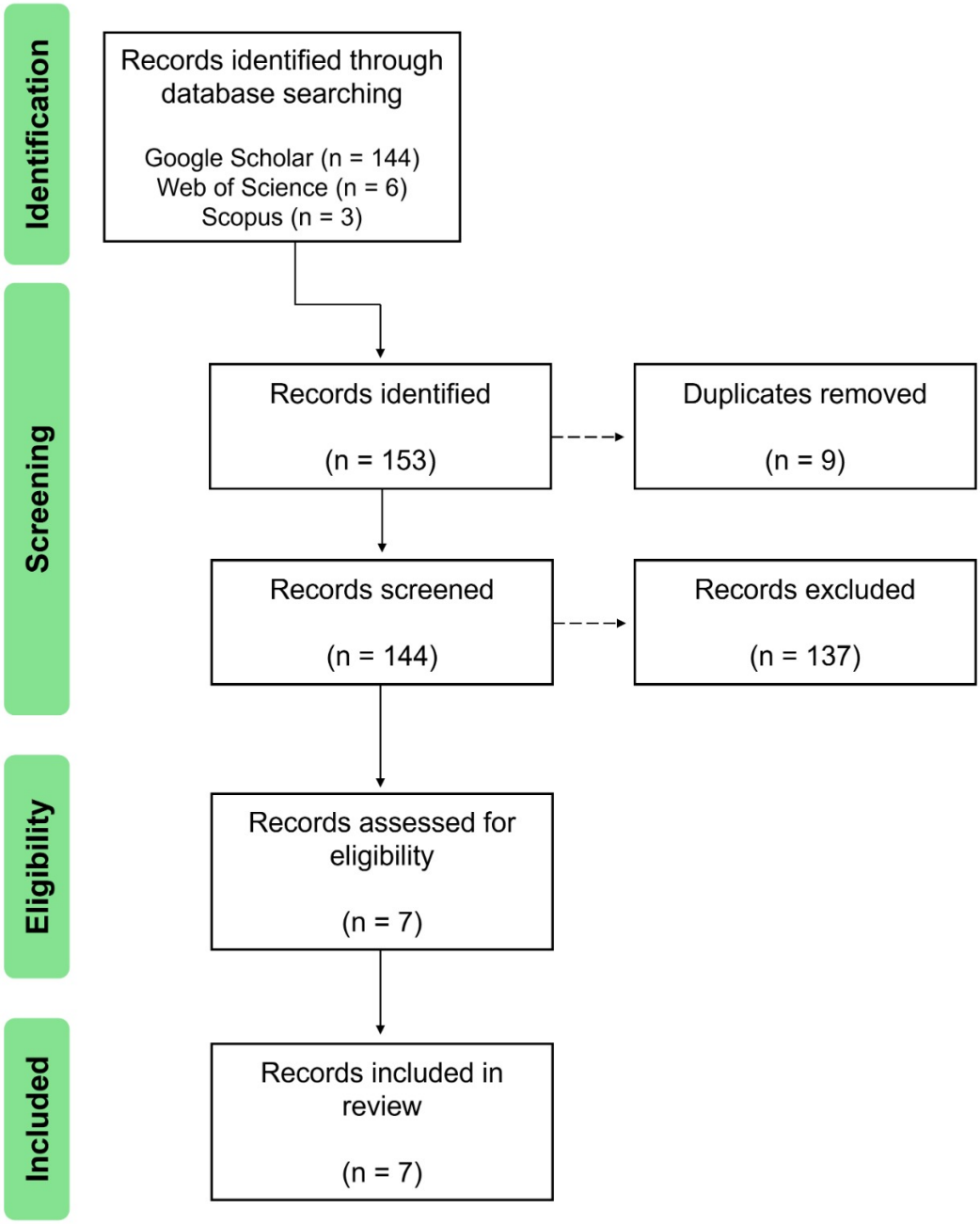


Figure 1. PRISMA flow chart for the methodology undertaken for the identification, screening, and eligibility of relevant literature based on Moher et al. (2010).

records were identified, including four from YouTube and three from Instagram (Table 1; Additional File 1).

Audiovisual records were considered eligible when: (1) the predator could be reliably identified as *B. sertaneja*; (2) the prey could be identified unequivocally to species level for inclusion in the primary dataset; and (3) the feeding interaction was clearly observable. Species identifications were based primarily on the visual evidence rather than on captions, titles, or descriptions provided by the original uploader. Identification considered diagnostic morphological characters, coloration patterns, body proportions, and geographic distribution. When species level identification could not be independently confirmed from the available visual evidence, the record was classified as uncertain or excluded from the primary

dataset.

Records lacking unequivocal evidence of predation or feeding, including material documenting only spatial proximity of potential contact between predator and prey, were excluded from the confirmed dataset. Similarly, duplicate material and records representing feeding events already documented in another source were treated as a single event.

Previously unpublished observations by the authors were documented through photographs, videos, and field notes. Whenever available, we recorded the date, locality, observer, habitat, substrate, prey identity, and sequence of observable behaviors. Audiovisual material provided directly to the authors by third parties was included only when its provenance could be established and permission for scientific use and appropriate attribution were obtained, when applicable. Three additional unpublished feeding records were documented by the authors and included in the dietary compilation (Table 1; Additional File 1).

Data extraction and analysis

For each confirmed dietary event, we recorded prey species, higher-level taxonomic category, source of evidence, and, when available, locality, date, behavioral information, and substrate. Dietary composition was summarized using two complementary measures: prey species richness within each major prey category and the proportional frequency of confirmed feeding events involving snakes, lizards, amphisbaenians, birds, and mammals.

The prevalence of ophiophagy was quantified as the proportion of confirmed feeding events involving snakes relative to the total number of events for which prey identity was established. Records with uncertain taxonomic identification, including those designated as *cf.* and *aff.*, were excluded from these calculations and treated separately.

Observable feeding behaviors were described qualitatively and categorized, when applicable, as pursuit, attack, restraint, constriction, prey manipulation, ingestion, and substrate use. When sufficient audiovisual evidence was available, behavioral sequences were reconstructed chronologically to characterize the progression of the feeding interaction.

RESULTS AND DISCUSSION

Dietary composition and predominance of ophiophagy

The literature search and selection process identified 13 records, from which 18 prey species were confirmed in the present compilation, representing 11 families and four major vertebrate groups (Table 1; Figure 2). Snakes represented the most diverse prey group, accounting for nine species (50.0%), followed by lizards with five species (27.8%), birds with three species (16.7%), and amphisbaenians with one species (5.6%). Reptiles thus accounted for 83.3% of the confirmed prey species richness. Four additional historical prey records reported by Vitt and Vangilder (1983) were treated separately as potentially attributable to *B. sertaneja*. With these records considered as potentially referable to *B. sertaneja*, the known dietary spectrum increases to 22 species, including 11 snakes (50.0%), five lizards (22.7%), one amphisbaenian (4.5%), three birds (13.6%), and two mammals (9.1%).

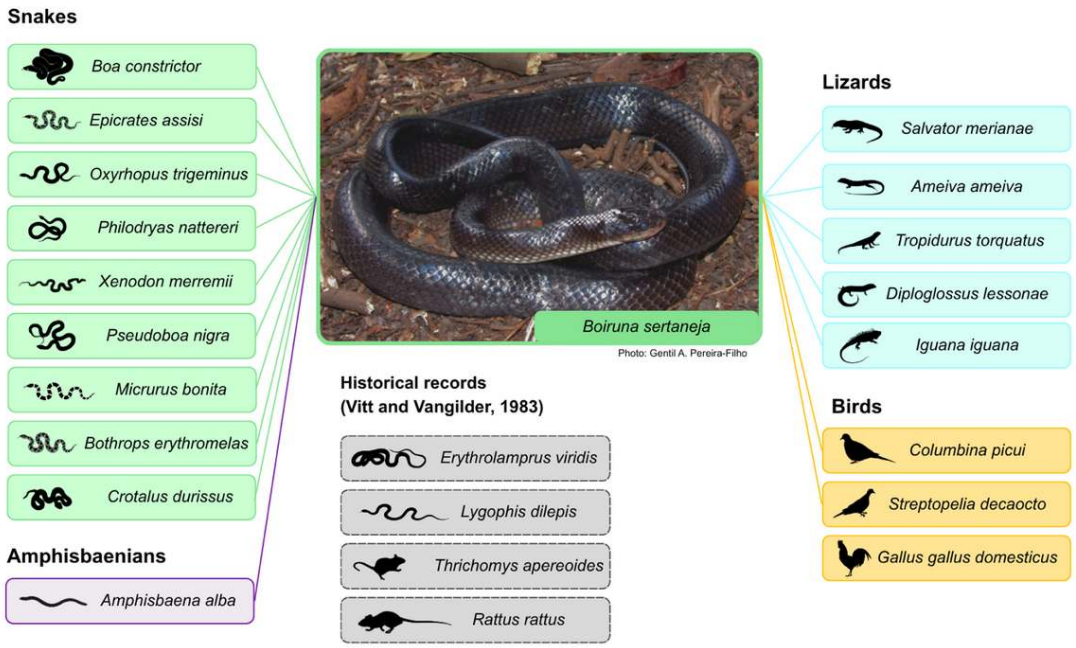


Figure 2. Schematic representation of the prey species recorded for *B. sertaneja* based on available dietary records.

Table 1. Documented prey of *Boiruna sertaneja.*

Prey group	Family	Prey species	Evidence	Source	Locality
Snakes					
	Boidae	*Boa constrictor* Linnaeus, 1758	Published record	Leite et al. (2017)	Bahia, Brazil
	Boidae	*Epicrates assisi* Machado, 1944	Unpublished observation	Alves et al. (submitted)	Parelhas, RN, Brazil
	Dipsadidae	*Oxyrhopus trigeminus* Duméril, Bibron & Duméril, 1854	Published + audiovisual	Gaiarsa et al. (2013); AV1; AV2; AV3	Tenente Laurentino Cruz, RN
	Dipsadidae	*Philodryas nattereri* (Steindachner, 1870)	Published record	Andrade-Oliveira et al. (2022)	Morada Nova, CE, Brazil
	Dipsadidae	*Xenodon merremii* (Wagler, 1824)	Published record	Gaiarsa et al. (2013)	Exu, PE, Brazil
	Dipsadidae	*Pseudoboa nigra* (Duméril, Bibron & Duméril, 1854)	Audiovisual record	AV4	Pernambuco, Brazil
	Elapidae	*Micrurus bonita* Nascimento, Graboski, Silva Jr. & Prudente, 2024	Audiovisual record	AV5	Pernambuco, Brazil
	Viperidae	*Bothrops erythromelas* (Amaral, 1923)	Audiovisual record	AV6	Pernambuco, Brazil
	Viperidae	*Crotalus durissus* Linnaeus, 1758	Audiovisual record	AV7	Vale do Piancó, PB, Brazil
Lizards					
	Teiidae	*Salvator merianae* Duméril & Bibron, 1839	Published record	Almeida et al. (2023)	Coremas, PB, Brazil
	Teiidae	*Ameiva ameiva* Linnaeus, 1758	Published record	Gaiarsa et al. (2013)	Exu, PE, Brazil
	Tropiduridae	*Tropidurus torquatus* (Wied-Neuwied, 1820)	Published record	Gaiarsa et al. (2013)	Exu, PE, Brazil
	Anguidae	*Diploglossus lessonae* Peracca, 1890	Published record	Gaiarsa et al. (2013)	Exu, PE, Brazil
	Iguanidae	*Iguana iguana* Linnaeus, 1758	Audiovisual record	AV8–AV9	Sossego, PB; Santa Cruz do Capibaribe, PE
Amphisbaenians					
	Amphisbaenidae	*Amphisbaena alba* Linnaeus, 1758	Audiovisual record	AV10	Umburanas, BA, Brazil

Continued...

Table 1. Documented prey of *Boiruna sertaneja.*

Prey group	Family	Prey species	Evidence	Source	Locality
Birds					
	Columbidae	*Columbina picui* (Spix, 1825)	Published record	Sales et al. (2019)	Rio Grande do Norte, Brazil
	Columbidae	*Streptopelia decaocto* Frivaldszky, 1838	Unpublished observation	Authors' observation	Esperança, PB, Brazil
	Phasianidae	*Gallus gallus domesticus* (Linnaeus, 1758)	Unpublished observation	Authors' observation	Esperança, PB, Brazil
Historical records potentially attributable to *B. sertaneja*					
	Dipsadidae	*Erythrolamprus viridis* (Günther, 1862)	Historical record	Vitt and Vangilder (1983)	Exu, PE, Brazil
	Dipsadidae	*Lygophis dilepis* Cope, 1862	Historical record	Vitt and Vangilder (1983)	Exu, PE, Brazil
	Echimyidae	*Thrichomys apereoides* (Lund, 1839)	Historical record	Vitt and Vangilder (1983)	Exu, PE, Brazil
	Muridae	*Rattus rattus* Linnaeus, 1758	Historical record	Vitt and Vangilder (1983)	Exu, PE, Brazil

Notes: AV = audiovisual record. Records derived from the same feeding event were treated as a single event to avoid duplication. Historical records reported by Vitt and Vangilder (1983) are presented separately because their attribution to *B. sertaneja* depends on subsequent taxonomic interpretation. *Tropidurus torquatus* was reported by Gaiarsa et al. (2013) based on a record originally attributed to Vitt and Vangilder (1983).

The predominance of snakes among documented prey reinforces the prominent role of ophiophagy in the diet of *B. sertaneja*. Alencar et al. (2013) similarly reported snakes as the predominant prey, accounting for 71% of the 14 dietary items examined, and characterized the species as a specialized snake predator. Although the two studies are not directly comparable because they quantify diet differently (i.e., frequency of dietary items in Alencar et al. (2013) and prey species richness in the present compilation), both indicate a marked predominance of snakes in the documented diet. These results therefore support the characterization of *B. sertaneja* as strongly ophiophagous, while records of lizards, amphisbaenians, birds, and potentially mammals demonstrate that its diet is not exclusively restricted to snakes.

The nine confirmed snake prey species belong to the families Boidae, Dipsadidae, Elapidae, and Viperidae, and include *Boa constrictor* Linnaeus, 1758, *Epicrates assisi* Machado, 1944, *Oxyrhopus trigeminus* Duméril, Bibron & Duméril, 1854, *Philodryas nattereri* (Steindachner, 1870), *Xenodon merremii* (Wagler, 1824), *Pseudoboa nigra* (Duméril, Bibron & Duméril, 1854), *Micrurus bonita* Nascimento, Graboski, Silva Jr. & Prudente, 2024, *Bothrops erythromelas* (Amaral, 1923), and *Crotalus durissus* Linnaeus, 1758 (Figure 3). This assemblage encompasses prey differing markedly in body size, ecology, and defensive strategies and includes three venomous species: *M. bonita*, *B. erythromelas*, and *C. durissus*.

The taxonomic and ecological diversity of these prey indicates considerable breadth within the ophiophagous component of the diet. Documented prey range from robust-bodied boids, such as juvenile or subadult *B. constrictor* and *E. assisi*, to dipsadids with diverse defensive strategies, as well as elapids and viperids. Audiovisual records further documented several additional predatory behaviors, including pursuit, restraint, constriction, prey repositioning, and orientation prior to ingestion. Predation of *Philodryas nattereri* on an elevated substrate previously demonstrated that *B. sertaneja* may use above-ground structures during feeding events (Andrade-Oliveira et al. 2022). This behavior is further illustrated by our record of *B. sertaneja* ascending vegetation to locate and attack *E. assisi*, with the interaction beginning approximately 1.5 m above the ground (Alves et al., submitted). Together, these observations demonstrate that *B. sertaneja* is capable of exploiting elevated substrates during prey location, capture, and manipulation, although the available evidence remains insufficient to characterize the species as semiarboreal.

An additional predation record involved an adult *B. sertaneja* feeding on a juvenile *B. constrictor* at Sítio Olho D'água Branco, municipality of Sumé, Paraíba, northeastern Brazil (Figure 4). The snakes were encountered on the ground inside a chicken enclosure at approximately 09:00 h on 19 August 2025. The predation event lasted approximately 30 min. Following ingestion, the mussurana moved toward an area of vegetation containing a forage cactus plantation of *Opuntia cochenillifera* (L.) Mill., 1768 (Washington L. S. Vieira, personal observation). This record adds *B. constrictor* to the documented prey spectrum and contributes information on prey size, feeding duration, and post-ingestion behavior.

Predation on venomous snakes

The consumption of *Micrurus bonita*, *Bothrops erythromelas*, and *Crotalus durissus* is particularly noteworthy because all three are medically important venomous snakes. Rapid capture and restraint may potentially reduce the opportunity for effective envenomation during predatory encounters, but the available observations provide no direct evidence that *B. sertaneja* possesses physiological immunity to their venom. In ophiophagous snakes, venom resistance may involve modifications of molecular targets affected by venom toxins, as well as circulating serum factors capable of neutralizing toxic components, with substantial variation among species (Heatwole and Poran 1995; Holding et al. 2016a,b; Drabeck et al. 2020). Experimental studies are therefore required to determine whether *B. sertaneja* exhibits resistance to the venoms of its snake prey and, if so, to identify the mechanisms involved and assess their specificity and effectiveness.

Lizards, amphisbaenians, and dietary breadth

The five lizard species and the first documented amphisbaenian prey further reinforce the predominantly reptivorous diet of *B. sertaneja*, while demonstrating that its feeding spectrum extends beyond snakes (Figure 5). Confirmed lizard prey comprise *Salvator merianae* Duméril & Bibron, 1839, *Ameiva ameiva* Linnaeus, 1758, *Tropidurus torquatus* (Wied-Neuwied, 1820), *Diploglossus lessonae* Peracca, 1890, and *Iguana iguana* Linnaeus, 1758. The historical record of *Tropidurus torquatus* from Exu, Pernambuco, may correspond to *T. hispidus*, considering its known geographic distribution and subsequent taxonomic revisions (Rodrigues 1987; Carvalho 2013). However, the original prey cannot be reexamined, and its species-level identity remains uncertain. The single amphisbaenian prey species recorded was *Amphisbaena alba* Linnaeus, 1758 (Amphisbaenidae) (Figure 3).



Figure 3. Snake and amphisbaenian prey documented for *Boiruna sertaneja*. Snake prey species recorded in the present compilation: (A) *Boa constrictor*, (B) *Epicrates assisi*, (C) *Oxyrhopus trigeminus*, (D) *Philodryas nattereri*, (E) *Crotalus durissus*, (F) *Xenodon merremii*, (G) *Micrurus bonita*, (H) *Bothrops erythromelas*, (I) *Pseudoboa nigra*, (J) *Lygophis dilepis*, and (K) *Erythrolamprus viridis*, (L) *Amphisbaena alba*, an amphisbaenian prey item. Photos: A, C, D, E, F, H, I, and L - Washington L. S. Vieira; B - Yuri Claudio; G - Gentil A. Pereira-Filho; K - Marco Freitas.

The record of *A. alba* is particularly noteworthy because it expands the documented dietary spectrum of *B. sertaneja* to include amphisbaenians. This record was obtained from a publicly available video rather than from a direct observation by the authors. As amphisbaenians are strictly fossorial squamates that



Figure 4. *Boiruna sertaneja* feeding on a juvenile *Boa constrictor* in a semiarid environment at Sítio Olho D'água Branco, municipality of Sumé, Paraíba, northeastern Brazil. Photos: Washington L. S. Vieira.

differ markedly in morphology and ecology from the other reptilian prey documented for *B. sertaneja*, their inclusion broadens the diversity of microhabitats potentially exploited for prey encounter. However, in the absence of information on the circumstances under which the prey was encountered and captured, this record alone does not indicate that B. sertaneja actively forages in fossorial microhabitats.

Variation in the extent of ophiophagy among closely related pseudoboini species is also noteworthy. Alencar et al. (2013) classified *B. maculata* as a dietary generalist, despite snakes accounting for 58% of its dietary items, and inferred independent origins of specialization on snake prey in *B. sertaneja* and *Clelia plumbea*. However, optimization of this trait is ambiguous at the node representing the most recent common ancestor of *Boiruna* and *Clelia* leaving some uncertainty regarding whether ophiophagous specialization evolved independently in the two lineages. Regardless of the precise evolutionary history of this specialization, these comparisons indicate that ophiophagy constitutes an important dietary component across several Pseudoboini lineages, although its prevalence and ecological expression vary among taxa. Comparisons involving *B. maculata*, however, should be interpreted cautiously, as preliminary genomic evidence suggests that populations currently assigned to this species may represent more than one distinct evolutionary lineage (H. Zaher, pers. obs.).

Birds and potential mammalian prey

Birds constituted a relatively minor component of the confirmed dietary dataset, but the new records demonstrate that *B. sertaneja* is capable of actively capturing live avian prey. The previously published record of *Columbina picui* involved consumption of a carcass (Sales et al. 2019), whereas the newly documented records of *Streptopelia decaocto* and *Gallus gallus domesticus* involved active predation (Figure 5). Both events were documented by the authors at Sítio Umbu, municipality of Esperança, Paraíba, and represent previously unpublished feeding records.

The *G. gallus domesticus* individuals were chicks captured in a nest despite the presence of the adult hen, whereas *S. decaocto* was preyed upon in an enclosure containing other individuals. These observations indicate opportunistic exploitation of readily accessible avian prey in anthropogenic environments. Although the limited number of records precludes any inference of a particular association with birds, they demonstrate that *B. sertaneja* can exploit food resources associated with rural properties and other human-modified environments. Such interactions may increase the frequency of encounters between *B. sertaneja* and local residents, particularly around poultry enclosures and other areas where potential prey are concentrated, thereby creating circumstances in which human–snake conflict may occur.

Four prey records reported by Vitt and Vangilder (1983) were retained separately as historical records potentially attributable to *B. sertaneja*: *Erythrolamprus viridis* (Günther, 1862), *Lygophis dilepis* Cope, 1862, *Thrichomys apereoides* (Lund, 1839), and *Rattus rattus* Linnaeus, 1758 (Figure 6). The latter two records, if correctly attributable to *B. sertaneja*, would extend its documented dietary spectrum to mammals. However, because these observations predate the formal description of the species and their attribution relies on retrospective taxonomic interpretation and geographic provenance, they should not be regarded as confirmed prey records. If their attribution is ul-



Figure 5. Active predation by *Boiruna sertaneja* on two bird species. *Gallus gallus domesticus* on the left and *Streptopelia decaocto* on the right. Both predation events were documented by the authors at Sítio Umbu, municipality of Esperança, Paraíba, Brazil, and represent unpublished observations. Photos: Guilherme O. Campos.

timately substantiated, they would indicate a broader trophic repertoire than that currently supported by confirmed records. For the present, they are best regarded as suggestive evidence that mammals may occasionally be consumed by *B. sertaneja*, rather than as evidence of a regular mammalian component of its diet.

New evidence from audiovisual records

Publicly available audiovisual material proved particularly valuable for expanding the documented prey spectrum of *B. sertaneja*. Records of *Pseudoboa nigra*, *Micrurus bonita*, and *Amphisbaena alba*, as well as additional feeding events involving previously documented prey species, were identified from publicly available photographs and videos. Predation on *E. assisi* was also supported by independent evidence, including an event documented by the authors (Alves et al., submitted). These records illustrate the potential of digital audiovisual sources to reveal uncommon feeding interactions that may be difficult to document through conventional approaches based on stomach contents, preserved specimens, or occasional field observations.

Audiovisual records also provided behavioral information that cannot generally be recovered from prey remains alone, including pursuit, restraint, constriction, prey manipulation, ingestion, and the use of elevated substrates during predatory interactions. However, digital sources are not generated through standardized sampling protocols and frequently lack precise information on locality, date, environmental conditions, or observation circumstances. They are also likely to be biased to represent conspicuous or unusual predation episodes, or interactions occurring in areas frequented by people. Consequently, such records should be regarded as complementary evidence rather than as a quantitative indicator of prey frequency or dietary preference (Sullivan et al. 2019; Vardi et al. 2024).

The use of audiovisual evidence therefore requires independent assessment of predator and prey identity, verification that the material documents an actual feeding interaction, traceability to the original source, and careful screening for duplicated records. The latter is particularly important because the same event may be reposted or circulated across multiple digital platforms.

Ecological, sociocultural, and conservation implications

The feeding interactions documented here also have potential implications for human–snake relationships in the Caatinga. Snakes are frequently killed because of fear and because venomous and non-venomous species can be difficult for non-specialists to distinguish. Mussuranas, however, may receive greater tolerance when recognized as non-venomous predators of species perceived as dangerous (Alves et al. 2012). Such tolerance is likely to be context dependent, and may decline when individuals approach houses or prey on domestic animals, as illustrated by the observations reported here.

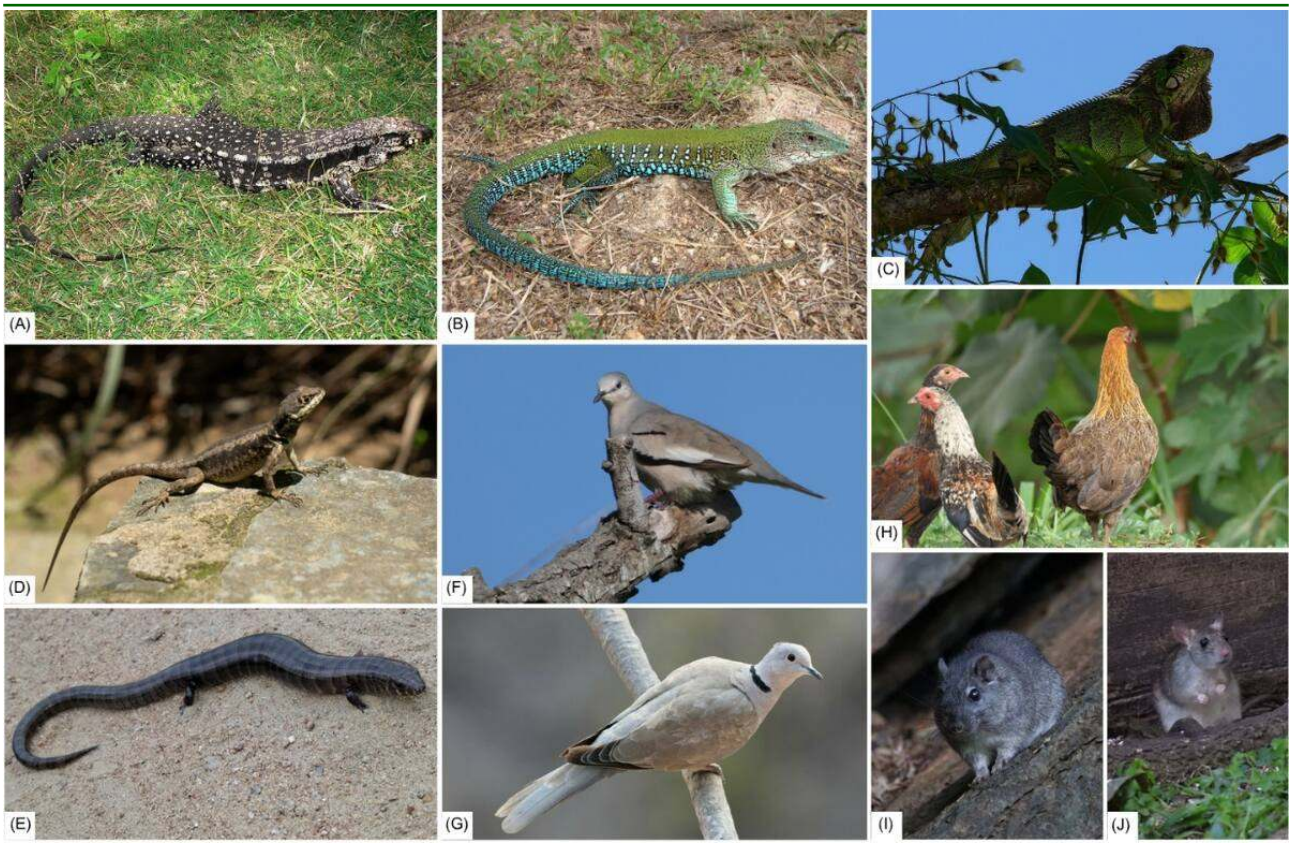


Figure 6. Lizard, bird, and mammalian prey documented for *Boiruna sertaneja*. Lizard prey species: (A) *Salvator merianae*, (B) *Ameiva ameiva*, (C) *Iguana iguana*, (D) *Tropidurus torquatus*, and (E) *Diploglossus lessonae*. Bird prey species: (F) *Columbina picui*, (G) *Streptopelia decaocto*, and (H) *Gallus gallus domesticus*. Mammalian prey species: (I) *Thrichomys apereoides* and (J) *Rattus rattus*. Photos: A, B, and C -Washington L. S. Vieira; D - Filipe Prates (via iNaturalist, CC BY 4.0); E - Taize Santos (via iNaturalist, CC BY 4.0); F - Federico Muñoz; G - Nina Wenóli; H - Damien Wallace; I - Afonso Carlos (via iNaturalist, CC BY-NC 4.0); J - Vicki Miller.

Boiruna sertaneja may therefore represent a potential species for environmental education initiatives addressing snake diversity, predator-prey interactions, and the ecological roles of native snakes in the Caatinga. Such initiatives should not, however, frame its conservation value solely in terms of its perceived usefulness to humans. *Boiruna sertaneja* is also an intrinsic component of Caatinga biodiversity and, as a predator, participates in trophic interactions that remain incompletely documented.

The long term conservation of *B. sertaneja* ultimately depends on maintaining suitable habitats and prey communities in the Caatinga, a biome increasingly affected by habitat loss, fragmentation, fire, and other forms of anthropogenic disturbance (Albuquerque et al. 2012; Santana et al. 2024). Its large body size and predominantly terrestrial habits may additionally increase exposure to threats such as road mortality, attacks by domestic animals, and deliberate persecution during movements through modified landscapes.

CONCLUSION

Overall, the available evidence characterizes *B. sertaneja* as a predominantly reptivorous and strongly ophiophagous predator, while also demonstrating a broader dietary spectrum that includes lizards, amphisbaenians, birds, with mammals remaining a plausible but unconfirmed component of the diet. By integrating scientific literature, historical records, unpublished observations, and independently validated audiovisual evidence, this study substantially expands the documented prey diversity of *B. sertaneja* and provides additional information on its feeding behavior and use of different substrates during predatory interactions.

Importantly, this compilation documents the breadth of known prey use rather than quantitative

dietary preference. The heterogeneous and largely opportunistic nature of the available evidence precludes reliable estimates of prey frequency or selection. Nevertheless, independent sources of evidence consistently identify snakes as the predominant component of the documented diet, reinforcing the characterization of *B. sertaneja* as strongly ophiophagous. More broadly, our results highlight the value of carefully validated digital records as a complementary source of natural history data, particularly for documenting rare trophic interactions and generating new hypotheses about the ecology and behavior of elusive and poorly sampled predators such as *B. sertaneja*.

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DATA AVAILABILITY

The data used to support the findings of this study are available from the corresponding author upon reasonable request.

CONFLICT OF INTEREST

The authors have no conflicts of interest to declare.

CONTRIBUTION STATEMENT

Conceived of the presented idea: RRNA
Carried out the data analysis: RRNA
Wrote the first draft of the manuscript: RRNA
Review and final write of the manuscript: RRNA, GAPF, GOC, WLSV, AKMB, FGRF, HZ

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Additional Files

Add File 1. Search and evidence records used to compile the diet of *Boiruna sertaneja* (B = bibliographic record; AV = audiovisual record; AO = author's observation).

ID	Prey family	Prey species	Evidence type	Source/Platform	URL/DOI	Locality
B1	Boidae	*Boa constrictor* Linnaeus, 1758	Bibliographic	Leite et al. 2017	10.13140/RG.2.2.34637.54248	Bahia
AO1	Boidae	*Epicrates assisi* Machado, 1944	Unpublished record/author's observation	Alves et al. submitted	–	Parelhas, Rio Grande do Norte
B2	Dipsadidae	*Oxyrhopus trigeminus* Duméril, Bibron & Duméril, 1854	Bibliographic	Gaiarsa et al. 2013	10.1590/S0031-10492013001900001	–
AV1	Dipsadidae	*Oxyrhopus trigeminus* Duméril, Bibron & Duméril, 1854	Audiovisual record	Instagram	https://www.instagram.com/p/CUAUc62LnBm/	Tenente Laurentino Cruz, RN
AV2	Dipsadidae	*Oxyrhopus trigeminus* Duméril, Bibron & Duméril, 1854	Audiovisual record	Instagram	https://www.instagram.com/reel/DA1lYylJ9Yv/	–
AV3	Dipsadidae	*Oxyrhopus trigeminus* Duméril, Bibron & Duméril, 1854	Audiovisual record	Youtube	https://www.youtube.com/watch?v=2qmdEcm3PW0	–
B3	Dipsadidae	*Philodryas nattereri* (Steindachner, 1870)	Bibliographic	Andrade-Oliveira et al. 2022	–	Morada Nova – CE