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Scientific note

Oxybelis aeneus (Wagler 1824): new record of predation and updated diet list

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Understanding feeding patterns is important for studies on trophic niches and ecological relationships (Oliveira *et al*. 2015), since the prey diversity and amount of food items used by each species are directly related to differentiation in habitat use (Carvalho *et al*. 2008).

Oxybelis aeneus (Wagler, 1824) is a medium-sized snake (Serpente, Colubridae) that is part of a suite of species (*O. aeneus* complex) with a wide distribution from southeastern Arizona, USA, to southern Brazil (Keiser Jr 1982, Nogueira *et al*. 2019, Jadin *et al*. 2020, 2021). After recent revisions, the *O. aeneus* complex has been divided into eight species, leaving the nominal species *O. aeneus* restricted to Brazil and Venezuela" (Jadin *et al.* 2019, 2020, 2021). This species is diurnal and arboreal, being the females bigger than males (Mesquita *et al.* 2012). It is commonly found in areas of natural vegetation, although it can dwell in anthropic areas (Mesquita *et al*. 2013).

Given the wide distribution of *O. aeneus*, extensive literature is available on some of its biological aspects, like parasitism (Goldberg & Bursey 2001), reproduction (Censky & McCoy 1988), behavior (Barquero 2018), and feeding habits (Mesquita *et al.* 2013). Thus, compiling this information is essential for a better understanding of the ecology of the specie and assists in making public policy decisions that may interfere with the conservation of wildlife species. Thus, in this study we present a synoptic literature review of all available data on the prey eaten by *O. aeneus*, as well as a new record of a food item, *Phyllopezus pollicaris* (Spix, 1825) for this species.

For the literature review of the food items consumed by *O. aeneus* we used the electronic databases available in Google Scholar, Scielo, Academia, and the Capes Portal, with the keywords: "*Oxybelis aeneus*, diet, food items, predation, ecology, foraging, ecological niche, and behavior". From the articles recorded in these online resources, we conducted a supplementary review of article citations, about the diet of *O. aeneus*, included in each article.

In total, 34 food items are recorded for the diet of this snake (Table 1), including the present record. The new predation record occurred on August 30, 2019, around 14:00 h, when an adult *O.*

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aeneus was found in the community of Lapa (14º24'47.88" N, 42º38'11.4" W), in an area with predominantly Caatinga tree physiognomy (Queiroz 2009), located in the rural area of the municipality of Pindaí, state of Bahia, Brazil (Queiroz 2009). The individual of *Oxybelis aeneus* was in a tree and bit an adult specimen of *P. pollicaris* on its head (Fig. 1). Before it was rescued, we waited for the swallowing process to be completed, which lasted approximately 30 minutes.

Although predation on lizards by snakes, especially colubrids, is cited in the literature (Mesquita *et al*. 2013; Oliveira *et al*. 2020), predation on lizards is rarely observed in nature (Aguiar & Di-Bernardo 2004), and events involving snakes are even scarcer (Vitt & Vangilder 1983). Thus, there is still difficulty in recording and qualifying or quantifying these events (Aguiar & Di-Bernardo 2004).

A total of 34 food items are recorded for the diet of this snake. Of these items, 83.3% were lizards, including *P. pollicaris* a nocturnal, insectivorous gecko lizard that is distributed throughout the open formations of South America (Recorder *et al*. 2012). Information on the diet of *O. aeneus* generally comes from occasional predation records and a few complete studies. A variety of lizard species were found in the diet of this snake species, with approximately 25 species recorded as prey. Thus, the species is considered a specialist in this group (Mesquita *et al*. 2013, Oliveira *et al*. 2020). With the literature review, we noted that the prey preference patterns of *O. aeneus* are small terrestrial lizard species (ranging from 55 mm to 24 cm in length), and occasionally amphibians (Mesquita *et al*. 2013), birds (Beebe 1946), and mammals (França & Araújo 2007), representing 23.5% of all known food items.

The diet of *O. aeneus* recorded here is similar to that reported by Costa *et al*. (2022) for the *Oxybelis aeneus* group with 76.5% of prey recorded as lizards, with *O. aeneus* being the species in the group that showed the highest predation on lizards in its diet. The wide distribution of *O*. *aeneus* can contribute to the inclusion of a variety of species in its diet, but regardless of sampling location, lizards are always the predominant prey, confirming that *O*. *aeneus* is specialist in preying lizards.

Table 1. Food items recorded in the diet of *Oxybelis aeneus* (*new predation record), modified from Costa *et al*. 2022.

TAXON	**LOCATION**	**SOURCE**
SQUAMATA		
"**LIZARDS**"		
Indeterminate lizards	Brazil	Cunha & Nascimento (1978), Cunha & Nascimento (1993), França & Araújo (2007)
ALOPOGLOSSIDAE		
Alopoglossus sp.	Brazil	Martins & Oliveira (1998)
DACTYLOIDAE		
Anolis spp.	Brazil	Cunha & Nascimento (1978), Silva *et al*. (2010)
Anolis chrysolepis Duméril & Bibron, 1837	Venezuela	Beebe (1946)
Anolis tandai Avila-Pires, 1995	Brazil	Ávila-Pires (1995)
GEKKONIDAE		

TAXON	LOCATION	SOURCE
Hemidactylus mabouia Moreau De Jonnès, 1818	Brazil	Mesquita *et al*. (2012, 2013), Franzini *et al*. (2018)
Lygodactylus klugei (Smith, Martin & Swain, 1977)	Brazil	Vitt & Vangilder (1983)
GYMNOPHTHALMIDAE		
Colobosaura modesta (Reinhardt & Lütken, 1862)	Brazil	Ávila-Pires (1995)
Micrablepharus atticolus Rodrigues, 1996	Brazil	França *et al*. (2008)
IGUANIDAE		
Iguana iguana (Linnaeus, 1758)	Brazil	Costa *et al*. (2022)
PHYLLODACTYLIDAE		
Gymnodactylus darwinii (Gray, 1845)	Brazil	Campos *et al*. (2022)
Gymnodactylus geckoides Spix, 1825	Brazil	Oliveira *et al*. (2020)
*Phyllopezus pollicaris** (Spix, 1825)	Brazil	Present study
POLYCHROTIDAE		
Polychrus acutirostris Spix, 1825	Brazil	Oliveira *et al*. (2020)
SCINCIDAE		
Brasiliscincus heathi (Schmidt & Inger, 1951)	Brazil	Mesquita *et al*. (2012, 2013), Oliveira *et al*. (2020)
Copeoglossum arajara (Reboucas-Spieker, 1981)	Brazil	Oliveira *et al*. (2020)
SPHAERODACTYLIDAE		
Coleodactylus meridionalis (Boulenger, 1888)	Brazil	Oliveira *et al*. (2020)
Gonatodes humeralis (Guichenot, 1855)	Brazil	Martins & Oliveira (1998); Oliveira-Souza *et al*. (2021)
TEIIDAE		
Ameiva ameiva (Linnaeus, 1758)	Venezuela	Beebe (1946)
Ameivula ocellifera (Spix, 1825)	Brazil	Vitt & Vangilder (1983), Mesquita *et al*. (2012, 2013), Silva *et al*. (2021)
Ameivula pyrrhogularis (Basto da Silva & Ávila-Pires, 2013)	Brazil	Oliveira *et al*. (2020)
Cnemidophorus lemniscatus (Linnaeus, 1758)	Brazil	Ávila-Pires (1995)
TROPIDURIDAE		
Tropidurus cocorobensis Rodrigues, 1987	Brazil	Almeida *et al*. (2009)
Tropidurus hispidus (Spix, 1825)	Brazil	Mesquita *et al*. (2013), Oliveira *et al*. (2020)
Tropidurus hygomi Reinhardt & Lütken, 1862	Brazil	Santos *et al*. (2012)
Tropidurus semiteniatus (Spix, 1825)	Brazil	Vitt & Vangilder (1983)
AMPHIBIA		
ANURA		

TAXON	LOCATION	SOURCE
Indeterminate anurans	Brazil and Venezuela	Beebe (1946), Cunha & Nascimento (1978), Cunha & Nascimento (1993), França & Araújo (2007), França *et al*. (2008)
HYLIDAE		
Scinax ruber (Laurenti, 1768)	Venezuela	Beebe (1946)
Scinax spp.	Brazil	Ávila-Pires (1995)
LEPTODACTYLIDAE		
Leptodactylus fuscus (Schneider, 1799)	Brazil	Mesquita *et al*. (2012, 2013)
Leptodactylus sp.	Brazil	Mesquita *et al*. (2012)
AVES		
Indeterminate birds	Brazil and Venezuela	Beebe (1946), Cunha & Nascimento (1978), Cunha & Nascimento (1993), Ávila-Pires (1995), França & Araújo (2007)
Estrilda astrild Linnaeus, 1758	Brazil	Costa *et al*. (2022)
MAMMALIA		
Indeterminate mammals	Brazil	Cunha & Nascimento, (1978), França & Araújo (2007)

Figure 1. New predation record for *Oxybelis aeneus* of the gecko *Phyllopezus pollicaris* in the community of Lapa, municipality of Pindaí, Bahia State, Brazil.

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REFERENCES

Aguiar, L.F.S. & Di-Bernardo, M. (2004) Diet and feeding behavior of *Helicops infrataeniatus* (Serpentes: Colubridae: Xenodontinae) in southern Brazil. *Studies on the Neotropical Fauna and Environment 39*: 7-14. https://doi.org/10.1080/01650520412331270927.

Almeida, G.V., Silva, G.L., Campos, T.F., Muniz, S.L. & Santos, E.M. (2009) Predação do lagarto *Tropidurus cocorobensis* pela serpente *Oxybelis aeneus. Boletim do Museu de Biologia Mello Leitão 25*: 83-86.

Ávila-Pires, T.C.S. (1995) Lizards of Brazilian Amazonian (Reptilia: Squamata). *Zoologische verhandelingen 299*: 1-706.

Barquero, M.D. (2018) *Oxybelis aeneus*: aggressive interactions with the clay-colored trush (*Turdus grayi*). *Herpetological Bulletin 143:* 43. Available at: https://www.thebhs.org/publications/the-herpetological-bulletin/issue-number-143-spring-2018/1819-12-i-oxybelis-aeneus-i-aggressive-interactions-with-the-clay-colored-trush-i-turdus-grayi-i (accessed: 1 June 2023).

Beebe, W. (1946) Field notes on the snakes of Kartabo, British Guiana, and Caripito, Venezuela. *Zoologica 31*: 11-52. http://dx.doi.org/10.29215/pecen.v2i1.587

Campos, F.S., Lage, A.R. & Lourenço-de-Moraes, R. (2022) Predation of *Gymnodactylus darwinii* (Squamata Phyllodactylidae) by *Oxybelis aeneus* (Squamata Colubridae) in Morro de São Paulo (Tinharé Island), Northeastern Brazil. *Herpetology Notes 15*: 97-99. Available at: https://www.biotaxa.org/hn/article/view/68084 (accessed: 1 June 2023).

Carvalho, C.B., Freitas, E.B., Faria, R.G., Batista, R.C., Batista, C.C., Coelho, W.A. & Bocchiglieri, A. (2008) História natural de *Leptodactylus mystacinus* e *Leptodactylus fuscus* (Anura: Leptodactylidae) no Cerrado do Brasil Central. *Biota Neotropica 8*: 105-115. https://doi.org/10.1590/S1676-06032008000300010.

Censky, E.J. & McCoy, C.J. (1988) Female reproductive cycles of five species of snakes (Reptilia: Colubridae) from the Yucatan Peninsula, Mexico. *Biotropica 20*: 326-333. https://doi.org/10.2307/2388323.

Costa, F.R.F., Pezeta, Y.F., Crozariol, M.A., de Oliveira, T.P., Henderson, R.W., & Gonzalez, R.C. (2022) A review of the diet of *Oxybelis aeneus* group (Squamata: Colubridae) including two new prey records from north-eastern Brazil. *Herpetology Notes 15*: 785-795. Available at: https://www.biotaxa.org/hn/article/view/73820 (accessed: 1 June 2023).

Cunha, O.R. & Nascimento, F.P. (1978). Ofídios da Amazônia. X - As cobras da região leste do Pará. Belém. *Museu Paraense Emílio Goeldi*, 218 p.

Cunha, O.R. & Nascimento, F.P. (1993). Ofídios da Amazônia. As cobras da região Leste do Pará. *Boletim do Museu Paraense Emílio Goeldi: série zoologia*, 9: 1-191.

França, F.G.R. & Araújo, A.F.B. (2007) Are there co-occurrence patterns that structure snake communities in Central Brazil? *Brazilian Journal of Biology 67*: 33-40. https://doi.org/10.1590/S1519-69842007000100005.

França, F.G.R., Mesquita, D.O., Nogueira, C.C. & Araújo, A.F.B. (2008) Phylogeny and ecology determine morphological structure in a snake assemblage in the Central Brazilian Cerrado. *Copeia 2008:* 23-38. https://doi.org/10.1643/CH-05-034.

Franzini, L.D., Pedro, C.K.B., Cavalcanti, L.B.Q. & Mesquita, D.O. (2018) Predation of *Hemidactylus mabouia* (Sauria: Gekkonidae) by a vine snake *Oxybelis aeneus* (Serpentes: Colubridae) in an Atlantic Forest fragment, northeastern Brazil. *Pesquisa e Ensino em Ciências Exatas e da Natureza 2*: 67-70. http://dx.doi.org/10.29215/pecen.v2i1.587

Goldberg, S.R. & Bursey, C.R. (2001) *Hypsiglena torquata* (Night snake) and *Oxybelis aeneus* (Brown vine snake). Endoparasites. *Herpetological Review 32*: 263.

Jadin, R.C., Blair, C., Jowers, M.J., Carmona, A., & Murphy, J.C. (2019) Hiding in the lianas of the tree of life: molecular phylogenetics and species delimitation reveal considerable cryptic diversity of New World Vine Snakes. *Molecular Phylogenetics and Evolution* 134: 61-65. https://doi.org/10.1016/j.ympev.2019.01.022

Jadin, R.C., Blair, C., Orlofske, S.A., Jowers, M.J., Rivas, G.A., Vitt, L.J., ... & Murphy, J. C. (2020) Not withering on the evolutionary vine: systematic revision of the Brown Vine Snake (Reptilia: Squamata: *Oxybelis*) from its northern distribution. *Organisms Diversity and Evolution 20*: 723-746. https://doi.org/10.1007/s13127-020-00461-0.

Jadin, R.C., Jowers, M.J., Orlofske, S.A., Duellman, W.E., Blair, C., & Murphy, J.C. (2021) A new vine snake (Reptilia, Colubridae, Oxybelis) from Peru and redescription of *O. acuminatus*. *Evolutionary Systematics* 5: 1-12. https://doi.org/10.3897/evolsyst.5.60626

Keiser Jr., E.D. (1982) *Oxybelis aeneus* (Wagler). *Catalogue of American Amphibians and Reptiles* 305: 1-4.

Martins, M. & Oliveira, M.E. (1998) Natural history of snakes in forests of the Manaus region, Central Amazonia, Brazil. *Herpetological Natural History 6*: 78-150.

Mesquita, P.C., Passos, D.C., Borges-Nojosa, D.M. & Cechin, S. Z. (2013) Ecologia e história natural das serpentes de uma área de Caatinga no nordeste brasileiro. *Papéis Avulsos de Zoologia 53*: 99-113. https://doi.org/10.1590/S0031-10492013000800001.

Mesquita, P.C.M.D., Borges-Nojosa, D.M., Passos, D.C. & Bezerra, C.H. (2012) Activity patterns of the Brown Vine snake *Oxybelis aeneus* (Wagler, 1824) (Serpentes, Colubridae) in the Brazilian semiarid. *Animal Biology 62*: 289-299. https://doi.org/10.1163/157075611X618228.

Nogueira, C.C., Argôlo, A.J., Arzamendia, V., Azevedo, J.A., Barbo, F.E., Bérnils, R.S., ..., & Martins, M. (2019): Atlas of Brazilian snakes: verified point-locality maps to mitigate the Wallacean shortfall in a megadiverse snake fauna. *South American Journal of Herpetology* 14: 1-274. https://doi.org/10.2994/SAJH-D-19-00120.1

Oliveira, C.R., Brasileiro, A.C. & Mascarenhas, W. (2020) *Oxybelis aeneus* (Brown Vine Snake). Diet. *Herpetological Review 51*: 876.

Oliveira, M., Gottschalk, M.S., Loebmann, D., Santos, M.B., Miranda, S., Rosa, C. & Tozetti, A.M. (2015) Diet composition and niche overlap in two sympatric species of *Physalaemus* (Anura, Leptodactylidae, Leiuperinae) in coastal subtemperate wetlands. *Herpetology Notes 8*: 173-177.

Oliveira-Souza, A.E., Pena, A.S., Costa-Anaissi, J.S., Melo, F.S., Pinheiro, R.T. & Costa-Campos, C.E. (2021) Predation by the vinesnake *Oxybelis aeneus* (Squamata, Colubridae) on the gecko *Gonatodes humeralis* (Squamata, Sphaerodactylidae) in a Brazilian Amazon forest fragment, with a compilation of its prey. *Herpetology Notes 14*: 1111-1115.

Queiroz, L.P.D. (2009) *Leguminosas da caatinga*. Universidade Estadual de Feira de Santana.

Recoder, R., Junior, M.T., Camacho, A. & Rodrigues, M.T. (2012) Natural history of the tropical gecko *Phyllopezus pollicaris* (Squamata, Phyllodactylidae) from a sandstone outcrop in Central Brazil. *Herpetology Notes 5*: 49-58.

Santos, R.A., Santana, D.O., Caldas, F.L.S. & Faria, R.G. (2012) *Tropidurus hygomi* (Reinhardt's Lava Lizard). Predation. *Herpetological Review 43*: 490-491.

Sawaya, R.J., Marques, O.A.V. & Martins, M. (2008) Composição e história natural das serpentes de cerrado de Itirapina, São Paulo, sudeste do Brasil. *Biota Neotropica 8*: 127-148. https://doi.org/10.1590/S1676-06032008000200015

Shine R. (ed.) (1995) *Australian Snakes: A Natural History*. Ithaca, Cornell University Press.

Silva N.V.N., Mello, A.V.A., Oliveira, P.M.D.A., de Andrade Lima, J.H., de Castro Ribeiro, L.R. & Simões, P.I. (2021) Predation of *Ameivula ocellifera* (Squamata, Teiidae) by *Oxybelis aeneus* (Squamata, Colubridae), in the Caatinga, Northeastern Brazil, including a list of saurophagy by this snake. *Heringeriana 15*: 96-100. https://doi.org/17648/heringeriana.v15i1.917960.

Silva, M.V., Souza, M.B. & Bernarde, P.S. (2010) Riqueza e dieta de serpentes do Estado do Acre, Brasil. *Revista Brasileira de Zoociências 12*: 165-176.

Vitt, L.J. & Vangilder, L.D. (1983) Ecology of a snake community in Northeastern Brazil. *Amphibia-Reptilia 4*: 273-296. https://doi.org/10.1163/156853883X00148

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