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NATURAL HISTORY NOTE

Predation of a Seba's Short-tailed Bat *Carollia perspicillata* (Linnaeus, 1758) by an Amazon tree boa *Corallus hortulana* (Linnaeus, 1758) in Central Amazon

Tamily Carvalho Melo dos Santos[1,] *, Caroline Carvalho de Melo[2], Rickelmy Martins de Holanda[3], Gerson Paulino Lopes[1,4,5]

[1] Instituto de Desenvolvimento Sustentável Mamirauá, Grupo de Pesquisa em Ecologia Integrativa da Amazônia & Grupo de Pesquisa em Medicina da Conservação e Saúde Única, Estrada do Bexiga, 2584, Tefé, Amazonas, Brazil.

[2] Linha Ambiental Consultoria em Negócios, Avenida Afonso Pena, 3924, Belo Horizonte, Minas Gerais, Brazil.

[3] Instituto de Desenvolvimento Sustentável Mamirauá, Grupo de Pesquisa em Ecologia Integrativa da Amazônia, Estrada do Bexiga, 2584, Tefé, Amazonas, Brazil.

[4] Universidade Federal do Amazonas, Laboratório de Evolução e Genética Animal, Avenida General Rodrigo Octávio Jordão Ramos, Manaus, Amazonas, Brazil

[5] Secretaria de Estado de Educação e Desporto Escolar, Coordenadoria Regional de Tefé, Centro Educacional Governador Gilberto Mestrinho, Estrada do Aeroporto, 1241, São Francisco, Tefé, Amazonas, Brazil

*Corresponding author: tamily-lfv@hotmail.com

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ABSTRACT

Bats are among the most taxonomically and ecologically diverse mammalian groups, yet many aspects of their ecology, including predator–prey interactions, remain poorly understood. Predation is a key driver of evolutionary arms races but is rarely observed in natural settings, particularly interactions involving nocturnal and elusive animals. Among snakes, the Amazon tree boa (*Corallus hortulana*) primarily prey on birds and mammals, including bats. Here, we report an observation of *C. hortulana* preying on a Seba's short-tailed bat (*Carollia perspicillata*) in the Brazilian Amazon. Although bats appear to be an important food source for C. hortulana, our observation is only the fourth such record in the region. These records contribute to understanding the trophic interactions between bats and their predators, highlighting the need for further documentation of predation events in tropical ecosystems.

Bats are among the most taxonomically and ecologically diverse mammalian groups, comprising more than 1400 species (Simmons & Cirranello 2024). Although bats are the second largest mammalian order, many aspects of their life still remain poorly understood, such as their predator–prey interactions, about which there is limited knowledge of the identity and diversity of their natural predators (Allen 1940, de Mores Costa et al. 2016, Mikula et al. 2024). Although it is one of the drivers of evolutionary arms races (van Valen 1973), predation is not easily observable. Thus, knowledge of predator-prey relationships has been largely based on the study of predator diets (Escarlate-Tavares & Pessôa 2005) and opportunistic observations (Mores Costa et al. 2016, Ruiz-Villar et al. 2024).

Despite their ability to fly and their elusive nature, bats have several natural predators, including other bats (Oprea et al. 2006, Borloti et al. 2019), amphibians (Gouveia et al. 2009, Castro et al. 2011, Mikula 2015), fish (Mikula 2015), birds (Beebe 1950, Fenton et al. 1977, Black et al. 1979, Rodríguez-Durán & Lewis 1985, Jung et al. 2011, Serra-Gonçalves et al. 2017), primates (Souza et al. 1997), marsupials (Gazarini et al. 2008, Patricio-Costa et al. 2010, Carvalho et al. 2011, Alencastre-Santos et al. 2022), spiders (Nyffeler & Knörnschild 2013) and, snakes (Miller 1904, Villa & Lopez-Forment 1966, Lemke 1978, Rodríguez & Reagan 1984, Rodríguez-Durán & Lewis 1985, Rufino & Bernardi 1999, Valdujo et al. 2002, Esbérard & Vrcibradic 2007, Valencia et al. 2008, França & Lima 2012 , Carvalho et al. 2019, Barbier et al. 2023).

Among the bat species recorded in the diet snakes, the Amazon tree boa, *Corallus hortulana* (Linnaeus, 1758), an arboreal snake that exhibits active and ambush foraging, feeds mainly on birds and mammals, including bats (Pizzatto et al. 2009, Henderson & Pauers 2012). Among bats, the species recorded in the diet of *C. hortulana* were *Carollia castanea* Allen, 1890 (Valencia et al. 2008), *Artibeus* sp. (Barnett et al. 2007, Carvalho et al. 2019), *Artibeus planirostris* (Spix, 1823) (Henderson 2002), *Artibeus obscurus* (Schinz, 1821) (Pizzatto et al. 2009), *Myotis* sp. (Martins & Oliveira 1998), *Platyrrhinus lineatus* Geoffroy, 1810 (Esbérard & Vrcibradic 2007), *Pteronotus* sp. (Barbier et al. 2023), *Carollia perspicillata* (Linnaeus, 1758) (Esbérard & Vrcibradic 2007), and other unidentified species (Hopkins & Hopkins 1982, Pizzatto et al. 2009).

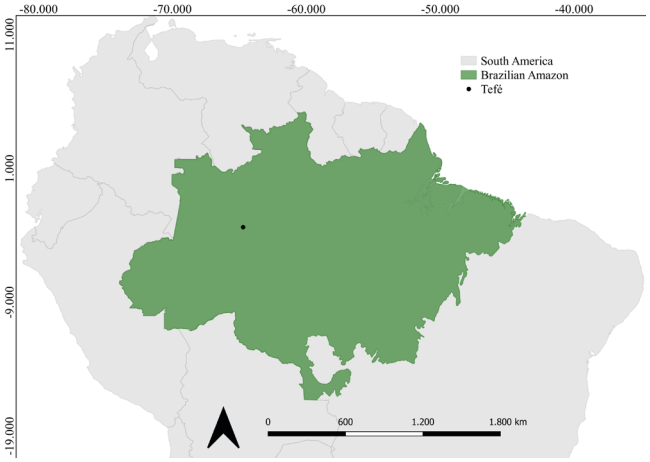

Fig. 1 - Location of Tefé City in the Brazilian Amazon, where the Amazon tree boa (*Corallus hortulana*) was captured. The map was generated using open-source GIS software QGIS v.3.28 (QGIS Development Team 2024).

In most recorded cases of bat predation by snakes, the snake was initially captured for other purposes, and bats were only identified as prey when the stomach contents were later analyzed (Martins & Oliveira 1998, Henderson 2002, Pizzatto et al. 2009).

There is one report that when the snake was handled it regurgitated the bat (Valencia et al. 2008). On another occasion, the snake was found inside a research station and had a prominence on its belly and, when stomach analysis was performed, the presence of the bat was observed (Barnett et al. 2007). Records of natural observation, such as ambushes at cave entrances (Barbier et al. 2023) and direct observations of snakes capturing bats in trees (Esbérard & Vrcibradic 2007), or observations after the snake had already captured the bat (Carvalho et al. 2019) are rare. There are also records of predation occurring when bats were captured in mist nets (Esbérard & Vrcibradic 2007).

Overall, predator-prey interactions involving bats remain poorly documented, particularly on Amazon. Here, we report an observation of an Amazon tree boa (*Corallus hortulana*) preying on a Seba's short-tailed bat (*Carollia perspicillata*), contributing to the limited records of bat predation in this region.

On 19th March 2024 at around 16:00 h we captured an Amazon tree boa snake at Tefé Airport (03°22'44.10" S, 64°43'27.28" W), Amazonas, Brazil (Fig. 1). The snake was on top of the roof of a small house, approximately at a height of 1.5 m from the ground. Capture was carried out under legal permit by Biodiversity Authorization and Information System/ICMBio of Brazilian government (nº 91927-1). The snake was identified by herpetologist Rickelmy Holanda.

The *C. hortulana* specimen presented a protuberance in its abdomen (Fig. 2A). The specimen was a female and was 109 cm snout-vent length (SVL) and 136.5 cm total length (TL). The specimen was collected following the official protocol by Federal Council of Biology of Brazil, and was measured, fixed, and deposited in the Herpetological Collection of the Instituto de Desenvolvimento Sustentável Mamirauá (HERPETO1786). An analysis of the stomach contents revealed the presence of an entire adult bat (Fig. 2B). The bat was identified by bat specialists Tamily Santos and Gerson Lopes as Seba's Short-tailed Bat. The bat species was identified according to the identification key of Díaz et al. (2021).

This is the first confirmed record of *C. perspicillata* predation by *C. hortulana* in the Amazon. However, previous records document other snake species preying on *C. perspicillata* (Esbérard & Vrcibradic 2007, França & Lima 2012), as well as an opportunistic predation event involving *C. hortulana* capturing *C. perspicillata* in a mist net within the Atlantic Forest (Esbérard & Vrcibradic 2007).

Fig. 2 - A: Specimen of Amazon tree boa *C. hortulana* with protruding belly (black arrow). **B**: Seba's Short-tailed Bat *C. perspicillata* found in the snake's stomach. Photos by Rickelmy Holanda, on 19th March 2024.

Although *C. perspicillata* is one of the most widespread and abundant bat species captured in Brazil (Santos et al. 2020), records of its predation by snakes, as well as bat predation events in general, remain scarce for the Amazon (Barbier et al. 2023). The predation recorded here may have occurred near the site where the snake was collected, as *C. perspicillata* is commonly found in human habitations (Marques-Aguiar 1985).

For the diet of *C. hortulana* there are six previous records for bats (Martins & Oliveira 1998, Barnett et al. 2007, Esbérard & Vrcibradic 2007, Valencia et al. 2008, Carvalho et al. 2019, Barbier et al. 2023). Although such records are infrequent, they suggest that bats are a part of the diet of Boidae snakes, particularly *C. hortulana*. However, further research is needed to determine how commonly bats feature in the diet of *C. hortulana* and whether they represent a key food source or are consumed opportunistically.

Despite being one of the most common and conspicuous boid snakes in Amazonian forests, *C. hortulana* has been rarely observed capturing prey, even with over 1,000 records on biodiversity platforms (https://www.inaturalist.org/taxa/32082-Corallus-hortulana/browse_photos). Notably, direct observations of predation remain rare (e.g. https://www.inaturalist.org/observations/106389245). This highlights the significance of our record for understanding the natural history of *C. hortulana* and its interactions with bats (Barbier et al. 2023). Such predation records provide valuable insights into the trophic interactions between bats and their predators, emphasizing the need for further documentation of these events.

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