PREDATION OF TWO BATS MOLOSSIDAE (CHIROPTERA) BY THE LICHTENSTEIN'S GREEN RACER *PHILODRYAS OLFERSII* (SERPENTES: DIPSADIDAE) IN SOUTHEASTERN BRAZIL

DEPREDACIÓN DE DOS MURCIÉLAGOS MOLOSSIDAE (CHIROPTERA) POR LA CULEBRA VERDE *PHILODRYAS OLFERSII* (SERPENTES: DIPSADIDAE) EN EL SUDESTE DE BRASIL

Lidia Silva de Lima[1], Nádia Santos-Cavalcante[1], Lucas de Souza Almeida[2], Paulo Roberto Machado-Filho[3], Breno Camara Gomes & Rodrigo C. Gonzalez [1*]

[1]*Museu de História Natural do Ceará Prof. Dias da Rocha, Universidade Estadual do Ceará, Rua Divino Salvador 225, Pacoti, Ceará, 62770-000, Brazil.*

[2]*Laboratório de Herpetologia, Departamento de Biodiversidade e Centro de Aquicultura (CAUNESP), Instituto de Biociências, Universidade Estadual Paulista 'Júlio de Mesquita Filho', Rio Claro, São Paulo, 13506-900, Brazil.*

[3]*Museu de Zoologia da Universidade de São Paulo, Avenida Nazaré 481, São Paulo, São Paulo, 04263-000, Brazil.*

**Correspondence: rodcastgon@gmail.com*

Received: 20245-02-19. **Accepted:** 2025-04-21. **Published:** 2025-06-17.

Editor: Katyuscia Araujo Vieira, Brasil.

Resumen.– Aquí reportamos el primer registro de una culebra verde (*Philodryas olfersii*) depredando un murciélago (*Eumops* sp.) en el sureste de Brasil. Nuestro informe sugiere que los murciélagos, aunque principalmente nocturnos, también podrían representar un elemento importante en la dieta de esta especie diurna.

Palabras clave.– Dieta, historia natural, Philodryadini, serpientes.

Abstract.– Here we report the first record of a Lichtenstein's green racer *Philodryas olfersii* on an *Eumops* sp. in southeastern Brazil. Our report shows that bats, which are mainly nocturnal, could also be an important item in this diurnal species' diet.

Keywords.– Diet, natural history, Philodryadini, snakes.

Philodryas olfersii (Lichtenstein, 1823) stands out among South American snakes for having a large distribution range, extending across all Brazilian domains (Nogueira et al., 2019; Castro et al., 2021). This species inhabits different environments, from well-preserved natural areas to regions heavily modified by human activity, including urban centers (Nogueira et al., 2019). It is a generalist predator, consuming a wide variety of vertebrate prey, including anurans, birds, mammals, lizards, and other snakes (Machado-Filho, 2015). Here we report two events of *Philodryas olfersii* preying upon Molossidae bats. This is the fourth most diverse family of Chiroptera, comprising 16 genera and approximately 134 species (Simmons & Cirranello, 2024). Molossids are strictly insectivorous and predominate in the tropical regions (Freeman, 1981). Many species in this family are very similar, and they can only be distinguished externally by anatomical features, such as the ear junction, the shape of the antitragus, the presence of warts on the upper edge of the mouth, and the presence of vibrissae (Freeman, 1981).

Of the two predation events presented here, only the first (Fig. 1a) could be identified at the genus level, being recognized as an *Eumops sp.* This genus has a wide geographic distribution, ranging from the southern United States to Central Argentina (Simmons, 2005). Out of the 17 known species, 11 are found in Brazil (Garbino et al., 2024).

The first record occurred on 15 February 2020 at 17:45 h., when an individual of *Philodryas olfersii* was photographed while preying upon an *Eumops sp.* on Praia da Biologia, Aracruz municipality, Espírito Santo state, Brazil (19.9731° S, 40.1377° W, at sea level). The snake was exiting a hole in a log, with the bat in its mouth. The bat was motionless, while the snake was carrying it

away (Fig. 1a). This whole event lasted about 8 minutes until they vanished in the nearby vegetation. None of them was collected.

The second case occurred on 11 July 2023 at 12:38 h, in Cantagalo municipality, Rio de Janeiro state, Brazil (21.93740° S, 42.34142° W, 420 m a.s.l.). Another individual of *Philodryas olfersii* was crawling out of a hole on a wood fence with a Molossidae in its mouth; the animal was not disturbed so it could swallow the bat (Fig. 1b). This event lasted about 4 minutes. None was collected.

Mammals are the primary prey group in the diet of *Philodryas olfersii* (Machado-Filho, 2015). Two bat species, *Myotis cf. nigricans* (Vespertilionidae) and *Nyctinomops laticaudatus* (Molossidae) have previously been recorded in the diet of this snake (Thomas, 1976; Barros et al., 2015). Our additional new records of two of Molossidae bats, reveal that bats of this family might also be an important item for this snake's diet.

Due to the large number of species and the secretive habits of snakes, many details on their natural history are yet to be known (Maritz et al., 2021). It is not common to observe snakes preying on bats, since they are also secretive and rarely seen during the day (Lima & O'Keefe, 2013; Martin-Solano et al., 2016). On the other hand, *P. olfersii* is a diurnal snake (Martins et al., 2008), which makes this interaction even more remarkable. In

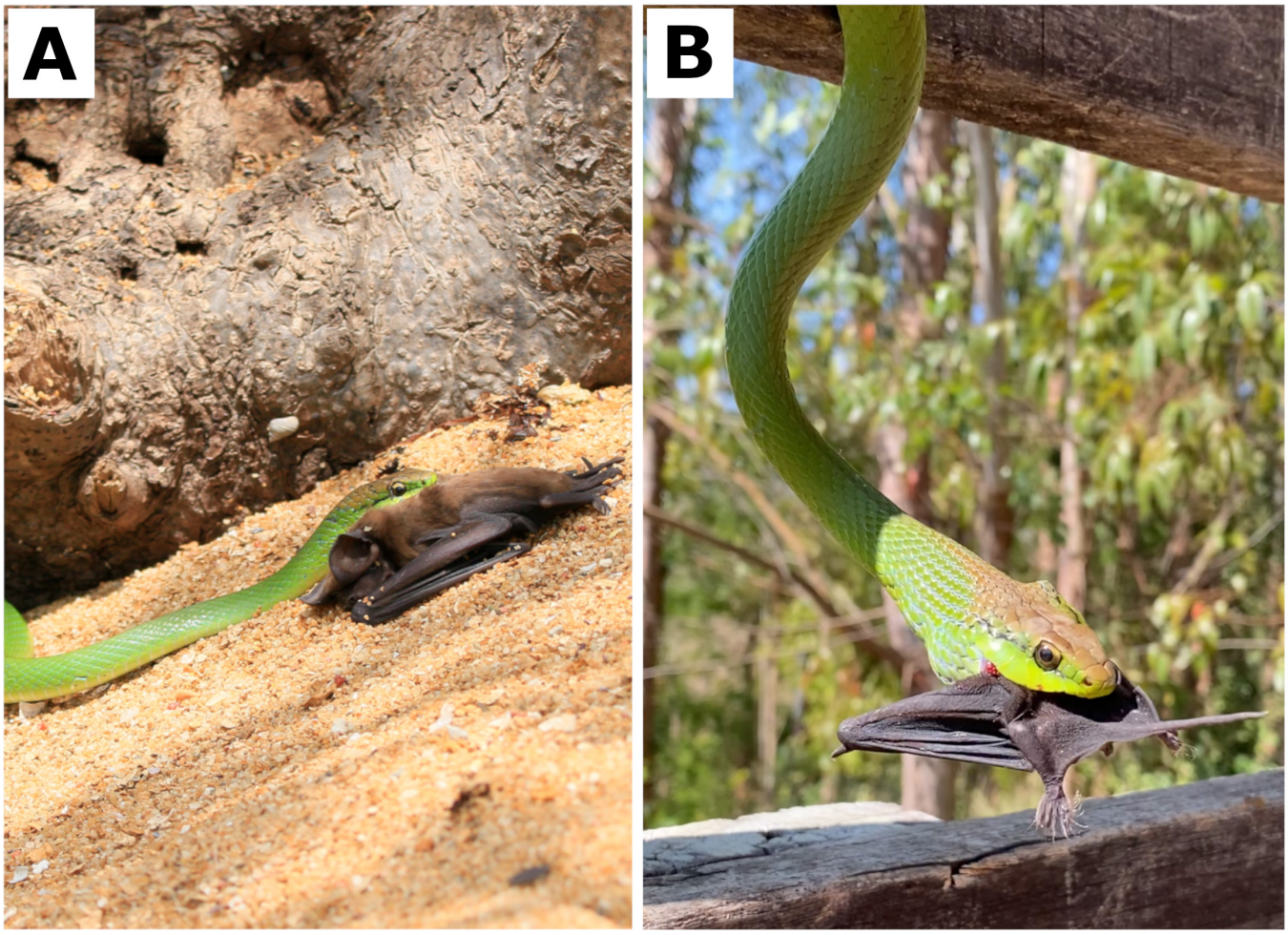

Figura 1. A) *Philodryas olfersii* depredando um indivíduo de *Eumops sp.* em plena luz del día em Aracruz, Estado de Espírito Santo, Brasil. Foto: Maximo Oppici. B) *P. olfersii* depredando um indivíduo de Molossidae em Cantagalo, Estado do Rio de Janeiro, Brasil. Foto: Breno Camara.

Figure 1. A) *Philodryas olfersii* preying on an individual of *Eumops sp.* in broad daylight in Aracruz, Espírito Santo state, Brazil. Photo: Maximo Oppici. B) *P. olfersii* preying on an individual of Molossidae in Cantagalo, Rio de Janeiro state, Brazil. Photo: Breno Camara.

both cases, the snakes were actively searching for prey inside cracks, trunks, and logs during the day, so it could find them asleep (Barros et al., 2015). Given that *P. olfersii* is a generalist species, and other mammals seem to be more frequent in its diet (Machado-Filho, 2015), preying upon bats may not mean they are favourite, but opportunistic resources that could not be wasted.

Acknowledgements.– We thank Maximo Oppici for providing the images and details about the predation event in figure 1a. RGC thanks Fundação Cearense de Apoio ao Desenvolvimento Científico e Tecnológico (process number: 08339530/2023).

LITERATURE CITED

Barros, M.A.S., L.C. Pinto, R.O. Pfau, F.F. Kislowski & M.D. Freire. 2015. *Philodryas olfersii* (Serpentes, Dipsadidae) feeding on bats in southern Brazil. Revista Brasileira de Biociências 13:231-236.

Castro, F.C., S.N. Souza, S.M. Almeida-Santos, K.T. Miyaji & C.R. Medeiros 2021. Bites by *Philodryas olfersii* (Lichtenstein, 1823) and *Philodryas aestiva* (Duméril, Bibron, and Duméril, 1854) (Serpentes, Dipsadidae) in São Paulo, Brazil: a retrospective observational study of 155 cases. Toxicon 197:55-64.

Freeman, P.W. 1981. A multivariate study of the family Molossidae (Mammalia: Chiroptera): morphology, ecology, evolution. Doctoral Thesis. The University of New Mexico. New Mexico, USA.

Garbino G.S.T, R. Gregorin , I.P. Lima, L. Loureiro, L. Moras, R. Moratelli, M.C. Nascimento, M.R. Nogueira, R.L.M. Novaes, A.C. Pavan, V.C. Tavares & A.L. Peracchi. 2024. Updated checklist of bats (Mammalia: Chiroptera) from Brazil. Zoologia 41:e23073.

Lima, S.L. & J.M. O'Keefe. 2013. Do predators influence the behaviour of bats? Biological Reviews 88:626-644.

Machado-Filho, P.R. 2015. Evolução do hábito alimentar e utilização do substrato pelo gênero *Philodryas* Wagler, 1830. Master's Degree. UNESP-São José do Rio Preto. Brasil.

Maritz, B., E.P. Hofmann, R.A. Maritz, H.W. Greene, M.C. Grundler & A.M. Durso. 2021. Challenges and opportunities in the study of snake diets. Herpetological Review 52:769-773.

Martin-Solano, S., T. Toulkeridis, A. Addison & W.E. Pozo-Rivera. 2016. Predation of *Desmodus rotundus* Geoffroy, 1810 (Phyllostomidae, Chiroptera) by *Epicrates cenchria* (Linnaeus, 1758) (Boidae, Reptilia) in an Ecuadorian Cave. Subterranean Biology 19:41-50.

Martins, M., O.A.V. Marques & I. Sazima. 2008. How to be arboreal and diurnal and still stay alive: microhabitat use, time of activity, and defense in Neotropical forest snakes. South American Journal of Herpetology 3:60-69.

Nogueira, C.C., A.J.S. Argolo, V. Arzamendia, J.A. Azevedo, F.E. Barbo, R.S. Bérnils, B.E. Bolochio, M.Borges-Martins, M. Brasil-Godinho, H. Braz, M.A. Buononato, D.F. Cisneros-Heredia, G.R. Colli, H.C. Costa, F.L. Franco, A. Giraudo, R.C. Gonzalez, T. Guedes, M.S. Hoogmoed, O.A.V. Marques, G.G. Montingelli, P. Passos, A.L.C. Prudente, G.A. Rivas, P.M. Sanchez, F.C. Serrano, N.J. Silva, C. Strüssmann, J. P.S. Vieira-Alencar, H. Zaher, R.J. Sawaya & M. Martins. 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.

Reis, N.R., C.B. Batista, I. Lima, A.L. Peracchi & A.D. Pereira (Eds). 2017. História Natural dos Morcegos Brasileiros: Chave de Identificação de Espécies. 1ª Edição. Technical Books, São Paulo, Brasil.

Simmons, N. 2005. Order Chiroptera. Order Chiroptera. Pp. 312-529. In Wilson, D.E. & D.M. Reeder (Eds.), Mammal Species of the World: a Taxonomic and Geographic Reference. 3ª Edição. v.1. Johns Hopkins University Press, Baltimore, USA.

Simmons, N.B. & A.L. Cirranello. 2024. Bat Species of the World: a taxonomic and geographic database. Version 1.6. [Accessed on March 2025].

Thomas, R.A. 1976. A revision of the South American colubrid snake genus *Philodryas* Wagler, 1830. Doctoral Thesis, Texas A&M University, Texas, USA.