Oecologia Australis (ISSN: 2177-6199)
Ahead of print (https://revistas.ufrj.br/index.php/oa/issue/view/1109/showToc)
Article ID: AO#69157
Published online: 28 November 2025

Case of attempted cannibalism in Philodryas nattereri

A CURIOUS CASE OF ATTEMPTED CANNIBALISM IN *PHILODRYAS NATTERERIP* (STEINDACHNER, 1870) (SERPENTES: COLUBRIDAE)

Hugo Yuri Elias Gomes de Assis[1], *Silvio Felipe Barbosa Lima*[2] & *Samuel Cardozo Ribeiro*[3*]

[1] Superintendência de Administração do Meio Ambiente, Av. Monsenhor Walfredo Leal, 181, Tambiá, 58020-540, João Pessoa, Paraíba, Brazil.

[2] Universidade Federal de Campina Grande, Centro de Formação de Professores, Unidade Acadêmica de Ciências Exatas e da Natureza, Rua Sergio Moreira de Figueiredo, Casas Populares, 58900-000, Cajazeiras, Paraíba, Brazil.

[3] Universidade Federal do Cariri, Instituto de Formação de Educadores, Laboratório de Biologia e Ecologia de Animais Silvestres, Rua Olegário Emídio de Araújo, 63260-000, Brejo Santo, Ceará, Brazil.

E-mails: contato.hugoyuri@gmail.com; sfblima@gmail.com; samuel.ribeiro@ufca.edu.br (*corresponding author)

Abstract: *Philodryas nattereri* is a generalist active forager snake that preys on small vertebrates, with one case of cannibalism recorded in the neotropical region. This note reports an attempted cannibalism between *P. nattereri* in a coastal environment in the state of Paraíba. The two individuals were observed actively confronting and tightly coiled around one another on the south bank of the Mamanguape River estuary in the *Barra do Rio Mamanguape* Environmental Protection Area, a mesoregion of the Atlantic Forest. One of the snakes was recorded biting the neck area of its conspecific counterpart. After approximately 60 minutes, both snakes were found dead at a distance from the interaction area, with one partially ingesting the other about halfway along its length. The attempted cannibalism between adults may have occurred in response to a number of factors that will be better understood with further studies on the ophiophagous feeding habits of the species.

Keywords: Atlantic Forest; coastal ecosystem; Colubroidea; Dipsadinae; Feeding habits.

Oecologia Australis (ISSN: 2177-6199)
Ahead of print (https://revistas.ufrj.br/index.php/oa/issue/view/1109/showToc)
Article ID: AO#69157
Published online: 28 November 2025

Intraspecific (cannibalism) and interspecific predation are feeding practices that occurs among snakes throughout the world (Freiria *et al*. 2006, Göçmen *et al*. 2008, Barros *et al*. 2011, Capula *et al*. 2014, Mesquita & Borges-Nojosa 2019, Coelho-Lima *et al*. 2021, Yeung *et al*. 2022, Vaccaro *et al*. 2023, Quezada-Riera *et al*. 2024). Predation among conspecific snakes is usually recognized as an opportunistic feeding event mainly associated with generalist species such as those belonging to the family Colubridae (Mienis 1986, Luiselli *et al*. 1996, Drobenkov 2000, 2014, Pontes *et al*. 2003, Luiselli 2006, Göçmen *et al*. 2008, Capula *et al*. 2014, Vaccaro *et al*. 2023).

Philodryas nattereri (Steindachner, 1870) is a diurnal, terrestrial, generalist-opportunistic active forager snake that inhabits different environments in the South America (Mesquita *et al*. 2011, 2013, Araújo *et al*. 2014, Guedes *et al*. 2018, Mesquita & Borges-Nojosa 2019, Amaral *et al*. 2022). This medium-sized snake colubrid preys on a broad range of small vertebrates, especially frogs (Mesquita *et al*. 2011, 2013, Guedes *et al*. 2018, Sales *et al*. 2020), lizards (França *et al*. 2008, Mesquita *et al*. 2011, Sales *et al*. 2020, Porto *et al*. 2022), rodents (França *et al*. 2008, Mesquita *et al*. 2011, Sales *et al*. 2020, Silva *et al*. 2024), bats (Mesquita *et al*. 2011), and birds (França *et al*. 2008, Mesquita *et al*. 2011, Sales *et al*. 2020), as well as other snakes (Mesquita *et al*. 2011, Mesquita & Borges-Nojosa 2019, Sales *et al*. 2020, Coelho-Lima *et al*. 2021, Sousa *et al*. 2023), with one case of cannibalism recorded in the South America (Coelho-Lima *et al*. 2021). Although a case of cannibalism on a juvenile has been recorded (Coelho-Lima et al. 2021), there are no previous reports of attempted cannibalism on adults. Thus, this note reports a case of attempted cannibalism between *P. nattereri* adults in a coastal environment in the state of Paraíba, northeastern Brazil. The event occurred on May 30, 2016, at 02:20 pm, when two individuals of *P. nattereri* were observed and photographed interacting on the south bank of the Mamanguape River estuary (06°46'22.38"S, 34°55'15.13"W, DATUM SIRGAS 2000), which has about 5400 hectares and is located in the *Barra do Rio Mamanguape* Environmental Protection Area, a mesoregion of the Atlantic Forest and a microregion of the northern coast of the state of Paraíba (Paludo & Klonowski 1999, Prata *et al*. 2020). The study

Oecologia Australis (ISSN: 2177-6199)
Ahead of print (https://revistas.ufrj.br/index.php/oa/issue/view/1109/showToc)
Article ID: AO#69157
Published online: 28 November 2025

site is a coastal ecosystem of sandbanks formed by a freshwater-marine plain (Medeiros *et al*. 2016) between the ocean and river in the estuarine region, covered with shrub-arboreal vegetation (**Figure 1**). The climate is hot and humid, with a dry season between September and February and a rainy season between March and August. Annual precipitation ranges from 1200 to 1800 mm, with temperatures ranging from 24°C to 26°C (Araújo *et al*. 2016).

Oecologia Australis (ISSN: 2177-6199)
Ahead of print (https://revistas.ufrj.br/index.php/oa/issue/view/1109/showToc)
Article ID: AO#69157
Published online: 28 November 2025

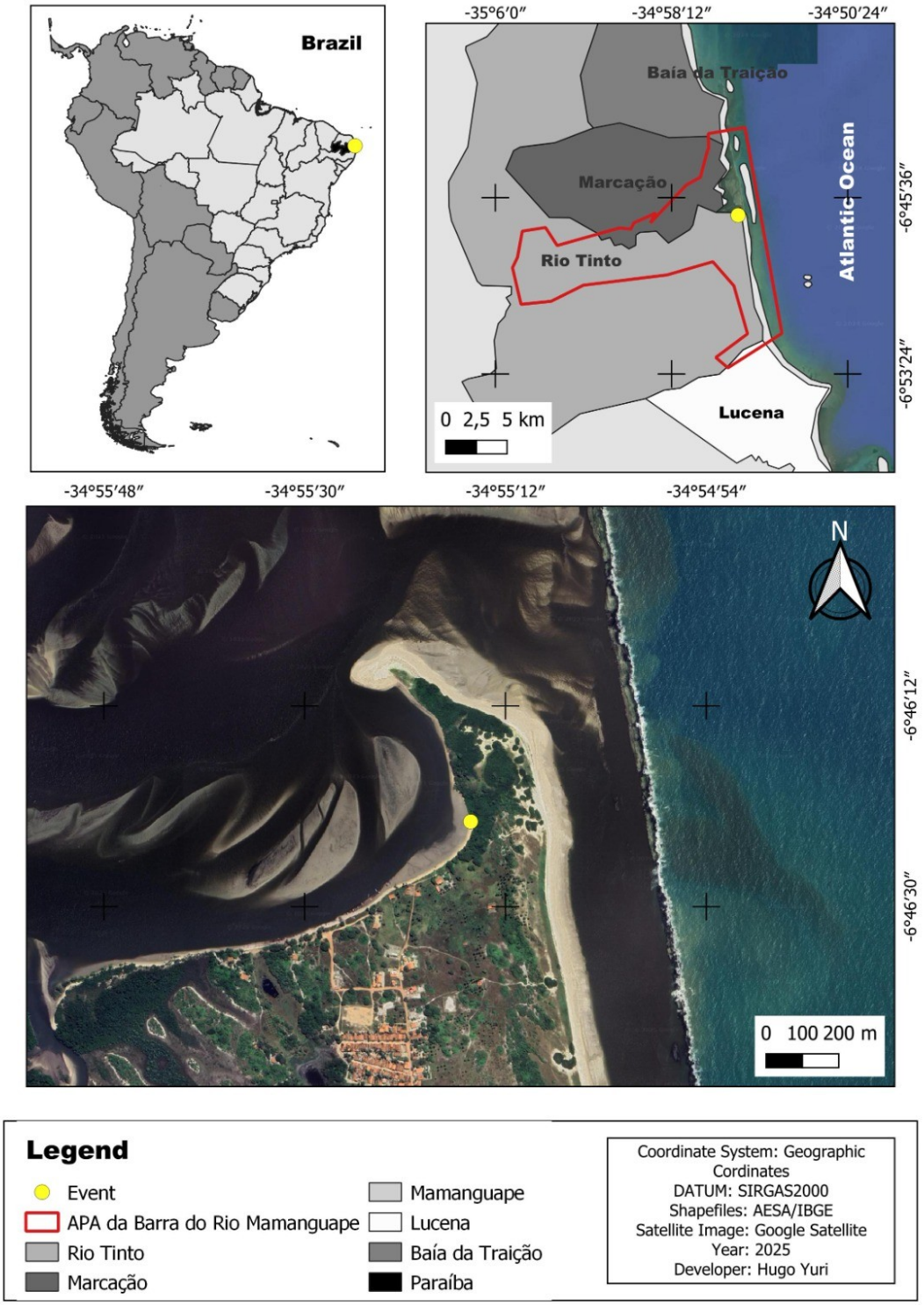

Figure 1. Map of study area showing the location of occurrence of cannibalism in *Philodryas nattereri*: **A**. South America, highlighting Brazil and state of Paraíba; **B**. Northern coast of state of Paraíba, highlighting municipality of Rio Tinto; **C**. Sandbar area of occurrence of cannibalism on coast of Paraíba. Yellow circle shows exact location of cannibalism event.

Oecologia Australis (ISSN: 2177-6199)
Ahead of print (https://revistas.ufrj.br/index.php/oa/issue/view/1109/showToc)
Article ID: AO#69157
Published online: 28 November 2025

The two individuals were observed *in situ* actively confronting and tightly coiled around each other on the sandy substrate for about 15 minutes. The snakes showed no flight reaction during this time, even when the observer approached. The photos show one of the snakes biting the neck area of its conspecific counterpart (**Figure 2A-D**). After approximately 60 minutes, both snakes were found dead at a distance from the interaction area, with one partially ingesting the other about halfway along its length (**Figure 2E**). The animals were not collected or sexed. Thus, the encounter and confrontation were for unknown reasons.

Oecologia Australis (ISSN: 2177-6199)
Ahead of print (https://revistas.ufrj.br/index.php/oa/issue/view/1109/showToc)
Article ID: AO#69157
Published online: 28 November 2025

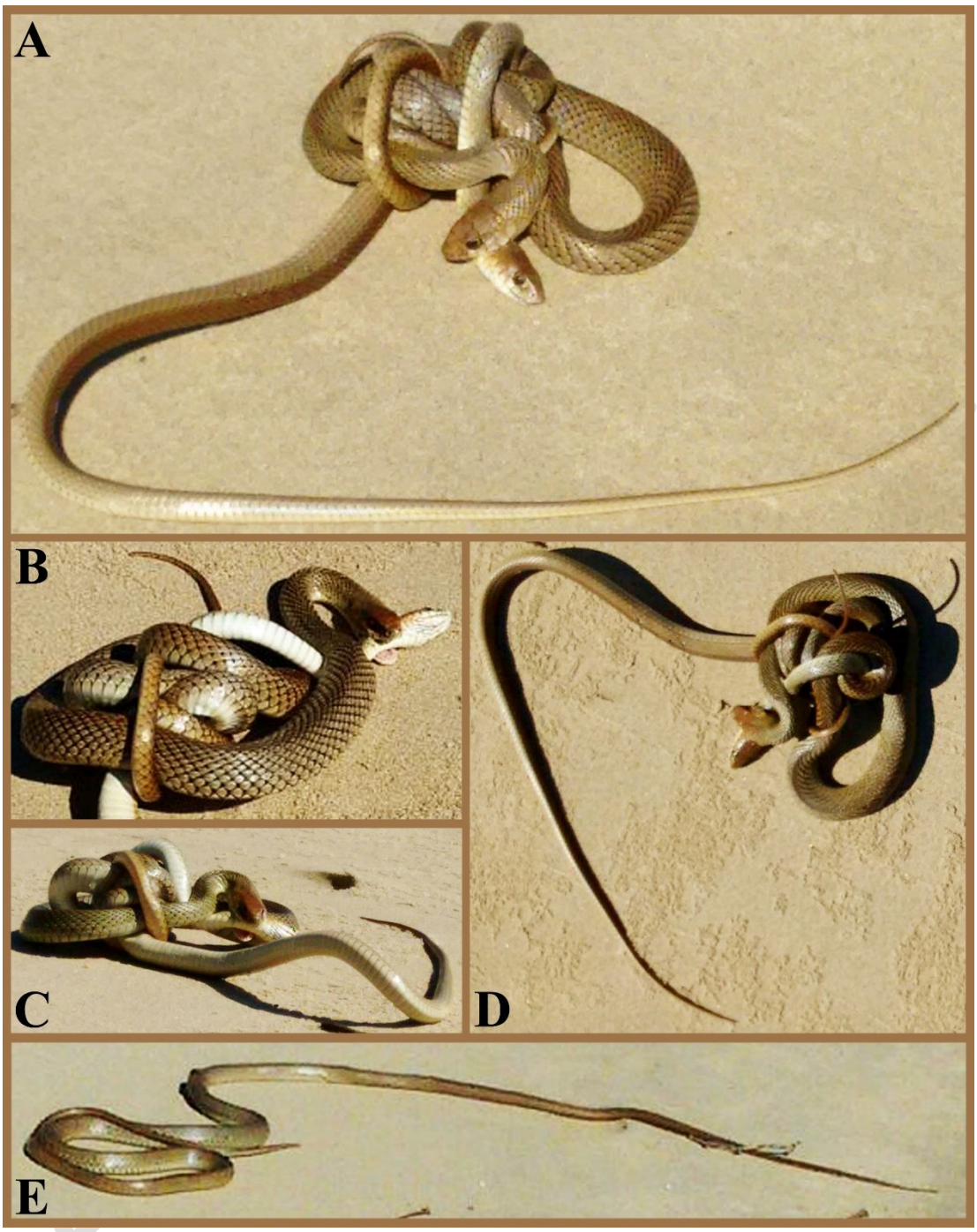

Figure 2. Cannibalism among adult individuals of *Philodryas nattereri*: **A-D**. Individuals in intraspecific predation event tightly coiled around one another, **E**. Snakes found dead with predator (left) wedged into prey (right).

Reptiles, especially snakes, present risks of interspecific and intraspecific predation increasing the chances of opportunistic cannibalism, mainly during times of shortages and with the existence of euryphagous/ophiophagous species (Polis & Myers 1985, Cloudsley-Thompson

1999). Colubrids have a greater number of records of cannibalism (Mienis 1986, Drobenkov 2000, 2014, Luiselli *et al*. 1996, Pontes *et al*. 2003, Luiselli 2006, Göçmen *et al*. 2008, Lisicic *et al*. 2011, Capula *et al*. 2014, Vaccaro *et al*. 2023). Among those of the genus *Philodryas*, *P. patagoniensis* (Girard, 1858) is well known for hunting and eating other snakes, mainly colubrids (Mesquita & Borges-Nojosa 2019). The congener *P. nattereri* is also recognized as a typical euryphagous, ophiophagous snake (França *et al*. 2008, Mesquita & Borges-Nojosa 2019, Sales *et al*. 2020, Sousa *et al*. 2023), but with scarce records on its feeding ecology involving conspecific individuals.

Our limited observations describe a unique natural history event involving an interaction between adult individuals of *P. nattereri* in a coastal environment, but without explaining the circumstances of the confrontation (i.e., scarcity of resources in the coastal ecosystem, territorial competition, mistaken recognition of prey of a similar size, which can be a risk in ophiophagous species, etc.). The observer did not collect the individuals after death because he was unaware of the relevance of examining the snakes and had no transportation or storage capacity at the time. This limitation resulted in the loss of critical data that would have greatly enriched this study, such as information on the sexing, weight, exact size, and body condition (e.g., malnutrition, signs of disease, ectoparasites, etc.) of both individuals. Furthermore, necropsy would confirm whether the cause of death of the snakes was due to predation and/or other factors. Figure 2E suggests that the predator was successful in the ecological relationship of cannibalism due to the partial consumption of the prey, but the interaction was fatal for both snakes.

To the best of our knowledge, there is only one previous record of cannibalism involving this species. An adult female was captured and regurgitated a young individual in the municipality of Caetité in the state of Bahia, northeastern Brazil (Coelho-Lima *et al*. 2021). No intraspecific predation events of *P. nattereri* have been recorded in the natural environment before the observation and photographic record of cannibalism in the present study (**Figure 2A-D**) involving the death of both individuals (**Figure 2E**).

Oecologia Australis (ISSN: 2177-6199)
Ahead of print (https://revistas.ufrj.br/index.php/oa/issue/view/1109/showToc)
Article ID: AO#69157
Published online: 28 November 2025

Predation events usually occur successfully when the predator (e.g., adult snake) is somewhat larger than the prey (e.g., juvenile, subadult, or even adult snake) (Mienis 1986, Pontes *et al*. 2003, Braz *et al*. 2006, Göçmen *et al*. 2008, Recuero *et al*. 2010, Barros *et al*. 2011, Capula *et al*. 2014, Mesquita & Borges-Nojosa 2019, Yeung *et al*. 2022, Vaccaro *et al*. 2023, Quezada-Riera *et al*. 2024). This is corroborated based on the predation of *P. nattereri* (SVL = 84.0 cm) on *Leptodeira annulata* (Linnaeus, 1758) (SVL = 50 cm) in the Seridó Ecological Station, municipality of Serra Negra do Norte, state of Rio Grande do Norte, northeastern Brazil (Guedes 2017) and also a cannibalism event of involving *P. nattereri* collected in the phytogeographic region of the *Cerrado* (Savanna) in the state of Bahia, northeastern Brazil (Coelho-Lima *et al*. 2021). Certain records have also shown that snakes of a similar size may or may not be successful in interspecific/intraspecific predation events (Freiria *et al*. 2006, Lisicic *et al*. 2011, Morais *et al*. 2020, Sales *et al*. 2020, Lüddecke 2023, Vaccaro *et al*. 2023), with the death of both individuals (predator wedged into its prey) (Maia & Travaglia-Cardoso 2017) in some cases, as found in the present study.

The intraspecific predation presented here constitutes a unique event considering the scarcity of records of cannibalism in *P. nattereri* in the South America, especially among adult individuals. Although ophiophagy is quite common in colubrid snakes (Capula *et al*. 2014, Guedes 2017, Vaccaro *et al*. 2023, Quezada-Riera *et al*. 2024) and some members of the genus *Philodryas* (Mesquita & Borges-Nojosa 2019), it is not possible to state that cannibalism is usual for *P. nattereri* due to the rarity of records in the natural environment and captivity. This incidence of cannibalism in *P. nattereri* may have occurred in response to a number of factors that will be better understood with further studies on the ophiophagous feeding habits of this colubrid.

ACKNOWLEDGMENTS

The authors are grateful to the three anonymous reviewers for critically reviewing the manuscript.

Oecologia Australis (ISSN: 2177-6199)
Ahead of print (https://revistas.ufrj.br/index.php/oa/issue/view/1109/showToc)
Article ID: AO#69157
Published online: 28 November 2025

REFERENCES

Amaral, J. M. S., Barbosa, V. N., Santos, S. S., & França, F. G. R. 2022. Body-bending behaviour recorded in Philodryas nattereri in the Atlantic Forest of northeast Brazil. *Revista de Ciências Ambientais*, $16(3)$, 1–4. DOI: 10.18316/rca.v16i3.8643

Araújo, S. C. M., Sousa, G. L., & Andrade, E. B. 2014. Philodryas nattereri. Diet. *Herpetological Review*, $44(3)$, 526.

Araújo, L. E., Silva, F. D. S., Alencar, H. N., Santos, E. C. A., & Santos, K. A. 2016. Variabilidade climática da APA da Barra do Rio Mamanguape – Paraíba. In: N. V. Almeida & M. D. Silva (Eds.), *Geotecnologias e Meio Ambiente: Analisando uma Área de Proteção Ambiental*. pp. 01–238. João Pessoa: FeF Gráfica.

Barros, M. M., Draque, J. F., Micucci, P. A., & Waller, T. 2011. Eunectes notaeus (yellow anaconda). Diet / cannibalism. *Herpetological Review*, $42(2)$, 290–291.

Braz, H. B. P., Lopes, P. H., Rocha, M. M. T., & Furtado, M. F. D. 2006. Liophis miliaris (common water snake): cannibalism. *Herpetological Bulletin*, $97(2006)$, 36–37.

Capula, M., Grano, M., Cattaneo, C., & Contini, F. 2014. Ophiophagy in Hierophis viridiflavus (Lacépède, 1789) (Serpentes, Colubridae): more than occasional? *Scripta Herpetologica*, $2014(2014)$, 49–54.

Cloudsley-Thompson, J. 1999. Cannibalism among reptiles. *British Herpetological Society Bulletin*, $70(70)$, 11–12.

Coelho-Lima, A. D., Cardoso, D. T., & Passos, D. C. 2021. The short life of a juvenile neotropical snake: a record of cannibalism in Philodryas nattereri (Steindachner, 1870). *Herpetology Notes*, $14(2021)$, 843–846.

Drobenkov, S. M. 2000. Ecology of the smooth snake (Coronella austriaca LAUR.) in Belarus. *Russian Journal of Herpetology*, $7(2)$, 135–138.

Drobenkov, S. M. 2014. Distribution, ecological traits and conservation of the smooth snake (Coronella austriaca) in Belarus. *Acta Biologica Universitatis Daugavpiliensis*, $14(1)$, 21–27.

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*, $2008(1)$, 23–38. DOI: 10.1643/CH-05-034

Freiria, F. M., Brito, J. C., & Avia, M. L. 2006. Ophiophagy and cannibalism in Vipera latastei Boscá, 1878 (Reptilia, Viperidae). *Herpetological Bulletin*, $96(2006)$, 26–28.

Göçmen, B., Werner, Y. L., & Elbeyli, B. 2008. Cannibalism in Dolichophis jugularis (Serpentes: Colubridae): more than random? *Current Herpetology*, $27(1)$, 1–7.

Guedes, T. B. 2017. Philodryas nattereri (Paraguay green racer). Diet. *Herpetological Review*, $48(3)$, 679–680.

Guedes, T. B., Sazima, I., & Marques, O. A. V. 2018. Does swallowing a toad require any specialisation? Feeding behaviour of the dipsadid snake Philodryas nattereri on the bufonid toad Rhinella jimi. *Herpetology Notes*, $11(2018)$, 825–828.

Lisicic, D., Pocanic, P., Lovric, V., Derezanin, L., & Tadic, Z. 2011. A case of cannibalism in Hierophis gemonensis: preying on conspecific adult. *Hyla*, $2011(2)$, 35–36.

Lüddecke, T. 2023. Quid pro quo: a documented case of cannibalism in the red-bellied black snake Pseudechis porphyriacus in Lamington (Queensland, Australia). *Diversity*, $15(5)$, 610. DOI: 10.3390/d15050610

Luiselli, L. 2006. Broad geographic, taxonomic and ecological patterns of interpopulation variation in the dietary habits of snakes. *Web Ecology*, $6(1)$, 02–16. DOI: 10.5194/we-6-2-2006

Luiselli, L., Capula, M., & Shine, R. 1996. Reproductive output, costs of reproduction, and ecology of the smooth snake, Coronella austriaca, in the eastern Italian Alps. *Oecologia*, $106(1)$, 100–110. DOI: 10.1007/BF00334412

Maia, D. C., & Travaglia-Cardoso, S. R. 2017. Oxyrhopus clathratus (Serpentes: Dipsadidae): reproduction and cannibalism. *Oecologia Australis*, \$21(2)\$, 197–200. DOI: 10.4257/oeco.2017.2102.10

Medeiros, I. S., Monteiro, J., Alencar, A., & Nadjacleia, V. 2016. Caracterização física da APA da Barra do Rio Mamanguape - PB. In: N. V. Almeida & M. D. Silva (Eds.), *Geotecnologias e Meio Ambiente: Analisando uma Área de Proteção Ambiental*. pp. 01–238. João Pessoa: FeF Gráfica.

Mesquita, P. C. M. D., & Borges-Nojosa, D. M. 2019. Philodryas nattereri (Paraguay green racer): ophiophagy. *Herpetological Bulletin*, \$108(2009)\$, 36–37.

Mesquita, P. C. M. D., Borges-Nojosa, D. M., Passos, D. C., & Bezerra, C. H. 2011. Ecology of Philodryas nattereri in the Brazilian semi-arid region. *Herpetological Journal*, \$21(3)\$, 193–198.

Mesquita, P. C. M. D., 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(8)\$, 99–113. DOI: 10.1590/S0031-10492013000800001

Mienis, H. K. 1986. Cannibalism in a juvenile large whip snake, Coluber jugularisasianus, in Israel. *Zoology in the Middle East*, \$1(1)\$, 88–90. DOI: 10.1080/09397140.1986.10637521

Morais, M. S. R., Araújo, P. F., Costa, R. M. T., & França, F. G. R. 2020. First record of cannibalism in Thamnodynastes phoenix Franco, Trevine, Montingelli & Zaher, 2017 (Serpentes, Colubridae). *Herpetozoa*, \$33(2020)\$, 17–19. DOI: 10.3897/herpetozoa.33.e47317

Paludo, D., & Klonowski, V. S. 1999. Estudo do impacto do uso de madeira de manguezal pela população extrativista e da possibilidade de reflorestamento e manejo dos recursos madeireiros. São Paulo: CNRBMA: p. 54.

Polis, G. A., & Myers, C. A. 1985. A survey of intraspecific predation among reptiles and amphibians. *Journal of Herpetology*, \$19(1)\$, 99–107.

Pontes, G. M. F., Oliveira, R. B., Di-Bernardo, M., & Borges-Martins, M. 2003. Philodryas patagoniensis (Papa-pinto). Cannibalism. *Herpetological Review*, $34(2)$, 154–154.

Porto, M. F., Peres, M. C. L., Oliveira, M. L. T., & Jesus, S. B. 2022. Predation of Tropidurus hispidus (Spix, 1825) by Philodryas natteri (Steindachner, 1870) in the Caatinga. *Ciência e Natura*, $44(44)$, e50. DOI: 10.5902/2179460X67024

Prata, J., Stevenson, V., Silva, J., Lima, S. F. B., & Christoffersen, M. L. 2020. Echinodermata from Barra de Mamanguape, Northeast of Brazil, tropical southwestern atlantic. *Thalassas*, $36(36)$, 273–289. DOI: 10.1007/s41208-020-00214-y

Quezada-Riera, A. B., Barrio-Amorós, C. L., Schenker, S., Kaiser, H., & Arteaga, A. 2024. Review of ophiophagy in neotropical cat-eyed snakes, genus Leptodeira, with the first report of ophiophagy in L. ornate (Bocourt, 1884). *Herpetology Notes*, $17(2024)$, 347–349.

Recuero, E., García-Martín, G., & García-París, M. 2010. On a case of cannibalism in Malpolon monspessulanus. *Boletín de la Asociación Herpetológica Española*, $21(2010)$, 42–43.

Sales, R. F. D., Sousa, J. D., Lisboa, C. M. C. A., Marinho, P. H., Freire, E. M. X., & Kokubum, M. N. C. 2020. New dietary records and geographic variation in the diet composition of the snake Philodryas nattereri in Brazil. *Cuadernos de Herpetología*, $34(2)$, 285–293. DOI: 10.31017/CdH.2020

Silva, R. H. P., Souza, J. A. S., Lucena, B. P., & Mariano, E. F. 2024. Agonistic response of Spix's yellow-toothed cavy Galea spixii (Mammalia: Caviidae) to attempted predation by Paraguay green racer Philodryas nattereri (Squamata: Dipsadidae), in a Caatinga area in Pernambuco, Brazil. *Herpetology Notes*, $17(2024)$, 1–4.

Sousa, J. D., Sales, R. F. D., Medeiros, J. V. A., & Carvalho Kokubum, M. N. 2023. Diet of the snake Philodryas nattereri (Steindachner, 1870) suggests a high plasticity of foraging in northeastern Brazil. *Austral Ecology*, $48(5)$, 1036–1041. DOI: 10.1111/aec.13318

Oecologia Australis (ISSN: 2177-6199)
Ahead of print (https://revistas.ufrj.br/index.php/oa/issue/view/1109/showToc)
Article ID: AO#69157
Published online: 28 November 2025

Vaccaro, A., Altadonna, G., & Turrisi, G. F. 2023. Further evidence of ophiophagy, including cannibalism, by the western whip snake Hierophis viridiflavus in Italy. *The Herpetological Bulletin*, \$163(2023)\$, 21–23. DOI: 10.33256/hb163.2123

Yeung, H. Y., Chan, B. P. L., & Yang, J. -H. 2022. First record of cannibalism in MacClelland's coralsnake, Sinomicrurus macclellandi (Squamata: Elapinae). *Herpetology Notes*, \$15(2022)\$, 151–152.

Submitted: 30 July 2025

Accepted: 06 November 2025

Published: 28 November 2025

Associate Editor: Dr. Felipe Polivanov Ottoni