

# Predation of a White-banded Treefrog, *Boana albomarginata* (Spix, 1824), by a Parrot Snake, *Leptophis liocercus* (Wied, 1824), in an Atlantic Forest fragment in Bahia, northeastern Brazil

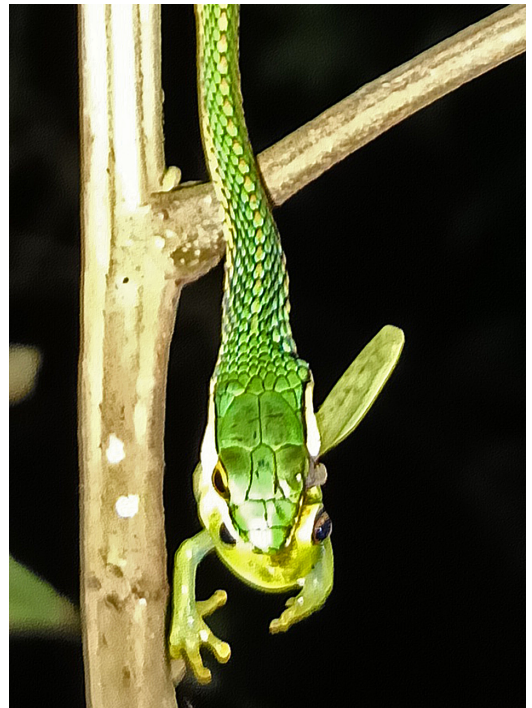
Tiago A.F. Silva<sup>1,\*</sup>, Rebeca S. Santos<sup>1</sup>, Natália S. Campos<sup>1</sup>, and Arielson S. Protázio<sup>1</sup>

Snakes are important predators in ecosystems, feeding on a wide variety of organisms (both invertebrates and vertebrates) and exhibiting varying levels of dietary specialisation (Pough and Groves, 1983; Stuginski et al., 2018). Many species, however, feed primarily on anurans (Vitt, 1983; Toledo et al., 2007; Hartmann et al., 2009). Despite numerous studies attempting to describe the diets of different snake species, most species lack comprehensive dietary data or are represented only by sporadic records (Ruffato et al., 2003; Costa et al., 2022). This highlights a gap in ecological information that limits our understanding of the dietary preferences of these organisms and underscores the need to enhance our knowledge of trophic interactions in ecosystems.

*Leptophis liocercus* (Wied, 1824), also known as the Parrot Snake, is a member of the family Colubridae, and inhabits coastal areas of Brazil. Its distribution ranges from the state of Paraíba (northeastern Brazil) to São Paulo (southeastern Brazil) and where it lives within the boundaries of the Atlantic Forest and Cerrado domains, in tropical and subtropical moist forests, grasslands, savannahs, and shrubland ecoregions (Albuquerque and Fernandes, 2022). The species is part of the *Leptophis ahaetulla* complex, which underwent a recent taxonomic revision and currently includes 11 species (Albuquerque and Fernandes, 2022). This revision, along with other studies, adds complexity to the process of gathering ecological information about each species, as many may occur sympatrically (Albuquerque et al., 2022;

Albuquerque and Fernandes, 2022; Albuquerque et al., 2025), emphasising the need for new data on the diet of each species.

Here, we report on a predation event involving *L. liocercus* and *Boana albomarginata* (Spix, 1824) (Fig. 1). The event occurred on 10 November 2024, at 21:24 h, during a fieldwork at a permanent pond within a fragment of the Atlantic Forest in the Área de Proteção



**Figure 1.** A juvenile *Leptophis liocercus* (RAN 346) preying on an individual of *Boana albomarginata* perched on a shrub in the Área de Proteção Ambiental do Lago da Pedra do Cavalo, municipality of Cachoeira, Bahia, Brazil. Photo by Arielson Protázio.

<sup>1</sup> Centro de Ciências Agrárias, Ambientais e Biológicas, Universidade Federal do Recôncavo da Bahia, Rua Rui Barbosa 710, Centro, Cruz das Almas, Bahia 44380-000, Brazil.

\* Corresponding author. E-mail: tafs91@gmail.com

Ambiental do Lago da Pedra do Cavalo (12.5773°S, 38.9879°W, elevation 176 m), municipality of Cachoeira, Recôncavo Baiano microregion, Bahia, northeastern Brazil. The *L. liocercus* individual was a juvenile (snout-vent length 358 mm; tail length 131 mm), which was perched in shrub vegetation approximately 170 cm above the ground when it attacked a *B. albomarginata* individual, which emitted an agonistic call. The frog was captured by a bite on the legs and ingested from the posterior region of the body. The entire event lasted approximately 70 seconds. After the predation, the snake was collected and stored in the Herpetological Collection of the Universidade Federal do Recôncavo da Bahia (voucher number RAN 346), municipality of Cruz das Almas, Bahia, Brazil.

Snakes of the *Leptophis* genus exhibit semi-arboreal behaviour and can be found foraging on the ground and in shrub vegetation in search of prey at their shelter sites (Albuquerque et al., 2007). There are notable records of *Leptophis* species preying primarily anurans (Albuquerque et al., 2007; Mesquita et al., 2013; Albuquerque and Martins, 2024). Albuquerque and Fernandes (2022) documented the predation of a treefrog from the *Dendropsophus marmoratus* group, by an individual of *L. liocercus* in Bahia, and the predation of a *Boana raniceps* by an individual of *L. liocercus* in Aracaju, Sergipe. Additionally, Solé et al. (2010) reported on an attempted predation effort by *Leptophis ahaetulla* (likely *Leptophis liocercus*) on *Trachycephalus mesophaeus* in Ilhéus, Bahia, suggesting the preference of these snakes for anurans in their diet.

Despite these records, there is no evidence of *L. liocercus* predating on *B. albomarginata*. *Boana albomarginata* is a treefrog with a broad geographical distribution in the Atlantic Forest (Frost, 2025) and is commonly found in large numbers on the shrub and emergent vegetation of both permanent and temporary water bodies (Haddad et al., 2013). In the permanent pond where we observed the predation event, *B. albomarginata* is a common species, frequently heard vocalising. Therefore, the lack of recorded trophic interactions between the two species is intriguing. It is possible that the diurnal habits of *L. liocercus* limit encounters with *B. albomarginata*, with the treefrog being only an occasional prey item. However, we believe that further investigation into the prey composition of *L. liocercus* will likely lead to new records of trophic interactions between the two species.

Finally, the timing of the foraging activity of *L. liocercus* also appears unusual. Predation records of *Leptophis* typically indicate diurnal activity, with

prey being sought at shelter sites (Albuquerque et al., 2007; Gama and Costa-Campos, 2014). However, the predation event in this case was observed at night, during vocalisation activity by male *B. albomarginata*. This raises several questions. It is possible that nocturnal foraging by *L. liocercus* is more common, with the snake targeting prey at reproductive sites? However, the lack of field investigations makes it difficult to confirm this behaviour. On the other hand, since the *L. liocercus* individual was a juvenile, nocturnal activity may serve as a strategy to avoid competition with adults, suggesting temporal partitioning. Similar behaviours have been reported for other snake species and, if confirmed for *L. liocercus*, it may represent an important ontogenetic behavioural variation (Hartmann et al., 2003; Leite et al., 2007).

This manuscript represents the first predation record of the White-banded Treefrog, *B. albomarginata*, by the Parrot Snake, *L. liocercus*. We recommend conducting further investigations to better characterise the prey components of the diet of *L. liocercus*, which would aid in understanding the trophic interaction between these two species in areas of Atlantic Forest and the dynamics of energy flow within this biome. Lastly, studies investigating ontogenetic variation in the behaviour and feeding habits of the adult and juvenile *L. liocercus* are encouraged.

**Acknowledgments.** We thank Mr. Joca for logistic support and valuable contributions, and the Instituto Chico Mendes de Conservação da Biodiversidade (ICMBio) for the collection permit (#71160-1).

## References

- Albuquerque, N.R., Fernandes, D.S. (2022): Taxonomic revision of the parrot snake *Leptophis ahaetulla* (Serpentes, Colubridae). *Zootaxa* **5153**(1): 1–69.
- Albuquerque, N.R., Santos, F.M., Borges-Nojosa, D.M., Ávila, R.W. (2022): A new species of Parrot-Snake of the genus *Leptophis* Bell, 1825 (Serpentes, Colubridae) from the semi-arid region of Brazil. *South American Journal of Herpetology* **23**: 7–24.
- Albuquerque, N.R., Galatti, U., Di-Bernardo, M. (2007): Diet and feeding behaviour of the Neotropical parrot snake (*Leptophis ahaetulla*) in northern Brazil. *Journal of Natural History* **41**: 1237–1243.
- Albuquerque, N.R., Martins, R.H. (2024): Diet and feeding behavior of the parrot snake *Leptophis nigromarginatus* (Günther, 1866) (Serpentes, Colubridae). *Biota Neotropica* **24**: 1–4.
- Albuquerque, N.R., Martins, R.H., Carvalho, P.S., Shepard, D.B., Santana, D.J. (2025): A new species of parrot snake, *Leptophis* (Serpentes: Colubridae) from the Brazilian Cerrado. *PeerJ* **13**: 1–24.

- Costa, F.R.F., Pezeta, Y.F.M., Crozariol, M.A., 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.
- Frost, D.R. (2025): Amphibian Species of the World: an Online Reference. Version 6.2. Available at: <https://amphibiansoftheworld.amnh.org/index.php>. Accessed on 27 March 2025.
- Gama, C.S., Costa-Campos, C.E. (2014): *Hypsiboas boans* (Giant Gladiator Treefrog). Predation. *Herpetological Review* **45**: 680.
- Haddad, C.F.B., Toledo, L.F., Prado, C.P.A., Loebmann, D., Gasparini, J.L., Sazima, I. (2013): Guia de Anfíbios da Mata Atlântica: diversidade e biologia. São Paulo, Brazil, Anolis Books. 544 pp.
- Hartmann, P.A., Hartmann, M.T., Giasson, L.O.M. (2003): Uso do habitat e alimentação em juvenis de *Bothrops jararaca* (Serpentes: Viperidae) na Mata Atlântica do sudeste do Brasil. *Phyllomedusa* **2**(1): 35–41.
- Hartmann, P.A., Hartmann, M.T., Martins, M. (2009): Ecologia e história natural de uma taxocenose de serpentes no Núcleo Santa Virgínia do Parque Estadual da Serra do Mar, no sudeste do Brasil. *Biota Neotropica* **9**(3): 173–184.
- Leite, P.T., Nunes, S.F., Cechin, S.Z. (2007): Dieta e uso de habitat da jararaca-do-brejo, *Mastigodryas bifossatus* Raddi (Serpentes, Colubridae) em domínio subtropical do Brasil. *Revista Brasileira de Zoologia* **24**(3): 729–734.
- 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.
- Pough, F.H., Groves, J.D. (1983): Specializations of the body form and food-habits of snakes. *The American Zoologists* **23**: 443–454.
- Ruffato, R., Di-Bernardo, M., Maschio, G.F. (2003): Diet of *Thamnodynastes strigatus* (Serpentes: Colubridae) in southern Brazil. *Phyllomedusa* **2**(1): 27–34.
- Solé, M., Marciano-Junior, E., Dias, I.R., Kwet, A. (2010): Predation attempts on *Trachycephalus cf. mesophaeus* (Hylidae) by *Leptophis ahaetulla* (Colubridae) and *Ceratophrys aurita* (Ceratophryidae). *Salamandra* **46**(2): 101–103.
- Stuginski, S.R., Navas, C.A., Barros, F.C., Grego, K.F., Martins, M., Carvalho, J.E. (2018): The role of feeding specialization on post-prandial metabolic rate in snakes of the genus *Bothrops*. *Zoological Science* **35**(4): 373–381.
- Toledo, L.F., Ribeiro, R.S., Haddad, C.F.B. (2007): Anurans as prey: an exploratory analysis and size relationships between predators and their prey. *Journal of Zoology* **271** (2): 170–177.
- Vitt, L.J. (1983): Ecology of an anuran-eating guild of terrestrial tropical snakes. *Herpetologica* **39**(1): 52–66.