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NOTA CORTA / SHORT NOTE

PREDATION OF *Dryophylax chaquensis* (SERPENTES: DIPSADIDAE) UPON *Elachistocleis matogrosso* AND *Boana raniceps* (ANURA)

Depredación de *Dryophylax chaquensis* (Serpentes: Dipsadidae) sobre *Elachistocleis matogrosso* y *Boana raniceps* (Anura)

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ABSTRACT

Anurans play a central role in food webs, being prey for different vertebrates, like snakes, mammals, fishes, and birds. The snakes from the tribe Tachymenini are known for their preference for preying on anurans, even different animals eventually being part of their diet. Data about *Dryophylax chaquensis* diet is resumed mainly by field observations and only anurans are known as its prey. Herein we report a field observation from Brazilian Pantanal of *Dryophylax chaquensis* regurgitating two anurans, *Elachistocleis matogrosso* and *Boana raniceps*. This is the first report of a *Boana raniceps* as prey of *D. chaquensis*, and the second record for *Elachistocleis matogrosso*. These present records confirm the bathracophagy preference of *D. chaquensis* and highlight the opportunistic habit of preying on frogs that are more abundant now.

Keywords: Frog, natural history, predation, snake.

RESUMEN

Los anfibios juegan un papel central en las redes tróficas, siendo presas de diferentes vertebrados como serpientes, mamíferos, peces y aves. Las serpientes del tribo Tachymenini son conocidas por su preferencia en la predación de anuros, aun cuando otros animales pueden eventualmente ser parte de su dieta. La dieta de *Dryophylax chaquensis* es conocida principalmente por observaciones directas y solo se conocen anfibios como presa. Aquí reportamos algunas observaciones de campo de *Dryophylax chaquensis* regurgitando dos anuros, *Elachistocleis matogrosso* y *Boana raniceps*. Nuestras observaciones confirman los hábitos batracofagicos de *D. chaquensis* y destacan su dieta oportunista, cazando los anfibios que son más abundantes en determinados momentos.

Palabras clave: Depredación, historia natural, rana, serpientes.

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INTRODUCTION

Frogs are an important source of food for several vertebrates, and snakes have a prominent position as the most representative group among all anuran's predators (Toledo et al., 2007). The snakes from the tribe Tachymenini are known by their batracophagous eating habits, even though, other groups may be included on its diet (Bellini et al., 2013, 2014; Bernarde et al., 2003; Canhete et al., 2018). The *Dryophylax chaquensis* Bergna & Alvarez, 1993 occurs in Brazil, Paraguay, Argentina and Bolivia, it is distributed in Chaco, Pantanal and Cerrado (Nogueira et al., 2019). Data about its diet is resumed mainly by field observations and only anurans are known as its prey (Alves and Albuquerque, 2017; Bellini et al., 2014; Carrillo, 2017; Dias-Silva et al., 2021; Dorado-Rodrigues et al., 2012). Here we report a predation event by *D. chaquensis* on *Elachistocleis matogrosso* Caramaschi, 2010 and *Boana raniceps* (Cope, 1862).

On 09th September 2021, around 19:00 h, at Base de Estudos do Pantanal (19° 34'36" S, 57° 01'09" W, 92 m elev.), in Corumbá municipality, Mato Grosso do Sul state, western Brazil, we collected an adult female of *Dryophylax chaquensis* actively foraging on the biomass of accumulated dead grass (ZUFMS-REP04311; snout-vent length [SVL] 341 mm, tail length 102 mm; Fig. 1a). The individual was captured and stored in a plastic bag. Around 22:00 h, when we returned to the lab, we noticed two regurgitated anurans in the same plastic bag of the snake, an adult of *Elachistocleis matogrosso* (ZUFMS-AMP14902; SVL 22,43 mm; Fig. 1b) and an adult of *Boana raniceps* (ZUFMS-AMP14901; SVL 41,95 mm; Fig. 1c). Both species were abundant on that night, with more than 20 records of each during the fieldwork. The prey was in good condition with some parts already digested and some injuries. All species were collected and housed at Coleção Zoológica da Universidade Federal de Mato Grosso do Sul. During the three days of the expedition, we found seven individuals of *D. chaquensis*, six of them on the ground and one in a bush (ca. 80 cm height).

Bellini et al. (2014) suggested that *D. chaquensis* is a terrestrial species and its diet is based on terrestrial frogs. Our record corroborated, at least partially, with this data (Table 1). *Elachistocleys matogrosso* was abundant on that day and all of them were found in the leaf letter. There is already a record of *D. chaquensis* preying *E. matogrosso* (see Carrillo, 2017), nevertheless, microhylids are uncommon prey for snakes due to their fossorial habits and explosive breeders (Toledo et al., 2007). However, in situations where they are abundant, as we recorded during the field, they might become easy prey, since no defensive behavior, nor antipredator substances in their skin are recognized for this species (Mebs et al., 2010; Mira-Mendes et al., 2016). This is the first report of a *Boana raniceps* as prey of *D. chaquensis*. The hylid was also abundant that night, however, individuals were found on the trees, bushes, and on leaf litter in similar proportion. Dias-Silva et al. (2021) recorded two events where *D. chaquensis* leave the ground to predate hylids, indicating that even the most part of the time it is terrestrial, usually it may climb to trees and bushes to forage, corroborating our observations. The predation on bushes is already registered for another species of *Dryophylax*, when Canhete et al (2018) recorded a *Dryophylax hyphochonia* (Cope, 1860) preying upon the treefrog *Scinax fuscomarginatus* (Lutz, 1925) on Cerrado area. These present records confirm the bathracophagy habit of *D. chaquensis* and highlight the opportunistic habit of preying on frogs that are more abundant now. Despite its preference for terrestrial prey (see Bellini et al., 2014), hylids and even microhylids are part of its diet. However, a diet study of *D. chaquensis*, checking prey availability, could better answer this question.

Table 1. List of prey records of *Dryophylax chaquensis*.

Prey	Family	Reference
Unidentified Amphibia	-	Bellini *et al*., 2014
Boana albupunctata	Hylidae	Dias-Silva *et al*., 2021
Boana caiapo	Hylidae	Dias-Silva *et al*., 2021
Boana Raniceps	Hylidae	**This study**
Leptodactylus chaquensis	Leptodactylidae	Dorado-Rodrigues *et al*., 2012
Leptodactylus chaquensis	Leptodactylidae	Bellini *et al*., 2014
Leptodactylus latrans	Leptodactylidae	Bellini *et al*., 2014
Leptodactylus podicipinus	Leptodactylidae	Alves and Albuquerque, 2017
Elachistocleys matogrosso	Microhylidae	Carrillo, 2017
Elachistocleys matogrosso	Microhylidae	**This study**

AUTHOR'S PARTICIPATION

Diego Gomiero Cavalheri contributed to the fieldwork and completed most of the writing; Ibrahim Kamel Rodrigues Nehemy contributed to the fieldwork and reviewed the text; Kélvin Cavalcante assisted with the writing and reviewed the text; Juan F. C. Carrillo provided revision for the writing; Diego José Santana contributed to the fieldwork and conducted the final review.

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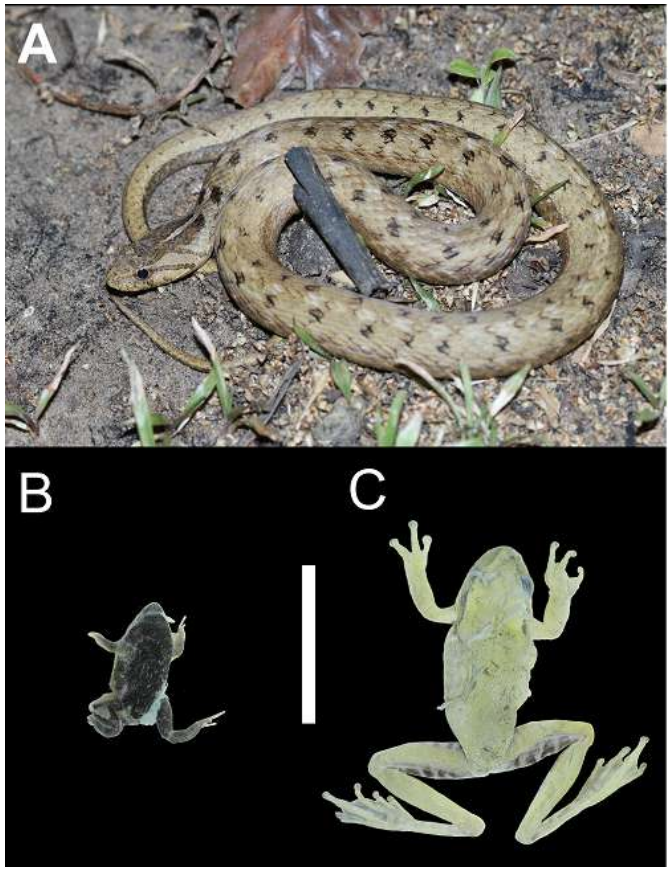

Figure 1. Female of *Dryophylax chaquensis* (Total length = 443mm) (a) preying a *Elachistocleys matogrosso* (b) and a *Boana raniceps* (c) in Brazililian Pantanal. Scale bar: 30mm.

CONFLICT OF INTEREST

No potential conflict of interest was reported by the authors.

REFERENCES

Alves, L. S., and Albuquerque, N. R. (2017). *Thamnodynastes chaquensis*. Diet. *Herpetological Review*, *48*(2), 459.

Bellini, G. P., Arzamendia, V., and Giraudo, A. R. (2013). Ecology of *Thamnodynastes hypoconia* in subtropical-temperate South America. *Herpetologica*, *69*(1), 67–79. https://doi.org/10.1655/HERPETOLOGICA-D-12-00027

Bellini, G. P., Giraudo, A. R., and Arzamendia, V. (2014). Comparative ecology of three species of *Thamnodynastes* (Serpentes, Dipsadidae) in subtropical-temperate South America. *Herpetological Journal*, *24*(2), 87–96.

Bernarde, P. S., Moura-Leite, J. C., Machado, R. A., and Kokobum, M. N. (2003). Dieta de *Thamnodynastes strigatus* (Serpentes, Colubridae) no sul do Brasil. *Phyllomedusa*, *2*(1), 27–34. http://www.ncbi.nlm.nih.gov/pubmed/11241971

Canhete, J. L. L., Moroti, M. de T., Carrillo, J. F. C., Ceron, K., and Santana, D. J. (2018). *Thamnodynastes hypoconia* (Cope, 1860), preys upon Scinax fuscomarginatus (Lutz, 1925). *Herpetozoa*, *31*(1/2), 110–112.

Carrillo, J. F. C. (2017). Predation of *Thamnodynastes chaquensis* (Serpentes, Colubridae) upon *Elachistocleis matogrosso* (Anura, Microhylidae) in the Brazilian Pantanal. *Herpetology Notes*, *10*, 355–357.

Dias-Silva, F., Couto, R. M. P., Miguel, M. C., Adams, G. B., Buhler, D., and Pereira, E. A. (2021). Pradatory interaction between two anuran species with *Thamnodynastes chaquensis* (Colubridae) in the Brazilian Cerrado. *Acta Biológica Colombiana*, *26*(2), 273–277. https://doi.org/10.15446/abc.v26n2.85132

Dorado-Rodrigues, T. F., Campos, V. A., Santos, M. M. dos, Pansonato, A., and Strüssmann, C. (2012). Circumstances and bioacoustics of the distress call of *Leptodactylus chaquensis* (Anura: Leptodactylidae) during predation by *Thamnodynastes chaquensis* (Serpentes: Dipsadidae) in the Brazilian Pantanal. *Salamandra*, *48*(4), 237–240.

Mebs, D., Jansen, M., Köhler, G., Pogoda, W., and Kauert, G. (2010). Myrmecophagy and alkaloid sequestration in amphibians: A study on *Ameerega picta* (dendrobatidae) and *Elachistocleis* sp. (Microhylidae) frogs. *Salamandra*, *46*(1), 11–15.

Mira-Mendes, C. V. de, Ruas, D. S., Castro, I., Solé, M., and Baumgarten, J. E. (2016). Defensive behaviours in the Bahia forest frog *Macrogenioglottus alipioi* Carvalho, 1946 (Anura: Odontophrynidae), with a review of the stiff-legged posture. *Herpetology Notes*, *9*, 91–94.

Nogueira, C. C., Argôlo, A. J. S., Arzamendia, V., Azevedo, J. A., Barbo, F. E., Bérnils, R. S., Bolochio, B. E., Borges-Martins, M., Brasil-Godinho, M., Braz, H., Buononato, M. A., Cisneros-Heredia, D. F., Colli, G. R., Costa, H. C., Franco, F. L., Giraudo, A., Gonzalez, R. C., Guedes, T., Hoogmoed, M. S., Marques, O. A. V., Montingelli, G. G., Passos, P., Prudente, A. L. C., Rivas, G. A., Sanchez, P. M., Serrano, F. C., Silva N. J., Strüssmann, C., Vieira-Alencar, J. P. S., Zaher, H., Sawaya, R. J., and 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), 1–274. https://doi.org/10.2994/sajh-d-19-00120.1

Toledo, L. F., Ribeiro, R. S., and 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. https://doi.org/10.1111/j.1469-7998.2006.00195.x