

## Predation of *Rhinophrynus dorsalis* (Duméril and Bibron, 1841) (Anura: Rhinophrynidae) by *Leptodeira rhombifera* (Günther, 1872) (Serpentes: Dipsadidae), in Guanacaste, Costa Rica

Jeyson Céspedes<sup>1,\*</sup>, Juan De Dios Astorga<sup>1</sup>, Josué Sánchez<sup>1</sup>, and Juan Obando<sup>1</sup>

The Mexican burrowing toad *Rhinophrynus dorsalis* (Duméril and Bibron, 1841) is a widely distributed species with a range that spans from southern Texas to the northwest of Costa Rica (Savage, 2002; Köhler, 2011; Leenders, 2016). In Costa Rica it is found in dry forests in the Guanacaste province, from 0 to 300 meters a.s.l. (Leenders, 2016). Most time of the year this species keeps inactive underground, surfacing only to mate during the first intense winter rains (James, 1966). Due to its behavior, it is one of the species that is little seen throughout the year (AmphibiaWeb, 2018).

On 17 May 2018 (at 8:33PM), we did a nocturnal walk in Guanacaste National Park, Pocosol sector, Costa Rica, (10.89047°N, -85.59814°W, WGS 84, 200 m a.s.l.). Next to a small, dry stream with high soil moisture located inside a patch of forest, we observed an adult snake of the species *Leptodeira rhombifera* (Günther, 1872) holding the posterior parts (rump and left hind limb) of an adult Mexican burrowing toad in its mouth (Fig. 1). The toad kept immobile for a period of approximately 30 minutes, with its body inflated in defense mode to avoid being swallowed (Fig. 2). The snake held the toad, waiting for the venom to paralyze its prey completely. After that period, we left the place, to avoid a negative effect on the process of predation. We did not prove if the snake completely swallowed the anuran. However, the partial paralysis of the toad and the approximate length of the snake with respect to the size of the anuran, make us believe that the predation event was successful.

The diet of *Leptodeira rhombifera* is based on anurans, mainly of the families Bufonidae, Hylidae, Leptodactylidae and Ranidae. In addition, tadpoles and small lizards (Solórzano, 2004), as well as fishes (Céspedes and Abarca, 2014) are consumed. However, there are no known reports of snake predation on the Mexican burrowing toad.

Publications on the natural history of *Rhinophrynus dorsalis* are scarce, possibly due to the fossorial habits of this species during most time of the year. Based on our literature study, only a further predation event on the Mexican burrowing toad exists. Ramirez and Solís (2014) reported the predation of an adult *R. dorsalis* by the spectacled owl *Pulsatrix perspicillata* (Latham, 1790) in Santa Rosa National Park, Guanacaste, Costa Rica. Therefore, our observation is the second known



**Figure 1.** *Leptodeira rhombifera* predating on a Mexican burrowing toad, *Rhinophrynus dorsalis*. Guanacaste National Park, Pocosol sector, Costa Rica. Photo by Juan De Dios Astorga.

<sup>1</sup> Manejo Forestal y Vida Silvestre, Universidad Técnica Nacional, Balsa, Atenas, Alajuela, Costa Rica.

\* Corresponding author. E-mail: jason08cv@hotmail.com



**Figure 2.** Mexican burrowing toad (*Rhinophrynus dorsalis*) puffing up body to avoid predation of *Leptodeira rhombifera*, National Park Guanacaste, Pocosol sector, Costa Rica. Photo by Juan De Dios Astorga.

instance of predation on an adult Mexican burrowing toad within its range of distribution. This is an important observation that carries new natural history of this data related to this amphibian.

**Acknowledgments.** We are thankful for the help and assistance by Julio Díaz Orias, an official of Minae-Sinac in charge of the Fire Program in the Guanacaste Conservation Area, for hosting us in the Guanacaste National Park, Pocosol Sector, while working as forest firefighters during the fire season. Likewise, a special thanks to the herpetologists Juan G. Abarca Alvarado for making a pre-review and Sven Mecke (HLMD) for reviewing and editing the paper.

## References

- AmphibiaWeb (2018): *Rhinophrynus dorsalis* (Mexican Burrowing Toad). Available at: <https://amphibiaweb.org/species/4319>. Accessed on 31 May 2018.
- Céspedes, J., Abarca, J. (2014): Nature Notes. *Leptodeira rhombifera*. Diet. Mesoamerican Herpetology **1**: 288.
- James, P. (1966): The Mexican burrowing toad, *Rhinophrynus dorsalis*, an addition to the vertebrate fauna of the United States. Texas Journal of Sciences **18**: 272–276.
- Köhler, G. (2011): Amphibians of Central America, First Edition. Offenbach, Germany, Herpeton.
- Leenders, T. (2016): Amphibians of Costa Rica: A Field Guide. First Edition. New York, USA, Zona Tropical Publications.
- Ramirez, J., Solis, M. (2014): *Rhinophrynus dorsalis* (Mexican burrowing toad). Predation. Herpetological Review **45**: 480.
- Savage, J. (2002): The Amphibians and Reptiles of Costa Rica: A Herpetofauna Between Two Continents, Between Two Seas. First Edition. Chicago, Illinois, USA, University of Chicago Press.
- Solórzano, A. (2004): Snakes of Costa Rica: Distribution, Taxonomy, and Natural history. First Edition. Santo Domingo, Heredia, Costa Rica, INBio.