 https://doi.org/10.22201/fc.25942158e.2024.1.931

NOTES ON THE DIET OF THE GROUD SNAKES *PLIOCERCUS EURYZONUS* AND *UROTHECA GUENTHERI* (SQUAMATA: DIPSADIDAE) FROM COSTA RICA

NOTAS DE ALIMENTACIÓN EN SERPIENTES DE TIERRA *PLIOCERCUS EURYZONUS* Y *UROTHECA GUENTHERI* (SQUAMATA: DIPSADIDAE) DE COSTA RICA

Juan G. Abarca[1-4*], Donald V. Soto[2], Claudia Gómez-Campos[3], Matthew J. O'Donnell[5,6] & Naiara Guimaraes Sales[6]

[1]*Costa Rica Wildlife Foundation, San José, Costa Rica*
[2]*Tapir Valley Nature Reserve, Bijagua, Upala, Alajuela, Costa Rica.*
[3]*Escuela de Ciencias Biológicas, Universidad Nacional, Heredia, Costa Rica.*
[4]*Unidad de Microbiología Médico Veterinaria, Servicio Nacional de Salud Animal (SENASA), Heredia, Costa Rica.*
[5]*Manchester Museum, The University of Manchester, Manchester, UK.*
[6]*School of Science, Engineering and Environment, The University of Salford, Salford, UK.*
[*]*Correspondence: barcazajuan@gmail.com*

Received: 2024-02-09. **Accepted:** 2024-02-18. **Published:** 2024-03-21.
Editor: Vivian Patricia Páez, Colombia.

Resumen.– Reportamos observaciones de la dieta de dos especies de serpientes terrestres: *Pliocercus euryzonus* fue observada alimentándose de una masa de huevos, probablemente de *Agalychnis callidryas*, por su parte *Urotheca guentheri* fue observada alimentándose de la serpiente *Ninia maculata*. Estos ítems alimenticios no habían sido reportados para ninguna de estas serpientes, por lo que representan un aporte importante para la historia natural de estas dos especies.

Palabras clave.– Comportamiento alimenticio, depredación, serpientes de cola de cristal, oofagia, ofiofagia.

Abstract.– We report observations of the diet of two species of terrestrial snakes: *Pliocercus euryzonus* was observed feeding on an egg mass, probably from of *Agalychnis callidryas*, while *Urotheca guentheri* was observed feeding on the snake *Ninia maculata*. These dietary items had not been reported for these snakes, so they represent an important contribution to the natural history of these two species.

Key words.– Feeding behavior, glass-tailed snakes, oophagy, ophiophagy, predation.

Snakes of the genus *Urotheca*, known as Grown snakes or Glass-tailed Snake are a medium size species (60-85 cm), uncommon terrestrial, diurnal, or nocturnal, that usually hunt on the forest floor or in leaf litter (Leenders, 2019). Due to this behavior some species are infrequently observed, and their natural history is scarce or unknown. In Costa Rica, five species of the genus *Urotheca* (*U. decipiens, U. fulviceps, U. guentheri, U. myersi* and *U. pachyura*) have been reported (Savage, 2002). *Pliocercus euryzonus* is also used as *U. euryzona*, so the taxonomic placement of this species has long been controversial (Leenders, 2019). Beyond taxonomic problems, the natural history of this group of species still has many gaps, and mainly feeding.

Reports of the *Pliocercus euryzonus* diet is based on frogs and possibly salamanders and for *Urotheca guentheri* has been reported to feed on small frogs and possibly lizards and tadpoles (Savage, 2002; Leenders, 2019; Solórzano, 2022). In this note we describe some observations of the diet of the latest two species in the lowlands of Costa Rica.

Black Halloween Snake, *Pliocercus euryzonus* is distributed from Guatemala to Ecuador, from near sea level to 1,500 m a.s.l. (Savage, 2002). This is a medium long-tailed terrestrial coral mimic snake, relatively common and found in forest interiors, in shaded understory habitat, or at dawn or dusk in more open

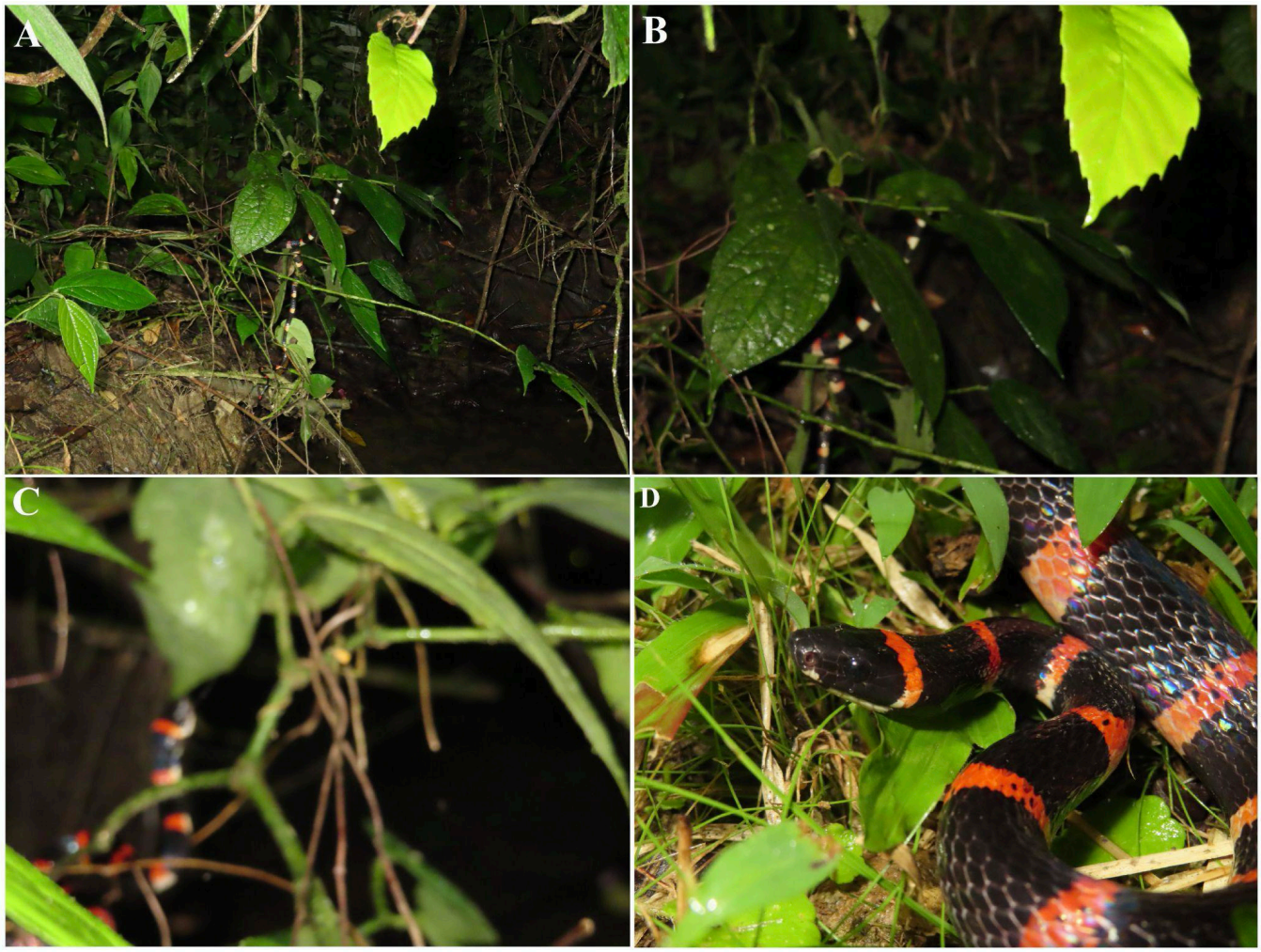

Figura 1. *Pliocercus euryzonus* alimentándose de una masa de huevos de rana, probablemente de la rana de ojos rojos *Agalychnis callidryas*. (A-C). D) El mismo ejemplar de *P. euryzonus* momentos después de alimentarse de la masa de huevos. Foto: Juan G. Abarca.

Figure 1. *Pliocercus euryzonus* feeding on a mass of frog eggs, probably the red-eyed frog *Agalychnis callidryas* (A-C). D) The same specimen of *P. euryzonus* moments after feeding on the egg mass. Photo: Juan G. Abarca.

settings along trails and in forest clearings in wet forest types and is associated with forest streams (Leenders, 2019).

On 18 August 2023, at 21:45 h, we encountered an adult *P. euryzonus* feeding on a fresh clutch of amphibian eggs, the egg laying probably belonged to *Agalychnis callidryas*, because we observed abundant amplexant pairs and oviposition of that species around the pond. The egg mass was in the vegetation above a small lagoon, at the edge of the forest, at the site known as El Ceibo, within the Braulio Carrillo National Park, in San Ramón de la Virgen de Sarapiquí Heredia, Costa Rica (10.327° N, 84.078° W, 526 m a.s.l.). The snake was on low branches, at the edge of the lagoon, and eating the egg mass with its head in a vertical position. Although we were able to observe this behavior from afar, a good photo of the process could not be taken, due to the awkwardness of the location, it was later found that the remains of the gelatinous mass that covered the eggs remained on the leaf (Figs. 1a and 1c).

Gunther's Ground Snake *Urotheca guentheri* is distributed from Honduras to western Panama, from sea level to 1,800 m a.s.l. (Solórzano, 2022). This small snake, brown with longitudinal white lines, is uncommon and usually prefers little disturbed forest habitats, in humid and rainy forests (Savage, 2002; Leenders, 2023). On Apr 20, 2021, at 16:18 h, we observed and photographed an adult of *U. guentheri*, feeding on a Spotted

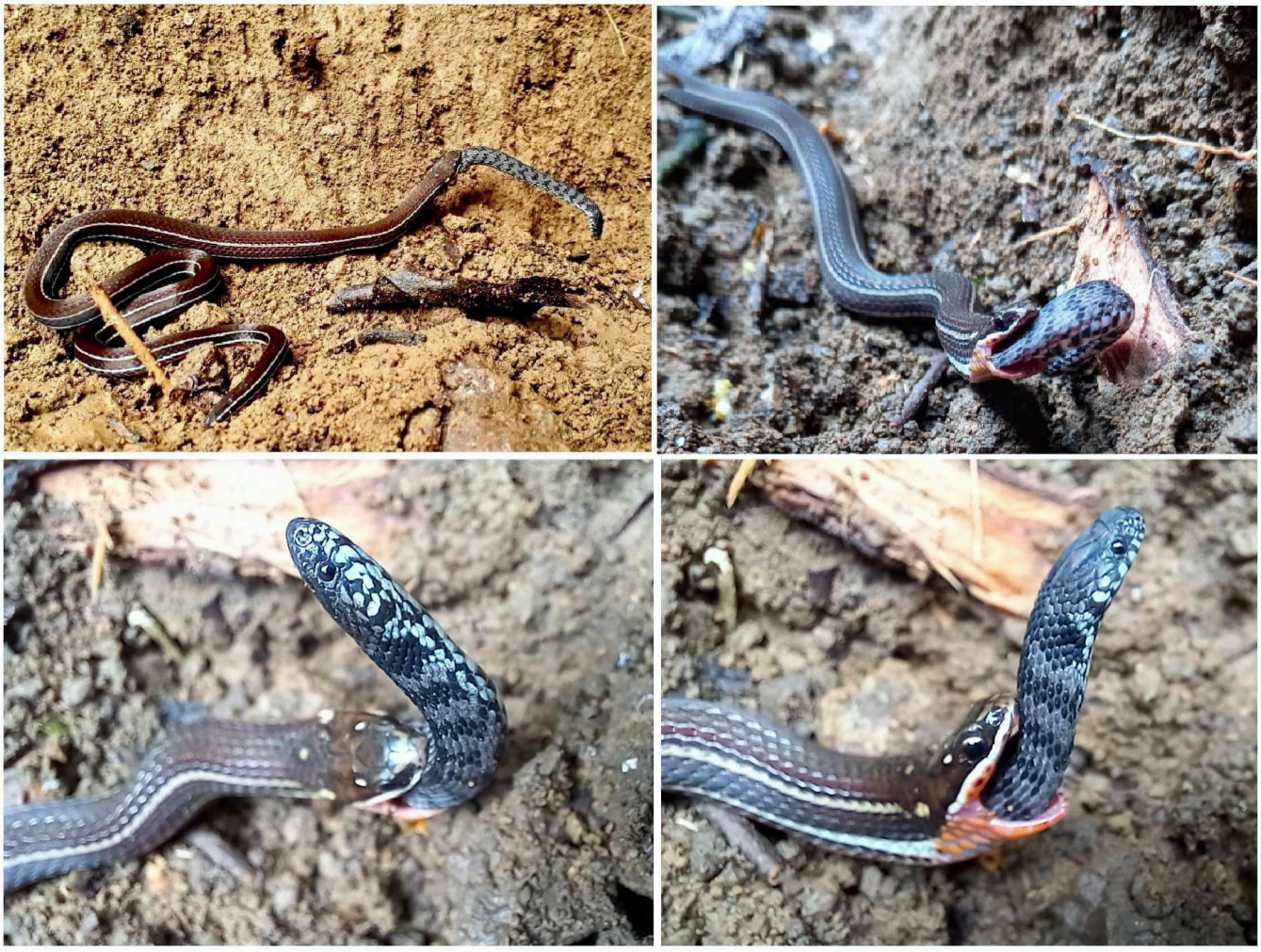

Figura 2. Depredación y proceso de ingesta de *Urotheca guentheri* en una culebra cafetalera *Ninia maculata*. Foto: Henry Brenes González.
Figure 2. Predation and ingestion process of *Urotheca guentheri* in a coffee snake *Ninia maculata*. Photo: Henry Brenes González.

Coffee Snake *Ninia maculata*, in the Tapir Valley Private Reserve, Bijagua, Upala, Alajuela, Costa Rica (10.715° N, 85.011° W, 756 m a.s.l.). At the time of observation, the snake was found in a cavity on the ground, where it had captured its prey and began to eat it from the back of the body (Fig. 2), the process lasted approximately 50 minutes until it finally devoured it and moved away.

The diet of snakes can be very varied and, in many cases, opportunistic (Vindas & Abarca, 2014). Feeding on frog eggs, is a very well documented behavior in several genera of neotropical snakes, including *Leptodeira, Sibon, Dipsas, Imantodes* and *Leptophis* (Baboolal, 2011; Lewis et al., 2013; Carbajal-Márquez et al., 2022; Solórzano, 2022; Díaz-García et al., 2023). However, for *Pliocercus euryzonus* it had not been considered as a food item. The abundance of frog eggs laid in tropical forest lagoons may represent a very important food resource for this and other species of snakes that frequent these lagoons.

For its part, ophiophagy in snakes is also a well-known behavior in species of the genera *Clelia, Erytrolampurs, Drymobius, Micrurus,* and *Bothrops* (Solorzano, 2022). However, for small snakes of the *Urotheca* group it may be an uncommon item and reduced to smaller species, such as snakes of the genus *Ninia*. The presence of the above items in the diet of these snakes, which are normally considered predators of frogs (Solorzano,

2022; Leenders, 2023), suggests that these species have a broader range of prey.

It has been suggested that decreases in amphibians may be associated with a reduction in snake populations or changes in their diet, mainly in high areas (Abarca, 2020). However, in the areas where we made the observations, no significant declines have been reported and the abundance of frogs is still extremely high. Therefore, studies on snake diets and improving dietary reports can help us better understand the dynamics of faunal communities in the tropics.

Acknowledgments.– We thank the officials of the Braulio Carrillo National Park, in the Ceibo sector, for access to the park as part of the amphibian and reptile research (SINAC-ACC-PI-re-069-2023). We also thank Henry Brenes González for providing us the photos of the *Urotheca guentheri* observation. We thank Carolina Esquivel Dobles, from the Tropical Biology Laboratory of the National University, for her support in the completion of the thesis that includes the present observations

CITED LITERATURE

Abarca, J.G. 2020. Notes of diet in highland snakes *Rhadinaea calligaster* and *Rhadinella godmani* (Squamata: Dipsadidae) from Costa Rica. Revista Latinoamericana de Herpetología 3:98-101.

Baboolal, L.A. 2011. The Online Guide to the Animals of Trinidad and Tobago. https://sta.uwi.edu/fst/lifesciences/sites/default/files/lifesciences/documents/ogatt/Leptophis_ahaetulla%20-%20Parrot%20Snake%20or%20Lora.pdf . The University of the West Indies. St. Augustine, Trinidad and Tobago. [Consulted in 27 January 2024]

Carbajal-Márquez, R.A., J.J. Sigala-Rodríguez & L. Fernández-Badillo. 2022. *Leptodeira polysticta* (Small-spotted Cat-eyed Snake) Diet. Herpetological Review 53:202.

Díaz-García, J.M., V. Vásquez-Cruz, A. Sandoval-Comte, J. Ramos-Luna & A. Kelly-Hernández. 2023. Depredación de huevos de la rana de cristal norteña *Hyalinobatrachium viridissimum* por la culebra-cordelilla chata *Imantodes cenchoa* en un bosque de niebla de Veracruz, México. Revista Latinoamericana de Herpetología 6149-153.

Leenders, T. 2019. Reptiles of Costa Rica: A Field Guide, 1st edition. Ithaca, London, Cornell University Press.

Leenders. T. 2023. Pocket Guide to the Amphibians and Reptiles of Costa Rica. Cornell University Press. Ithaca, New York, USA.

Lewis, T.R., R. Griffin, P.B.C. Grant, A. Figueroa, J.M. Ray, K.E. Graham & G. David. 2013. Morphology and ecology of Sibon snakes (Squamata: Dipsadidae) from two forests in Central America. Phyllomedusa 12:47-55.

Savage, J.M. 2002. The Amphibians and Reptiles of Costa Rica. A Herpetofauna Between Two Continents, Between Two Seas. The University of Chicago Press, Chicago, USA.

Solórzano, A. 2022. Snakes of Costa Rica: Distribution, Taxonomy, and Natural history. 2nd Edition. Editorial Lil. San José, Costa Rica.

Vindas, J.C. & J.G. Abarca. 2014. *Leptodeira rhombifera*. Diet. Mesoamerican Herpetology 1:288-289. Savage, J.M. 2002. Amphibians and Reptiles of Costa Rica: A Herpetofauna Between Two Continents between Two Seas. Chicago, London, the University of Chicago Press. USA.