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FROG EATS FROG: FIRST RECORD OF ANUROPHAGY IN *SERRANOBATRACHUS* (STRABOMANTIDAE), AN ENDEMIC GENUS FROM THE SIERRA NEVADA DE SANTA MARTA, COLOMBIA

RANA COME RANA: PRIMER REGISTRO DE ANUROFAGIA EN *SERRANOBATRACHUS* (STRABOMANTIDAE), GÉNERO ENDÉMICO DE LA SIERRA NEVADA DE SANTA MARTA, COLOMBIA

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Resumen.— Los anuros en su mayoría, son depredadores generalistas que consumen una amplia variedad de presas, incluyendo vertebrados. Si bien existen múltiples reportes y análisis de la dieta de anfibios, el consumo de otros anuros (anurofagia) requiere más investigación para comprender su relevancia a nivel trófico, especialmente en especies endémicas y en peligro. Aquí presentamos el primer registro de anurofagia en *Serranobatrachus*; género endémico de la Sierra Nevada de Santa Marta, Colombia. En particular, documentamos un evento de depredación de *S. megalops* sobre *S. insignitus*; hallazgo que contribuye al conocimiento de un grupo con escasos registros de comportamiento.

Palabras clave.— Anuros, competencia, depredación, dieta, *Terrarana*.

Abstract.— Anurans are typically generalist predators that consume a wide variety of prey, including vertebrates. Although there are numerous reports and analyses of amphibian diets, anurophagy (the consumption of other anurans) requires further investigation to understand its trophic relevance, particularly in endemic and endangered species. Here, we present the first record of anurophagy in *Serranobatrachus*, a genus endemic to the Sierra Nevada de Santa Marta, Colombia. Specifically, we document a predation event of *S. megalops* on *S. insignitus*, a finding that contributes to the understanding of a group with limited behavioral records.

Keywords.— Anurans, competition, diet, predation, *Terrarana*.

Most amphibians are considered generalists in terms of diet (Vignoli & Luiselli, 2012; Vitt & Cadwell, 2014; López-Bedoya et al., 2024). In their adult stage, whether anurans, salamanders, or caecilians consume a wide diversity of invertebrates (see Wells, 2007). Frogs and toads typically consume small prey such as insects, worms and small crustaceans, which align with their morphology, ecology, and behavior (Solé & Rödder, 2009; Vitt & Caldwell, 2014; Masey et al., 2015). Although some insight into the amphibian diet has been gained, it is primarily limited to a handful of common groups. Critical baseline data are still lacking for many amphibian species, particularly those that are endangered or have restricted distributions in highly biodiverse regions, such as Colombia (López-Bedoya et al., 2024).

Serranobatrachus is a genus of direct-development frogs represented by seven species whose distribution is limited to the cloud forests and páramos grasslands of the Sierra Nevada de Santa Marta, in the department of Magdalena, Colombia (Hedges et al., 2008; Arroyo et al., 2022). The species of this genus primarily have terrestrial habits, although some may use shrub or herbaceous strata (Lynch & Ruiz-Carranza, 1985, Barros-Granados, 2022), and their diet consists of various arthropods such as arachnids, crustaceans, insects, or myriapods (Barros-Granados, 2022).

Serranobatrachus megalops (Ruthven, 1917) is endemic to the forests of the northern and western slopes of the Sierra Nevada

de Santa Marta, Colombia, at altitudes between 1300 and 2450 meters (Frost, 2024). It is a nocturnal species primarily found in leaf litter, on rocks, or in the lower strata of vegetation (Lynch and Ruiz-Carranza, 1985; Barros-Granados et al., 2022). It is usually abundant and can inhabit both conserved environments and areas with secondary vegetation and pine plantations (Carvajalino-Fernández et al., 2008; Roach et al., 2020). However, based on their criteria, Roach et al. (2024) considered *S. megalops* to be exposed to medium to high vulnerability in the regional climate change vulnerability assessment. Research on the stomach content of this species revealed that it feeds primarily on isopods, with arachnids and hymenopterans also constituting a significant part of its diet (Barros-Granados, 2022).

During a field survey on January 16, 2024, at 20:27 h, in the forests of the "El Dorado" Reserve of the Proaves Foundation, in the department of Magdalena, Colombia (11.099000° N and 74.063694° W, WGS84, 2157 m a.s.l.), we recorded an adult of *S. megalops* (approximately 40 mm of SVL) consuming a juvenile of *S. insignitus* (Fig. 1). The specimen was still on the ground at the edge of a stream. We did not capture or take measurements of the frogs to avoid interrupting the interaction, which lasted at least five minutes during which we observed this event before we left the place.

Strabomantidae is one of the most researched amphibian families in Colombia regarding trophic ecology (dietary information is available for 9.5 % of the species) (López-Bedoya et al., 2024). Several species of this family are considered generalist predators and primarily feed on invertebrates (Arroyo et al., 2008; García et al., 2015; Gutiérrez-Cárdenas et al., 2016; Barros-Granados, 2022), although it has been found that they can consume small vertebrates (Santos et al., 2018).

However, post-metamorphic anurophagy has not been documented in the family Strabomantidae, with the nearest phylogenetic record reported for *Craugastor metriosistus* (preying on juvenile *Rhaebo heamatiticus* and another unidentified frog), another amphibian specie restricted to Colombia (Caicedo-Martínez et al., 2021).

The event we documented could be explained by the size difference between juveniles and adults, as this has been reported as the strongest predictor for anurophagy (Masey et al., 2015), and because individuals of different developmental stages use the same microhabitats (Arroyo et al., 2008), which may exacerbate competition and even trigger cannibalism (Székely et al., 2020). In contrast, anurophagy predominantly occurs in several families of indirect development like Ranidae, Ceratophridae, Leptodactilydae or Dicroglossidae (Caicedo-Martínez et al., 2021) and this kind of event has been observed between conspecifics (Souza et al. 2023), sexes (Gould & Beranek, 2024) and development stages (Caicedo-Martinez et al., 2021).

Together with size, habitat use and species diversity are described as relevant predictors of anurophagy and the synergy of these factors makes more probable the interaction between

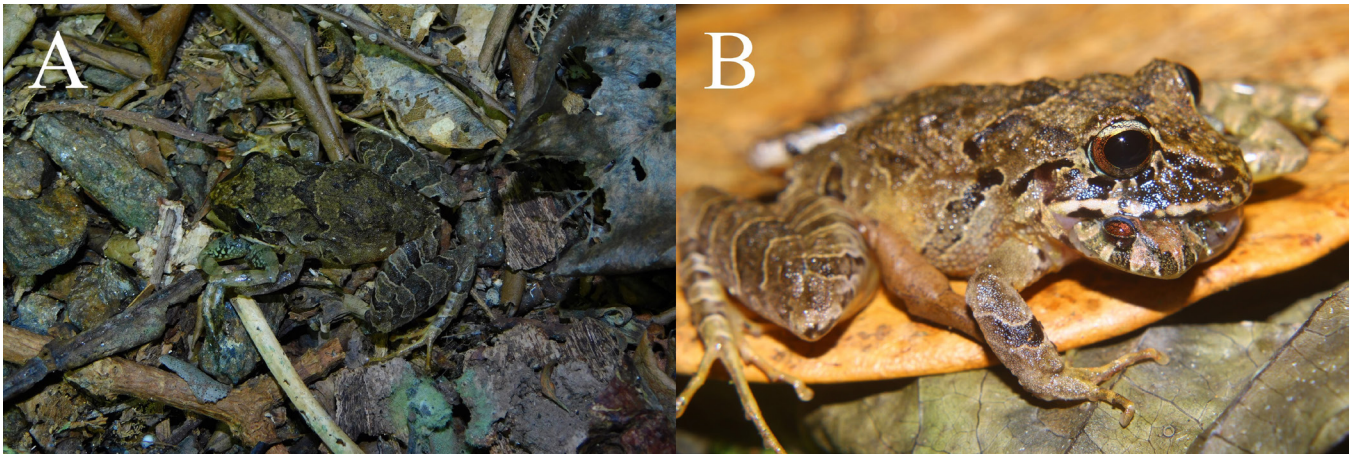

Figura 1. Vista dorsal de un ejemplar adulto de *Serranobatrachus megalops* consumiendo a un juvenil de *S. insignitus* (A). Acercamiento al ejemplar de *S. insignitus* dentro de la cavidad bucal de *S. megalops* (B). Fotos: (A) Gabriela Alejandra Valencia Macías, (B) Erick Rodrigo Ocaña Díaz.

Figure 1. Dorsal view of adult *Serranobatrachus megalops* preying on a juvenile *S. insignitus* (A). Close-up of the juvenile *S. insignitus* inside the oral cavity of *S. megalops* (B). Photos: (A) Gabriela Alejandra Valencia Macías, (B) Erick Rodrigo Ocaña Díaz.

anurans (Masey et al., 2015; Souza et al., 2023). For example, juveniles of *S. insignitus* are typically found at ground level, beneath rocks and logs (Lynch & Ruíz-Carranza, 1985), while adults of *S. megalops* also use these microhabitats and do not move to higher vegetation strata. Contrarily, other species of the genus may occupy higher strata and exhibit a greater variety of food items, as is the case with *S. santaemartae* (Barros-Granados, 2022).

We observed this event next to a stream which is an important place for multiple amphibian species during breeding season, but in the other hand it also represents a homogeneous space with scarce refuges for small or juvenile anurans, which could exposure them to longer generalist predators (Caicedo-Martínez et al., 2021; Gould & Beranek, 2024).

More samples are needed to confirm that *S. megalops* has a generalist diet, but from the current knowledge of the group and their relatives, we stand this interaction as an opportunistic behavior. Even when opportunistic or rare, every event of cannibalism plays a role in population ecology, as has been demonstrated in other groups like lizards (Oliveira et al., 2025), but further experiments should be conducted to assess how anurophagy could impact prey population, especially in frogs with such restricted distribution as *Serranobatrachus*.

This observation addresses a key gap in the components of the diet of an endemic species of Colombia (López-Bedoya et al., 2024). Research on the natural history of *Serranobatrachus* remains a priority, and each study is critical for elucidating trophic relationships in endemic species.

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