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# Observation of *Erythrolamprus poecilogyrus* (Wied-Neuwied, 1825) (Squamata: Colubridae) preying upon *Rhinella granulosa* (Spix, 1824) (Anura: Bufonidae) in the Caatinga phytogeographic domain

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**Abstract**: *Erythrolamprus poecilogyrus* (Wied-Neuwied, 1825) is a snake with well-documented natural history owing to diurnal and nocturnal activities. *Rhinella granulosa* (Spix, 1824) has previously been documented in the diet of *E. poecilogyrus* based on stomach content analysis. This study is the first observational record of this snake predating on *R. granulosa* in the Caatinga phytogeographic domain. The predation event was observed in northeastern Brazil (06°50'55"S, 38°20'48"W). Both colubrid and bufonid were found on a sandy substrate with the prey's head inside the mouth. The snake frequently moved the anterior region of its body and jaw to adjust its bite while attempting to swallow the frog. The lack of field observations of predation events between certain snakes and anurans reinforces the importance and highlights the need for more studies on the natural history of these groups in the phytogeographic domains of South America.

**Key words**: Amphibia, Dipsadinae, northeastern Brazil, semi-arid region.

## Observación de *Erythrolamprus poecilogyrus* (Wied-Neuwied, 1825) (Squamata: Colubridae) depredando *Rhinella granulosa* (Spix, 1824) (Anura: Bufonidae) en el dominio fitogeográfico de Caatinga

**Resumen**: *Erythrolamprus poecilogyrus* (Wied-Neuwied, 1825) es una serpiente con una historia natural bien documentada debido a sus actividades diurnas y nocturnas. *Rhinella granulosa* (Spix, 1824) ha sido previamente documentada en la dieta de *E. poecilogyrus* basándose en el análisis del contenido estomacal. Este estudio constituye el primer registro observacional de esta serpiente depredando a *R. granulosa* en el dominio fitogeográfico de la Caatinga. El evento de depredación se observó en el noreste de Brasil (06°50'55"S, 38°20'48"W). Tanto el colúbrido como el bufónido se encontraron en un sustrato arenoso con la cabeza de la presa dentro de la boca de la serpiente. La serpiente movía frecuentemente la región anterior de su cuerpo y mandíbula para ajustar su mordida mientras intentaba tragar la rana. La falta de observaciones de campo de eventos de depredación entre ciertas serpientes y anuros refuerza la importancia y destaca la necesidad de más estudios sobre la historia natural de estos grupos en los dominios fitogeográficos de Sudamérica.

**Palabras clave**: Amphibia, Dipsadinae, noreste de Brasil, región semiárida.

Anuran amphibians are important components of the trophic ecology of snakes (Mesquita *et al.* 2013; Rodrigues *et al.* 2016; Pereira Filho *et al.* 2017), particularly among anurophagous hunters and predators (Mesquita *et al.* 2013; Corrêa *et al.* 2016; Andrade *et al.* 2020). Studies have shown that the diet of certain snakes may consist predominantly or exclusively of prey anurans, indicating that snake predation can have a significant impact on anuran fauna (Prieto *et al.* 2012; Mesquita *et al.* 2013; Alencar & Nascimento 2014; Cortéz-Gómez *et al.* 2015; Corrêa *et al.* 2016; Batista *et al.* 2019; Andrade *et al.* 2020).

Commonly known as the Yellow-bellied Liophis, *Erythrolamprus poecilogyrus* (Wied-Neuwied, 1824) is a small to medium-sized terrestrial snake with well-documented natural history owing to diurnal and nocturnal activities (Domeneghetti 2015; Smith & Rojas 2023). It is relatively common in physiognomies with pioneer formations to dense forests (Rodrigues *et al.* 2016; Pereira Filho *et al.* 2017) throughout the phytogeographic domains of South America (Domeneghetti 2015; Pereira Filho *et al.* 2017; Nogueira *et al.* 2019; Oliveira *et al.* 2021; Smith & Rojas 2023). This colubrid occurs in many natural and highly anthropogenic areas (Nogueira *et al.* 2019), and feeds mainly on anurans (Prieto *et al.* 2012; Alencar & Nascimento 2014; Corrêa *et al.* 2016; Andrade *et al.* 2020). Bufonids, hylids, and leptodactylids are among the main groups of anurans preyed upon by *E. poecilogyrus* (Prieto *et al.* 2012; Alencar & Nascimento 2014; Andrade *et al.* 2020). Furthermore, this snake feeds on fish, mammals, and other reptiles (Andrade *et al.* 2020; Lizarro *et al.* 2021).

The granular or common lesser toad, *Rhinella granulosa* (Spix, 1824), is a bufonid frog of great ecological importance in northeastern and southeastern Brazil, mainly in the phytogeographic domain of Caatinga (Narvaes & Rodrigues 2009). This species primarily feeds on small invertebrates (Santana & Juncá 2007; Protázio *et al.* 2015; Moser *et al.* 2025), which are a constituent part of the diet of other metazoans (Mesquita 2009; Mesquita *et al.* 2013; Oliveira *et al.* 2017; Fonseca *et al.* 2018; Carvalho *et al.* 2022).

*Rhinella granulosa* has previously been documented in the diet of *Erythrolamprus poecilogyrus* based on stomach content analysis (Michaud & Dixon 1989; Alencar & Nascimento 2014; Andrade *et al.* 2020). No photographic record of this predation event has been published. Based on that, herein we report the first observational record of *E. poecilogyrus* predating on *R. granulosa* in the Caatinga phytogeographic domain and it discusses aspects of the behavior of this colubrid.

The predation event occurred on August 28, 2025, at 19:25 h in Marizópolis Municipality (06°50'55"S, 38°20'48"W), which is located in the western region of the state of Paraíba (**Figure 1**). This municipality is situated within the Sertaneja Depression geoenvironmental unit and occupies an area of 73.8 km$^2$. This unit represents the typical semi-arid landscape of northeastern Brazil, which is characterized by a rather monotonous pediplain surface, with slightly undulating relief and narrow valleys. The vegetation is composed of strata of hyperxerophilous Caatinga woody-shrubby vegetation with patches of deciduous forest. The climate is tropical semi-arid, with summer rains between November and April (average annual rainfall: 431.8 mm) (Beltrão *et al.* 2005).

The predation event was observed in a highly anthropized urban area. Both colubrid and bufonid were found on a sandy substrate inside a sports field (**Figure 1**) with the prey already seized in the snake's jaw (**Figure 2**). An individual of *Rhinella granulosa* (approximately 8.5 cm in total length) was found alive with its ventral region facing upwards and its head inside the mouth of an *Erythrolamprus poecilogyrus* (approximately 70 cm in total length) (**Figure 2**). The posterior part of the snake's body was partially coiled around its prey but did not constrict it (**Figure 2**). The snake frequently moved the anterior region of its body and jaw to adjust its bite while attempting to swallow the frog. It remained in the same site for approximately 3 min, even during the approach of a group of people, and photographic records taken from a distance of approximately 60 cm (**Figure 2**). The snake was removed from the sports field using a shovel without showing any reaction of escape or attack. The snake retained the live prey in its jaws during removal. After being placed on the ground, the snake released the frog and went under the nearby rubble, while the *R. granulosa* individual also moved away from the site.

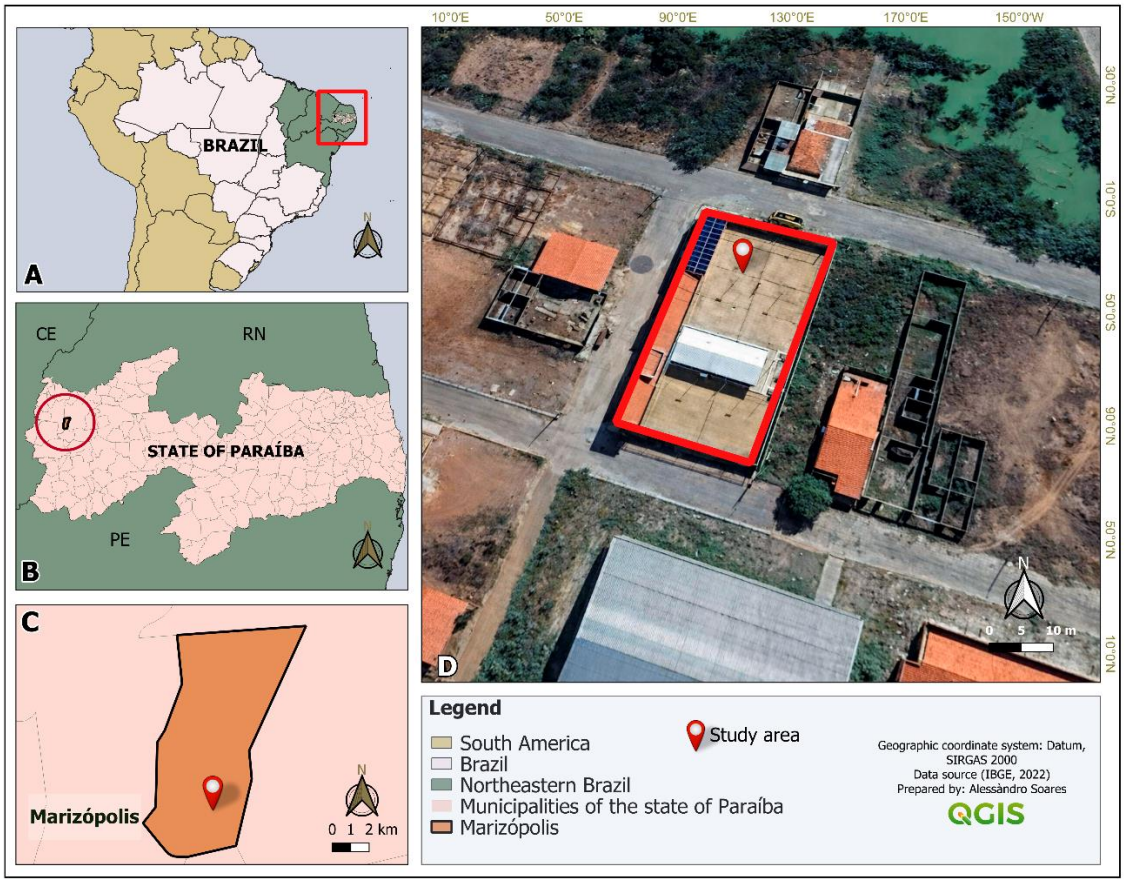


**Figure 1**. Map of the study area showing (**A**) part of South America, highlighting Brazil, northeastern Brazil, and the state of Paraíba; (**B**) State of Paraíba and municipality of Marizópolis; (**C**–**D**) Municipality of Marizópolis showing the location of the predation event (red mark shows the exact location).

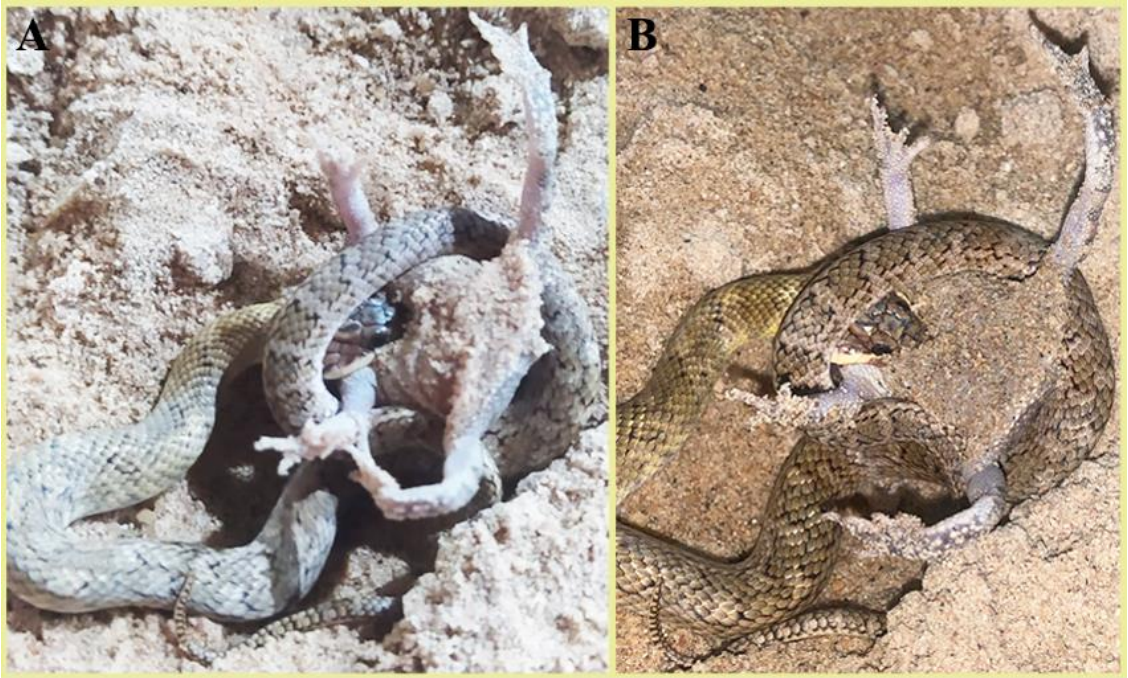


**Figure 2**. *Erythrolamprus poecilogyrus* (Wied-Neuwied, 1825) preying on *Rhinella granulosa* (Spix, 1824): (**A**) Complete view of the predator and prey under the influence of the floodlights of the sports court; (**B**) Enlarged view of the predation event showing part of the snake and the entire frog under the influence of the lighting from the photographic equipment.

There are a number of predation events between snakes of the genus *Erythrolamprus* Boie, 1826 and anurans based on direct observations in the natural environment (Muscat & Moroti 2018; Rocha-Lima *et al.* 2018; Carvalho *et al.* 2019; Santos-Jr. *et al.* 2022; Canal Filho *et al.* 2023). Such studies represent interaction events observed only once or a few times in the phytogeographical domains. In the case of *Rhinella granulosa*, a few studies have also reported bufonids as a component of the trophic ecology of *E. poecilogyrus*, but based on individuals identified in the stomach contents (Michaud & Dixon 1989; Alencar & Nascimento 2014; Andrade *et al.* 2020). In contrast, this study highlights the first observational record of *E. poecilogyrus* preying on *R. granulosa*.

A relevant ecological aspect of *Erythrolamprus poecilogyrus* is that individuals can be found actively hunting their prey or in opportunistic capture actions from ecosystems with extremely contrasting environmental parameters, that is semi-aquatic limnetic habitats to xerophytic phytogeographic domains, including highly degraded and urbanized areas (Argôlo 2004; Pereira Filho *et al.* 2017; Andrade *et al.* 2020), as corroborated in this study (**Figures 1–2**). Certain studies have shown that the diet composition of *E. poecilogyrus* in different ecosystems/environments (e.g., wetlands of the Chaco-Pampean plain, alluvial floodplains of the Paraná, and Atlantic Forest domain on the Doce River) may consist predominantly of bufonid anurans, mainly of the genus *Rhinella* Fitzinger, 1826 (Prieto *et al.* 2012; Alencar & Nascimento 2014; Andrade *et al.* 2020).

The adult *Erythrolamprus poecilogyrus* was safely removed from the sports practice area without any aggressive behavior from the snake. Subsequently, the snake moved to a protected area. As predicted by Mesquita et al. (2013), this species exhibits almost no aggressive behavior towards predators and usually attempts to escape during interactions.

The species *Erythrolamprus poecilogyrus* began to swallow the medium-sized *Rhinella granulosa* headfirst in a manner similar to the capture position and direction of prey ingestion practiced by other snakes in different predation events (Brown *et al.* 2003; Palmuti *et al.* 2009; Prieto *et al.* 2012; Corrêa *et al.* 2016; Burg & Miguel 2020). The anteroposterior direction of ingested prey items is a common practice among snakes due to positive factors such as less risk of injury, less resistance to ingestion (De Fraga *et al.* 2013; Corrêa *et al.* 2016), shorter handling time, and consequently, less vulnerability in a predation event (Brown *et al.* 2003; Prieto *et al.* 2012).

This study is the first to observe *Erythrolamprus poecilogyrus* preying on *Rhinella granulosa*, despite both species being abundant and widely distributed in the Neotropical region. The ecological interaction between these metazoans is certainly common, mainly because of the high availability of frogs in the environment. However, the lack of field observations of predation events between certain snakes and anurans reinforces the importance and highlights the need for more studies on the natural history of these groups in the phytogeographic domains of South America (mainly in the Caatinga ecoregion), which are essential for environmental conservation.

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