

# FIRST PREDATION RECORD ON A CAECILIAN, *CAECILIA SP.* (GYMNOPHIONA: CAECILIIDAE), BY THE POORLY KNOWN CAUCA CORALSNAKE, *MICRURUS MULTISCUTATUS* (SQUAMATA: ELAPIDAE)

PRIMER REGISTRO DE DEPREDACIÓN SOBRE UNA CECILIA, *CAECILIA SP.* (GYMNOPHIONA: CAECILIIDAE) POR LA POCO CONOCIDA CORAL CAUCANA, *MICRURUS MULTISCUTATUS* (SQUAMATA: ELAPIDAE)

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**Resumen.**— Reportamos el primer registro de dieta para la Coral caucana, *Micrurus multiscutatus*, depredando una cecilia del género *Caecilia* en tierras bajas del pacífico de Colombia. Además, describimos la técnica empleada por la serpiente coral para someter a la cecilia.

**Palabras clave.**— Dieta, historia natural, presa, técnica de sometimiento.

**Abstract.**— We report the first record for the diet of the Cauca Coralsnake, *Micrurus multiscutatus*, preying on a caecilian species, *Caecilia sp.*, in the pacific lowlands of Colombia. In addition, we describe the subdue technique used by the coralsnake to subdue the caecilian.

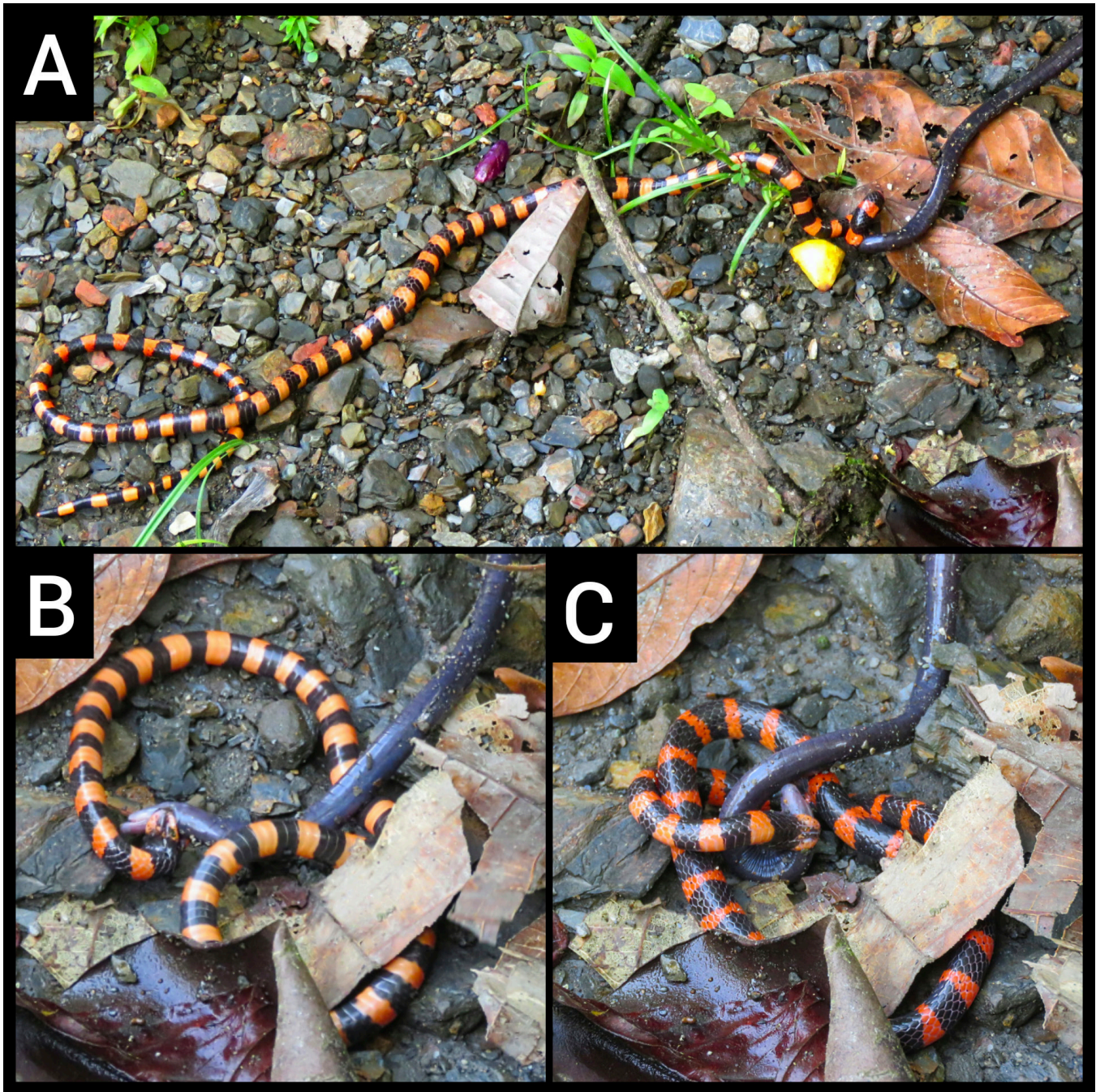
**Key words.**— Diet, natural history, prey, subdue behavior.

The coralsnakes of the genus *Micrurus* prey on a variety of animals, ranging from smaller snakes (including cannibalism and rare predation on congeners), small lizards and amphisbaenians, to specialized feeding habits where particular species prey on caecilians, swamp eels and other fishes, onychophorans or other invertebrates (Roze, 1996; Campbell & Lamar, 2004). The Cauca coralsnake, *Micrurus multiscutatus*, belongs to the bicolored group (sensu Silva et al., 2016), which is composed of only five species: *M. camilae* Renjifo and Lundberg 2003, *M. mipartitus* (Duméril, Bibron & Duméril 1854), *M. multifasciatus* Jan 1858, *M. multiscutatus* Rendahl & Vestergren 1941, and *M. spurrelli* (Boulenger, 1914).

The Cauca coralsnake occurs on the Chocoan region in the western side of Cordillera Occidental of Colombia (departments of Chocó, Cauca, Nariño, Risaralda, and Valle del Cauca) and northwestern Ecuador at Esmeralda province (Yáñez-Muñoz & Altamirano, 2006; Pitalua-L et al., 2018; GBIF, 2023). This species

can be easily distinguished from its sympatric congeners by the bicolored pattern of 59-68 black body rings and 3-4 black rings on the tail, alternating with red/orange rings, and by the large red/orange or yellow head band covering the parietal scales, curved in their posterior edge ending in a V shape (Rendahl & Vestergren, 1941; Roze, 1996; Campbell & Lamar, 2004; Yáñez-Muñoz & Altamirano, 2006).

*Micrurus multiscutatus* is a terrestrial and semi-fossorial snake (Yáñez-Muñoz & Altamirano, 2006) that inhabits tropical lowland rain forest and lower montane wet forest, as well as in human modified environments such as pastures and crops (Roze, 1996; Campbell & Lamar, 2004; Vera-Pérez et al., 2018) from 50 to 1800 m asl (Vera-Pérez et al., 2018). This species is classified as Near Threatened (NT) on the IUCN Red List (Cisneros-Heredia et al., 2015), and its natural history remains unknown, reflected by the fact that there is no available literature on its diet and behavior.



**Figura 1.** Coral Caucana (*Micrurus multiscutatus*) depredando una Cecilia (*Caecilia* sp.) en Buenaventura, Valle del Cauca, Colombia. A-C: Diferentes vistas de la Coral Caucana asegurando la Cecilia de la cabeza mientras forcejeaban. Fotos: Timothy R. Forrester.

**Figure 1.** Cauca Coralsnake (*Micrurus multiscutatus*) preying on a Caecilian (*Caecilia* sp.) in Buenaventura, Valle del Cauca, Colombia. A-C: Different views of the Cauca Coralsnake securing the caecilian's head while struggling with it. Photos: Timothy R. Forrester.

The natural history of the bicolored group species, including information about their feeding habits, is mostly unknown (Roze, 1996; Campbell & Lamar, 2004), with the exception

of *M. mipartitus*, whose prey items are well known in nature and captivity, with a wide diet composed by amphisbaenians, caecilians, small lizards, and snakes (Ayerbe et al., 1990; Bernal



**Figura 2.** Técnica de sometimiento exhibida por la Coral Caucana (*Micrurus multiscutatus*) envolviendo el cuerpo de la cecilia. A-B: Lazos corporales hechos alrededor del cuerpo de la cecilia. Fotos: Timothy R. Forrester.

**Figure 2.** Subdue technique of the Cauca Coralsnake (*Micrurus multiscutatus*) wrapping around the body of the Caecilian. A-B: Body loops made around the caecilian's body. Photos: Timothy R. Forrester.

& Palma, 2011; Rodríguez-García & Díaz-Ayala., 2015; Ríos-Soto et al., 2018; Vera-Peréz et al., 2019; Fernández-Roldán et al., 2021). *Micrurus camilae* and *M. multifasciatus* are also known to

eat caecilians (Burger, 1997; Barrera-Ocampo & Bran-Castrillón, 2023), and the diet of *M. spurrelli* remains unknown (Roze, 1996). For this reason, to fill gaps in the trophic ecology of *Micrurus*

species, here we report the first dietary record for *M. multiscutatus* preying on a *Caecilia* sp. and describe the subdue technique used by the coralsnake.

The genus *Caecilia* is the only genus of caecilians known in the Chocoan lowlands of Colombia (Castro-Herrera & Vargas-Salinas, 2008, Acosta-Galvis, 2023) represented by five species: *C. guntheri*, *C. leucocephala*, *C. nigricans*, *C. perdita* and *C. wilkinsoni* (Fernández-Roldán & Lynch, 2023).

In the late morning (11:40 h) on 2 April 2017, in the municipality of Buenaventura, Valle del Cauca, Colombia (3.61792° N, 76.91308° W, WGS 84; 393 m a.s.l.), in the lower portion of the Anchicayá Valley on a secondary road surrounded by humid tropical forest, we observed an adult male of *Micrurus multiscutatus* feeding on a caecilian of the genus *Caecilia*. We performed the taxonomic determination of the caecilian based on the following characters observed: body size moderately large, dorsal and ventral body surfaces uniformly dark grayish, inconspicuous grooves, and a head of a lighter color than the rest of the body. Besides, currently there are not known records of *Oscacaecilia* or *Microcaecilia* species in the in the Chocoan lowlands of Colombia (Acosta-Galvis, 2023; Frost, 2023); thus, the external characteristics observed aligns with the known morphology for the species of the genus *Caecilia*. However, due the cryptic morphology of caecilians, it is recommend to collect the caecilian specimens in order to provide a suitable taxonomic identification.

The snake was struggling with the caecilian keeping it secured from the head using the mouth and deliberately tried to wrap its body around the caecilian's body on multiple occasions without releasing the head of the *Caecilia* sp., even though it desperately tried to release itself by twisting movements (Figs. 1 and 2). We interpreted this as a subdue behavior. The event was observed for about two minutes, until the snake vanished onto the forest leaf litter, pulling the caecilian by the head with little resistance. Neither animal was collected, but the event was documented with videos and photographs (Appendix 1).

Although there are several published records of predation on caecilians by coralsnake in the Neotropics (Fernández-Roldán & Gómez Sánchez, 2021), very few present a detailed description of the behavior of the species involved. The known information about the behavior of coralsnakes to subdue caecilians in predation events consists primarily of biting the prey, sometimes more than once before securing the bite. They hold on to the body tightly while continuing to actively 'chew' the bitten place until the prey is paralyzed. Subsequently, the coralsnakes move their jaws to the head, sometimes without releasing the prey's

body, in order to start ingesting the caecilian (Roze, 1996; Bernal & Palma, 2011; Viana & Mello-Mendes, 2015; Fernández-Roldán & Gómez-Sánchez, 2021; Barrera-Ocampo & Bran-Castrillón, 2023). When the prey is a large snake, coralsnakes avoid bites by moving their bodies out of danger. Another strategy to avoid being bitten in a vulnerable body part is to curve their tail tip to make it look like their head. By moving it, they can distract prey such as snakes or lizards from biting vital parts of the coralsnakes' body (Roze, 1996). Even though coralsnake do not strangle their prey, sometimes body loops are made around the prey's body which helps them to press down and dominate their prey (Roze, 1996), but there are few records of this in literature.

In this case, the Cauca coralsnake had the caecilian's head secured (Fig. 1), and twisted its body abruptly while simultaneously attempting to wrap it around the caecilian's body several times (Fig. 2; Appendix 1). This may be a strategy to limit the prey mobility when they are relatively long with a slippery body since coralsnakes may ingest prey almost as long as themselves (Marqués & Sazima, 1997; Campbell & Lamar, 2004; Bello-Sánchez et al., 2021), as the case of the observed caecilian that was almost as long as the *M. multiscutatus* (Appendix 1). Coralsnakes use body loops to get a firmer hold on lizards and small snakes (Roze, 1996). Therefore, this type of behavior could facilitate the submission of large caecilians as well. It is necessary to describe the behaviors observed in events of this nature in order to expand knowledge about prey-predator interactions in the genus *Micrurus*. However, here we present *M. multiscutatus* using body loops to subdue a caecilian.

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## APPENDIX 1

**Appendix 1.** Video of a Cauca Coralsnake (*Micrurus multiscutatus*) preying on a Caecilian (*Caecilia* sp.) in Buenaventura, Valle del Cauca, Colombia. Observe how the Cauca Coralsnake attempted to wrap its body around the caecilian's body on multiple occasions without releasing the head of the caecilian. Video by Timothy R. Forrester (Available at: <https://www.youtube.com/watch?v=5Kjacq6CQoU>).

## APÉNDICE 1

**Apéndice 1.** Videode una CoralCaucana (*Micrurus multiscutatus*) depredando una Cecilia (*Caecilia* sp.) en Buenaventura, Valle del Cauca, Colombia. Obsérvese como la CoralCaucana intenta envolverse alrededor del cuerpo de la cecilia en múltiples ocasiones sin liberar la cabeza de la cecilia. Video por Timothy R. Forrester (Disponible en: <https://www.youtube.com/watch?v=5Kjacq6CQoU>).