



# The Painted Coralsnake, *Micrurus corallinus* (Squamata: Elapidae), Does Use Defensive Tail Displays

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Defensive tail displays are commonly observed in ophidians, and are particularly prevalent in the aposematically colored genus of New World coralsnakes *Micrurus*. However, according to the literature, these displays are absent in the Atlantic Forest endemic Painted Coralsnake, *Micrurus corallinus* (Merrem 1820). In this note we document the presence of these displays in this species, and highlight a previously overlooked reference to such displays.

The Painted Coralsnake is distributed in eastern and southern Brazil (Bahia, Ceará, Espírito Santo, Minas Gerais, Paraná, Mato Grosso do Sul, Rio de Janeiro, Rio Grande do Sul, Rio Grande do Norte, São Paulo, and Santa Catarina), eastern Paraguay (Alto Paraná, Caazapá, Canindeyú, Guairá, and Itapúa), and northwestern Argentina (Misiones Province) (Giraud 2004; Cacciali et al. 2016; Nogueira et al. 2019). In Paraguay, it is one of the most frequently observed of the Atlantic Forest snakes, but its association with this highly fragmented habitat means that it is considered Vulnerable at the national level (Martínez et al. 2020).

Defensive tail-displaying behaviors are widespread in the genus *Micrurus*, with typical displays involving snakes raising, curling, and twitching the tail while concealing the head in leaf litter, inside a hole, or beneath the coiled body (Roze 1996). Tail displays in snakes have been hypothesized to function in three ways: (1) diverting attack from the head to the tail; (2) inhibiting attack through an aposematic or protean display; and (3) disorienting the predator through a flash display (Greene 1973). Certainly, in coralsnakes (whose entire appearance is aposematic), the principal function of these displays would likely be the first option, whereas the occasional employment of “tail-striking” in the genus adds a further layer of “aggressive defense” by implying that the “false head” is capable of injecting venom (Allen 1940; Serafim and Duarte 2008). This is further reinforced by the presence in many species of a subcaudal color pattern that resembles the coloration of the head (Jowers et al. 2019; Brown et al. 2020)

(Fig. 1). As a consequence, that coralsnakes are able to bite or sting with the tail is a widely held belief in some areas of Brazil (Azevedo 1960).

On 27 November 2021 at Estancia Nueva Gambach, Área para Parque Nacional San Rafael, Itapúa Department, Paraguay, we observed a *Micrurus corallinus* sitting on a rotting tree stump about 30 cm above the ground. When we approached, the snake positioned its head and the front half of its body to conceal itself in the leaf litter, leaving the posterior part of the body exposed and curled into a distinctive “S” shape; the tip of the tail was tightly curled and held higher than the rest of the body, so that it superficially resembled a head (Fig. 2). When we moved or made a noise the snake would rapidly extend its body, with the tail remaining curled in the “head” shape (Fig. 3). On some occasions the body would also rapidly retract, giving the impression that the snake had struck at the observers. On other occasions the body would remain outstretched for a short period before



**Figure 1.** Ventral view of a deceased Painted Coralsnake (*Micrurus corallinus*) showing the similarity in color pattern of the head and subcaudal areas, Estancia Nueva Gambach, Itapúa Department, Paraguay, November 2008. Photograph by Paul Smith.



**Figure 2.** A Painted Coralsnake (*Micrurus corallinus*) showing tail-curling behavior (left) and with its body extended and tail-tip curled following a “strike” (right), at Estancia Nueva Gambach, Itapúa Department, Paraguay, on 27 November 2021. Photographs by Rebecca Smith.

retracting into the “S” shape. This behavior continued for around four minutes, before the snake finally retreated into a hole in the rotten log.

So widespread are these behaviors in the genus *Micrurus* that Roze (1996: 74), in his review of coralsnake behavior and ecology stated: “Thus far, I know of only two coral snakes (*M. corallinus* and *M. limbatus*) that do not use a defensive tail display. *M. corallinus*, when molested, only thrashes around...,” and this claim was repeated by Serafim and Duarte (2008). In fact, *M. corallinus* does perform the typical defensive tail displays of the genus, and an overlooked description by Jackson (1979) described their use when threatened with predation by the weasel-like grison *Galictis* sp. (Mammalia: Mustelidae) in captive experiments. Jackson (1979) described *M. corallinus* as coiling and raising the tail, and sometimes “jabbing at the grisons” with it, noting that once the snake was able to conceal its head it “struck several times with the coiled tail,” an action that caused the attacking grison to momentarily retreat. We have observed all of the behaviors described by Jackson (1979) in wild snakes in Paraguay, and herein confirm the use of defensive tail displays by *M. corallinus* with photographic and video documentation (see Supplementary Material - [https://youtu.be/1n-Pu\\_JV5s](https://youtu.be/1n-Pu_JV5s)).

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