Instituto Nacional de Salud

• Renjifo's Coral Snake •

(*Micrurus renjifoi*)

Bites, venoms, and venomous snakes of Colombia

G4

MEDICAL IMPORTANCE GROUP 4

Snakes that bite rarely, and have not caused significant envenoming or have not causes documented bites

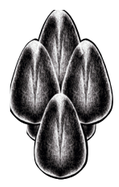
! Poorly Reliable: Confidence for this species is poor due to the lack of data and information on Colombian populations. Therefore, most of our knowledge comes from a few studies and populations outside the national territory.

! Detail of: Head, body and tail.

1. Envenomation symptoms

Envenomation symptoms caused by Micrurus renjifoi bites are unknown. Most rec-ords of coral snakebites are classified only to genus level in the Colombian Sur-veillance Public Health System (SIVIGILA, Spanish acronym). Likewise, there is no information about the venom composite or proteome for this species. However, general symptoms can be observed in patients who have been bitten by coral snakes of the genus Micrurus.

Unlike accidents with snakes of the family Viperidae, coral snakebites may or may not leave fang marks in the skin; therefore, if no marks are observed, the event should not be underestimated [1]. Symptoms related to a coral snake bite depend on the envenoming severity, causing from pain and inflammation on the biten zone (usually hands and feet) to respiratory paralysis [2]. The first symptoms include loss of sensitivity, numbness and paraesthesia (tingly sensation) on the bitten zone, but these symptoms may not emerge in mild cases. Systemic neurological symtoms appear in moderate and severe envenoming cases, depending on the amount of venom inoculated. In severe cases, neurological manifestations emerge within 30 min after the bite, but in moderate cases they appear between one to two hours after the bite. The neurological symptoms begin with fuzzy vision, difficulty speaking, disorientation, sickness and vomiting in moderate cases. Afterwards, muscular problems like paraesthesia, loss of strength in limbs, neck paralysis and difficulty to walk, can appear. Finally, respiratory paralysis occurs, bringing the patient to a critical condition, needing assisted (mechanical) breathing in severe cases [2].



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2. Treatments and snakebite care

Due to the neurotoxic action of the coral snake venom and given that symptoms can appear in less than an hour, envenoming by Micrurus renjifoi must be taken as a serious accident, and medical attention must be carried out immediately to avoid serious lesions or even the death of the patient [3]. In comparison with envenomings produced by viper snakes, envenomation by coral snakes could trigger respiratory failure. Therefore, time plays a very important role for the survival of the patient. For this reason, treatment with antivenoms is the most effective and recommended therapy [4].

As first aid, patients should remain in total rest, monitoring their movements and respiratory performance all the time in case they need respiratory assistance [2]. According to the clinical and paraclinical manifestations, the snakebite accident should be classified as mild, moderate or severe. With this classification, the medical staff will be able to categorize the envenomation severity to define the management and antivenom therapy. The severity of the envenomig must be reclassified within the first 12 hours after the bite [5].

For envenomations caused by any species of coral snake, there is a general management protocol. Firstly, coral antivenom serum must be applied within the first two hours after the bite, before or when the signs of paralysis appear [5]. The amount of antivenom serum to be administered will depend on the severity degree and neutralization capability of the serum laboratory brand. However, it is recom-mended to start with five vials (INS antivenom) for mild cases and 10 vials (INS an-tivenom) for moderate to severe cases [1,5]. The dosage regimen does not differ between children and adults [6]. In moderate and severe envenoming cases, pa-tients should be referred to a second or third level hospital, where ventilatory support and Intensive Care Units (ICU) are available, without stopping the application of antivenom [5]. When hypersensitivity to antivenoms arises, supervision by trained medical staff is important.

3. Snakebite capacity

In Colombia, there are no specific epidemiological records for Micrurus renjifoi. Until 2004, ophidian accidents were not officially notified beacuse they were not con-sidered as events of public health interest [7]. However, among Colombian medically important species, coral snakes only represented 1,2% of the snakebite cases in the whole country over the last decade [8,9]. The absence of accidents reported for M. renjifoi may be since it is a very rare species. Also, Micrurus snakes are usually calm and try to flee when they are threatened.

4. Recognition

M. renjifoi is known only from the type series, which consists of two females [10]. This small bicolored coral snake can be recognized by possessing black rings separated by equally long, or longer, pale pinkish orange rings, a pale pinkish orange parietal ring, a black nuchal ring that passes posterior to the parietal tips and the seventh su-pralabial, pale tail rings neither red nor orange, and 238-243 ventrals in females [10].

5. Distribution

Micrurus renjifoi is known only from the type locality in the Orinoquian region (south side of the Río Tomo, near its juncture with the Río Orinoco, 97 km SSW of Puerto Carreño, Vichada department, Colombia, 115-156 m) [10]. Given that the type locality lies on the Colombo-Venezuelan border, Micrurus renjifoi probably also occurs in the llanos of Venezuela. (Figure 1).

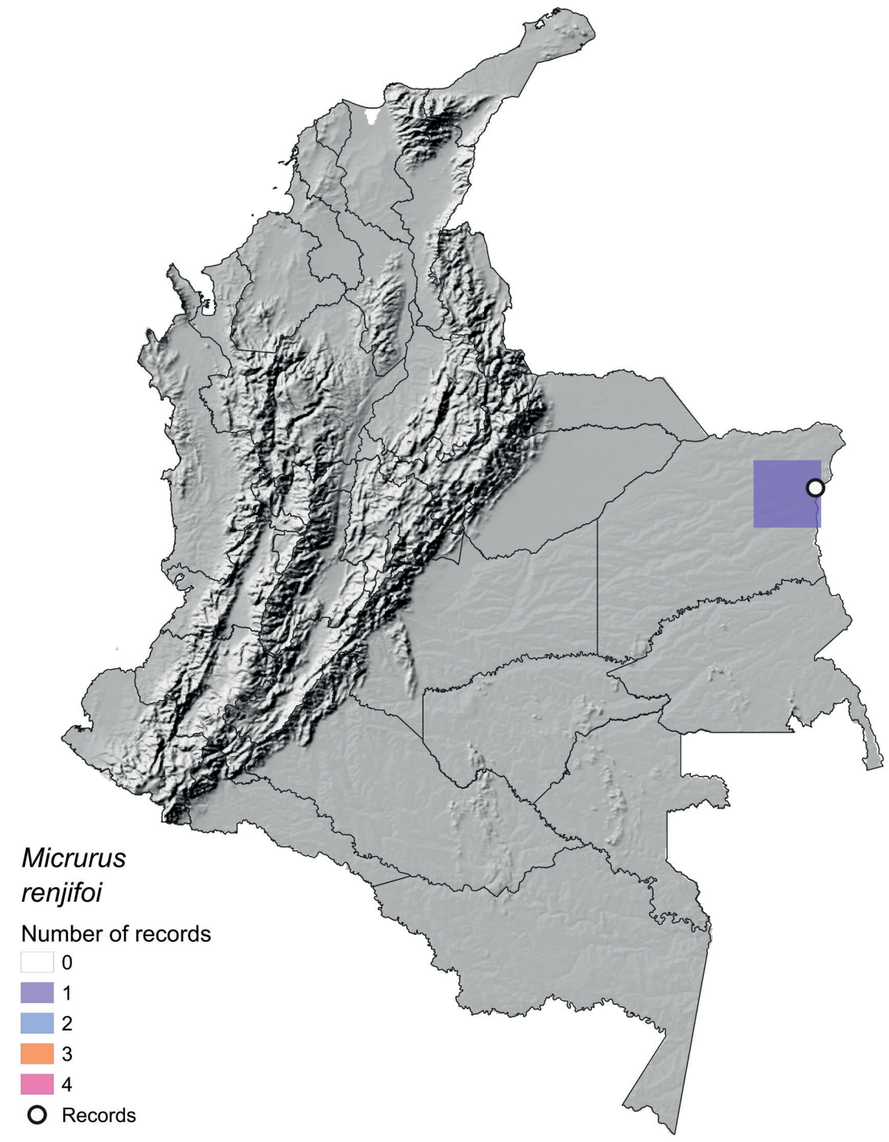

Figure 1. Geographic distribution of *Micrurus renjifoi* in Colombia.

6. Natural history

Knowledge on the ecology and natural history of Micrurus renjifoi is limited to the information provided in the original description [10]. M. renjifoi is a rare coral snake that occurs in the eastern llanos of Colombia, which is a complex of savannas and forests. The type locality lies in a non-inundated, semi-deciduous gallery forest. The only two known specimens of M. renjifoi trashed from side to side and raised and curled the tail when disturbed. Both type specimens are females and on of them (holotype) was gravid and contains two eggs [10].

7. See it in the wild, rural or peri-urban areas

Micrurus renjifoi is only known from the two type female specimens [10]. No additional individuals have been reported since the original description. Therefore, virtually nothing is known about the ecology of this species.

8. Conservation

Data Deficient. Due to its rarity, the available information is absent or inadequate to make a direct or indirect assessment of its extinction risk based on its distribution and/or population status [11]. Micrurus renjifoi is not listed in Resolution 1912 of 2017 from the Ministry of Environment and Sustainable Development of Colombia, nor is it included in the CITES appendices.

9. Scientific name and common names

The genus name Micrurus alludes to the short tail characteristic of these snakes. It is derived from the Greek words "*mikros*," meaning "small," and "*oura*," meaning "tail." The specific epithet *renjifoi* is a patronym honoring the Colombian biologist Juan Manuel Renjifo. In Colombia, the two common names for this species are "coral" and "true coral."

Table 1. Summary of important biological, venomic, epidemiological and medical traits.

★

TOXICITY AND BIOLOGICAL ACTIVITY	VENOM ACTIVITY PROFILE	GENERAL BIOLOGICAL TRAITS
LD_{50} (µg/mice): Unknown	**Proteolytic:** Unknown	**Total Length (cm):** ♂ Unknown ♀ 30.4 (18.2–42.7)
MCD (µg/mL): Unknown	**Neurotoxic:** Yes	**Weight (g):** Unknown
MDD (µg/mice): Unknown	**Myotoxic:** Unknown	**Reproduction:** oviparous
MED (µg/mice): Unknown	**Hemotoxic:** Unknown	**Dieta:** Unknown
MHD (µg/mice): Unknown	-	**Distribution:** Orinoquian region (Orinoco drainage), 115–156 m of elevation, in Colombia (probably in Venezuela)

PROTEOME			
PLA_2: Unknown	**SVSP:** Unknown	**SVMP:** Unknown	**NGF:** Unknown
CRISP: Unknown	**CTL:** Unknown	**DIS:** Unknown	**KUN:** Unknown
BPPs: Unknown	**VEFG:** Unknown	**3FTx:** Unknown	
Crotoxin: No	**Crotamine:** No	**LAAO:** Unknown	

MAIN ENVENOMATION SYMPTOMS		RISK	GRADE OF ENVENOMATION
Hemorrhage: Unknown	**Ecchymosis:** Unknown	**Bites per year:** Unknown	**Mild:** Unknown
Nausea: Unknown	**Hematemesis:** Unknown		
Hypotension: Unknown	**Blisters:** Unknown	**Bites per 1,000 people yearly:** Unknown	**Moderate:** Unknown
Edema: Unknown	**Vomiting:** Unknown		
Coagulopathy: Unknown	**Diarrhea:** Unknown	**Sequalae caused per year:** Unknown	**Severe:** Unknown
Sialorrhea: Unknown	**Local Pain:** Unknown		
Hematuria: Unknown	**Necrosis:** Unknown	**Deaths caused per year:** Unknown	
Renal failure: Unknown			

★ Poorly Reliable: Confidence for this species is poor due to the lack of data and information on Colombian populations. Therefore, most of our knowledge comes from a few studies and populations outside the national territory. LD_{50}: median lethal dose; MCD: minimum coagulant dose; MDD: minimum defibrinating dose; DEM: minimum edema-forming dose; DHM: minimum hemolytic dose; PLA_2: phospholipases A_2; SVSP: serine proteases, SVMP: metalloproteinases; NGF: nerve growth factor; CRISP: cysteine-rich secretory protein; CTL: C-type lectin/lectin-like, DIS: disintegrins, KUN: Kunitz peptides; BPPs: bradykinin-potentiating peptides; VEFG: vascular endothelial growth factor; 3FTx: three-finger toxins; LAAO: L-amino acid oxidases.

10. Referencias

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