

## Case Report

# Envenomation by an opisthoglyphous snake, *Erythrolamprus aesculapii* (Dipsadidae), in southeastern Brazil

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### Abstract

Snakebites by aglyphous or opisthoglyphous snakes are common in Brazil. We report a case of snakebite by the opisthoglyphous *Erythrolamprus aesculapii*. The victim presented with pain, edema, and bleeding at the bite site, along with erythema, similar to a *Bothrops* envenomation. In this type of snakebite, if the snake is not brought to the hospital, the victim may receive unnecessary serum therapy, with the risk of adverse reactions to the antivenom. The possibility of reducing after-effects with anti-inflammatory drugs and early antibiotic therapy for secondary infection need to be further investigated, preferably in multicenter studies, while observing good clinical practice.

**Keywords:** Snakebite. Serpentes. Snakes.

### INTRODUCTION

Snakebites by aglyphous or opisthoglyphous snakes are relatively frequent in Brazil, and correspond to up to 40% of the cases of ophidism that are reported to the health system<sup>1,2</sup>. These snakebites are caused mainly by species of the families Colubridae and Dipsadidae<sup>2</sup>. These snakes possess a supralabial venom gland (the so-called "Duvernoy's gland"), which is considered homologous to the venom glands of the elapids and vipers<sup>3</sup>. When these snakes bite, they can cause envenomation with systemic signs and symptoms<sup>2</sup>, including some fatal cases in children<sup>4</sup> and even in adults<sup>5</sup>.

Many reports of envenomation by colubrid and dipsadid snakes have involved herpetologists, snake technicians, and pet hobbyists<sup>2,6</sup>. In these cases, most injuries occurred on the fingers

or hands during snake handling. The most well-known were the fatal cases involving the herpetologists Karl Patterson Schmidt and Robert Mertens with the African opisthoglyphous colubrids *Dispholidus typus* and *Thelotornis kirtlandii*, respectively<sup>5</sup>. In Brazil, the main "non-venomous" snake species reported in snakebites belong to the genera *Philodryas*, *Helicops*, *Erythrolamprus*, *Oxyrhopus*, *Thamnodynastes*, *Xenodon*, and *Sibynomorphus*<sup>1,2</sup>.

The terrestrial and diurnal species *Erythrolamprus aesculapii*, a species with a coral snake color pattern, shows an opisthoglyphous dentition, and is widely distributed in South America<sup>7</sup>. Juveniles feed mainly on small lizards, while adults hunt snakes and amphibians<sup>7</sup>. In Brazil, Salomão et al.<sup>2</sup> reported 10 cases attended to at the Hospital Vital Brazil in Butantan during a 40-year period (1959–1999), in which pain, edema, and bleeding at the bite site and erythema were described. Here, we report the case of a snakebite by *Erythrolamprus aesculapii* that occurred with a herpetologist.

### CASE REPORT

The incident occurred with a 24-year-old male herpetologist, with a height of 1.75 m and weighing 80 kg, on 22 November,

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2016 at 11:00 h, at the Santa Bárbara Ecological Station, municipality of Águas de Santa Bárbara, (22° 48' 57.9" S, 49° 14' 12.8" W), São Paulo state, Brazil. The professional was bitten while handling the snake during research activities.

The specimen of *E. aesculapii* (field tag MRCM 0361; snout-vent length 599 mm, tail length 90 mm, weight 55 g) bit the herpetologist on the left ring finger (**Figure 1**), "chewing" for about a minute, without causing immediate pain. Five minutes later, edema and pruritus began. The victim then took an antihistamine (dexchlorpheniramine 2 mg and betamethasone 0.25 mg). At 12:00 h, the edema had affected the whole hand and bleeding also occurred at the site of the bite. Four hours later (16:00 h), moderate pain occurred in the hand and fingers, a blister began to appear at the site of the bite, and the edema evolved, reaching the wrist and forearm. At 17:00 h, bleeding stopped at the bite site, the initial blister increased, and others appeared, and a bruise appeared on the bitten finger. At 23:00 h, the patient took another antihistamine (desloratadine 5 mg), the edema reached 2/3 of the arm and ecchymosis spread to the other fingers. The victim did not seek medical attention on the day of the bite.

The next day (23 November), at 7:30 h, the edema had spread to the elbow, and there was paresthesia on the tip of the bitten finger, as well as blisters. At 9:00 h, the patient went to a primary care unit, where ketoprofen 100 mg/2 ml was administered intramuscularly. The only abnormality that appeared on the full blood count was mild eosinophilia. The patient remained under observation until 18:00 h and was discharged on oral cefalexin

500 mg (6/6 h, 7 days), oral ketoprofen 100 mg (8/8 h, 5 days) and topical neomycin sulfate 5 mg and bacitracin zinc 250 IU (cream, 15 g).

The following day (24 November), the edema decreased, but there was still pain in the hand and paresthesia on the tip of the bitten finger. At 22:00 h on the same day, the edema was reduced to half the length of the arm, with paresthesia persisting at the tip of the finger and blisters in the affected region. The manifestations progressively subsided and the patient had no further complaints a week after the accident.

## DISCUSSION

Most of the reported cases of envenomation by opisthoglyphous snakes in Brazil were caused by species of the genus *Philodryas*<sup>2,8,9</sup>. In the state of São Paulo, the genera that caused the most accidents were *Helicops* (21.7% of the cases) and *Philodryas* (20.2%), perhaps because the species of these genera were more abundant and more likely to bite when stepped on or handled<sup>2</sup>. In this same study, only ten cases (0.5% of the total of 1,965 cases) were attributed to *Erythrolamprus aesculapii*<sup>2</sup>. In the cases reported by Salomão et al.<sup>2</sup>, most of the bites (66.7%) occurred in the distal regions of the upper limbs (fingers and hands) and 33.34% occurred on the feet. The symptoms of the victim described herein (pain, edema, and bleeding at the site of the bite and erythema) were the same mentioned by Salomão et al.<sup>2</sup>. These symptoms resemble those typical of envenomation by *Bothrops* sppw<sup>10</sup>.



**FIGURE 1:** A: The adult *Erythrolamprus aesculapii* (total length 689 mm) at the moment of the bite; B: Signs of the bite on the finger; C: Signs of edema in the left arm; D: Finger with blisters.

Two other congeneric species (*Erythrolamprus miliaris* and *Erythrolamprus poecilogyrus*), despite having an aglyphous dentition, may also cause envenomation during bites<sup>2,11</sup>. Similar symptoms (local pain, bite wound bleeding, edema, erythema, paresthesia, and ecchymosis) may be observed in these bites, with less intensity than those reported here, probably due to a greater difficulty in inoculating the venom during bite due to their aglyphous condition<sup>2,11</sup>.

Envenomation by colubrids and dipsadids, which traditionally are considered non-venomous, can result in local pain, edema, erythema, hemorrhage, and other symptoms that may lead to a false diagnosis and thus be confused with *Bothrops* bites<sup>1</sup>. If the snake that caused the envenomation is not brought to the hospital, the victim may receive unnecessary serum therapy, with the risk of adverse reactions to the antivenom<sup>1,2,8,10</sup>.

We recommend for practitioners dealing with snakes (herpetologists and snake technicians) to be especially cautious when handling "non-venomous" species that may cause envenomation (e.g., *Philodryas*, *Thamnodynastes*, *Apostolepis*, *Phalotris*, *Clelia*, *Hydrodynastes*, and *Erythrolamprus*) and, in case of an accident, to report to the health team that the bite was not caused by a viper or an elapid, with no need for serum therapy. Differential diagnoses of similar lesions caused by venomous and non-venomous snakes need to be developed in order to better estimate the real burden of injuries caused by different snake species and avoid unnecessary antivenom use. Hospital-based studies may help to bridge this gap in snakebite epidemiology. Standardization of treatment protocols for the clinical management of injuries caused by aglyphous or opisthoglyphous snakes is urgent. The possibility of reducing local effects by means of drugs with anti-inflammatory activity and early antibiotic therapy for secondary infection needs to be further investigated, preferably in multicenter studies, while observing good clinical practice.

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### Conflict of Interest

The authors declare that there is no conflict of interest.

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