

# First report of an accident with the speckled forest pit viper (*Bothriopsis taeniata*) in Brazil

## Primeiro registro de acidente pela jararaca estrela (*Bothriopsis taeniata*) no Brasil

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### RESUMO

Relatamos o primeiro caso de acidente por *Bothriopsis taeniata* no Brasil. A vítima, trabalhador rural com 43 anos de idade, foi picada pouco acima do calcanhar direito, apresentando quadro clínico compatível por envenenamento botrópico leve: discreto edema com hemorragia no local da picada e dor, embora com ausência de coagulopatia.

**Palavras-chaves:** *Bothriopsis taeniata*. Acidente botrópico. Amazônia.

### ABSTRACT

The first reported case of an accident with *Bothriopsis taeniata* in Brazil is described. The victim, a 43-year-old man, was bitten just above his right heel and presented a clinical condition compatible with mild *Bothrops* poisoning: local edema with hemorrhage at the bite site and pain, although without coagulopathy.

**Key-words:** *Bothriopsis taeniata*. *Bothrops* accident. Amazon region.

Viperidae snake poisoning is considered a public health problem in many regions, especially in subtropical and tropical countries<sup>4 11 16</sup>, causing both morbidity and mortality. 25,364 snakebites were notified in Brazil in 2008, with a mortality rate of 100 deaths/year<sup>9</sup>. *Bothrops* bites represent on average 90% of all poisonous snakebites in this country. There are six South American species in the genus *Bothriopsis* (family Viperidae), commonly known as forest pit vipers, and they range greatly in size<sup>2</sup>. Two species (*Bothriopsis bilineata* and *Bothriopsis taeniata*) are found in lowland rainforests and both of them are considered semi-arboreal species<sup>6</sup>. *Bothriopsis taeniata* is a rare pit viper in Brazil<sup>16</sup> and is almost never detected, because of the resemblance of its cryptic body to leaves and lichens on the forest floor. This paper reports on an authenticated case of a bite by this species and reviews the known literature on its venom.

### CASE REPORT

In November 2007, a 43-year-old man was bitten just above his right ankle by a snake, while working on a rural site. He did not apply a tourniquet or attempt to cut or suck the wound. He immediately washed the wound with water and then alcohol, and took a homemade plant-based medicine labeled *Pau-X* (of unknown composition and formula<sup>3</sup>). He had previously been bitten by an unidentified *Bothrops* sp in 1998, according to the Santarém City Hospital records. He walked a short distance immediately after the snakebite to seek help, and was admitted to the emergency department of Santarém City Hospital (State of Pará, northern Brazil), 2½ hours after the accident. The bite site presented minimal bleeding, but swelling had developed to just below the knee (**Figure 1**). He was conscious, in good general condition and vital signs were normal. Coagulation tests were normal, and a peripheral blood film revealed the following: platelets 162,000/mm<sup>3</sup> (normal values: 150,000-400,000); hemoglobin 15.5g/dl (14-17.4g%); hematocrit 43% (41.5-50.4%); white blood cells 11,500/mm<sup>3</sup> (4,400-11,300/mm<sup>3</sup>) with 83% segmented (1-5%); 13% lymphocytes (18-40%); 2% eosinophils (1-4%); urea 34mg/dl (10-50mg/dl); creatinine 1.20mg/dl (0.4-1.3mg/dl), creatine kinase 267U/l (38-174U/l); and lactate dehydrogenase 344U/l (100-190U/l).

The patient brought the dead adult snake with him (total length of 120cm, **Figure 2**), and this was identified by comparison

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**FIGURE 1**

Ecchymosis and edema in the left ankle, two and a half hours after the bite.



**FIGURE 2**

The speckled forest pit viper (*Bothriopsis taeniata*) that bit the patient.

with digital images as a specimen of *Bothriopsis taeniata*, by the Herpetology Laboratory of the Butantan Institute, São Paulo, southeastern Brazil. Unfortunately, the specimen was then discarded. He received four vials of anti-*Bothrops* antivenom after administration of dipyrone, cimetidine and hydrocortisone in accordance with the guidelines of the Brazilian Ministry of Health<sup>14</sup>. The leg swelling reduced and the patient was discharged in a good condition, without complications, on the second day after the accident.

## DISCUSSION

The Amazon region represents almost 60% of Brazil, and snakebites are common in this region. It is rare for the animal involved in the accident to be brought in by the victim<sup>8</sup>. Seven Viperidae occurs in the Brazilian Amazon region (*Bothrops atrox*, *Bothrops brazili*, *Bothriopsis bilineatus*, *Bothriopsis taeniata*, *Bothrocophias hyoprora*, *Crotalus durissus* and *Lachesis muta*)<sup>16</sup>. The genus *Bothriopsis* is represented by six species in South America. *Bothriopsis taeniata* can be found from sea level up to at least 2,133m<sup>2</sup>. *Bothriopsis taeniata* has exceptionally long fangs<sup>2</sup>, and the largest size attained by this species is 180cm in total length<sup>17</sup>. The efficacy of three

Latin American antivenoms administered to 210 patients bitten by snakes was compared in Ecuador<sup>17</sup>. In that study, twenty nine (14%) of the victims brought in the snake responsible for the bite. Six of the accidents were caused by *Bothriopsis taeniata*, but only two of these victims brought in the snakes (which were 150 and 180cm in total length), while the remainder were identified by enzyme immunoassay. Two cases of bites in Ecuador and Peru by *Bothriopsis taeniata*, both of them on the lower leg, have been reported<sup>18</sup>. *Bothriopsis taeniata* has been described as a semi-arboreal but predominantly terrestrial pit viper<sup>6</sup>, but also as canopy dweller<sup>2</sup>. Paradoxically, the prevalence of bites on lower limbs suggests that this snake has significant terrestrial activity. Unfortunately, data on the patients in such cases, as well as on the snake, are very limited.

To the best of our knowledge, this is the first authenticated case report of a bite by this species in Brazil. The venom from *Bothrops* species has coagulant, hemorrhagic and local inflammatory activity<sup>7 8 10</sup>. *Bothriopsis bilineata* and *Bothriopsis taeniata* have high proteolytic activity on thrombin, plasmin, kallikrein, and cathepsin C<sup>15</sup>. *Bothriopsis taeniata* from Ecuador presented hemorrhagic, anticoagulant and myotoxic activity<sup>15</sup>. *Bothriopsis taeniata* (formerly *Bothrops castelnaudi*) has anticoagulant activity that has been attributed to *in vitro* inhibition of factor X and prothrombin<sup>12</sup>. Although anti-*Bothrops* serum has been formulated from a pool of five coagulant *Bothrops* venoms (*Bothrops alternatus*, *Bothrops jararaca*, *Bothrops jararacussu*, *Bothrops moojeni* and *Bothrops neuwiedi*)<sup>12</sup>, it neutralized the anticoagulant effect of *Bothriopsis taeniata*. *Bothriopsis taeniata* venoms induced neutrophil migration and induced significant hemorrhaging in the peritoneal cavity of mice, thus suggesting that this venom has hemorrhagic activity caused by metalloproteinases<sup>15</sup>.

In conclusion, this case report has shown that the venom of *Bothriopsis taeniata* caused a clinical condition compatible with mild *Bothrops* poisoning without coagulopathy. Furthermore, because of this snake's camouflaging (i.e. the resemblance of the snake's body to leaves and lichens on the forest floor), some of the other accidents with local swelling and hemorrhage that have occurred in the Amazon region may have been caused by *Bothriopsis* species.

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