Journal of Clinical Toxicology
ISSN: 2161-0495

Amaral et al., J Clin Toxicol 2018, 8:4
DOI: 10.4172/2161-0495.1000392

Case Report Open Access

Envenomations in Humans Caused by the Venomous Beetle *Onychocerus albitarsis*: Observation of Two Cases in São Paulo State, Brazil

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Received date: July 23, 2018; **Accepted date:** August 21, 2018; **Published date:** August 24, 2018

Abstract

Beetles (Coleoptera) are the most diverse group of animals in the world and occur in many environments. In Atlantic and Amazon rainforests, the scorpion-beetle *Onychocerus albitarsis* (Cerambycidae), can be found. It has venom glandules and inoculators organs in the antenna extremities. Two injuries in humans are reported, showing different patterns of skin reaction after the stings.

Keywords: Venom; Coleoptera; Cerambycidae; Stings

Introduction

The beetles are insects belonging to the order Coleoptera, the most diverse group of animals in the world. There are currently 250,000 species of beetles, divided into about 190 families, distributed throughout the planet except for the polar regions [1,2]. The Cerambycidae family is the most diverse of the order, grouping so-called saw-wood beetles, which are able to cut the wood from tree trunks where they feed and reproduce. The subfamily Lamiinae shows an important economic rule by owning species considered pests to monocultures. Saperda genus holds some aplle tree's pest, and genus Oberea has harmful species to raspberry cultures [1].

The *Onychocerus albitarsis* (Coleoptera, Cerambycidae, Lamiinae) is a phytophagous species, and occur in South America, with records in Bolivia, Peru, Paraguay and Brazil, mainly in the Amazon and Atlantic Rainforests biomes [2-5]. However, ecological data of this species are scarce. With about 2 cm in length, shows a varied coloration between black, white and yellow tones [6] (Figure 1), and has as characteristic a long pair of articulated antennas, with distal stings connected to glands of venom [2]. These stingers resemble scorpions' stingers and are used primarily to defend themselves and can cause injuries in humans [2,7,8].

This is the only described beetle species capable of inoculating toxins. Defensin proteins have been isolated from the *Acalolepta luxurosa* larvae, which have similiar structure to the peptides that compose the scorpions' venom [2,9] beetles of genera Paederus, Epicauta and Lytta are capable of releasing vesicant substances when crushed or pressed [10-12] the bombardier beetle *Pheropsophus sp.* is capable of storing reactive substances and releasing it when threatened, and can cause injury in humans [13]. But unlike *O. albitarsis*, they do not have an organ of inoculation. Thus, there are no studies describing their toxins, with only chemical residues being recorded in the venom release pores at the end of the stings [2].

Figure 1: *Onychocerus albitarsis* of case 2, and detail of the antenna's sting.

Case Reports

Case 1

A 29-year-old female patient sought care reporting an unknown beetle sting. She had contact with the beetle by accidently touching it with her left forearm, while walking in a trail inside a forest fragment, in a rural area in Botucatu city, São Paulo State (22°50'27.35"S, 48°25'32.89"O). She took the animal to identification (Figure 2A). At the time of the injury, she reported experiencing significant acute pain, followed by the appearance of a central papule with surrounding erythema (Figure 3A). About 24 hours after the injury, the patient presented pruritus and progression of the lesion to an erythematous plaque (Figure 3B). The plaque with local pruritus persisted for seven days. The patient received topical corticosteroids and came back for avaluation after seven days. Since the injury had no longer signs of activity and the patient had no more complaints, she was discharged.

Case 2

A 28-year-old male patient sought care after being stung by an unknown beetle on the right second finger, on the distal phalanx. Described being stung after touching the beetle, which was on the floor of a gas station of highway SP-280, while fueling his car. The gas station is located in a rural area with forest fragments in Boituva City, São Paulo State (23°17'37.65"S, 47°43'14.13"O). He took the animal for identification (Figure 2B). At the time of the injury, he reported having acute pain of moderate intensity, and immediately noticed a slight finger swelling (Figure 3C), about 0.5 cm. The pain disappeared in a few minutes and the edema lasted for an hour. The patient received topical corticosteroids and did not seek further medical attention.

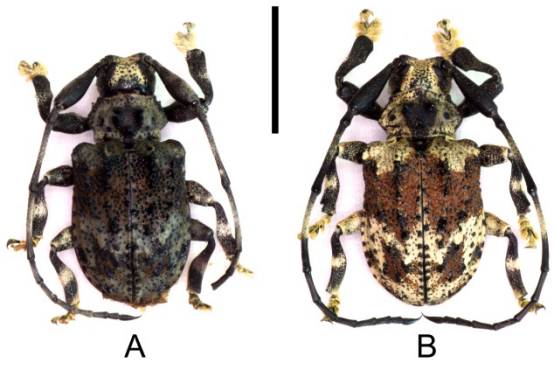

Figure 2: Specimens collected of case 1 (A) and 2 (B). Scale bar equals to 1 cm.

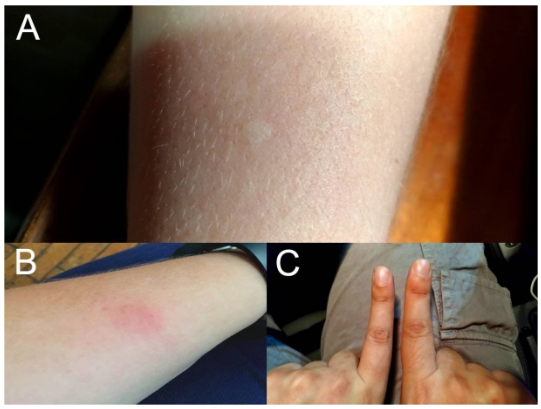

Figure 3: Injuries of case 1 at the moment of sting (A), and after 24 hours (B); injury of case 2 at the moment of sting.

Specimens identification and deposition

Both specimens (Figure 2) were deposited in the Zoology Museum of the Biosciences Institute of Botucatu of the São Paulo State University, indetified at subfamily level by biologist Antonio L. S. Amaral using dicotomic keys of identification, and to species level trough key characters and help of specialized bibliography [6-8].

Ethics review board

The Botucatu's School of Medicine of Universidade Estadual Paulista do not demand approval of Ethics Review Board to publish a case report, therefore, the present work did not need Ethics Review Board authorization before being published.

Discussion

The geographic distribution of the rare scorpion-beetle *O. albitarsis* is little known, occurring in South America. The existence of a beetle capable of inoculating toxins by the antennae is a fact, by itself, little known.

The patterns of post-sting reactions were diverse, but both caused significant inflammation, with clinical similarity with a histamine test (triple response of Lewis, including the central papule and surrounding erythema). There are no more data on venom of scorpion-beetles and it is important to report the occurrence of injuries caused by venomous beetles (not poisonous, such as the Epicauta, Paederus and Lytta genera). Additionally, the research on the composition of the venom will bring new facts for the understanding of the repercussions of the injuries and their therapeutics.

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