

## VETERINARY CARE OF SCORPIONS



Thiago M. Chiariello, DVM

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**Abstract**

The care of terrestrial invertebrates as pets, in zoological displays, or for scientific reasons is increasing; therefore, veterinarians and technicians must be prepared for this demand. There are approximately 1600 species of scorpions, with many being maintained in captive environs. Scorpions represent a public health concern in numerous locales worldwide, which enhances the demand for research investigations. Consequently, there is an increased demand for scorpions along with how to properly care for these animals in captivity. The objective of this article is to provide information regarding appropriate handling of the scorpion patient, recognizing potential signs of illness, and how to perform common medical procedures. Copyright 2017 Elsevier Inc. All rights reserved.

**Key words:** arthropod; scorpion; arachnid; care; medicine

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Scorpions are arthropods belonging to the class Arachnida, order Scorpiones, which are composed of approximately 1600 species. These arachnids have a wide geographical range, tropical-to-temperate distribution, and inhabit all continents except Antarctica.<sup>1</sup> The scorpion body is divided into cephalothorax (prosoma), which is covered dorsally by the carapace, and abdomen (opsthosoma). The prosoma bears all the appendages (chelicerae, pedipalps, and 4 pairs of legs) except the pectines, a sensory organ located ventrally in the opsthosoma. The abdomen is subdivided into mesosoma, which bears 8 respiratory openings (spiracles), and a taillike metasoma, ending in the sting (Fig. 1).<sup>2,3</sup> It is beyond the scope of this article to discuss all anatomic and physiologic features of scorpions, but a basic knowledge is essential to understand and recognize the different signs of diseases. Polis<sup>1</sup> and Hjelle<sup>2</sup> provide most of the essential information related to scorpion anatomy and physiology.

The keeping of terrestrial invertebrates in captivity as pets, in zoological displays, or for scientific reasons is increasing. Therefore, veterinarians and technicians treating exotic animals must be prepared for this demand. Scorpions are maintained in captivity in many countries where accidents with these animals represent a public health concern for venom extraction and subsequent serum production.

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**HUSBANDRY**

There are several different scorpion species currently being raised in captivity, including

*Pandinus imperator*, *Centuroides gracilis*, *Heteromerus* spp., and *Opisthacanthus* spp., among others. Often, each species of scorpion is native to a different natural environment; thus, different living conditions are required in a captive setting. Thus, it is not possible to provide a general care sheet for each scorpion species one may own. Many important factors must be considered when caring for scorpions including humidity, temperature, type and amount of substrate (e.g., sand, topsoil, coconut fiber, and bark), light cycle, terrarium furniture (e.g., hidings and water source), environmental enrichment, feeding type and schedule, and number of animals per

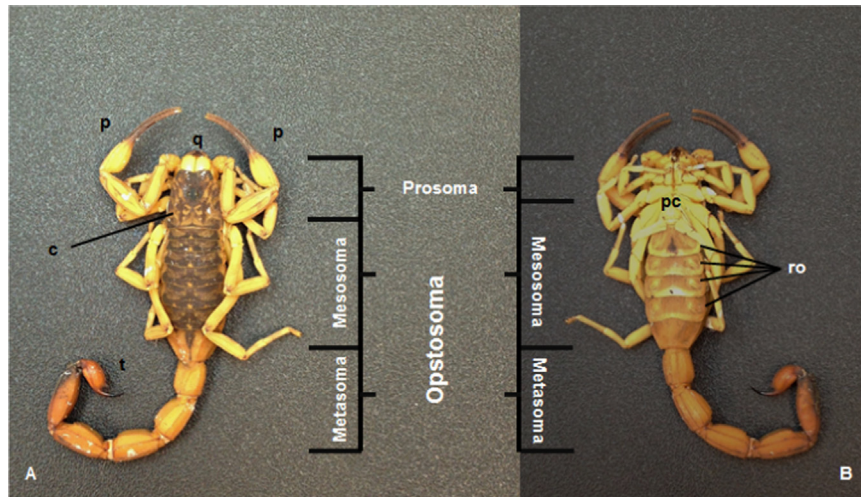
From the Laboratory of Arthropods, Butantan Institute, São Paulo, Brazil.

Address correspondence to: Thiago M. Chiariello, DVM, Laboratory of Arthropods, Butantan Institute, Av. Vital Brazil, 1500, São Paulo, Brazil 05503-900. E-mail: [thiago.chiariello@butantan.gov.br](mailto:thiago.chiariello@butantan.gov.br), [thiago.chiariello@gmail.com](mailto:thiago.chiariello@gmail.com).

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**FIGURE 1.** Dorsal (A) and ventral (B) view of a *Tityus serrulatus*. c, carapace; p, pedipalps (pincers); pc, pectines; q, quelicerae; ro, respiratory openings; t, telson.

terrarium. A review of husbandry needs of common scorpion species maintained in captivity is provided in the [Table](#).

### Housing

A scorpion terrarium should have smooth and relative high walls and a closed lid to avoid climbing and possible escapes. Owners must be aware that some scorpion species are highly venomous and potentially dangerous to humans; thus, an escape-proof enclosure is advisable. The type and amount of substrate for the enclosure should be selected according to the species to be housed. There are some scorpion species with burrowing habits requiring a greater amount of substrate than those that prefer hiding on the surface.

### Illumination and Hidings

Scorpions have nocturnal habits, but this does not exclude the need for a light cycle of 12 hours per day and 12 hours per night. The physiologic importance of light is not well understood for scorpion species, but the significance of a light cycle for invertebrates in general has been determined.<sup>4</sup>

Hiding places and different surfaces (e.g., branches and stones) can be used for decoration and are important for environmental enrichment, stimulating the animals to explore their captive environment, and to display natural behavior. Owing to the risk of contamination, all natural materials must be thoroughly cleaned before being introduced into the enclosure.

### Humidity and Temperature

The need of a heat source to provide a proper environmental temperature is dependent on the location of the enclosure (room temperature and severity of the season of the year) and the scorpion species within. When required, it is advisable to use heat lamps or ceramic bulbs, avoiding direct contact with the animal and thereby reducing the incidence of thermal injuries. Humidity within the enclosure must be constantly observed to avoid dehydration of the animal due to overheating of the animal's environment that could subsequently lead to decreased moisture content of the terrarium air. Humidity can be controlled by increasing the terrarium ventilation when in excess or spraying water into the enclosure when the moisture level is too low, always according to the individual species requirements. Ventilation can be provided through openings on the sides or the lid of the enclosure, but the size of the openings must be small enough to prevent an animal from escaping.

### Food and Water

Scorpions are strictly carnivorous; thus, captive-bred prey insects can be offered on a weekly or biweekly schedule. Wild-caught prey items should be avoided owing to the risk of pesticide contamination and introduction of parasites. Water must be provided ad libitum in a shallow dish, but the major source of water for scorpions is contained in their food.<sup>1</sup> For juveniles or small scorpion species, gravel can be placed into the water dish to avoid drowning. Poor water quality, availability, and presentation are often factors

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