



## Scorpions

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### What You Should Know

- Scorpions are most active at night, and hide under boards, rubbish, bricks, and in wood piles.
- Although all scorpions have venom, only one species in the United States is considered to have a potentially life threatening sting.

Scorpions are eight-legged carnivorous arthropods and belong to the class Arachnida. This class also includes ticks, spiders, and mites. There are approximately 1,300 species of scorpions worldwide and 75 species in the United States, but only 9 are recognized in Utah (Table 1). Scorpions are usually found in semiarid deserts. Most species that occur in the United States have been found in Arizona, parts of Texas, and central Oklahoma. Most Utah scorpions are found in the southern part of the state; however, three species are occasionally found in northern Utah.

Scorpions are easily distinguished from other arthropods. They vary in color from black, gray, brown, and yellow, and range in size from  $\frac{1}{2}$  to  $7\frac{1}{4}$ " long. Scorpions have two major body regions: cephalothorax (head and thorax) and abdomen. Scorpions can have 2 to 5 pairs of eyes depending on the species; however, some cave dwelling species are blind. The mouthparts are made up of a pair of chelicerae for grasping prey. The thorax has four pairs of walking legs and a pair of pedipalps (Fig. 1). The pedipalps are modified legs that have pinchers for grasping prey. The pedipalps are covered with trichobothria, or hairs, that sense air vibrations and aid in capturing prey and mating. The entire cephalothorax is covered by the carapace, which is a hard bony outer covering. The abdomen is made up of the mesosoma and the metasoma. The mesosoma contains the lungs, digestive organs and the pectines. The pectines are feathery sensory organs which hang beneath the abdomen and trail on the ground, and are thought to alert the scorpions of nearby prey and potential mates. The metasoma is a tail that curves up and bears the telson, or stinger (Fig. 1). Inside the telson is a pair of venom glands.



Fig. 1. The black hairy scorpion, *Hadruroides spadix*, is found in southeastern Utah. Note the enlarged pedipalps for grasping prey and the stinging telson at the end of the tail.<sup>2</sup>

### Life Cycle

Most scorpions live between 3 and 5 years, although some species are thought to live 10 to 15 years. They usually mate in the fall or early spring. The male performs a courtship dance prior to mating that can last several hours. The male will grab the pedipalps of the female and lead her around until he finds a suitable place to deposit his spermatophore, or sperm packet. Once he deposits his spermatophore on the ground, he leads the female over the top of it. After mating is complete, the male and the female separate. Although sexual cannibalism is rare with scorpions, the male usually leaves quickly to avoid being eaten by the female.

Female scorpions do not lay eggs. Instead, the female bears live birth after a gestation period of anywhere between 6 and 18 months depending on the species. The female can produce 2 to 100 young in a litter. The average litter is about eight young. The immatures look like adults except are smaller in size. After birth the young climb on the back of their mother and stay there until the first molt (Fig. 2). After the first molt the immatures leave their mother and defend themselves. Scorpions go through 5 to 7 molts over 2 to 6 years before becoming adults.

## Habitat and Feeding Behavior

Scorpions are nocturnal. They find shelter during the day and come out at night to feed. Overall, scorpions have flattened bodies in which they can easily fit under stones and wood. They tend to hide under boards, in stacked lumber, firewood piles, attics, and in debris. Scorpions can accidentally enter homes through very small openings by windows and doors.

All scorpion species possess venom. The most venomous species have more delicate pedipalps and larger, stronger tails. Scorpions use venom to kill or paralyze their prey and to defend themselves against predators. The venom is a mixture of salts, peptides, and proteins. The formula creates a neurotoxin that slows down the nervous system. Scorpions are able to regulate how much venom they inject, depending on the size of the prey. Scorpions often ambush their prey. They sit and wait until they sense its approach. Nymphs and adults consume all types of insects, spiders, centipedes, and smaller scorpions. Larger scorpions may feed on small lizards, snakes, and mice. They capture their prey using their pedipalps, and if necessary, paralyze them with their sting. Scorpions cannot ingest solid food. Once the prey has been paralyzed, the scorpion will pinch off sections using their chelicerae. Pre-digestive fluids in the mouth help to liquefy prey before entering the stomach. Anything that can not be turned into liquid is discarded.

Scorpions are prey to creatures such as, centipedes, tarantulas, lizards, birds, and small mammals including shrews, grasshopper mice, and bats.



Fig. 2. A female scorpion will carry her young on her back until after the first molt.<sup>1</sup>

## Medical Importance

Most scorpion stings are relatively harmless to humans. Stings generally produce local effects such as pain, numbness, or swelling; symptoms usually subside within 30 minutes. Unless a person has an allergic reaction to the venom, the stings are no more serious than stings of ants, bees, or wasps. The only species in Utah that is potentially harmful to humans is *Centruroides exilicauda*, or the Arizona bark scorpion (Fig. 3). Children and older adults are more likely to express symptoms if stung. Symptoms of a Arizona bark scorpion sting usually subside within 48 hours, and may include restlessness, convulsions, staggering gait, thick tongue sensation, slurred speech, drooling, excessive sensitivity of skin, muscle twitches, abdominal pain and cramps, and respiratory depression.

People stung by a scorpion should consult a doctor. The individual reaction to the venom can vary greatly. In most cases treatment of a scorpion sting consists of managing the symptoms. If access to a doctor is delayed due to location, use the following guidelines if possible:

- Hold ice over the sting site to reduce pain and swelling.
- Do not submerge the affected area in water.
- Do not make any incision at the site of the sting.
- Keep the victim relaxed and calm.
- Victim should not consume alcohol or take sedatives.
- Capture the scorpion for identification, if possible.



Fig. 3. The Arizona bark scorpion, *Centruroides exilicauda*, is a potentially harmful to humans.<sup>1</sup>

## Management

Scorpions are not typically a problem around homes unless they are in a recently developed desert area. Outside, they can be found burrowing into sand boxes, ditches, and gravel pits. Scorpions are very difficult to control outside. To minimize scorpions from around a home, eliminate favorable habitat. Do not keep shoes, boots, clothing items, or wet towels outside. Clean up any debris around the house, and only bring firewood inside when it is immediately going to be burned. Wear gloves and boots when cleaning areas where scorpions may hide. Scorpions are not generally found inside human structures, and are considered transient pests that accidentally enter a home. Scorpions can be found under the house, or in areas with water (e.g., bathroom, laundry room, etc.). Sealing windows and doors, and caulking any cracks in the foundation will discourage scorpions from entering a structure.



Fig. 4. Scorpions often glow under a blacklight.<sup>1</sup>

## Chemical Control

Scorpions should be considered beneficial predators since they feed on a variety of arthropods. However, if scorpion population becomes intolerable, pesticide applications may be warranted. Hiding places and burrows should be located and treated. Repeated applications may be necessary for effective control as some scorpions hide for many months after feeding. An ultraviolet blacklight may help identify scorpions at night (Fig. 4). Outdoor applications of residual products should be aimed at eliminating scorpions from entering a structures. There are many over-the-counter products labeled for use in Utah that are effective against scorpions around the home. Dust formulations may provide more effective control. Products registered in Utah include carbaryl, beta-cyfluthrin, bifenthrin, deltamethrin, esfenvalerate, lambda-cyhalothrin permethrin, and prodimamine.

**Table 1. List of scorpions found in Utah**

Scientific Name	Common Name	Distribution	Body Size*
<i>Anuroctonus phaiodactylus</i>	Wood scorpion	Great Basin	Large
<i>Centruroides exilicauda</i>	Arizona bark scorpion	Kane County	Medium
<i>Hadrurus arizonensis</i>	Giant desert hairy scorpion	Southwestern Utah	Large
<i>Hadrurus spadix</i>	Black hairy scorpion	Southeastern Utah	Large
<i>Paruroctonus becki</i>		Washington County	Medium
<i>Paruroctonus boreus</i>	Northern scorpion	All of Utah	Medium
<i>Paruroctonus utahensis</i>	Eastern sand scorpion	Southeastern Utah	Medium
<i>Vaejovis confusus</i>		Western Utah	Medium
<i>Serradigitus wupatkiensis</i>		Southeastern Utah	Small

\*Large (>100 mm); Medium (50-100 mm); Small (<50 mm)

<sup>1</sup> Image courtesy of Wikipedia (<http://en.wikipedia.org/wiki/Scorpion>).

<sup>2</sup> Images courtesy of Jim Kalisch, Department of Entomology, University of Nebraska-Lincoln (<http://entomology.unl.edu/images/scorpions/barkscorpion4a.jpg>).

**Precautionary Statement:** All pesticides have benefits and risks, however following the label will maximize the benefits and reduce risks. Pay attention to the directions for use and follow precautionary statements. Pesticide labels are considered legal documents containing instructions and limitations. Inconsistent use of the product or disregarding the label is a violation of both federal and state laws. The pesticide applicator is legally responsible for proper use.

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