SCORPIONS

Integrated Pest Management around the Home and Landscape

Scorpions (Figure 1) are nocturnal, predatory animals that feed on a variety of insects, spiders, centipedes, and other scorpions. Large scorpions occasionally feed on vertebrates such as small lizards, snakes, and mice. Most scorpions live in warm, dry climates, and many of the species found in North America occur in Arizona, adjacent areas of California, and parts of New Mexico. Of the 70 or so species found in North America, only one, the bark scorpion, *Centruroides exilicauda* (formerly *C. sculpturatus*), is considered dangerous to people.

IDENTIFICATION

Scorpions are easily distinguished by their crablike appearance, pair of pincers, four pairs of legs, and long, segmented tail ending with an enlarged segment bearing a stinger (Figure 2). Although they have two eyes in the center of the head and usually two to five more along the margin on each side, they don't see well and depend on touch. When running, they hold their pincers outstretched, and the posterior end of the abdomen is usually curved upward. Scorpions that hide under stones and other objects during the day tend to carry their stinger to one side, whereas burrowing scorpions hold their stinger up over their backs.

Scorpions are arthropods in the class Arachnida and order Scorpionida. Notable species of scorpions in the southwestern United States include the bark scorpion, which has venom that is dangerous to people; the Arizona hairy scorpion, the largest of the North American scorpions; and the stripedtail scorpion, one of the most common species. Other less common species of scorpions also occur in California and can be found from sea level to elevations above 7,000 feet. Like the Arizona hairy scorpion and the stripedtail scorpion, these species play a beneficial role in the environment and pose no real danger to humans.

The bark scorpion (Figure 3) is found throughout Arizona, in the extreme southeastern portion of California near Arizona, and in southwestern New Mexico. In Mexico, the bark scorpion is found in Baja California Norte, Baja California Sur, and Sonora. Bark scorpions reach a length of 3 inches and have a very thin tail only $^1/_{16}$ inch wide; the body is yellow without stripes or patterns. The bark scorpion is the only common climbing scorpion and does not normally burrow but usually lives above ground under tree bark and in palm trees and crevices of rocky cliffs. Because it can ascend slump block walls or stucco, this species is the scorpion most likely to enter dwellings. The bark scorpion is attracted to moisture around homes and in the house. It also may be found in stacked lumber or bricks, firewood piles, cellars, and attics. It needs only a crack of $^1/_{16}$ inch to enter a home.

Figure 1. Adult scorpion, *Vaejovis* species.

The Arizona hairy scorpion, *Hadrurus arizonensis*, is a common desert species found in Southern California and throughout Arizona. In Southern California it has been reported in Imperial, Inyo, Kern, Los Angeles, Riverside, San Bernardino, and San Diego counties. At maturity it can be 5 to 7 inches long. Like many other desert scorpions, the Arizona hairy scorpion is a burrower but may also be found under rocks, logs, sleeping bags, and other surface objects. This scorpion

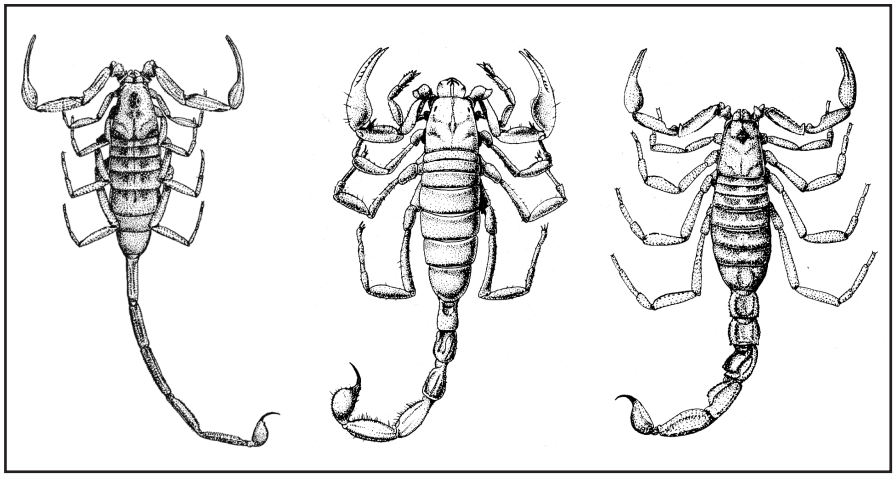

Figure 2. Bark scorpion (left), Arizona hairy scorpion (center), and stripedtail scorpion (right).

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can often be found around homes and in garages. It is a night feeder attracted to water, swimming pools, irrigated areas, or outside lights where food prey such as beetles, cockroaches, crickets, moths, and other insects are attracted as well. During the day it may be found in woodpiles, palm trees, and decorative bark or under loose boards, woodpiles, rocks, or the bark of trees. Like some other scorpions, the Arizona hairy scorpion may enter homes in search of water. Common indoor places where it might be found are dark, cool areas in the bathroom or kitchen as well as crawl spaces, attics, and closets.

The stripedtail scorpion, *Vaejovis spinigerus*, is one of the most common scorpion species in Southern California, Arizona, and the United States. It is a burrowing scorpion that is often found in sandy soil but can survive in a variety of habitats from desert floor to rocky hillside. At maturity, the stripedtail scorpion is about 2 1/2 inches long, and the body is striped on the upper side. This scorpion is venomous but not considered dangerous. It may be found under common objects such as sleeping bags, shoes, and other similar items.

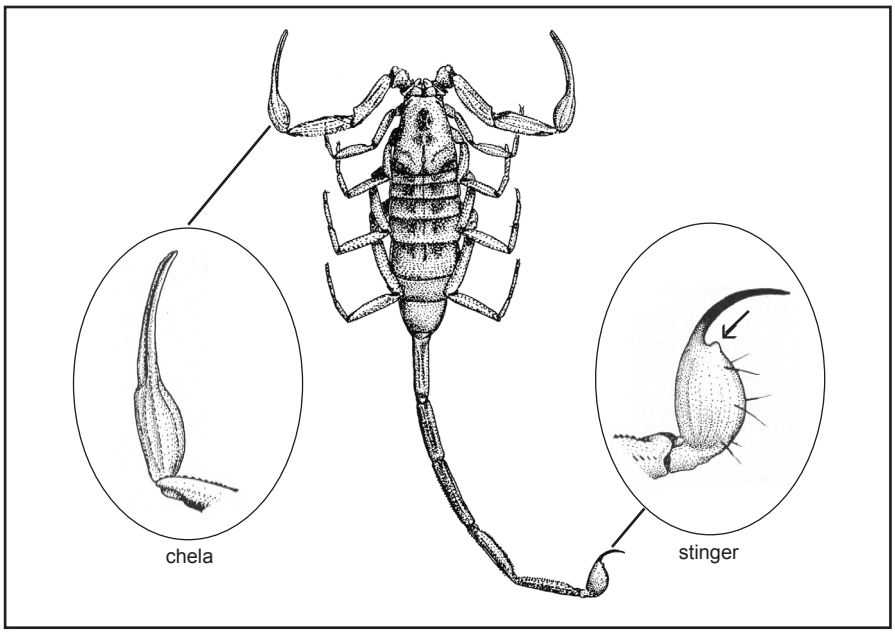

Figure 3. Bark scorpions, which are the only dangerous species in California, differ from other species with their thin tail, their narrow chelae (or pincers)—they are about six times as long as the broadest part of their body—and the little bump (or tooth) just below the stinger.

LIFE CYCLE

Scorpions grow slowly. Depending on the species, they may take 1 to 6 years to reach maturity. On average scorpions may live 3 to 5 years, but some species can live as long as 10 to 15 years.

Scorpions have an interesting mating ritual. The male grasps the female's pincers with his and leads her in a courtship dance that may last for several hours. The exact nature of this courtship dance varies from one species to the next. In general, the male deposits a sperm packet and maneuvers the female over it. The sperm packet is drawn into the female's genital opening located near the front on the underside of her abdomen. The female stores the sperm packet, and the sperm is later used to fertilize her eggs. After mating, unless he is quick and able to escape, the male is often eaten by the female.

Once the female is impregnated, the gestation period may last several months to a year and a half depending on the species. A single female may produce 25 to 35 young. Scorpions are born live, and the young climb onto their mother's back. The young scorpions remain on their mother's back until their first molt. They assume an independent existence once they leave their mother's back. Scorpions molt five or six times until they become full-grown adults.

Scorpions generally hunt at night and use their stinger to paralyze prey. However, if the scorpion is strong enough to overpower its prey, instead of injecting its venom it will simply hold the prey and eat it alive. This conserves venom, which can take up to 2 weeks to regenerate, during which time the scorpion's main defense is inactive.

Outdoors during the day, scorpions hide in burrows or debris, under wood, stones, or tree bark, and under floors of buildings in crawl spaces. Indoors scorpions may be found in cracks and crevices of woodwork, behind baseboards, in closets and attics, and inside walls. Scorpions gain entry into buildings through poorly sealed doors and windows, cracks in foundations, attic vents that aren't properly screened, and through plumbing and other openings.

IMPACT

The effect of a scorpion's sting depends primarily on the species of scorpion involved. The sting of scorpions in *Vaejovis* and *Hadrurus* genera is usually no more serious than stings of ants, bees, or wasps, unless a person has an allergic reaction. Normal reactions include an immediate intense, localized, burning sensation with little redness or swelling; symptoms usually subside after about 30 minutes.

The sting of a bark scorpion, however, can be serious, producing severe pain and swelling at the site of the sting, numbness, frothing at the mouth, difficulty breathing, respiratory paralysis, muscle twitching, and convulsions. These symptoms are signs for the need of immediate medical attention. Especially at risk are children and the elderly. In California, the bark

scorpion occurs only in the extreme southeastern part of the state, along the Arizona border.

Anyone stung by a bark scorpion or experiencing an allergic reaction to a sting should seek medical attention. Keep the sting victim calm and relaxed, and don't allow the consumption of alcohol or other sedatives. It may be helpful to apply pressure compression as well as an ice pack to the sting site. Capture the scorpion for identification if you can do it without risking your safety. Antivenins are available to treat severe reactions to stings.

Death from scorpion sting is rare, because stinging encounters are uncommon and antivenin is effective. During a 10-month period in the Southwest, physicians reported 1,573 cases of scorpion stings. The last reported death in Arizona, where scorpions are common, was in 1948.

MANAGEMENT

To prevent stinging encounters with scorpions, don't leave shoes, boots, clothing items, or wet towels outdoors where scorpions can hide. Shake towels around the swimming pool and shake all clothing and shoes before putting them on. Wear gloves when working in the yard. Wear shoes outdoors, especially during the evening hours. A portable black light (UV light) may be used to survey for scorpions in and around the home. Scorpions glow brightly under black light and are therefore easily found and removed.

Scorpions can enter buildings through openings around plumbing fixtures and loose-fitting doors and windows as well as cracks in foundations and walls. Outdoor lights attract insects and thus the scorpions that feed on insects. Yellow outdoor lighting is less attractive to insects and is recommended in areas where scorpions are prevalent. The first strategy for control is to modify the area surrounding a house, because scorpions are difficult to control with insecticides. Use the following checklist to protect your home:

- Clean the yard by removing all trash, logs, boards, stones, bricks, and other objects from around the foundation of the home.
- Prune overhanging tree branches away from the house, because they can provide a path to the roof for scorpions.
- Don't store firewood inside the house; bring in only wood to be directly placed on the fire, and check for scorpions before bringing the wood inside.
- Install weatherstripping around loose-fitting doors and windows.
- Caulk around roof eaves, pipes, and any other cracks that allow entrance into the home.
- Make sure window screens fit tightly in the window frame, and keep the screens in good repair.

Pesticides aren't always effective against scorpions, because they hide in cracks and crevices during daylight hours. Adult scorpions are more difficult to kill with pesticides because of their larger body size and thicker cuticle. Read and follow label directions, and use pesticides only in combination with other control measures outlined above. Don't overuse pesticides out of frustration just because they appear to be working too slowly at label rates of application. If you choose to use pesticides, apply them to exterior walls around the foundation of the house from the ground up to 1 foot; also make applications around doors, window eaves, and other potential points of entry. Follow directions on the package for dosage, mixing, and application methods.

HOW TO SAFELY CAPTURE A SCORPION

Scorpions can be captured by placing a quart-sized glass jar over the scorpion and sliding a sheet of heavy construction paper under the jar. With the sheet of paper securely over the mouth of the jar, invert the jar; the scorpion will fall to the bottom of the jar. Screw a secure lid over the mouth of the jar. Scorpions can also be picked up safely with forceps that are 10 to 12 inches long, or with other long mechanical devices made for picking up small objects, and placed in a glass jar secured with a screwtype lid. Glue boards measuring 8 x 5¼ inches may also be useful in trapping scorpions.

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WARNING ON THE USE OF CHEMICALS

Pesticides are poisonous. Always read and carefully follow all precautions and safety recommendations given on the container label. Store all chemicals in the original, labeled containers in a locked cabinet or shed, away from food or feeds, and out of the reach of children, unauthorized persons, pets, and livestock.

Pesticides applied in your home and landscape can move and contaminate creeks, rivers, and oceans. Confine chemicals to the property being treated. Avoid drift onto neighboring properties, especially gardens containing fruits or vegetables ready to be picked.

Do not place containers containing pesticide in the trash or pour pesticides down the sink or toilet. Either use the pesticide according to the label, or take unwanted pesticides to a Household Hazardous Waste Collection site. Contact your county agricultural commissioner for additional information on safe container disposal and for the location of the Household Hazardous Waste Collection site nearest you. Dispose of empty containers by following label directions. Never reuse or burn the containers or dispose of them in such a manner that they may contaminate water supplies or natural waterways.

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