

Biology and Control of Spiders, Scorpions, Centipedes and Millipedes

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Spiders are not insects, but like insects they have jointed legs and a hard outer skeleton. In contrast to insects, spiders have four pairs of legs, with a body divided into only two regions (cephalothorax and abdomen). They have no wings or antennae but have jaws, which are a pair of enlarged structures (chelicerae) called fangs.

All spiders feed on living animal life. Their “jaws” and venom are simply a means of capturing and subduing prey. The majority of spiders either cannot effectively pierce the skin of humans or never have the opportunity to do so. Or if they do, the venom at the most causes only trivial, transient pain, a slight local reaction at the site where the venom is injected or no reaction at all.

Many people fear spiders because they believe they are aggressive and will seek to bite humans with little or no provocation. On the contrary, most spiders are not aggressive. Spiders rush across their webs to investigate a disturbance, which creates a situation where spiders appear to be aggressive. This is a natural reaction, as spiders employ webs to entrap other animals for food, and the rush to investigate is merely a hunting reaction.

Fatalities from spider bites are rare, and the consequences of the bite depend on the type of spider and sensitivity of the individual to toxins. The severity of the reaction to poisonous spider bites is dictated by many factors. The amount of venom injected may vary from almost none to a full dose, depending on the site of the bite,

the length of time the fangs are in the tissues and the quantity of venom in the gland sacs at the time of biting. Also, the severity of individual reaction to the venom varies widely depending on the age and general state of the victim’s health. In Arkansas, two spiders are poisonous. They are the black widow and the brown recluse spiders.

Black Widow Spiders

Since early times, natives of many countries have known and feared the bite of the black widow spider. In Arkansas, the black widow or “hourglass” spider can be found throughout the state. This spider is easily recognized by the jet black body with the red or orange hourglass mark on the underside of the abdomen. The males are much smaller than the females and usually have yellow and red bands and spots over the back, as do the immature spiders.



Black widows spin tangled webs of coarse silk in dark places, usually outdoors. Trash, rubble piles and littered areas are usually most favored by the black widow. Outbuildings such as privies, sheds and garages may be

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infested as well as crawl spaces, cellars and basements. The webs are usually built near the ground, occasionally within dwellings, but normally under or around houses and in nearby littered areas. The threads of the black widow spider web are so strong that they were used as cross hairs in gunsights on World War II naval ships.

The female black widow is shy and nocturnal in habit. She does not leave her hidden web voluntarily and is completely out of her element away from the web. She is not aggressive and often may be subjected to extreme provocation without attempting to bite. However, the female may rush out and bite when her web is disturbed or when she is accidentally trapped in clothing or shoes. In the past, bites were commonly inflicted on persons using old-fashioned outdoor privies. Laborers or householders moving lumber and rubble from infested areas may accidentally trap the spiders with the fingers.

Black Widow's Bite

The first sensation felt when bitten by a black widow is the pinprick sharp insertion of the fangs. This is usually followed by a burning sensation for a few minutes. Pain usually progresses after the bite up or down the arm or leg, finally localizing more or less in the abdomen and back. The abdominal muscles become rigid and boardlike with severe cramps. Other symptoms may be nausea, depression, insomnia, tremors, a speech defect and a slight rise in body temperature. The general symptoms may appear after a few hours or may be observed within a few minutes of the bite. Muscular spasms and cramps of the arms, legs, back and abdomen may be quite painful at the height of the reaction.

If bitten by a black widow spider, first make a positive identification and then clean the site of the spider bite well with soap and water. If the spider bite is on an arm or a leg, tie a snug bandage above the bite to help slow or halt the spread of venom. Ensure that the bandage is not so tight as to cut off circulation in the arm or the leg. Use a cold cloth at the spider bite location. Apply a cloth dampened with cold water or filled with ice. Seek immediate medical attention. Treatment for the bite of a black widow may require an antivenom medication.

The venom of the black widow spider is 15 times as toxic as the venom of the prairie rattlesnake. However, only a minute amount of toxin is injected with a single bite by the spider, compared to a relatively large amount of rattlesnake venom.

The decline in the use of outdoor privies and increased public knowledge concerning the black widow have resulted in a decline in the number of bites by the black widow. Preventive measures to

reduce the occurrence of black widow spiders include cleaning areas of rubble, scrap and lumber materials or old machinery unused for long periods. Sprays may be used around buildings and in crawl spaces to reduce spider populations. Spraying near the ground and in cracks and crevices around windows or doors will significantly reduce spider populations and reduce the number of insects that are available as food sources.

Brown Recluse Spiders

The brown recluse spider is one of several poisonous spiders in the United States whose bite can cause a severe reaction. This spider can become a problem not only for homeowners but also for pest control operators doing inspections or providing other services in crawl spaces, basements, attics and outbuildings. This spider can be difficult to control without a thorough understanding of its habits.



The brown recluse spider is a native species and is one of several similar-looking fiddleback, violin or brown spiders in the genus *Loxosceles* found in the United States. The brown recluse is a medium-sized, soft-bodied spider 1/4 to 1/2 inch long with leg span about the size of a half dollar. The males are slightly smaller than the females. The brown recluse is yellowish tan to brown with no obvious pattern, while the base of the legs are yellow-orange in color. Although the legs are covered with very minute brown hairs, they appear bare to the naked eye. Each foot has two claws. The legs of the adult are 1 inch or more and gradually taper. The third pair of legs is the shortest.

The brown recluse spider spins small, loose, white to off-white webs with irregular strands without a definite pattern. It can be a "cobweb-type" webbing, which is used primarily as a retreat for the spider rather than a trap for prey. Indoors, the web can be somewhat flattened and is usually found against a

wall or ceiling in an undisturbed corner of a room. Outdoors, the brown recluse spider spins a tube or cocoonlike web of thick silk for the winter.

The brown recluse feeds on a wide variety of small insects. It is active primarily at night and will stalk prey in the open. During the day, it hides in dark niches and corners, hence its name. Cockroaches and other household insect pests can readily sustain spider infestations indoors. The brown recluse can survive long periods without food.

The female lays eggs from May through August in sacs containing 40 or more eggs, which she guards until she dies. A female will bear as many as 300 eggs during her lifetime. These spiders mature in about 11 months and may live as long as two years.

The brown recluse is found mainly in the Midwestern and Southern states, but has been spreading into the Middle Atlantic states. This spider is a serious problem in Oklahoma, Missouri, Arkansas and Kansas and in parts of the surrounding states. It has also been reported in California, Wyoming, Arizona, Florida, Washington, D.C., and in other locations. However, it should be remembered that a complex of fiddleback spiders can be found in these areas that can be easily confused with the more dangerous brown recluse.

Brown Recluse's Bite

Both the female and the male brown recluse have the ability to bite and inject venom. The brown recluse is not aggressive and usually retreats from situations that may be threatening. However, it usually bites when it is disturbed or is being crushed. Most bites occur on the hands and arms when people put on clothing that has been stored or when they roll over in bed. The bite is usually not felt but may cause a stinging sensation. The victim may not be aware of the bite for one to three hours. This is followed by a small blister, local swelling and mild to severe pain two to eight hours later.

The person who is bitten may become restless, feverish and have difficulty sleeping. The local pain is frequently quite intense, and the area surrounding the bite remains congested and hard to the touch for some time. The tissue affected locally by the venom is killed and gradually sloughs away, exposing the underlying muscles. The edges of the wound thicken and are raised, while the central area is filled by dense scar tissue. Healing takes place quite slowly and may take six to eight weeks. The end result is a sunken scar, which has been described as resembling a "hole punched or scooped from the body." Scars ranging from the size of a penny to half-dollar have been reported.

The necrotic condition described above is typical of all bites of the brown recluse. However, in some cases, a general systemic reaction has also occurred. In one case, the person who was bitten broke out with a rash resembling that of scarlet fever. In another case, the kidneys were apparently affected, causing bloody urine to be passed. These systemic disturbances probably occur infrequently and are the result of a "full" bite (i.e., the injection of a maximum amount of venom) or extreme sensitivity to the venom. This general reaction to the bite of the brown recluse is certainly a serious condition, and hospitalization of the patient may be required. Those in poor general physical condition, young children and older people are more apt to be affected seriously by the bite of the brown recluse.

If bitten by a brown recluse spider, first make a positive identification, if possible, and then clean the site of the spider bite well with soap and water. If the spider bite is on an arm or a leg, tie a snug bandage above the bite to help slow or halt the spread of venom. Ensure that the bandage is not so tight as to cut off circulation in the arm or the leg. Use a cold cloth at the spider bite location. Apply a cloth dampened with cold water or filled with ice. Seek immediate medical attention. Doctors may treat a brown recluse spider bite with corticosteroids.

Spider Bite Prevention

Recognizing the spider, and knowing it is poisonous, should reduce the chance of contact. Examine and shake out clothing that has hung unused for a long time in closets and other storage areas before wearing. Boots that have not been worn for some time are a favorite hiding place. Be cautious when you clean storage areas. Places suspected of harboring spiders may be treated with insecticides. Reducing insects around infested areas is an important factor in spider control, as the insects serve as food for the spiders.

The brown recluse should be controlled in the spring and early summer since the spiders move about in the late summer and fall months. This tendency to wander may be due to efforts of the sexes to locate one another for mating. Most of the bites experienced by humans occur from June to October.

Other Spiders

Many other spiders inhabiting Arkansas are feared by the public. This is usually because of their large size or conspicuous markings. The following are brief descriptions of these nonpoisonous species.

Tarantulas

Tarantulas are the largest of American spiders and are found primarily in the hill areas of Arkansas. Their large size (the leg span of large females may be as much as 5 inches in diameter) and forbidding hairy appearance have given these spiders an undeserved reputation of dangerous aggression. The jaws of the tarantula work in a vertical plane rather than in a horizontal one, as do those of the true spiders. To use the fangs in this plane, the tarantula must elevate the front of the body. When cornered by humans or other animals, this position is taken and the fangs are used in a rakelike manner. Fortunately, the venom contained in sacs, held entirely within the base of the fangs, is not very toxic to mammals. The strong jaws, however, can inflict slightly painful wounds. A tarantula bite may feel like a pinprick, with mild pain, smarting and soreness. **The possibility of being bitten by a tarantula is quite remote.** Accidental contact is almost impossible, and the encroachment of civilization has greatly reduced their numbers.



Wolf Spiders

Some of the more common species of the family *Lycosidae* or “wolf spiders” are large, handsome spiders. Perhaps because of their size and rapid movements, they are almost universally feared. They are, in fact, quite shy and retreat rapidly to shelter when disturbed. The venom of two of the larger species has been tested on laboratory animals and has proven to be quite harmless to mammals. Opportunity for personal contact with the larger *Lycosids* is rare. They do not ordinarily inhabit buildings and, being very strong and swift, do not tarry long in the presence of humans.



Spider Control

Effective spider control requires good sanitation and elimination of insect prey as well as chemical treatment. **The following spider management program is suggested:**

- Discourage spiders by destroying webs, egg sacs and spiders by brushing or vacuuming.

Benefits From Spiders

Since the black widow and brown recluse spiders are the only poisonous species known to occur in Arkansas (and in fact, in most of the United States), this leaves hundreds of species of spiders in our everyday environment that are either beneficial or neutral in relation to humans. The vast majority are distinctly beneficial to humans by destroying noxious insects in and around the home, yard and garden. Wholesale destruction of spiders in general should be avoided since they feed on many harmful species of insects.

- Remove collections of paper, boxes and rubbish piles in the house, attic, storage areas, etc. Elimination of harborage will discourage spiders.
- Maintain household insect control. Lack of food will discourage spiders and force them to move elsewhere.
- Caulk or seal openings to control both insect and spider entry.
- Use labeled insecticides for spider control.
 - Space treatment with aerosols containing pyrethrins, such as Ortho Roach, Ant & Spider Killer, are effective and provide fast kill of exposed spiders.
 - Treatment of suspected spider harborage with either **esfenvalerate** (Ortho Bug-B-Gon Garden & Landscape Insect Killer Concentrate), **cyfluthrin** (Bayer Advanced Home Pest Control Indoor & Outdoor Insect Killer) or **bifenthrin** (Ortho Home Defense Perimeter & Indoor Insect Killer) insecticides can be effective.
 - Insecticide dusts containing **deltamethrin** (Delta Dust) can be used in void areas, attics and storage buildings.

Scorpions

Among the near relatives of spiders are the scorpions. You can recognize them by their large pincerlike pedipalps (claws) and the long post-abdomen that bears a bulbous terminal segment with a poison-sting. Scorpions are common in warm countries. Several species are found in the dry, hot Southwestern states and in Mexico, but few are

found in the northern areas of America. The striped bark scorpion *Centruroides vittatus* is the most common scorpion in the southern United



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States. Scorpions found in Arkansas, while capable of delivering a painful sting, are not life-threatening.

The scorpion's body is pale yellowish brown, usually with two lengthwise dark stripes on the abdomen. In older specimens, the body may be a uniform dark brown with the stripes faint or lacking. Scorpions come in around fireplaces and poorly constructed basement foundations.

On rare occasions, a human victim may exhibit an extreme allergic reaction to scorpion venom. The symptoms usually appear as itching and swelling of the face, nose and throat with an elevation of temperature to around 104°F. If victims, especially children, exhibit allergic symptoms, they should be taken to a doctor immediately.

Most people are stung by scorpions when moving rocks, lumber or other material where the creatures may be hiding. Stings may also occur when a person puts on shoes or other clothing where a scorpion is hiding.

You can control scorpions around summer cabins and homes by cleaning the premises of rock, lumber and rubble piles that furnish attractive shelter. Foundations and chimney bases, cellars and crawl spaces may be sprayed with insecticides. These chemicals will kill some of the scorpions and also eliminate insects that serve as their food.

Scorpion Control

A careful inspection and cleanup of the area is the first step in controlling scorpions. They are active at night, especially when temperatures are above 75°F. Inspect an area at night with a flashlight or black light to locate scorpions. When inspecting for scorpions, wear protective gloves and boots and look under rocks, loose tree bark, around firewood, lumber or other debris piled outside. Cracks and crevices in walls are also good hiding places for scorpions. Scorpions will go to moisture, especially under dry weather conditions, so look in areas that are moist.

Other suggestions for long-term control include:

- Remove all trash and debris. This is always a good recommendation since outdoor roaches and other pests on which scorpions feed are also attracted to trashy areas.

- Store firewood and lumber off of the ground, and keep it dry.
- Remove unnecessary rocks.
- Provide for good runoff of rainwater away from the house.
- Use small gravel as an ornamental groundcover immediately adjacent to the home rather than any wood-type cover.
- Seal any openings in outside walls with mortar or caulking.
- Screen and weatherstrip doors, windows and vents.
- Repair or prevent wet areas caused by plumbing leaks, air conditioners, etc.
- Use a dehumidifier in damp basements.
- Indoor and outdoor areas infested with scorpions may be treated with sprays or dusts of residual chemicals labeled for scorpions. Examples of chemicals used for scorpion control include carbaryl (Sevin), bifenthrin (Ortho Home Defense Perimeter & Indoor Insect Killer), cyfluthrin (Bayer Advanced Home Pest Control Indoor & Outdoor Insect Killer) and esfenvalerate (Ortho Roach, Ant & Spider Killer). One technique to treat scorpions is to concentrate them into a preferred habitat by spreading wet burlap or cloth on the ground near suspected infested areas. By grouping scorpions, chemical sprays can be applied to the collected individuals.

Centipedes

The presence of centipedes or “hundred-legged worms” around the house usually indicates that insects are also present and are being used as food by the centipedes. All



Photo by J. D. Hopkins

species bear a pair of front legs equipped with claws having poison glands at the base. These legs extend forward to work with the mouthparts and are used to subdue and kill insects and other small prey. Large tropical species of centipedes are said to be quite venomous and capable of inflicting serious injury to humans. The small species found generally distributed over Arkansas are harmless. A single large dark brown centipede (*Scolopendra*) appears to be large enough to puncture human skin with poison claws. However, no instances of human injury by this large centipede have been reported in Arkansas.

Millipedes

Close relatives of the centipedes are the “thousand-legged worms” or millipedes. The kinds that occur in Arkansas are entirely harmless. **Some millipede species have repugnatorial glands, but none of the secretions from these glands are known to be harmful to humans. Millipedes neither bite nor sting.**



Millipedes vary from less than 1/2 inch up to 3 inches in length. When disturbed, they typically curl up into a tight ring and remain motionless. Their food is decaying organic matter and thus, they are usually found in flower beds that contain leaf mold and other organic mulches. Occasionally, millipedes migrate in large numbers from flower beds along foundations up into porches or houses. They can be controlled by spraying the foundation walls and window sills with insecticides.

Millipede and Centipede Control

If millipedes or centipedes are occurring in great numbers indoors, it is usually an indication that there is a large population in the area surrounding the home. To control these pests, the most important step is to remove materials that provide them with shelter in the immediate area around the home. This includes mulch, rocks, boards and similar materials.

Secondly, dethatching the lawn and mowing closely allows for drier conditions, which repels these pests. Watering in the morning rather than the evening also gives the lawn a chance to dry before the millipedes, in particular, become active at night.

Thirdly, prevent them from entering the house by making sure doors and windows fit tightly and cracks and crevices are caulked.

If necessary, insecticides are available that are labeled for outdoor use against millipedes and centipedes. These include products containing **carbaryl** (Sevin WP), **bifenthrin** (Ortho-Klor Termite & Carpenter Ant Killer Concentrate, Ortho Bug-B-Gon Max Lawn & Garden Insect Killer Concentrate or Ortho Home Defense Max Perimeter & Indoor Insect Killer Ready-To-Use), **lambda-cyhalothrin** (Spectracide Triazicide Once & Done, Spectracide Bug Stop Indoor Plus Outdoor Insect Killer Ready-To-Use or Spectracide Triazicide Once & Done Insect Killer Ready-To-Use), **cyfluthrin** (Bayer Advanced Power Force Carpenter Ant & Termite Killer Plus Concentrate or Bayer Advance Home Pest Control Indoor & Outdoor Insect Killer Ready-To-Use), **esfenvalerate** (Ortho Bug-B-Gon Multi-Purpose Insect Killer Ready-To-Use) or **deltamethrin** (Bayer Advance Power Force Carpenter Ant & Termite Killer Plus Ready-To-Use). Apply insecticides around the outside of the home, concentrating where millipedes and centipedes may live or enter the structure. Treat the lower 2 to 3 feet of the foundation wall as well as a band of soil 2 to 4 feet out from the foundation. Applications should be made with just enough water for the insecticide to penetrate through mulch and thatch to reach the soil. Although pesticides are available for indoor use, removal with a vacuum or dustpan and broom is often sufficient.

Pesticides provide only temporary control unless measures are taken to alter the environment outside the home as described above.

When using pesticides, check the label carefully to make certain the product is labeled for the target pest. Also make sure it is approved for use indoors if that is the intended area for treatment. **FOLLOW ALL LABEL INSTRUCTIONS AND PRECAUTIONS EXACTLY!** Note that professional pest control operators have access to products and methods not available to the general public. If a heavy pest infestation is a problem, contact a pest management professional.

All chemical information is given with the understanding that no endorsement of named products is intended, nor is criticism implied of similar products that are not mentioned. Before purchasing or using any pesticide, always read and carefully follow the directions on the container label.

Printed by University of Arkansas Cooperative Extension Service Printing Services.

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FSA7018-PD-4-2014RWC

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