
BROWN RECLUSE AND OTHER RECLUSE SPIDERS

Integrated Pest Management In and Around the Home

If asked to name all the spiders they are familiar with, most Californians would have a short list: tarantula, black widow, and brown recluse. Tarantulas are well known because of their large, intimidating size and their use in many movies as eight-legged villains. Black widows are very common throughout the state, are potentially dangerous, and are easily identifiable by their shiny black body color and red hourglass on the belly. The brown recluse, however, is an enigma: there are no populations of the brown recluse, *Loxosceles reclusa*, in the state and fewer than 10 verified specimens have been collected over several decades in California. Yet people frequently relate stories in which they or someone they know was supposedly bitten by a brown recluse in California. This publication was written in response to the confusion that exists regarding brown recluse spiders in California.

COMMON AND SCIENTIFIC NAMES

Over the years, the group of spiders to which the brown recluse belongs has been known by various colloquial names: "violin" spiders, "fiddleback" spiders, "recluse" spiders, and "brown" spiders. Recently the American Arachnological Society chose "recluse spiders" as the official common name for this group. The scientific name for the recluse spider group is *Loxosceles* (lox-SOS-a-leez). All known members of the group have a scientific name, and the more familiar members of this group also have a common name (e.g., brown recluse, desert recluse, Arizona recluse).

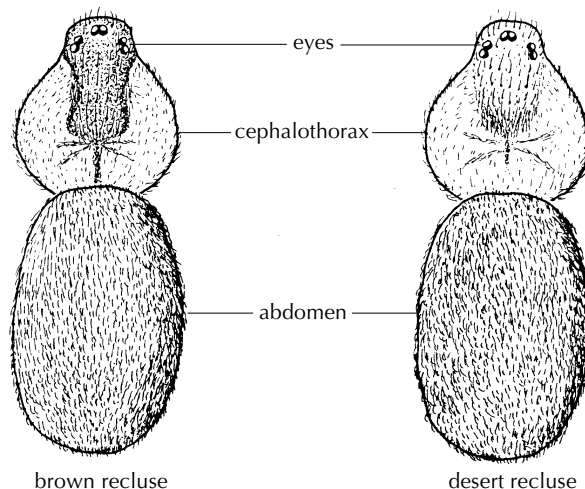


Figure 1. The head region (cephalothorax) and abdomen of a brown recluse, *Loxosceles reclusa* (left), and a desert recluse, *Loxosceles deserta*. Note the characteristic spacing of the six eyes arranged in three dyads. The violin marking is well defined on the brown recluse but is very faint on the desert recluse.

IDENTIFICATION

The most definitive physical feature of recluse spiders is their eyes: most spiders have eight eyes that typically are arranged in two rows of four but recluse spiders have six equal-sized eyes arranged in three pairs, called dyads (Fig. 1). There is a dyad at the front of the cephalothorax (the first main body part to which the legs attach) and another dyad on each side further back.

Many publications refer to the violin marking on the dorsal surface of the cephalothorax as the most important diagnostic feature. Although this marking is fairly consistent in mature brown recluses (Fig. 1) and Texan

recluses (*L. devia*), it can vary in intensity and sometimes fades in preservative, and it is very faint or nonexistent in several recluse species found in the southwestern United States (e.g., the desert recluse). Therefore, checking the eye pattern will eliminate almost all suspect recluse spiders from consideration whereas the presence or absence of the violin marking may lead to misidentifications. In addition, the abdomens of all recluses are covered with fine hairs and are uniformly colored, although the coloration can vary from light tan to dark brown, depending on what they have eaten. There is never a coloration pattern on the abdomen. Finally, the legs are

similarly covered with fine hairs whereas many nonrecluse spiders have stout spines on their legs.

Some spiders share each of these physical characteristics (six eyes in dyads, dark pattern near the eyes, uniformly colored abdomen with fine hairs, no spines on the legs); however, no nonrecluse spider has all four characteristics. On this basis, more than 99% of the spiders found by Californians can be identified as something other than a recluse spider. If, however, you do find a recluse spider in California, it will most likely be the native desert recluse, *L. deserta*. To further identify *Loxosceles* spiders to species requires a high-power microscope and the skills of a spider expert (arachnologist).

MISIDENTIFICATION

Because of the misinformation surrounding the brown recluse's presence in California, many spiders that are virtually harmless are turned in by the public for identification, but most of them are not even from the recluse family. The few *Loxosceles* spiders that have been turned in for identification were the desert recluse (not the brown recluse) and, not surprisingly, were found in the eastern deserts where they are native (Fig. 2). Presented be-

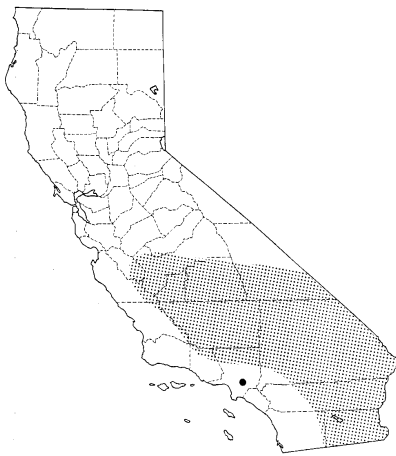


Figure 2. Distribution of the desert recluse, *Loxosceles deserta* (shaded area) and a South American recluse spider (dot), *Loxosceles laeta*, in California.

low are descriptions of spiders that share some of the same physical features as the brown recluse and might be misidentified as a recluse spider. For additional information, consult a spider identification book such as Kaston's *How to Know the Spiders*, listed in the Suggested Reading section.

Six-Eyed Spiders

The spitting spiders (*Scytodes* spp.) are closely related to recluse spiders and have six eyes arranged in a similar pattern. However, they also have many black spots or lines on their bodies that would exclude them as recluses. The woodlouse spider, *Dysdera crocata*, has six eyes arranged in two groups of three (triads) and no bodily markings; nonetheless, it is commonly mistaken for a recluse in California and in other parts of the United States.

Spiders with Violin-Shaped or Other Dark Markings

Many common tan or gray spiders have dark markings on the head region, which convinces people that they have caught a bona fide recluse spider. These spiders include cellar spiders (*Psilochorus* spp., *Physocyclus* spp.), pirate spiders (*Mimetus* spp.), and sheet web spiders (Linyphiidae). The marbled cellar spider, *Holocnemus pluchei*, also confuses people even though the dark marks are on the ventral (underside) not the dorsal (top) surface of the body.

Ubiquitous Brown Spiders

Virtually every spider that is tan or brown has been turned in as a potential brown recluse. There are hundreds of species of these spiders in California. They include ground spiders (Gnaphosidae), sac spiders (*Cheiracanthium* spp., *Trachelas* spp., and many of the liocranoid spiders), wolf spiders (Lycosidae), grass spiders (Agelenidae), orb weavers (Araneidae), and male crevice spiders (Filistatidae). More specifically, males of both the western black widow (*Latrodectus hesperus*) and the false black widow (*Steatoda grossa*) are frequently brought in for recluse verification. All of these brown spiders

have eight eyes and can quickly be eliminated from consideration.

AMERICAN RECLUSE SPIDERS

Eleven species of recluse spiders are native to the United States and a few non-natives have become established in circumscribed areas of the country. The brown recluse spider is the proper common name for only one species, *Loxosceles reclusa*. It is the most widespread of the North American recluse spiders and lives in the south central Midwest from Nebraska to Ohio and south through Texas to Georgia (Fig. 3). Although the brown recluse **does not** live in California, we do have four species of native recluse spiders. The most common Californian recluse spider is the desert recluse, *L. deserta*. It is found mostly in the Sonoran and Mojave deserts, in the foothills of the lower San Joaquin Valley, and in adjacent areas of Mexico (Fig. 2), all of which are sparsely populated by humans. In older literature, this spider was referred to as *L. unicolor*. There are additional species (*L. russelli*, *L. palma*, *L. martha*), but they are so uncommon that they are of scientific interest only.

In addition to these native species, a South American recluse spider, *Loxosceles laeta* (pronounced "LEE-ta"), has become established in portions of Los Angeles (Alhambra, Sierra Madre, Monterey Park) (Fig. 2). This spider, however, seems to be confined to a very limited area in Los Angeles County even though it has lived there for over 30 years. Also, occasional interceptions of the Mediterranean recluse, *L. rufescens*, are found in commercial goods shipped from out-of-state, but no populations of this spider have been found in California.

Life History Characteristics

Recluse spiders, as their name implies, are reclusive. These nocturnal spiders emerge from their retreats at night and actively hunt down prey or may wait for prey to land in the small area several inches from their retreat. Although they do not build webs to capture prey, they do use silk to build

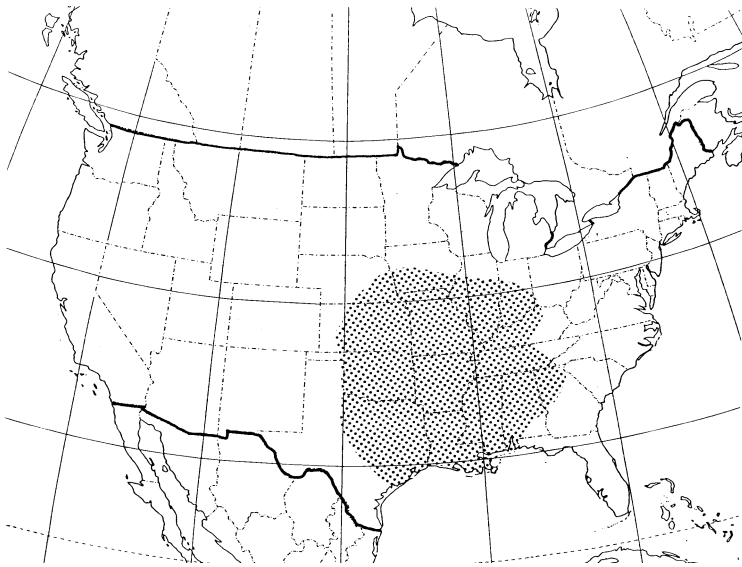


Figure 3. Distribution of populations of the brown recluse, *Loxosceles reclusa*, in the United States. Areas around the borders of the shaded area may also have brown recluses, but they will be less common.

a retreat in which they hide during the day. As dawn approaches, they may seek shelter in dark places such as clothing or shoes. Also, mature males roam in search of females. It is these two behaviors that can bring them into contact with people.

In nature, recluses are found in cracks and crevices in and under rocks. Recluses have very much benefited from human-altered environments where they are readily found under trash cans, plywood, tarps, or rubber tires, in boxes, etc. They are synanthropic (found in association with humans) and therefore are considered a "house" spider. In fact, in South America the recluse species have common names that translate as "the spider behind the picture" or "the spider in the corner."

Recluse spiders are relatively long lived. Among the various species, they mature after about 1 year and average a 2- to 4-year life span with some living more than 7 years under laboratory conditions. They are also well known for surviving long periods (6-12 months) without food before perishing.

Abundance of Recluses

One consistent life history characteristic of recluse spiders is that in the right environment their populations are usually dense. *Loxosceles reclusa* is a common house spider in the midwestern United States. If you find recluses, you do not find one, you find many. Examples for the brown recluse include 9 under a piece of plywood in Oklahoma, 52 in an indoor laboratory, and 6 under a waterbed frame in Arkansas, 150 in a Kansas home, 40 collected in a Missouri barn in 1 hour, and 44 in sticky traps in a Tennessee home in 1 day.

Similarly, for the desert recluse in California, 12 of these spiders were collected under a doghouse in Yucca Valley and six were removed from a cottage bedroom in the Mojave Desert. In a study in Chile, 645 of 2189 homes that were searched contained the South American recluse spider, *L. laeta*. The five most infested homes averaged 163 spiders each and in none of these houses had spider bites been reported.

Unlike many other spiders that disperse by either migrating or being

carried by air currents when small ("ballooning"), recluse spiders can only expand outside their native range as a result of human intervention. There are fewer than 10 documented cases of the spider being collected in California, spanning more than 4 decades, typically in facilities that receive goods from out of state. Searching the immediate area yielded no additional brown recluses and therefore they were considered to be individual stowaways. Undoubtedly, more brown recluses have been inadvertently brought into the state via commerce and the relocation of household belongings; however, amazingly few specimens have ever been collected. Never have any of these translocated spiders been able to establish a foothold and start a population in California. Considering that there are millions of brown recluses cohabiting with people in the southcentral Midwest and brown recluse bites are only an occasional occurrence there, California does not have anywhere near sufficient populations of these spiders to be responsible for the number of cases or illnesses that are attributed to them.

MEDICAL MISDIAGNOSES

One reason for the great "awareness" of the recluse spiders throughout the United States is that necrotic wounds are misdiagnosed as "brown recluse bites." Although recluses can cause these wounds, the biological data involving the distribution of the spider indicate that most of these diagnoses are incorrect. A world-renowned toxicology physician who worked at University of Southern California Medical Center estimates that most spider bites in California referred to him were actually the work of other arthropods and that 60% of "brown recluse spider bite" diagnoses came from areas where no *Loxosceles* spiders were known to exist. Nationwide, some "brown recluse bites" were subsequently correctly diagnosed as *Staphylococcus* infection, *Streptococcus* ("flesh-eating bacteria") infection, Lyme disease, herpes simplex, diabetic ulcer, or

bites from bedbugs, mites, ticks, small wasps, biting flies, or other spiders.

In addition, in one case where the offending spider was killed in the act of biting, a Californian doctor misidentified the spider as a brown recluse even though the spider had eight eyes, stripes on the cephalothorax, a patterned abdomen, and spines on the legs. In any event, 90% of all brown recluse bites in the Midwest heal without severe problems and millions of people have lived there for years without experiencing bites.

CONTROL

If you do not live in the shaded areas on the map in Figure 2, you do not need to be concerned with recluse spiders in California. If you do live within the range of these spiders, you still need to verify that you have recluses on your property before attempting control. Not all microhabitats within the shaded areas will be suitable for recluse survival. For example, even though *L. laeta* occurs in densely populated sections of Los Angeles, this species is usually found in dark commercial and municipal storage basements.

For more information contact the University of California Cooperative Extension or agricultural commissioner's office in your county. See your phone book for addresses and phone numbers.

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To simplify information, trade names of products have been used. No endorsement of named products is intended, nor is criticism implied of similar products that are not mentioned.

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This leaves the desert recluse as the only Californian recluse of concern and a minor one at that. After verifying that you do have desert recluses in your home or workplace, there are steps you can take to reduce encounters with them that are similar for reducing encounters with spiders in general. The most important thing you can do is remove and reduce trash and rubbish from your property, such as woodpiles, boxes, plywood, tires, and trash cans—especially if they are stored right next to the house. With attached garages, block off house access by sealing cracks around doors and access holes for electrical conduits or plumbing. In the bedroom, move the bed away from the wall and remove any skirts around the bed. This minimizes chances that a spider can crawl onto the bed. In the Midwest, some brown recluse bites occur when a sleeping person rolls over during the night, and the trapped spider bites in self defense. Do not leave clothes and shoes on the floor, or shake them if they are left out. Apparel and equipment that is only occasionally worn (gardening clothes and gloves, boots, baseball mitts, roller skates, etc.) should be stored in tightly closed plastic bags, especially if stored in the garage or other dark storage areas.

Typically, pesticide control of spiders is difficult unless you actually see the spider and are able to spray it. There are various insecticides available in retail outlets labeled for spider con-

trol. It is just as easy and much less toxic to crush the spider with a rolled up newspaper or your shoe. You can also remove a spider from your home by placing a jar over it and slipping a piece of paper under the jar that then seals off the opening of the jar when it is lifted up. If you plan to send the spider to an expert for identification, try to keep it in an undamaged condition because a crushed specimen may be difficult to identify.

SUGGESTED READING

Gertsch, W. J. and F. Ennik. 1983. The spider genus *Loxosceles* in North America, Central America, and the West Indies (Araneae, Loxoscelidae). *Bull. Amer. Mus. Nat. Hist.* 175(3):264–360.

Hite, J. L., W. J. Gladney, J. L. Lancaster, Jr., and W. H. Whitcomb. 1966. *Biology of the Brown Recluse Spider*. Arkansas Experiment Station Bulletin #711, 26 pages.

Kaston, B. J. 1978. *How to Know the Spiders*, 3rd ed. Dubuque, Iowa: Wm. C. Brown Co., 272 pages.

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Waldron, W. G., M. B. Madon, and T. Suddarth. 1975. Observations on the occurrence and ecology of *L. laeta* in Los Angeles County, California. *California Vector Views* 22:29–36.

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.

Confine chemicals to the property being treated. Avoid drift onto neighboring properties, especially gardens containing fruits and/or vegetables ready to be picked.

Dispose of empty containers carefully. Follow label instructions for disposal. Never reuse the containers. Make sure empty containers are not accessible to children or animals. Never dispose of containers where they may contaminate water supplies or natural waterways. Do not pour down sink or toilet. Consult your county agricultural commissioner for correct ways of disposing of excess pesticides. Never burn pesticide containers.

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