

Brown Recluse Spiders in Colorado: Recognition and Spiders of Similar Appearance

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Insect Series | Home and Garden

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Brown recluse and related recluse spiders (*Loxosceles* spp., Family Sicariidae) are, by far, the most commonly misidentified spiders in Colorado. Unfortunately, also greatly overdiagnosed are purported spider bites caused by brown recluse spiders – a situation perpetuated by many in the Colorado medical establishment as well as through self-diagnosis.

Colorado hosts a great many kinds of spiders that are brown or have some patterning that may superficially resemble brown recluse spiders. However, close examination can readily distinguish them (see Table 1).

Identification

The quickest way to positively identify if a spider might be a recluse spider is to examine the arrangement of the eyes. This requires some magnification. Recluse spiders have three pairs of eyes, a very unusual feature among spiders. Overwhelmingly, most spiders found in Colorado have four pairs. The arrangement of the eyes on the recluse spiders is one pair in the front, the other two along the sides, forming a semicircle.

Overall body color is brown, which may range from a light to dark brown. The abdomen is uniformly colored, without patterning. On the cephalothorax (the body region including the head and legs) a brown marking is usually present. This is typically described as a “violin pattern” and the eyes are incorporated into the base of it. The contrast intensity of this pattern can vary among the different recluse species and life stages. (Brown patterning on the cephalothorax also occurs in many Colorado spiders, including funnel weavers and cellar spiders.)

Legs of recluse spiders are long and thin. The legs have a silky appearance,



Figure 1: Brown recluse spider. (Photo courtesy of the University of Nebraska.)



Figure 2: Brown recluse spider. (Photo courtesy of Lisa Ames.)



Figure 3. Brown recluse spider showing the violin pattern on the cephalothorax. (Photo courtesy of Lisa Ames.)

covered with fine hairs and large spines are not present. The legs are uniform in color, never banded.



Quick Facts

- Colorado has many kinds of spiders that are brown or have patterning that may resemble brown recluse spiders.
- The quickest way to positively identify a recluse spider is to examine the arrangement of the eyes – there should be three pairs.
- Brown recluse spiders usually have a “violin pattern” on the cephalothorax.
- Funnel weaver spiders and wood louse hunters are the two groups most commonly mistaken for recluse spiders.

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Table 1. Features to identify recluse (brown) spiders (*Loxosceles* species).

Eyes	3 pairs, of approximate equal size, arranged in semicircular pattern.
Cephalothorax	Overall color uniformly brown; Darker brown pattern in center, somewhat resembling a violin, usually present.
Abdomen	Overall color uniformly brown, without any patterning.
Legs	Uniformly colored, without any banding or patterning; Silky appearance due to fine hairs; no spines present.
Activity	Active at night; restricted to web-lined refugia during day.
Webs	Webs are not produced in open areas where they are readily seen.

Recluse spiders are active at night. During the day they hide in dark crevices and hollows. In areas of the U.S. where they are common, recluse spiders found in homes are often found in basements.

Recluse Spiders in the United States

There are 10 native recluse spiders (*Loxosceles* spp.) in the U.S. with most confined to areas of southwestern states bordering Mexico. In addition, the Mediterranean recluse, *Loxosceles rufescens*, is occasionally introduced and likely now established in many parts of the country, although nowhere is it considered to be common. The South American species *L. laeta* is established in a few localized areas on both coasts.

Identification of the various *Loxosceles* to the species level can only be done by an expert. Specimens of *Loxosceles* that are collected from Colorado currently can be identified by personnel at the Denver Museum of Nature and Science. The best

known of the recluse spiders found in the U.S. is the brown recluse, *Loxosceles reclusa*. It occurs in many of the midwestern and south central states, and can be very common in and around homes in eastern Kansas, Missouri, Arkansas, Louisiana, Oklahoma, parts of Texas, and some other states. Occasionally it is transported out of its normal range, but it rarely survives and establishes outside the area.

Most, if not all, of the recluse spiders have venom that can cause tissue death (cytotoxins). Nine protein fractions have been identified in the venom with most attention given to the enzyme sphingomyelinase D, considered the main contributor to cell injuries resulting from bites by these spiders.

The amount of venom introduced during a bite, and possibly the toxicity of the venom, varies among the recluse spiders. For example, the medical importance of the brown recluse is well documented in the literature. However, it has been suggested that bites of the common South American species,

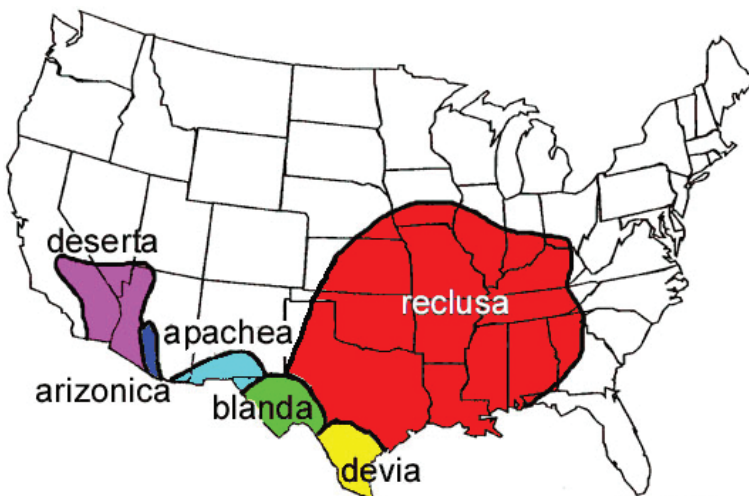


Figure 4: General distribution of *Loxosceles* spiders in the United States. (Created by Rick Vetter.)



Figure 5: Female funnel weaver spider, *Agelenopsis* sp.



Figure 6: Male funnel weaver spider, *Agelenopsis* sp.



Figure 7: Cellar spider, side view.



Figure 8: Cellar spider. (Photo courtesy of the University of Nebraska.)



Figure 9: *Dysdera crocata*, the 'roly-poly hunter'.



Figure 10: Running crab spider, *Philodromus* sp.

L. laeta, are potentially even more dangerous. Conversely, only very few cases of complications are reported from the ubiquitous Mediterranean recluse (*L. rufescens*) and the native southern California species, *L. deserta*, suggesting that these are less important medically. The remaining species of native *Loxosceles* species that occur in North America do not appear to be associated with serious medical problems.

Symptoms of Brown Recluse Bite

Brown recluse bites initially may be felt as a slight pinprick – or not noticed at all. The majority of bites result in no further effects. Even if bitten, spiders may not introduce any venom which results in a dry bite.

In a small percentage of cases, an irregular red area develops around the bite area within 2 to 8 hours and the site becomes painful and itchy. A small blister may develop at the bite site. Typically this heals normally with no further effects.

In a small fraction of these cases, further complications can develop. A bluish sinking patch, with the central blister, may occur within 24 to 72 hours after a bite. This may progress into an irregular lesion, an inch or two in diameter, with surrounding redness

and sensitivity to touch. This can further expand exposing underlying tissues as the dead cells slough away. This ulcerated area is dry, since capillaries are sealed by the effects of the venom, but it may take a couple of months to heal with permanent scarring sometimes produced.

Recluse Spiders in Colorado

The brown recluse, and all other recluse spiders, are extremely rare in Colorado. Confirmed specimens at the Denver Museum of Nature and Science collection include only one specimen of *Loxosceles reclusa* collected from the state (Boulder County, 1996). Also on record are four specimens of the Mediterranean recluse, *L. rufescens* (Denver, Bent, and Las Animas counties plus one from Larimer County located at the Colorado State University collection) and a single collection of *L. apachea* (Larimer County).

Clearly incidence of these spiders in Colorado is incidental, resulting from occasional transfers coming from chronically infested areas of the country. Establishment and sustained breeding of these spiders in Colorado is much rarer, if it occurs at all. (There are two fairly credible reports of some species of *Loxosceles* established in a basement area; one each in Pueblo and Prowers counties. The species involved have not been recorded and the infestations were isolated to a single building.)

Despite the near total lack of *Loxosceles* spp. spiders in Colorado, dermonecrotic lesions are commonly diagnosed (misdiagnosed) as spider bites and, more specifically, as resulting from the bites of recluse spiders. Other, more likely, causes for such dermonecrotic lesions, and causes that have been misdiagnosed as spider bites, include bacterial infections from *Staphylococcus* or *Streptococcus* strains; viral infections, particularly herpes or shingles; fungal infections; lymphoma or lymphomatoid papulosis; lyme disease; diabetic ulcers; and poison ivy to name just a few (Table 2). One of the most likely causes of such dermonecrotic lesions is a bacterial infection known as Community-Acquired Methicillin-Resistant *Staphylococcus aureus* (CA-MRSA). CA-MRSA outbreaks are occurring with ever increasing frequency throughout the country in hospitals, prisons, and among members of athletic teams. This bacterial

strain can result in lesions similar to those caused by bites of *Loxosceles reclusa*.

Colorado Arachnids Mistaken for Brown Recluse Spiders

Several spiders found in Colorado – and some other arachnids – are commonly mistaken for brown recluse. These include the following:

Funnel weavers (Agelenidae). The funnel weavers are an extremely common, brown-colored spiders. They get their name from the web they produce, which is densely constructed of silk to produce a mat with a funnel-like retreat area where the spider normally rests. These webs can

Table 2. Medical conditions with symptoms sometimes confused with brown recluse spider bites (adapted from Vetter 2000).

Bacterial

- Methicillin-resistant *Staphylococcus aureus* (MRSA or false spider bite diagnosis)
- Other *Staphylococcus* infections
- *Streptococcus* infection
- Gonococcal arthritis dermatitis
- Cutaneous anthrax

Reaction to drugs

- Warfarin poisoning

Viral

- Infected herpes simplex
- Chronic herpes simplex
- Varicella zoster (shingles)

Arthropod-induced

- Lyme disease
- Rocky Mountain spotted fever
- *Ornithodoros coriaceus* bite (soft tick)
- Insect bites (flea, mite, biting fly)

Fungal

- Sporotrichosis
- Keratin cell mediated response to fungus

Topical

- Poison ivy/poison oak
- Chemical burn

Lymphoproliferative disorders

- Lymphoma
- Lymphomatoid papulosis

Underlying disease states

- Diabetic ulcer

Vascular disorders

- Focal vasculitis
- Purpura fulminans
- Thromboembolic phenomena
- Polyarteritis nodosa

Miscellaneous/Multiple causative agents

- Pyoderma gangrenosum
- Pressure ulcers
- Stevens-Johnson syndrome
- Erythema multiforme
- Erythema nodosum
- Toxic epidermal necrolysis
- Lyell syndrome

often be seen amongst dense shrubs, on lawns, and in corners of a house.

Funnel weavers also very commonly enter homes. Indoor migrations are greatest in late summer and early fall as the mature spiders wander in search of mates and cooler outdoor temperatures. The majority of these migrants are males, which possess conspicuous, paired bulbous structures from the head region that superficially may appear as fangs. However, these structures are pedipalps, used only to transfer sperm.

Funnel weaver spiders are the group most commonly mistaken for recluse spiders in Colorado. However, they can readily be distinguished based on several features: body is hairy; four pairs of eyes; and legs that are often are banded or patterned.

Funnel weaver spiders common in the state usually are in one of three genera: *Tegenaria* spp., *Agelenopsis* spp., *Hololena* spp. Particularly common around homes in Colorado are the species *Tegenaria domestica*, *Agelenopsis pennsylvanica*, and *Hololena hola*.

Cellar spiders (Pholcidae). Cellar spiders are very longlegged spiders found almost always in association with a web. (A common name for the family is daddylonglegs spiders, although this causes confusion with the arachnids in the Order Opiliones, commonly called daddylonglegs, which are not spiders.) Webs are produced in dark corners of basements, garages and outbuildings. An interesting behavioral aspect is that often these spiders will bounce in the web when disturbed.

Confusion of these spiders with the brown recluse sometimes occurs because of patterning that may be found on the body, superficially resembling the violin pattern notable on the brown recluse. However, the cellar spiders commonly encountered can readily be distinguished based on several features: very long legs; body form that is longer than wide; eight eyes, often in two clusters of three eyes with a pair of eyes in between; and they are almost always associated with a web.

The two types of cellar spiders found in Colorado that are sometimes mistaken for brown recluse are *Pholcus phalangioides* and *Psilochorus* spp.

Wood louse hunters (Dysderidae). Along with funnel weavers, the wood louse hunter, *Dysdera crocata*, is also commonly mistaken for a brown recluse. Within

homes, these spiders are almost always found in basements. Outdoors they may be common under rocks and around gardens. This European spider feeds on isopods – sowbugs or the pillbug (a.k.a. ‘roly poly’).

This is one of the very few spiders, along with the recluse spiders, that also have three pairs of eyes. These are densely clustered in a small area in the center of the head, not spread out on the cephalothorax in three pairs as with the recluse spiders. However, the following features are useful to distinguish these from recluse spiders: very large jaws tipped with long fangs; cephalothorax and legs uniformly colored reddish brown; and the abdomen is uniformly of lighter brown or tan color.

Running crab spiders (Philodromidae). The running crab spiders are active hunters normally found searching for insect prey among plants, but they occasionally wander into homes. Their body form is somewhat similar to the more common crab spiders (Thomisidae family) with a generally rounded abdomen and the front two pairs of legs being longer than the others. (The second pair is always the longest.) They are variable in color but some have dark markings that may cause confusion with the violin pattern of the recluse spider. The running crab spiders can be distinguished from recluse spiders by: second pair of legs is longer than the other legs; four pairs of eyes, in two rows; somewhat flattened body form; and dorsal marking, if present, is often located on the abdomen and is not distinctly a violin pattern.

Two genera of running crab spiders most commonly cause confusion with recluse spiders, *Philodromus* spp. and *Thanatus* spp. Those that are most commonly found in homes are *Philodromus cespitum* and *Tibellus oblongus*.

Wolf Spiders (Lycosidae). The wolf spiders are active hunters and often are among the most common spiders found crawling around yards and gardens. They do not produce webs for prey capture, but physically overpower insect prey. After an egg sac is produced, females carry it, and attach it to the tip of the abdomen.

Most wolf spiders are drab colored, but some may have darker patches on the body. These typically are in the form of two longitudinal stripes, but they are sometimes confused with the violin pattern of the recluse. Wolf spiders can be separated from



Figure 11: Wolf spider, *Pardosa* sp.



Figure 12: Wolf spider, *Schizocosa* sp.



Figure 13: A sunspider, *Eremochelis bilobatus*.

recluse spiders by several features: four pairs of eyes with the two upper pair much larger than the lower pair; hairy body form; and an abdomen that is longer than it is wide.

The most commonly encountered species around homes are those in the genera *Pardosa* and *Schizocosa*. Occasionally, very large spiders in the genus *Hogna* – the giant wolf spiders – are encountered.

Sunspiders (Order Solifugae).

Sunspiders are not true spiders (Order Araneae) but placed in a different arachnid order, Solifugae. Other common names for these bizarre-looking arachnids include wind scorpions and solpugids. Species found in the Middle East are sometimes known as camel spiders.

Sunspiders are readily distinguishable from spiders by the presence of long leg-like pedipalps arising from near the front of the body. This gives them the appearance of having five pairs of legs. Sunspiders also have a very large cephalothorax with prominent forward-projecting jaws. These are used to capture and crush insect prey. Sunspiders do not possess venom glands.

References

- Benoit, R. & J.R. Suchard. 2006. Necrotic skin lesions: Spider bite—or something else? *Consultant*. Volume 46 (12). October 1, 2006 <http://consultantlive.com/showArticle.jhtml?articleID=193105532>
- Dominguez, T.J. 2004. It's not a spider bite, it's Community-Acquired Methicillin-Resistant *Staphylococcus aureus*. *Journal of American Board of Family Practice* 17(3):220-226.
- Maretic, Z. 1987. Spider Venoms and their Effects. In: *Ecophysiology of Spiders* (ed. W. Nentwig), Springer-Verlag, New York, pp. 142-159.
- Vetter, R.S. 1999. Identifying and misidentifying the brown recluse spider. *Dermatology Online Journal* 5(2): 7, <http://dermatology.cdlib.org/DOJvol5num2/special/recluse.html>
- Vetter, R.S. 2000. Medical myth: idiopathic wounds are often due to brown recluse or other spider bites throughout the United States. *Western Journal of Medicine* 173:357-358.
- Vetter, R.S., P.E. Cushing, R.L. Crawford & L.A. Royce. 2003. Diagnoses of brown recluse spider bites (loxoscelism) greatly outnumber actual verifications of the spider in four western American states. *Toxicon* 42:413-418.