

## BITING, STINGING AND VENOMOUS PESTS: INSECTS

(For non-insects such as scorpions and spiders, see page 23).

**Bees** include a large number of insects that are included in different families under the order Hymenoptera. They are closely related to ants and wasps, and are common and important components of outdoor community environments. Bees have lapping-type mouthparts, which enable them to feed on nectar and pollen from flowers. Most bees are pollinators and are regarded as beneficial, but some are regarded as pests because of their stings, or damage that they cause due to nesting activities.



Pollination by honey bees  
Photo: Padmanand Madhavan Nambiar

### NOTABLE SPECIES

**Common name(s):** Bee, honey bee

**Scientific name, classification:** *Apis* spp.,

**Order:** Hymenoptera, **Family:** Apidae.

**Distribution:** Worldwide. The western honey bee *A. mellifera* is the most common species in North America.

**Description and ID characters:** Adults are medium to large sized insects, less than  $\frac{1}{4}$  to slightly over 1 inch in length. Sizes and appearances vary with the species and the caste.



Western honey bee, *Apis mellifera*  
Photo: Charles J. Sharp

**Best identifying features:** Robust black or dark brown bodies, covered with dense hair, mouthparts (proboscis) can be seen extending below the head, hind pair of wings are smaller than the front pair, hind legs are stout and equipped to gather pollen, and often have yellow pollen-balls attached to them.

**Pest status:** Non-pest, although some are aggressive and can sting in defense.

**Damage/injury:** Usually none, and are regarded as the most beneficial insects.

Swarming colonies near homes and buildings may cause concern, but they often move on. Swarming bees will sting only when disturbed or threatened.

Bees nesting inside homes or structures can be pests because they cause annoyance with their foraging and nest building activities. The chances of people getting stung in such situations are also much higher. Such bees along with their nest materials should be carefully removed with professional help.

Bee stings are very painful, with the pain, tenderness and swelling lasting 2-3 days, but prolonged or severe reactions may occur in sensitive people, more pronounced in those who have been sensitized by previous stings. Symptoms include swelling of throat, lips and mouth, abdominal cramping, diarrhea, nausea and vomiting, breathing distress, decreased blood pressure and loss of consciousness. Hives, itching and swelling in the sting site may also continue longer. Multiple stings, by several bees can prove life-threatening, especially when the quantity of venom

injected is unknown, or the attending medical professionals are unfamiliar with the issue. Bee venom contains a mixture of proteins and enzymes that break down cell membranes and lead to destruction of cells and tissues. In multiple stings, the quantity of cell debris produced is higher and can be difficult for the kidneys to



Honey bee stinger  
Photo: Pest and Disease Image Library, Bugwood.org



Common yellow jacket stinger  
Photo: Thomas J. Blackwell, www.tjblackwell.co.uk

eliminate. This can lead to kidney failure, which is a serious medical condition requiring hospitalization. About 20 people die each year in the U.S. due to honey bee stings, mostly due to anaphylactic shock following the sting.

Honey bees use their venom to defend their colony against intruders. Their stingers are very minute, needle-like structures projecting out from the tip of the abdomen, and are equipped with well-developed barbs (unlike wasp stingers). They often get lodged on the skin of larger animals or clothing in humans, and torn out of the bee's body along with the attached venom glands after a sting, resulting in the death of the bee. However, honey bees can repeatedly sting smaller vertebrates or other insects without losing their sting. The stinger can continue to release venom for several minutes even after it is separated from the bee's body. In the event of a bee sting, it is important to remove the stinger from the sting site as soon as possible to reduce the amount of venom that enters the body. Prompt removal using any available means can greatly reduce the severity of the sting.



Honey bee stinger lodged in skin after a sting  
Photo: Monica M. Kowal, thebeelady.wordpress.com

**Africanized bees** also known as 'killer bees' are closely related to the common honey bees *A. mellifera*. They are descendants of hybrids between the African honey bee *A. m. scutellata* and various European species, and are considered invasive because they easily outcompete the other local honeybees. It is difficult to

distinguish between the different species because their appearance and many aspects of their behavior are similar. However, Africanized bees are observed to exhibit stronger defensiveness and swarming tendencies. They have a larger alarm zone around their hive, which they will aggressively defend in larger numbers, often chasing intruders or perceived threats to long distances. They are known to be better pollinators and honey producers, but are less predictable, exhibiting more frequent swarming, and migrating in response to stress. Because it is difficult to differentiate between honey bees by appearance, it is best to assume that all wild bees may be ‘Africanized’, and treat them with extreme caution.

**Life history:** Honey bees are one of the most widely studied insects, the branch of study being known as apiology. They are held in high regard for their multiple benefits to mankind. As in many other social insects, honey bees form colonies containing a queen, drones, large numbers of workers assigned with specific duties, and larvae and pupae in various stages of development. Bees in a colony communicate with each other using specific chemical and mechanical cues. Workers use patterns of movements known as “dances” to communicate about food sources. Mature males (drones) leave their home colonies when they are ready to mate and form aggregations. Young, mature queens fly out of their home colony to these aggregations and may mate with several drones, before returning to their home colony. Drones die soon after mating, but the newly mated young queens leave their home colony with a group of workers to form a new colony, in a process called “**swarming**” and the group is called a “**swarm**”.

A moving swarm might cause alarm in people especially if they are near homes or buildings, but usually they are least aggressive at this time,



Swarm on a tree branch  
Photo: G. Keith Douce, UGA



Swarm on the side of a building  
Photo: Ward Upham, Kansas State Univ.



Honey bees inside irrigation box  
Photo: Dawn Gouge



Honey bees establishing a colony in the siding of a home  
Photo: Timothy Haley, USDA-FS

because they do not have brood to protect. They may react defensively to prolonged disturbance such as being poked with a stick, or water being thrown at them. These swarms are highly likely to move on in a day or so without any intervention, and it is best to leave them alone. However, if the swarm locates a suitable nesting site such as a hole in a block wall allowing the bees' entrance to the wall void, they may move inside the wall. It is best to seek professional help to manage the bees at this point before they are established and have brood to protect. The void or hole which allowed the bees to take up residence should be closed, or if a hive was formed, it should be cleaned out completely.

**Common name(s):** Bumble bee, bumblebee

**Scientific name, classification:** *Bombus* spp., **Order:** Hymenoptera, **Family:** Apidae. The western bumble bee *Bombus occidentalis* is a common southwestern species.

**Distribution:** Worldwide.

**Description and ID characters:** Adults are large, hairy bees, often measuring over 1 inch in length.

**Best identifying features:** Black, rounded bodies covered in dense, soft hair, giving a fuzzy appearance, often have bands of yellow, orange or white on thorax and abdomen, hind legs have pollen-basket which serves to collect pollen, slow and clumsy movements.

**Pest status:** Non-pest, although some are aggressive and females can sting in defense.

**Damage/injury:** Usually none, and are regarded as beneficial insects. Will sting only when disturbed or threatened. Important pollinators of many plants, sometimes “rob” honey from flowers with long and narrow mouths, by piercing the base of flower to drain out honey.

**Life history:** Bumblebees are social insects and form colonies, but these are much smaller than honey bee colonies. Colonies contain a single queen and about 50 workers. They are formed in burrows in the ground, or abandoned nests or hollows of other insects or animals.

**Common name(s):** Carpenter bee

**Scientific name, classification:** *Xylocopa* spp., **Order:** Hymenoptera, **Family:** Apidae. The California carpenter bee *Xylocopa californica* is a common southwestern species.

**Distribution:** Worldwide.

**Description and ID characters:** Adults are large sized, measuring about  $\frac{3}{4}$  to 1 inch in length. Often mistaken for bumble bees due to similar size and coloration.



Western bumble bee  
Photo: Stephen Ausmus, USDA-ARS



California carpenter bee  
Photo: John F. Carr

**Best identifying features:** Black, stout, shiny bodies with blue, green or purplish metallic sheen, lacking dense hair as in bumble bees.

The Eastern carpenter bee *Xylocopa virginica*, might be encountered in parts of Texas, and is more likely to be confused with bumble bees due to the yellow colored hairs on its thorax. However, it can be distinguished by a black hairless spot in the center of the yellow thorax and smoother abdomen, whereas in bumble bees, the thorax and abdomen have bands of dense yellow or white hairs.

**Pest status:** Structural pest

**Damage/injury:** Burrow into wooden structures to build nests and can potentially weaken the structure in isolated cases.

Damage is very rare in most urban settings.

**Life history:** Carpenter bees are mostly solitary bees and do not form colonies, but small groups consisting of closely related females are common. Although, technically, they are a “wood-boring insect”, they are not really considered a true structural pest. They do not eat wood, and will not spread throughout the structure, but they will attack any outside wood that is not painted or finished. Carpenter bees get their name from their ability to drill through wood and nest in the hole. Their drilling creates a near-perfect hole, approximately ½ inch in



An Eastern carpenter bee (*X. virginica*) near nest entrance  
Photo: Johnny N. Dell, Bugwood.org



Carpenter bee damage-note the neat circular hole with fecal stains outside (left)-Photo: Tony Alter; Wood shavings mixed with pollen and other debris, seen below the hole (right)- Photo: PixOnTrax

diameter. The hole is usually located on the underside of the wood surface; including siding, decks, overhangs, fence posts and window frames. Although the hole appears to be only an inch or two deep, it rarely ends there. Along with the coarse wood powder found underneath the nest entrance, there are usually dirty-yellow streaks of fecal matter staining the wood below the hole. If you are near a nest, you will likely be buzzed by the male carpenter bee on guard. He is loud and aggressive, but does not have the ability to sting you. The female can sting but she is normally very docile. A single pair (male and female) occupies each nest. Carpenter bees are also important pollinators, and sometimes rob honey from the base of flowers.

**Common name(s):** Digger bee, ground bee

**Scientific name, classification:** *Centris* spp., **Order:** Hymenoptera, **Family:** Apidae. The pallid digger bee *Centris pallida* is the most common southwestern species.

**Distribution:** Western U.S.

**Description and ID characters:** Medium sized, furry gray-black and yellow bees, larger than honey bees but smaller than bumble bees, measuring up to ¾ inch in length.

**Best identifying features:** Heavy, hairy bodies, prominent yellow eyes. Often found cruising near the ground in open areas such as lawns, even during midday when other bees are not very active. Swift flight compared to other bees.

**Pest status:** Non-pest, but can cause concern to lawn-owners when large numbers fly in low circles above their lawns or adjoining ground. Will sting only under extreme pressure, but sting is mild. Can damage turf occasionally, with their nesting activities.

**Damage/injury:** No significant damage. However, large numbers of digger bees nesting in turf can result in unsightly dirt mounds. They are more of a problem in low-density and poorly managed turf with bare areas. They are important pollinators of several economically important crops and landscape plants native to the desert southwest such as cactuses, desert willow and palo verde.

**Life history:** Digger bees are not social, and pair only to mate. The adult bees feed on pollen and nectar.

Nests are built underground. Young males emerge from their brood cells earlier than the females. The males fly in large numbers over an area where several nests



Digger bee  
Photo: Nancy Hamlett



Digger bee nests in poorly managed turf (left), closer view of nests (right)  
Photo: Diane Stephens, Houston County Master Gardener, GA

were constructed in the previous year. The newly emerging females emit a characteristic scent which the males pick up using their antennae. Once they locate a female, they will dig into her brood cell, help her out and mate. After mating, the female digger bees will burrow into the ground using their mandibles and front legs and construct their nests underground. Eggs are laid in individual cells, each provisioned with pollen or bee bread (mixture of pollen and nectar). The hatching larvae consume the stored food, pupate within their cells, and emerge as adults, breaking open the cells. Often several hundreds of females will nest in the same area. Exposed bare dirt or sandy soil near lawns or embankments are preferred nesting spots. Large aggregations of individual nests can occur when soil conditions are favorable.

**Common name(s):** Leaf-cutter bee  
**Scientific name, classification:** *Megachile* spp.,  
**Order:** Hymenoptera, **Family:** Megachilidae.  
**Distribution:** Worldwide.  
**Description and ID characters:** Small to medium sized black and yellow bees, about ½ - ¾ inch in length.

**Best identifying features:** Carry pollen on the underside of the abdomen, unlike other bees which carry pollen on their legs.

**Pest status:** Non-pest, but can occasionally cut out circular pieces from leaves to line their nests. However, the benefits from pollination outweigh this slight damage.

**Damage/injury:** No significant damage. Excellent native pollinators because they need repeated visits to flowers due to their inefficient system of gathering pollen (on the abdomen). Some species such as the alfalfa leaf-cutter bee *Megachile rotundata*, can be encouraged to nest in specially prepared wooden blocks drilled with holes, to benefit from their pollination.

**Life history:** Adult females excavate a tunnel about the circumference of a pencil in soft wood plants to lay their eggs. They line the cell with circular fragments cut out from the edges of plant leaves (especially rose, bougainvillea or ash). Eggs are laid in individual cells, each provisioned with pollen or bee bread (mixture of pollen and nectar). The hatching larvae consume the stored food, pupate within their cells and emerge as adults.



Leaf-cutter bee, note underside of abdomen loaded with pollen  
Photo: Vijay Cavale



Leaf-cutter bee  
Photo: Joseph Berger, Bugwood.org



Leaf-cutter bee damage  
Photo: Whitney Cranshaw, Bugwood.org

**Common name(s):** Sweat bee

**Scientific name, classification:** *Agapostemon* spp., *Augochlorella* spp., *Halictus* spp.,

**Order:** Hymenoptera, **Family:** Halictidae.

**Distribution:** Worldwide.

**Description and ID characters:** Small to medium sized bees, about 1/4 - 1/2 inch in length, often dark or metallic colored. Attracted to the salt in human sweat, earning them their common name.

**Best identifying features:** Small size and hovering flight. Colors range from brown or black with horizontal yellow stripes or bands on the abdomen, to metallic green, blue, purple or red.

**Pest status:** Non-pest, but can be active in large numbers and attraction to sweat may result in encounters during outdoor activities. Will readily sting in defense, but only mildly.

**Damage/injury:** No significant damage.

Swatting a sweat bee on the skin may result in a sting, accompanied by a small electric shock-like sensation but nothing more severe.

Excellent pollinators, and often, large clusters of pollen can be seen attached to their legs as they fly about during the summer.

**Life history:** Sweat bees are not social, and nest underground or in rotten wood. Females may share a common tunnel entrance to adjacent nests, but individual nests are separate. Eggs are laid in individual cells, each provisioned with pollen or bee bread (mixture of pollen and nectar). The hatching larvae consume the stored food, pupate within their cells and emerge as adults, breaking open the cells. They will fly off to find mates and start their own nests.



Sweat bee on dandelion flower head  
Photo: Scott Bauer, USDA-ARS



Sweat bee  
Photo: Jon Sullivan

**Wasps** are common and widely misunderstood insects in most landscapes, often feared because of their stinging behavior. However, they are important predators of many pests and serve to keep them under control by effective foraging. They belong to different families under the order Hymenoptera, and are closely related to ants and bees. Wasps have chewing type mouthparts that are well equipped to cut and chew captured prey. Females of most wasps have a well-developed ovipositor (stinger) at the tip of their abdomen that they use to deposit eggs, attack and paralyze prey or predators, or to defend themselves.

### NOTABLE SPECIES

**Common name(s):** Tarantula hawk, spider wasp

**Scientific name, classification:** *Pepsis* spp., *Hemipepsis* spp., **Order:** Hymenoptera, **Family:** Pompilidae.

**Distribution:** Worldwide.

**Description and ID characters:** Large, dark colored wasp with long, antennae. Measuring up to 2 inches in length, they are the largest among wasps.

**Best identifying features:** Dark, shiny, black or blue-black body, orange or bronze colored wings, very long, dark legs, large size. Body and wings are iridescent, and may appear to change color with the viewing angle.

**Pest status:** Non-pest, females can sting if handled.

**Damage/injury:** Usually none, being quite docile. But if repeatedly disturbed or threatened, they can give an extremely painful sting which is considered the second most painful insect sting in the world, and the most painful in the west. The stings are reported to be “blinding and debilitating, leaving the victim a screaming, balled-up, hot mess” for a few minutes, but the pain subsides soon afterwards and a reddish swelling remains. Other prolonged reactions may occur in sensitive people. The adult wasps actually feed on nectar, pollen, juice from fallen fruits, etc. but the females hunt for spiders to feed their larvae.

**Life history:** Adult wasps are commonly seen during mid-summer, especially after a few monsoon showers. They are active during the day and the females are excellent predators, but are seldom preyed upon because their large size and bright coloring wards off most predators. They forage near the ground, trying to locate tarantulas using smell. When a female locates a tarantula, she will either sting it immediately, or if it is inside a burrow she will enter and sting, or disturb the spider and force it to emerge outside and then sting it. The sting paralyzes the spider in seconds, and it remains in this condition for the rest of its life. She then drags the



Tarantula hawk  
Photo: Dave Hood



Tarantula hawk attacking tarantula  
Photo: Julio Ospinao

spider to her own nest, often a burrow in the ground among debris, and lays a single egg on the spider's abdomen. The hatching larva feeds on the spider till it pupates and emerges as an adult from the spider's abdomen.

**Common name(s):** Yellow jacket, yellowjacket, meat bee

**Scientific name, classification:** *Vespula* spp., *Dolichovespula* spp., **Order:** Hymenoptera, **Family:** Vespidae.

**Distribution:** Worldwide. Common southwestern species include the western yellowjacket (*V. pennsylvanica*), common yellowjacket (*V. vulgaris*), and the introduced and invasive German yellowjacket (*V. germanica*). Aerial yellowjackets (*V. arenaria*) are occasionally encountered.



Western yellow jacket  
Photo: Dave Kirkeby

**Description and ID characters:** Medium sized, robust wasps, 1/2 to 1 inch in length, with broad waist that is barely visible, often hidden between the thorax and abdomen. They can be mistaken for honey bees, or syrphid flies due to their coloration.

**Best identifying features:** Jagged yellow and black patterns on the body, absence of dense hair as in honey bees, side-to-side movement in preparation to land from



Typical head patterns of western, common and German yellowjacket workers  
Photo: Buck, Marshall & Cheung 2008



Common yellowjacket worker abdomen patterns  
Photo: Buck, Marshall & Cheung 2008



C92.10-13 Workers, variation of metasomal pattern

German yellowjacket worker abdomen patterns

Photo: Buck, Marshall & Cheung 2008

flight. Species level identification is often **difficult**, with patterns differing with castes on individuals of the same species.

**Pest status:** Mostly beneficial because they are predators of pest insects such as flies, grasshoppers and caterpillars. The three southwestern species can be serious pests because they aggressively forage on human foods, and females can sting if disturbed or threatened.

**Damage/injury:** Usually sting when they are disturbed while foraging. Wasp stingers are very minute, slender and smooth and do not have large barbs (as in honey bee stingers – see section on bees). They do not get lodged in the victim's skin, or get torn out of the wasp's body after a sting, resulting in the death of the wasp and therefore, a single wasp can sting multiple times.

Stings can be very painful, with the pain, tenderness and swelling lasting 2-3 days, but prolonged or severe reactions may occur in sensitive people, more pronounced in those who have been sensitized by previous stings. These may be manifested as one or several of symptoms such as swelling of throat, lips and mouth, abdominal cramping, diarrhea, nausea and vomiting, breathing distress, decreased blood pressure and loss of consciousness. Hives, itching and swelling in the sting site may also continue longer. Stings can prove life-threatening depending on where a person is stung, or when the quantity of venom injected is unknown as in multiple stings, or the attending medical professionals are unfamiliar with the issue. Wasp venom is primarily used by the wasps to paralyze their prey. It contains a mixture



Aerial yellowjacket nest in a tree

Photo: Carl Barrentine



Aerial yellowjacket

Photo: Gilles Gonthier

of proteins and enzymes that break down cell membranes and lead to destruction of cells and tissues. In multiple stings, the quantity of cell debris produced is higher and can be difficult for the kidneys to eliminate. This can lead to kidney failure, which is a serious medical condition requiring hospitalization.

The three southwestern species are potentially serious pests in child care and school playgrounds, parks, zoos, water parks, and other outdoor recreation areas. All three species forage human foods. Camping and recreational areas are often closed because of yellow jackets.

The wasps are attracted to sugary or sweet-smelling food and drinks and will even enter opened, unattended soda cans through their small opening, or land on uncovered food. This can result in multiple stings inside or around the mouth and lips when people try to consume these items. Wasps that fall into swimming pools, ponds or lakes can also sting, and must be removed before people enter the water. It is very important to be aware of wasp or bee activity in an area before engaging in outdoor activities, to avoid them as much as possible and also to teach children to do the same.

Commercial available traps with heptyl butyrate are attractive to the western yellowjacket, *V. pensylvanica*. Isobutanol traps are useful to trap common (*V. vulgaris*) and German (*V. germanica*) yellowjackets. The placement of multiple traps can reduce the number of foraging yellowjackets, but they will not control or eliminate them. Only one insecticide is currently registered as a bait for yellowjackets and it has not been shown to be effective. If the subterranean nests or nests within structures are located, they can be treated with insecticidal dusts. Precaution should be exercised when treating nests, protective bee suits being advised. The homeowner may need the assistance of a professional pest control technician.

**Life history:** Yellowjackets are social insects, and a typical colony contains workers, drones and queens. A newly fertilized queen overwinters in a protected spot and emerge in spring. She will start a nest in a suitable concealed location and lay eggs. The first batch of eggs usually emerge as workers, and later more and more individuals of different castes are produced. Western yellow jacket nests are usually formed in holes in the ground or cavities in walls, tree trunks, etc. Aerial yellowjackets build large, hanging paper nests in trees. Workers aggressively defend their nests, and forage for food. They prey on other insects, but the southwestern species aggressively scavenge on human food and garbage especially during late summer and fall.

Yellowjacket nests usually last a year. The nest reaches its peak size in late summer, by which time new queens and drones are ready to mate, and leave the nest to start new ones. Once they leave, the old nest gradually declines, with the inhabitants dying out and the nest itself degenerating due to lack of maintenance against weathering.



German yellowjackets near nest entrance  
Photo: Gideon Pisanty



German yellow jacket flight  
Photo: Hans-Jörg Hellwig



European paper wasp flight  
Photo: Thomas Bresson

**Common name(s):** Paper wasp

**Scientific name, classification:** *Polistes*

spp., *Mischocyttarus* spp., **Order:**

Hymenoptera, **Family:** Vespidae.

**Distribution:** Worldwide. Common southwestern species include the common paper wasp (*P. exclamans*), yellow paper wasp (*P. flavus*), brown paper wasp (*P. fuscatus*), the introduced and invasive European paper wasp (*P. dominula*), western paper wasp (*M. flavitarsis*), and Navajo paper wasp (*M. navajo*).

**Description and ID characters:** Medium to large sized wasps, about 1 inch in length. Colors vary with the species, most southwestern species are shades of brown and yellow. However, European paper wasps are black with yellow



European paper wasp  
Photo: Simon Eugster



Yellow paper wasp  
Photo: Dave Beaudette



Common paper wasps with their nest  
Photo: Dave Kirkeby

markings, and are often mistaken for yellow jackets but can be distinguished by their typical features.

**Best identifying features:** Large size, but long and slender body, distinct, slender waist, long legs and antennae, generally slow relaxed flight with legs dangling beneath the body.

Yellow paper wasps are easily distinguished by their yellow bodies, and dark wings. Navajo paper wasps are deep chocolate-brown in color with the end of the abdomen colored yellow. Common paper wasps (and the Arizona paper wasp—a sub species *P. exclamans arizonicus*) are slightly smaller and spindle-shaped, colored brownish-yellow with thin yellow bands across the abdomen.



Brown paper wasp  
Photo: Bruce J. Marlin



Navajo paper wasp  
Photo: Royal Tyler

**Pest status:** Non-pest, can be a nuisance when nesting in or near homes. Rarely aggressive, but can deliver painful stings occasionally, that can trigger hypersensitive reactions.



Paper wasp sting symptoms on hands. A normal hand is shown for comparison  
Photo: Dawn Gouge

**Damage/injury:** Usually none, being quite docile. However, it is best to remove nests inside or very near homes because the wasps may become defensive when

there is too much movement near the nest. They are protective of their nests and will sting in defense. Encounters are common when people try to prune landscape shrubs or plants that contain a nest and several wasps will sting in defense. Stings can result in pain, swelling and other more severe reactions in sensitive persons.

**Life history:** Paper wasp nests are much smaller than yellow jacket nests, and contain up to 250 individuals, often much fewer. The nests are started by a young mated female, who seeks out a suitable protected, spot at such as under eaves or rafters of homes and buildings, in attics, or tree and shrub branches. The nest construction begins by forming a 'petiole' or stalk that will attach it to the supporting structure, and a single brood cell at its end. This is followed by other cells added in a hexagonal pattern. As the cells are added the nest grows in size and hangs like an open umbrella. The cells are open and can be seen from beneath, including the white, legless grubs within them. The female lays her first batch of eggs directly into the brood cells, and these develop into the first batch of workers. Some females are known to use abandoned nests of other females rather than building their own, and others join existing nests and share its duties. Soon, more eggs are laid, and more batches of larvae develop, with some becoming reproductive males and females. These will soon leave the nest to mate and start new ones, and the old nest gradually declines.

**Common name(s):** Mud dauber, dirt dauber, mud wasp, thread-waisted wasp

**Scientific name, classification:** Multiple species, **Order:** Hymenoptera, **Family:** Sphecidae. Crabronidae. The black and yellow mud dauber *Sceliphron caementarium* and the black and blue mud dauber *Chalybion californicus* (Family Sphecidae) and the organ pipe mud dauber *Trypoxylon politum* (Family Crabronidae) are some of the species encountered in the southwest.

**Distribution:** Worldwide.

**Description and ID characters:** Medium to large sized wasps, about 1-1 ½ inches in length. Colors vary with the species.

**Best identifying features:** Long body, thread-like waist, long legs and antennae, generally slow relaxed flight with legs dangling beneath the body.

**Pest status:** Non-pest, not aggressive.

**Damage/injury:** Usually none, being quite docile. Sting only under extreme pressure.



Black and blue mud dauber  
Photo: Johnny N. Dell, Bugwood.org



Black and yellow mud dauber near nest  
Photo: O.P. Sharma, Bugwood.org

**Life history:** Mud daubers are solitary wasps and exhibit no social behavior. They get their name from the female's habit of molding mud into characteristic shapes to form nests. Nests can be urn-shaped with several cells inside and a single external opening (black and yellow mud dauber), or a series of elongated mud tubes (organ pipe mud dauber). Some species use abandoned nests or hollows of other wasps. Several nests of the same, and even different species exist peacefully in the same location because they are very docile. The females usually build the nests, painstakingly gathering mouthfuls of mud back and forth from the ground. Nests are built on high spots on walls, ceilings and eaves. A male locates a female building her nest and mating occurs during her nest-building visits, after which the male stands guard over the nest, while the female forages. Both sexes feed on nectar, but the female hunts spiders to stock the nest for her larvae. Each mud dauber species preys on specific kinds of spiders; the black and blue mud dauber is noted for its preference for widow spiders. The eggs are laid on the spiders, which the female drags into a cell and seals it with mud. The hatching larvae feed on the spider till they pupate, and then emerge as adults. Mud daubers do not guard their nests, which are therefore highly prone to predation.



Organ pipe mud dauber nest  
Photo: Dave Pollinator



Organ pipe mud dauber with prey (spider)  
Photo: Judy Gallagher

**Common name(s):** Velvet ant

**Scientific name, classification:** Multiple species, **Order:** Hymenoptera, **Family:** Mutillidae.

**Distribution:** Worldwide. Genera encountered in the desert southwest include *Pseudomethoca* and *Dasymutilla*.

**Description and ID characters:** Velvet ants comprise a large family of wasps that resemble hairy ants. They exhibit extreme sexual dimorphism, with the males and females of a species bearing no resemblance to each other. Females are wingless and are usually seen foraging on the ground. The males have wings.

**Best identifying features:** Large ant-like body covered with dense, brightly colored or metallic red, orange, white or golden hairs. Their exoskeletons are extremely tough and serve to protect them from moisture-loss and predators. Some species can produce audible squeaks.

Velvet ants can be distinguished from true ants (Family Formicidae), by their straight antennae and slightly constricted waists (as opposed to elbowed antennae and distinct, narrow waists with one or two nodes in ants).

**Pest status:** Occasional biting and stinging pest.

**Damage/injury:** Can cause extremely painful stings that may trigger allergic reactions in sensitive people.

**Life history:** Mature velvet ants feed on nectar. Mating takes place in large aggregations after which the female seeks out larvae or pupae of other insects, usually wasps or bees, on which she lays her eggs-one on each host larva or pupa. The emerging larva feeds on the host till it is ready to pupate. It constructs a pupal case from the host shell or remains, and in a few days, emerges as an adult. Some species overwinter in the pupal state.



Velvet ant

Photo: Joseph Berger, Bugwood.org

### Sources, further information:

Bee and wasp stings

<http://www.ipm.ucdavis.edu/PMG/PESTNOTES/pn7449.html>

Bee management <http://ag.arizona.edu/urbanipm/buglist/bees.pdf>

Bees and wasps

<http://www.ipm.ucdavis.edu/PMG/invertebrates/links.beeswasps.html>

Buck, Marshall and Cheung, 2008.

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## BITING, STINGING AND VENOMOUS PESTS: NON-INSECTS

### SCORPIONS

Scorpions are venomous arthropods in the class Arachnida, relatives of spiders, mites, ticks, solifugids, and pseudoscorpions. They are often thought of as desert animals, but they occur in many other habitats. Many North American species thrive in warm, dry environments and therefore, frequently occur in the desert southwest and are important components of this ecosystem.

Scorpions are unique in their appearance. They have an elongated body that can be divided into three major parts: the cephalothorax (head+thorax), the abdomen (mesosoma) and segmented tail (metasoma) that is tipped with a venomous stinger. They have four pairs of legs and pedipalps with pincer-like pincers on the end, which are used for grasping. Scorpions are mostly nocturnal and all are predatory, feeding on a wide variety of insects and other smaller animals. All the southwestern species of scorpions reproduce sexually (although there are species elsewhere that can reproduce asexually), and the females are ovoviviparous, meaning that eggs hatch



Desert hairy scorpion under normal light (left) and ultraviolet light (right)  
Photos: Dawn Gouge

within the mother and live young (scorplings) are born. Scorpions glow under UV light because of a chemical in their exoskeletons, and this is useful in their detection. However, the chemical does not develop until 2-3 days after a molt, and therefore newly molted or new born scorplings may go undetected under UV light.

### NOTABLE SPECIES

**Common name(s):** Arizona bark scorpion, bark scorpion

**Scientific name, classification:**

*Centruroides sculpturatus*, **Order:** Scorpiones,

**Family:** Buthidae.

**Distribution:** Southwest U.S.

**Description and ID characters:** Small, light brown scorpion, around 3 inches in length, females are slightly smaller.



Arizona bark scorpion  
Photo: Brian Basgen

**Best identifying features:** Delicate, slender in appearance, long, slender pincers, the presence of a tooth or tubercle at the base of the stinger and the long triangular sternum (all other southwestern species, have a five-sided, or a pentagonal sternum), slender legs.

**Pest status:** Important stinging pest, the only species of medical importance and the most venomous scorpion in North America.

**Damage/injury:** The sting of the bark scorpion, can be life threatening. When stung the victim may experience severe local pain (but rarely swelling), sensitivity to touch, heat, and cold, numbness, tingling and possible extremity weakness. Frothing at the mouth, difficulties in breathing (including respiratory paralysis), muscle twitching, and convulsions have been reported, although death is rare, especially in more recent times. In children, who are at highest risk, “roving eye”, hyperactivity and abdominal cramps have been reported.

**Life history:** Bark scorpions are encountered in a variety of situations, most commonly found under rocks, logs, tree bark, and other surface objects. They are the most commonly encountered house scorpion in many habitats, and often associated with rocky areas and natural wash areas. They are able climbers, and can climb vertical rough walls, but do not make it far across a horizontal ceiling. Bark scorpions do not create burrows or nests, but may utilize rodent burrows, or stay hidden in dark cracks and crevices during the day and hunt at night. Bark scorpions overwinter in aggregates of 20-30, which is an unusual behavior because most scorpion species are solitary in nature. They become active in the spring, all through summer and into fall. After elaborate courtship and mating rituals, the male fertilizes the female. Gestation lasts several months after which the about 30 live scorpplings are born. They stay attached on the back of their mother for 2-3 weeks, till their first molt, after which they move down and start independent lives. Bark scorpions are gregarious, very hardy, and are known to live up to 6 years.

**Common name(s):** Giant/desert hairy scorpion, Arizona hairy scorpion

**Scientific name, classification:** *Hadrurus arizonensis*, **Order:** Scorpiones, **Family:** Caraboctonidae.

**Distribution:** Southwest U.S.

**Description and ID characters:** Largest scorpion in North America, measuring up to 5 ½ inches in length.

**Best identifying features:** Robust yellowish brown body that is darker on the top, covered with small brown hairs, sturdy legs and enlarged, lobster-like pincers.



Arizona bark scorpion female with scorpplings on her back  
Photo: Brian Basgen



Desert hairy scorpion  
Photo: Dawn Gouge

**Pest status:** Stinging pest.

**Damage/injury:** Although bigger in size than the bark scorpion, the sting of the hairy scorpion is reported to be a lot less painful, and it is not of medical significance. However, swelling is reported and reactions in sensitive people may include breathing distress, excessive swelling, prolonged pain and other symptoms.

**Life history:** Well adapted to desert life, they are usually found in washes or low-elevations, but can occasionally wander close to homes and structures such as garages and patios attracted by insects coming to lights, and will hide temporarily under many objects such as under furniture, sleeping bags and shoes. In the wild, they dig burrows in the ground and spend the day inside them, emerging at night to hunt. Owing to their large size and aggressive nature, they can capture and feed on a wider variety of prey than bark scorpions, and these include lizards and snakes. Mating takes place outside the burrows and females give birth to live young, as in other scorpions.

**Common name(s):** Striped-tail scorpion, devil scorpion

**Scientific name, classification:**

*Hoffmannius (Vaejovis) spinigerus*,

**Order:** Scorpiones, **Family:** Vaejovidae.

**Distribution:** Southwest U.S.

**Description and ID characters:**

Medium sized, brown colored scorpion, less than 3 inches in length.

**Best identifying features:** Robust

body with dark and light stripes or grooves on the top, the tail is typically thicker than the hands and pedipalps, 'keels' or ridges on the tail are darkened and spiny or granulated in appearance.

**Pest status:** Stinging pest.

**Damage/injury:** Can inflict a sting, but is considered far less painful compared to the bark scorpion. It is not considered medically significant or dangerous.

**Life history:** Striped-tail scorpions are burrowing scorpions, often found in sandy soil but can survive in a variety of habitats from desert floor to rocky hillside, and also can occasionally be found in and around homes and structures where they may hide inside and under shoes, furniture, bags, etc. They prey on many small invertebrates. Habits and habitats are similar to hairy scorpions, but are much less aggressive.

**Common name(s):** Yellow ground scorpion, ground scorpion

**Scientific name, classification:** *Hoffmannius (Vaejovis) confusus*, **Order:** Scorpiones, **Family:** Vaejovidae.

**Distribution:** Southwest U.S.

**Description and ID characters:** Medium sized, brown colored scorpion, less than 3 inches in length, often mistaken for the bark scorpion or striped-tail scorpion.



Striped-tail scorpion  
Photo: Acrocynus

**Best identifying features:** Robust, uniformly light yellowish brown (without dark area on top), thick ridged tail without pronounced dark stripes on the underside, as in the striped-tail scorpion.

**Pest status:** Stinging pest.

**Damage/injury:** Can inflict a sting, but is considered less painful and its venom is far less potent compared to the bark scorpion. It is not considered medically significant or dangerous.

**Life history:** Similar to the striped-tail scorpion.



Yellow ground scorpion  
Photo: Vasilij A. Loskutov

## SPIDERS

Spiders are predatory arthropods in the order Araneae, and are closely related to mites, ticks, scorpions, solifugids and pseudoscorpions. They occur all over the world in all kinds of terrestrial habitats and are incredibly diverse in their appearance, habits and food preferences. Common features of all spiders, however, are their body plan consisting of two major segments – the cephalothorax (head+thorax) and abdomen, four pairs of legs and web-spinning appendages. Spider silk is known for its elasticity and strength, and web patterns are indicative of the species. Some spider species produce venom that is dangerous to humans and can cause severe reactions in some people, but the majority are beneficial, by preying on various insect and other arthropod pests. They are excellent predators and use various elaborate techniques to capture prey. Spiders reproduce sexually and are oviparous, meaning that they lay eggs. Many species exhibit maternal care of the eggs and the young spiderlings after they hatch.

## NOTABLE SPECIES

**Common name(s):** Cellar spider, skull spider, daddy-long-legs spider

**Scientific name, classification:** *Pholcus* spp., **Order:** Araneae, **Family:** Pholcidae.

**Distribution:** Worldwide.

**Description and ID characters:**

Small, delicate spiders with long, thin legs that break off with the slightest external pressure. Body length is about ¼ inch, leg span up to 2 inches or more.

**Best identifying features:** Tiny body and long legs, several times longer than the length of the body, occurrence during the daytime. Often mistaken for harvestmen,



Female cellar spider  
Photo: Joseph Berger

which belong to a related arachnid order, but can be identified by their distinct cephalothorax and abdomen as opposed to an apparently single body in harvestmen.

**Pest status:** Non-pest.

**Damage/injury:** None. Considered beneficial because they prey on small insects and other dangerous spiderlings in human dwellings.

**Life history:** Cellar spiders are commonly noticed in homes and buildings, especially in cellars or attics with less disturbance, and can often be seen during the day. They are almost entirely found in association with human dwellings and structures, and very rarely in the wild being unable to tolerate cold weather. When disturbed, they start vibrating in their web violently in an attempt to scare off and discourage the intruder, earning yet another common name, vibrating spider. They are good predators, and often capture prey larger than themselves. Cellar spiders have venom, but it is weak, and will produce only mild burning sensation if applied to the skin. However, they do not bite and are therefore of no concern.

**Common name(s):** Recluse spider

**Scientific name, classification:** *Loxosceles* spp., **Order:** Araneae, **Family:** Sicariidae. The western or desert recluse *L. deserta* is the common southwestern species. Other species that may be encountered are *L. arizonica*, *L. sabina*, *L. kaiba* and *L. russelli*.

**Distribution:** Worldwide.

**Description and ID characters:** Small light brown or tan spiders, with the body about ½ inch long, and leg span of about 1½ – 2 inches as adults. Their legs are long and delicately covered with short, dark hairs.

**Best identifying features:** Three pairs of eyes arranged in a semicircle on the top of the cephalothorax, violin-shaped marking immediately behind the eyes, which also gives them the name “fiddleback” or “violin” spider.

Other spiders that might be mistaken for brown spiders have four pairs of eyes rather than three and do not have the violin. The violin mark is not always distinct and sometimes cannot be used as a conclusive identifying character. The true brown recluse spider (*Loxosceles reclusa*) does not occur in the southwest. They tend to aggregate in large numbers, but the species encountered in the southwest tend to be more solitary.

**Pest status:** Important and serious biting pest.

**Damage/injury:** Recluse spiders are not aggressive by nature and bites occur when they get trapped inside clothing, shoes, etc. and get directly pressed on to skin. Their fangs are actually quite short, and rarely penetrate fabric.



Male recluse spider  
Photo: Dawn Gouge



Female recluse spider  
Photo: Dawn Gouge

All species and stages of *Loxosceles* except the eggs, are venomous, may be medically significant, and their bites can result in the condition known as '**necrotic arachnidism**'. The bite itself is often unnoticed and the severity of the reaction varies greatly between individuals. In the case of necrotic arachnidism, the bitten area becomes painful, swollen and blisters within hours. This site will evolve into what has classically been described as a **bull's-eye lesion** with a dark center (dead skin) outlined by white and set on a red and inflamed background. It takes several weeks for the blackened area to fall away, leaving a pit of scar tissue. On rare occasions, the response involves a large amount of tissue destruction and a serious life-threatening situation may occur. However, most bites only result in mild reactions.

**Life history:** Recluse spiders are normally found under rocks, scraps of wood or dead cactus, in wood rat nests, or in other similar sites in the desert. They also occupy dark places in buildings in desert locations, being brought into homes on firewood or pieces of cactus skeleton collected from the desert. They do not seem to thrive in irrigated areas, and prefer dry habitats, with a preference for hollow-block walls. In their normal habitat they spin a coarse, sticky, irregular web of very white silk, on which they are usually found in the daytime. They avoid light, but actively forage at night.

Recluse spiders normally live for about 2 years. Each female produces several egg sacs over the summer, and the eggs hatch in about one month. The spiderlings take about one year to grow to adulthood.

**Common name(s):** Tarantula

**Scientific name, classification:** Different genera, **Order:** Araneae, **Family:** Theraphosidae. *Aphonopelma* spp. are common in the U.S.

**Distribution:** Worldwide.

**Description and ID characters:** Large, hairy brown spiders, body length is about 2 inches, leg spans can reach 5-6 inches.

**Best identifying features:** Robust body covered with dense hair.

**Pest status:** Occasional biting pest, hairs can produce irritation.

**Damage/injury:** All tarantulas are venomous and can potentially bite, the aggressive nature and potency of venom varies with species. They can also give 'dry bites' without injecting venom. The hair on some parts of the tarantula's body such as the abdomen, are specialized for defense and are called 'urticating hairs'. These are tipped with tiny barbs that embed on to predator skin and body parts. Once embedded, they are very difficult to remove, and the irritation can persist for several days. However, many species are extremely docile and are kept as pets for years.

**Life history:** Tarantulas, especially the females are long-lived, many living for over 10 years. Both sexes typically mature in five years and females continue to molt even after reaching maturity. Tarantulas display specific courtship and mating rituals, after which the males leave the spot, often living for a few months before



Tarantula  
Photo: Ronald F. Billings, Bugwood.org

dying. The female lays her eggs in a burrow, sometimes guarding it till the young emerge and disperse. Tarantulas are also very hardy, and can survive months, even years with minimal food. In the wild, they feed on a variety of smaller invertebrates.

**Common name(s):** Widow spider

**Scientific name, classification:** *Latrodectus*

spp., **Order:** Araneae, **Family:** Theridiidae.

The western widow *L. hesperus* is the common southwestern species.

**Distribution:** Worldwide.

**Description and ID characters:** Black or very dark brown spiders with long slender legs.

**Best identifying features:** Bright red hourglass shaped mark on the underside of the abdomen in females. The infamous common name “black widow” specifically refers to the eastern species *L. mactans*, which is not established in the southwest. *Latrodectus hesperus* is very similar in appearance. The adult female has a shiny black (occasionally dark brown) body approximately 1.5 cm long and slim black legs with a span of about 4 cm. The female abdomen is bulbous and carries the most famous and easily distinguishable characteristic of this species: the bright red hourglass-shaped marking. Immature females are tan or light brown colored with red, brown, and cream-colored markings on the dorsal surface of the abdomen, and a cream-colored hourglass. The legs are tan with black stripes. Males are much smaller than adult females (about  $\frac{1}{20}$ <sup>th</sup> the size) and, like immature females, are patterned with red, brown, and cream.

**Pest status:** Important and serious biting pest.

**Damage/injury:** Black widows are not aggressive, but may bite if grabbed or pressed against the skin, which may occur accidentally when trapped in clothing or trapped on a person’s body. The venomous bite of widow spiders is considered dangerous because of the neurotoxin latrotoxin, which causes the condition ‘latrodectism’, which includes abdominal pain

similar to appendicitis as well as pain to muscles and even the soles of the feet. Other symptoms include alternating salivation and dry-mouth, paralysis of the diaphragm, profuse sweating and swollen eyelids. Most healthy people recover rapidly in two to five days but rare fatalities that occur are due to heart and lung failure. The female black widow has unusually large venom glands and her bite is



Female black widow-dorsal view  
Photo: Sturgis McKeever, Bugwood.org



Female black widow-ventral view,  
with egg sac  
Photo: Mark Chappell, UC Riverside



Juvenile female black widow  
Photo: Dawn Gouge

particularly harmful to humans; and can be fatal to small children, the elderly or the infirm. Bites are rarely fatal to normal healthy adults if proper medical treatment is provided.

**Life history:** Female black widows are generally found on their irregularly-shaped webs near the ground in protected corners and entranceways to houses, between stones and flower pots, in woodpiles, rodent burrows, etc. Female widow spiders seem to favor certain spots around structures and once identified, can routinely be predicted to contain a spider, even if it is regularly removed. They are not commonly found inside modern homes. The female requires a shaded, secluded resting place where she spends the



Male black widow  
Photo: David Kirkeby

daylight hours if her web is constructed in an open area. The life cycle from egg to maturity requires about four months under laboratory conditions, but probably less outdoors where temperatures are much higher. Mating is an elaborate process that begins when a wandering male encounters the webbing of a female. The male approaches the female cautiously while sending vibratory messages to her through her web. If she is receptive, she will remain motionless long enough for the male to deposit sperm in her genital opening. After insemination, the male usually lingers on the outer edges of the female's web and moves away. Contrary to the popular belief, and the reason for their common name, western widow spider mating does not involve sexual cannibalism. It occurs only in rare, confined situations such as in a laboratory container, but never in the open. The true black widow *L. mactans*, has been observed to exhibit sexual cannibalism in the open, but this again is not the rule and occurs mostly if the male cannot get away quickly enough.

## SCORPION/SPIDER LOOK-ALIKES

**Common name(s):** Pseudoscorpion, false scorpion, book scorpion

**Scientific name, classification:** Different genera,

**Order:** Pseudoscorpionida, **Family:** Different families.

*Chelifer cancrivorus* (Family Cheliferidae) is a common species in homes.

**Distribution:** Worldwide.

**Description and ID characters:** Tiny scorpion-like arthropods, about 1/8<sup>th</sup> inch in length.

**Best identifying features:** Strong resemblance to scorpions, flattened pear shaped body, prominent pedipalps, and lack of tail.

**Pest status:** Non-pest.

**Damage/injury:** They are tiny and inoffensive, and are rarely seen due to their size. Many pseudoscorpions have venom glands within the pedipalpal fingers, making them the only venom-producing arachnids other than spiders and scorpions. They can inflict bites, but such instances are very rare.



Pseudoscorpion  
Photo: Christian Fischer

**Life history:** Natural habitats for pseudoscorpions include under leaf litter and mulch, in moss, under stones and beneath tree bark. They have also been reported in bird nests and between siding boards of buildings. They can be transferred from one spot to another by riding or attaching to larger insects and animals, or when articles are moved. Pseudoscorpions are predaceous and are generally beneficial in and around homes since they prey on clothes moth larvae, carpet beetle larvae and booklice in undisturbed books and clothing, as well as ants, mites, and small flies. They reproduce sexually, and give birth to live young.



Pseudoscorpion in an old book  
Photo: Sean McCann

**Common name(s):** Solifugid, camel spider, wind scorpion, sun spider, solifuge

**Scientific name, classification:**

Different genera, **Order:** Solifugae,

**Family:** Different families.

*Eremobates pallipes* (Family Eremobatidae) is a common species in the southwest.

Solifugids are sometimes referred to as ‘solpugids’ or ‘solpugida’; these are actually members of one family, Solpugidae under Order Solifugae. The correct term covering all members of the order is ‘solifugid’.



Solifugid/wind scorpion  
Photo: Braboowi

**Distribution:** Worldwide.

**Description and ID characters:** Small predatory arthropods, bearing resemblance to scorpions and spiders, but lack venom glands, web-spinning organs or pincers on their pedipalps. Most species are around 2 inches in length; larger species measuring up to 5 inches exist.

**Best identifying features:** Elongated spider-like body with four pairs of legs, long pedipalps lacking pincers, prominent and powerful jaws on the front of the head. They probably have the largest jaw size to body size ratio among animals. They can run extremely fast and are therefore called ‘windscorpions’.

**Pest status:** Non-pest.

**Damage/injury:** Almost none. They can obviously bite or pinch using their jaws, but such instances are very rare. They do not sting, and do not have venom glands. Their unfamiliar, large spider-like appearance and swift movements might probably frighten some people.



Close-up of solifugid jaws  
Photo: Jon Richfield

**Life history:** Solifugids are common in warm, dry environments such as the southwest, but they can be found in many other habitats. They hunt and feed on various smaller arthropods and invertebrates, and occasionally even on snakes, lizards and rodents. The sensitive pedipalps are used to locate prey, capture it and bring it closer to the jaws, which then cut it up.

Solifugids are mostly solitary, often the only contact with another individual is for mating. Females lay eggs in the ground and covers them with soil. They care for the young till they can hunt and feed themselves.

**Common name(s):** Tailless whip scorpion, whip spider (not to be confused with whipscorpion), amblypygid

**Scientific name, classification:** Different genera, **Order:** Amblypygi, **Family:** Different families. *Phrynus* spp., Family Phrynidae are common.

**Distribution:** Throughout North America.

**Description and ID characters:** Medium to large sized predatory arthropods appearing like a mixture of several other arthropods. Sizes vary greatly, body lengths of about 1 inch are common, legs can be several times the length of the body.

**Best identifying features:** Dark brown, gray or black coloration, resemblances to spiders, scorpions and crabs, highly flattened body, segmented abdomen, four pairs of long, thin legs and four pairs of eyes. The front pair of legs which are the ‘whips’ in this case, is longer than the others and is not used for walking but is sensory in function and used to probe the environment and many other purposes.

Amblypygids walk on six legs. Pedipalps are long and armed with spines all along their inner margin.

**Pest status:** Non-pest.

**Damage/injury:** Almost none. Non-venomous, do not bite or sting, but can grab or pinch with their spiny pedipalps if repeatedly disturbed, and this may result in small puncture-like injuries.

**Life history:** Live in the ground, hiding in debris, tree stumps or other moist spots during the daytime, and emerging to hunt at night. The front pair of legs or ‘whips’ are used for navigation and to locate prey, which are captured with the pedipalps and cut up using jaws located in front of the head. Amblypygids prey on a variety of smaller arthropods, mostly insects. Reproduction is sexual, and egg laying and hatching processes are similar to those of vinegaroons.

**Common name(s):** Whip scorpion, vinegaroon, uropygid

**Scientific name, classification:** Different genera, **Order:** Thelyphonida, **Family:** Different families. *Mastigoproctus* spp., Family Thelyphonidae are common.

**Distribution:** Throughout North America.

**Description and ID characters:** Dark brown or black, scorpion-like arthropods, 1 - 3 inches in length, with four pairs of legs.



Tailless whipscorpion  
Photo: David Cappaert

**Best identifying features:** Dark brown or black body color, prominent spined, arm-like pedipalps in front of the head and a whip-like tail.

**Pest status:** Non-pest.

**Damage/injury:** Vinegaroons have no venom glands, but they have glands near the rear of their abdomen that can spray a combination of acids (acetic and caprylic) in response to being disturbed, that releases a vinegary smell. They can also bite or pinch using their pincers, but such instances are rare.

**Life history:** Vinegaroons are nocturnal predators, and actively hunt and feed on many other arthropods and small invertebrates. They rest in burrows dug out in the ground, or other dark, concealed spaces, into which they drag their prey and feed on it.

Reproduction is sexual, and after mating, the female seals herself inside a burrow. She then delivers her eggs enclosed in a membranous brood sac which protects the eggs from desiccation, and remains attached to her back. The young ones develop in the sac and hatch out of it, but latch on to the mother till their first molt. The entire process of egg-laying and development takes several months during which the female never leaves her burrow even to feed, finally emerging only when the young are ready to move out.



Whip scorpion/vinegaroon  
Photo: Thomas Brown

**Sources, further information:**

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