

Spiders...in San Joaquin Valley Grape Vineyards

Grape growers, researchers and pest control advisors are interested in the role of spiders as biological control agents. This publication provides basic identification of common spider species found in California's San Joaquin Valley along with information on their ecology and behavior.

While the photographs we provide are a helpful descriptive tool, one should realize that juvenile and adult spiders often differ in shape, color and/or size. For example, spiderlings can be $< 1/32$ " but can grow to an adult $> 1/2$ " in size (measurements are based on body size, not including the spider's legs). To help identify common spiders, we discuss basic body characteristics, as well as eye patterns (which should be viewed using a hand lens). General descriptions listed below are of adult spiders.

All spiders are exclusively carnivorous. What and how much each spider species consumes can vary greatly. Our observations on spider ecology and behavior were taken from laboratory and field studies. Ongoing studies will identify the effectiveness of spiders as biological control agents of vineyard pests.

Spiders have two basic body parts: **carapace** and **abdomen** (Fig. 1). They have eight legs, a pair of **chelicerae** with fangs, a pair of **pedipalps** (sensory organs; also used by males for reproduction), and a set of **spinnerets** from which silk webbing is produced. Most species have eight eyes (see Figs. 2, 3, 4 and 5), which are in two rows and termed subequal if they are all about the same size.

We classify spiders as **Large** if average body size is $> 1/3$ ", **Medium** if between $1/5$ " and $1/3$ " and **Small** if $< 1/5$ ".

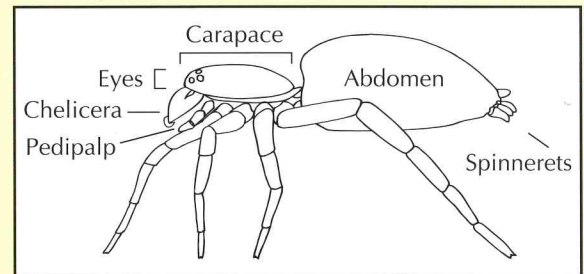


Fig. 1: Side view of spider body

Spiders Found in the Grapevine Canopy

COBWEB WEAVERS - Family Theridiidae

Theridion dilutum

Theridion melanurum

Adults of both *Theridion* species are small with globular abdomens. Eyes are subequal. *Theridion dilutum* is cream colored to yellow with few body hairs. *Theridion melanurum* is dusky brown, has a wider carapace, hairier abdomen and legs, and more extensive black bands along leg joints.

Both species are day active, spin sticky webs, and sit and wait for prey on leaf undersides and in grape bunches.

Theridion dilutum produces several egg sacs (spring to autumn); *Theridion melanurum* reproduces in spring to early summer. Female protects round egg sac until hatch. Overwintering habit unknown. High densities of *Theridion* spp. associated with high leafhopper populations.

Not known to bite humans.

Prey observations—Field: leafhopper nymphs, mites, gnats. Laboratory: leafhopper nymphs, mites, *Drosophila* flies.



Photo by Jack Kelly Clark

Theridion dilutum



Photo by M.J. Costello

Theridion melanurum

SAC SPIDERS - Family Clubionidae

Agrarian Sac Spider (*Cheiracanthium inclusum*)

Adult medium size, body pale yellow to dull green, chelicerae dark brown/black, long thin legs with small black brushes at the feet. Eyes subequal. Nocturnally active, hunts along trunk, canes and foliage, locating prey by touch. Rests during day in web on leaf undersides or in fruit clusters. Juveniles and adults overwinter under bark. Female covers egg sac by folding leaves and weaving dense web. Most common spider in San Joaquin Valley vineyards.

Known to bite humans; reaction similar to mosquito bite.

Prey observations–Field: flies, leafhopper nymphs, other spiders. Laboratory: leafhoppers, mites, omnivorous leafroller larvae, *Drosophila* flies, mealybugs.



Photo by M.J. Costello

Agrarian Sac Spider

ANTMIMIC SPIDERS - Family Corinnidae

Trachelas pacificus

Adult medium size, carapace brick-red and abdomen grey-brown, legs stout with front pairs dark. Eyes subequal, second row recurved (Fig. 2). Nocturnally active hunter, rests during day in web on leaf undersides or under bark. Juveniles and adults overwinter under bark. Egg sac (1/4" diameter) white, round and domed, commonly called "white cap."

Known to bite humans if aggressively handled; reaction similar to mosquito bite.

Prey observations–Field: leafhopper nymphs, mealybugs. Laboratory: leafhopper nymphs, mites, omnivorous leafroller larvae, *Drosophila* flies.



Photo by M.J. Costello

Trachelas pacificus

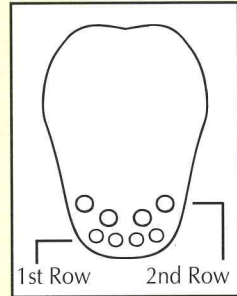


Fig. 2: Eye pattern of *Trachelas pacificus*, top view



Photo by K.M. Daane

Funnel Weaver

FUNNEL WEAVERS - Family Agelenidae

Hololena nedra

Adult large, abdomen with orange-brown chevron flanked by two dark gray bands. Juvenile gray with orange chevron flecked with red. Eyes subequal, second row procurved (Fig. 3). Day active, sits and waits for prey using funnel-shaped web (may extend 8-12" across foliage). Adult overwinters under bark, produces egg sac in winter. In spring, spiderling makes web on single leaf.

Not known to bite humans.

Prey observations–Field: leafhopper adults, western grapeleaf skeletonizer moths, flies, midges, gnats, scarab beetles.

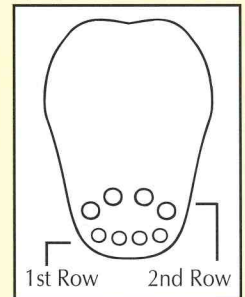


Fig. 3: Eye pattern of funnel weaver, top view

ORBWEAVERS - Family Araneidae

Neoscona oaxacensis

Adult large, abdomen triangular to oval with yellowish or dark gray background, pale outline of herringbone pattern flanked by cream colored spots. Young juveniles are globular, cream colored, with black spots on abdomen. Sits and waits for prey in orb-shaped web; active from dusk until early morning. Young juveniles form 1-3" diameter webs on canes or trellis wires; half grown juvenile and adult webs span vine rows. Overwinters as egg or newly hatched spiderling.

May bite if caught under clothing; bite not considered serious.

Prey observations–Field: gnats, midges, mosquitoes, noctuid moths, lacewings; juveniles will catch leafhopper adults, vinegar flies.



Photo by M.J. Costello

Orbweaver

SPIDERS FOUND IN THE GRAPEVINE CANOPY (cont.)

JUMPING SPIDERS - Family Salticidae

Metaphidippus vitis

Adult small-medium size, abdomen iridescent bronze, carapace black, legs stout and short; two front eyes conspicuously large (Fig. 4). Day active hunter, captures prey by jumping many times its body length. Juvenile overwinters under bark, female guards egg sac in spring.

Not known to bite humans.

Prey observations—Field: thrips, midges, gnats, flies, other spiders.

Laboratory: *Drosophila* flies; will not feed on variegated leafhopper nymphs.



Metaphidippus vitis

Photo by K.M. Daane



Photo by K.M. Daane

Johnson Jumper (*Phidippus johnsoni*)

A less common jumping spider is the Johnson jumper (*Phidippus johnsoni*). Adult medium size, with a red and black abdomen; entire spider hairy.

Known to readily bite humans; bite not considered serious.

Prey observations—Laboratory: *Drosophila* flies, caterpillars.

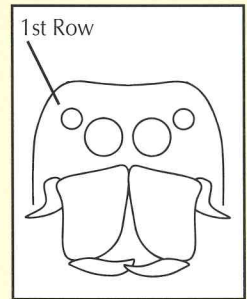


Fig. 4: Eye pattern of jumping spider, front view

Johnson Jumper

Spiders Found on Floor Vegetation

WOLF SPIDERS - Family Lycosidae

Pardosa ramulosa

Adult medium size, long spined legs, abdomen gray with gray-brown chevron, carapace dark brown with gray bands; first eye row slightly procurved, second row strongly recurved and eyes larger (Fig.5). Day active hunter, rapid runner. Usually found on ground, but occasionally in canopy. Female carries globular white egg sac below abdomen, young spiderlings ride atop after hatching.

Not known to bite humans.

A less common wolf spider found in vineyards is *Schizocosa mccooki*, which is conspicuous because of its large size (adults may reach 3/4").

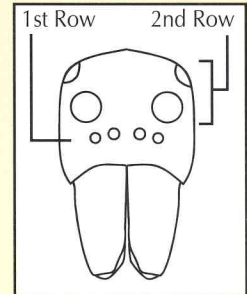


Fig. 5: Eye pattern of wolf spider, front view



Photo by K.M. Daane

Wolf Spider

A Dangerous Spider

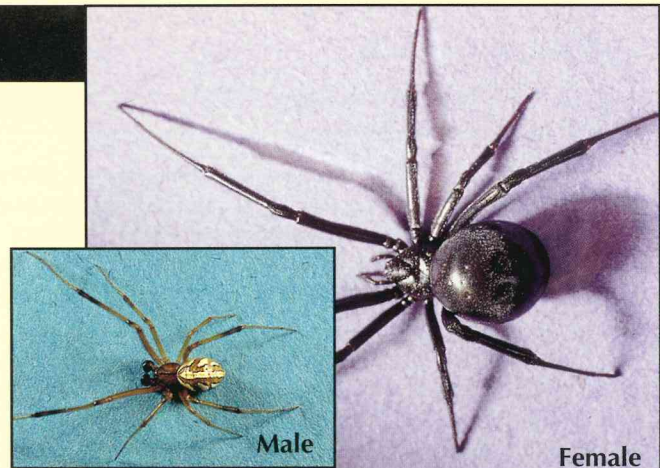
Black Widow Spider (*Latrodectus hesperus*)

Family Theridiidae

Female large, abdomen round shiny black, with red hourglass pattern on underside; male body small to medium, abdomen with brown background and light swirl pattern. **RARE** compared to other spiders described in this field guide. Habitat preference for deep vine trunk crevices or irrigation pipe stands, but can be found in canopy and bunches. Nocturnally active, sits and waits for prey.

Female **NOT** inclined to bite humans unless physically contacted. Venom is neurotoxic and virulent; complications can occur up to three days after bite. Male seldom, if ever, bites.

Prey observations—Field: crickets, cockroaches.



Black Widow Spider

Photos by M.J. Costello

Spiders Found Both in Canopy and on Floor Vegetation

LYNX SPIDERS - Family Oxyopidae

Western Lynx Spider (*Oxyopes scalaris*)

Striped Lynx Spider (*Oxyopes salticus*)

Adult medium size, abdomen tapers to a point, legs spiny, rear six eyes viewed from above form a hexagon. Western lynx spider has yellowish carapace with reddish-brown sides, grayish abdomen. Striped lynx spider has yellowish carapace with four gray lengthwise bands, abdomen light yellow (iridescent purple in male); first three pairs of legs of older juveniles and adults have black stripe on underside of femur.

Day active hunter, catches prey by speed or jumping ability. Western lynx spider most often found in grapevine canopy, whereas striped lynx spider most often found on floor vegetation.

Not known to bite humans.

Prey observations—Field: ants, leafhopper adults, flies, small wasps.
Laboratory: leafhopper nymphs and adults, *Drosophila* flies.



Photo by K.M. Daane

Western Lynx Spider (with leafhopper)



Photo by M.J. Costello

Crab Spider

CRAB SPIDERS - Family Thomisidae

Misumenops, *Xysticus*, *Coriarachne* (various species)

Small to medium size, light to dark brown, distinct crab-like appearance (first two pairs of legs almost twice as long as others). Day active, captures prey by crouching and ambushing. Overwinters as half-grown juvenile.

Not known to bite humans.

Prey observations— Field: flies. Laboratory: leafhopper nymphs, caterpillars.

DWARF WEAVERS - Family Linyphiidae

Erigone dentosa

Adult small, abdomen and carapace shiny dark-brown; long, thin tan-brown legs. Male has prominent protuberance on pedipalps. Day active, sits and waits for prey using fine-web snare. Found in canopy and clusters in spring and autumn, in ground cover year-round. Overwinters in litter on vineyard floor.

Not known to bite humans.

Prey observations—Field: leafhopper nymphs, thrips, gnats.



Photo by M.J. Costello

Dwarf Weaver

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