



Spiders: An Undeserved Bad Reputation

Authored by Matt Sharpe, Lab Technician, Department of Entomology, Virginia Tech; and Gillian Eastwood, Associate Professor, Department of Entomology, Virginia Tech

Introduction

When you see a spider, your first instinct may unfortunately be to step on it or squash it, but, before you do, consider two things: (1) spiders are predators that eat insects, and (2) in North America, there are only two groups of spiders that are of medical concern to humans (the widow and recluse spiders), and the rest are harmless or can even be beneficial.

Although most spider species are venomous (though not necessarily to us), in most cases, that venom is used to subdue prey (primarily insects), and, as ubiquitous predators in every ecosystem, they will feed on whatever insect is within their reach.

This means spiders should be a welcome sight, even encouraged to thrive, in your home and garden.

More spiders = fewer pest insects.

The World Spider Catalog hosted by the [Natural History Museum Bern](http://wsc.nmbe.ch) (<http://wsc.nmbe.ch>) currently lists 53,686 species of spiders worldwide (with more being discovered every year). Around 3,500 species have been sighted in the U.S. (<http://usaspiders.com>).

In Virginia, [Spider ID](https://spiderid.com/locations/united-states/virginia/) lists only 56 species sighted (<https://spiderid.com/locations/united-states/virginia/>); however, estimates range from <100 to “nearly 900” species, and former Virginia Tech Insect ID Specialist Eric Day estimates there are actually several hundred species in Virginia, with many yet to be sighted.

Several factors can help turn an initial “step n’ squash” response into one of “observe, and if not a black widow or brown recluse, quietly retreat, or enjoy spotting these arthropods.”

Spider Identification

Spiders are not insects.

Spiders have eight legs and two body parts, whereas insects have six legs and three body parts. Spiders have simple eyes (usually eight, rarely six) while insects have compound eyes (two). Spiders, in fact, belong in the phylum Arthropoda (Arthropods), class Arachnida (Arachnids), and the order Araneae (Spiders). All spiders found in North America belong to the suborder Opisthothelae.

Determining spider families, genera, and species, can be difficult to identify due to their diminutive size (over 50% of spiders are only 1mm - 5mm in length), complex anatomy parts (difficult to see without magnification), taxonomic keys based on adult spiders (may be ineffective when identifying immature specimens), rapid movements (escaping a close eye or camera), and close variations within species (many species look similar but are biologically different). However, with the help of study and reference aids (bugguide.net, Virginia Tech Entomology Lab, and other websites), you may be able to identify the spiders you observe down to family and genus. With practice, you can make an identification of some spider families or groups, as spiders are generally placed into two categories: those that build webs, and those that do not.

Specific web-builder spiders can be further identified by their web type, ranging from irregular-shaped to orb, or tubular. Examples include cobweb or tangle webs (e.g., American house spider), sheet webs (e.g., hammock spider), orb webs (e.g., barn spider, black & yellow garden spider, spiny-backed orb-weavers), funnel webs (grass spider), and woolly webs (cribellate orb weavers). One interesting note is that most web-builders have poor eyesight and instead rely on vibrations made by prey caught in their webs. Find out more fascinating details about spider webs at:

(<https://spideridentifications.com/spider-facts/spider-web>)

Non-web-building spiders are called hunting spiders and consist of those that “hunt” and ambush their prey, and those that lie in wait, ready to nab insects as they pass by. Crab spiders are passive, while examples of aggressive hunters include fishing spiders (“skating” across water, diving to capture prey) and jumping spiders (running sideways, backwards, jumping many times their body length to pounce). Jumping spiders have the best vision of spiders (seeing objects up to eight inches away) and are easily recognizable by their large middle eyes.

Spiders are Predators

Worldwide, spiders reportedly kill an estimated 400-800 million metric tons of prey annually. While over 90% of that prey are insects, they will also consume other arthropods, even including other spiders.

Spiders can be found in every microhabitat and in every terrestrial ecosystem, except Antarctica. They are also found in many freshwater and marine ecosystems. Some spiders are specialists, while others are generalists in their habitat choice. Regardless, most spiders are territorial. It may be disconcerting to some people, but it is likely that, no matter where you are, you’re within just a few feet of a spider.

Most spiders are nocturnal, when tactile and chemical cues are more important than sight. Generally, their prey is smaller than or equal to the spider’s own size; however, jumping and orb-weaver spiders are known to capture prey many times larger than themselves. Unable to chew their food, spiders use fangs to inject venom into their prey, then inject digestive enzymes to liquify tissue, turning their prey into a digestible “smoothie.”

Which Spiders are Dangerous (and what if I get bitten)

In North America, only two spiders are of medical concern:

- (1) **widow spiders**, in the family Theridiidae and genus *Latrodectus*; and
- (2) **recluse spiders**, in the family Sicariidae and genus *Loxosceles*.

Only two of the five widow species in the U.S. are typically found in Virginia: Northern and Southern Black Widows. Females (males do not bite) of both species have the classic black widow marking: a distinctive red hourglass on the underside of the abdomen (Fig. 1); on the Northern black widow, the hourglass is split in the middle.



Figure 1. Female Southern black widow - *Latrodectus mactans* (Photo: James Gathany CDC)

Of several species of recluse spiders, the most common in the eastern U.S. is the Brown Recluse. Most brown recluse spiders are light-to-medium brown, with distinguishing features including three pairs of eyes in a semicircle (most spiders have eight eyes) and a violin-shaped dark marking extending from the neck toward the abdomen (Fig. 2).



Figure 2. Brown recluse. *Loxosceles reclusa* (CDC)

Bites from both widow spiders and recluse spiders can result in a range of reactions, from no reaction to a severe reaction. Symptoms from widow spider bites usually disappear within 1 - 7 days, while symptoms from the brown recluse may appear 24 - 36 hours after being bitten, and healing may take 6 - 8 weeks (in severe cases, the wound can last several

months). If bitten, seek medical attention immediately. The preferred habitats of both are sheltered areas, such as woodpiles, under rocks, and in debris. Precautionary measures to help avoid bites include wearing long sleeves and gloves, shaking out work clothes and shoes, and regularly cleaning storage areas. For more information on spiders of medical importance and how to protect yourself, visit <https://www.pubs.ext.vt.edu/ENTO/ENTO-73/ENTO-73.html>.

Are Spiders Beneficial? In a word, “YES.” Given the sheer volume of spiders, the insects they consume annually, and their presence in virtually every microhabitat and ecosystem, they bring value to the vegetable garden as natural insect predators.

Spiders such as the cute jumping spider (Fig. 3) or garden spider (Fig. 4) are harmless and beneficial.



Figure 3. Bold jumping spider. *Phidippus audax*

Additionally, multiple studies have shown that spiders can play a key role in suppressing agricultural pests.

Should spiders be an integral part of the gardener’s Integrated Pest Management (IPM) protocols?

In general, they already are, by the sheer volume of their numbers and presence (although their volume can be somewhat reduced in vegetable gardens due to the “disturbed habitat”). Factors such as the use of pesticides (killing spiders or insects, their primary food source) and spiders’ indiscriminate prey selection (they may eat a honeybee as readily as a stink bug) must also be considered. For these reasons, while welcoming spiders to your garden,

using spiders as specific control agents would be less effective than other methods.

Whenever possible, it is recommended that you leave these valuable predators alone to hunt in your garden. They deserve our appreciation, not our scorn.

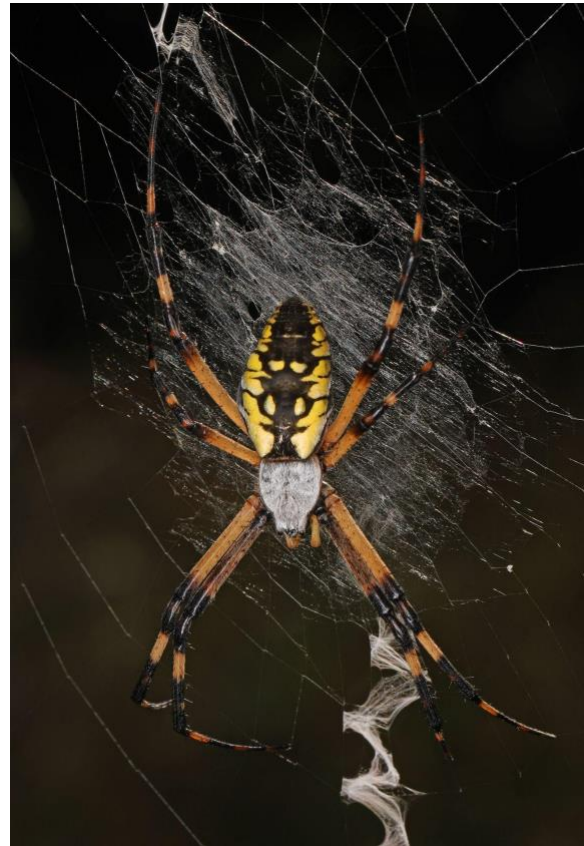


Figure 4. Black and yellow garden spider. *Argiope aurantia*

References

- Hoffman, R.L. 2010. “Purse-web Spiders, Genus *Sphodros*, in Virginia (Mygalomorphae: Atypidae).” *Banisteria*, Virginia Natural History Society 36: 31-38
- Nyffeler, M., and K. Birkhofer. 2017. “An estimated 400-800 million tons of prey are annually killed by the global spider community.” *Sci Nat* (2017) 104: 30
- Ubick, D., P. Paquin, P.E. Cushing, and V. Roth. 2017. “Introduction: Importance of spiders.” *Spiders of North America* (2nd ed.) 1: 14

Additional Resources

Dalton, S. 2008. Spiders: The Ultimate Predators
Howell, W.M., and R.L. Jenkins. 2004. Spiders of
the Eastern United States: A Photographic Guide

Acknowledgements

Thank you to Jim Revell and Tim McCoy, who were
the original authors of this publication.

Visit Virginia Cooperative Extension: ext.vt.edu

Virginia Cooperative Extension is a partnership of Virginia Tech, Virginia
State University, the U.S. Department of Agriculture (USDA), and local
governments, and is an equal opportunity employer. For the full non-
discrimination statement, please visit ext.vt.edu/accessibility.

2026

ENTO-393NP (ENTO-641NP)