Virtual Creature Fest: Wolf Spiders

Get to know some of New Jersey's spine-tingling spiders.

YIKES! An accidental encounter with one of these tablespoon-sized arachnids can evoke a shriek from even the most intrepid soul. Despite their terrifying appearance, wolf spiders (*Lycosidae spp*.) are not nearly as threatening as they seem. They are frightening because of their large size and their lurking habits, but these misunderstood spiders are not aggressive.

There are about 240 species of wolf spiders in the United States. All of them are prolific hunters of insect pests and are beneficial to us freaked out humans. They build retreats in holes or old rodent tunnels, under rocks, in piles of firewood, under floorboards, decking and siding, and in dark corners of basements and sheds. Wolf spiders are nocturnal and only come out of hiding during the night to hunt. They don't spin webs but instead run down or ambush their prey.

Wolf spiders are covered with sensory hairs that give them a furry appearance, hence the wolf reference. The hairs provide them with an acute sense of touch and help them sense vibrations of nearby prey and to dodge predators. They have eight eyes arranged in three rows. The bottom row consists of four small eyes, the middle row has two very large eyes, and the top row has two medium-sized lateral eyes. Wolf spiders possess the second-best eyesight of all spider groups. Only jumping spiders have better eyesight. Take a tour of a Cost Rican wolf spider and its eight eyes here.

Unlike most other arachnids which have poor vision, wolf spiders have excellent eyesight, especially at night. Their eyes have a reflective tissue called tapetum lucidum that reflects visible light back through the retina, increasing the light available to the photoreceptors. This contributes to their superior night vision. When a beam of light is flashed on a spider's eyes at night, the *tapetum lucidum* reflects the light back and an effect called eyeshine is produced. This eyeshine can be seen when the light from a flashlight or camera flash has been reflected from the spider's eyes directly back toward its source, producing a greenish-blue "glow" that is easily observed. This is the same effect as a cat's eyes glowing in the dark.

Wolf spiders mate in the fall and the males die before the onset of winter. The fertilized females seek warm, dry places to overwinter which is why they crawl into our basements when it gets cold. Since the female doesn't produce egg cocoons until the following May, if she couldn't find shelter, she would die before reproducing. The female carries her sacs on her spinnerets until the eggs hatch. Once the eggs hatch, the spiderlings climb onto her back and live off the protein from their eggs for weeks. The babies go everywhere with her, including hunting. If one spiderling falls off, the female will stop what she is doing until it crawls up onto her back again. A mother spider can have more than 100 babies clinging to her and if the mother is disturbed the babies often flee in all directions. These juveniles grow slowly and only reach half of their full size by the fall. Then the young spiders will also overwinter in protected sites and complete their growth the following spring and summer. The females may live for several years beyond the year in which they reach maturity.

Wolf spiders have two sharp fangs that inject a mild venom into their prey to paralyze them. The venom is nonlethal to humans, although the bite may cause swelling, pain, redness and itching similar to a wasp sting. Wolf spiders will bite if threatened or trapped next to the skin. Keep the spiders out of your house by sealing up cracks and always wear gloves when messing around in dark places. The last thing a wolf spider wants is to have a surprise run in with you in the dark!

Test Your Knowledge

1. Why are wolf spiders called wolf spiders?
Answer: They are covered with furry hairs and hunt their prey.

2. Why do female wolf spiders seek out warm dry places like our basements in winter?
Answer: Because after wolf spiders mate, the female must overwinter before she produces egg cocoons the following spring. If left outdoors she would not survive the elements to reproduce.

3. What are baby spiders called?
Answer: Spiderlings.

3. What do wolf spider spiderlings do after they hatch?
Answer: They stay on the mother's back until they mature.

4. How many eyes do wolf spiders have?
Answer: Eight.

5. What happens when you shine a flashlight into a wolf spider's eyes?
Answer: They glow in the dark.

6. What tissue is responsible for causing spiders eyes to reflect light and shine in the dark?
Answer: The tapetum lucidum.

Activity: Go Spider Spotting
Get a flashlight and go outside in your yard in the dark. Make sure you turn out all outdoor lighting so that it is dark. Hold a flashlight level with your eyes. The light will reflect from the spiders' eyes at an easier angle for you to spot. Sweep the light across the grass. If spiders are in the grass, from about 15 or 20 feet away you may see a bright point of glowing blue-green light. The glow is your flashlight beam reflecting off a spider's eyes. Walk over and check out the source of the glow. You may be shocked at how bright the eyeshine from even a tiny spider can be. Do not hurt the spider; they are only hunting pests and want nothing to do with you! A more detailed description of this activity can be found here.

Activity: Wolf Spiders Down Under
To get an international look at wolf spiders, the Australian Museum provides beautiful photos and information in an easy to read format. Within that continent, the **distribution** of the wolf spider is discussed: Many Wolf Spiders have wide distributions, especially across inland regions. This distribution is aided by their ability to disperse aerially as spiderlings or small juveniles over large distances. Many also have very specific microhabitat preferences such as stream-side gravel beds, montane herb-fields, or coastal sand-dunes.

Using the Range Map and the Distribution Information, consider questions such as these regarding climate change:

1. How might the wolf spider of Australia be influenced by the impact of climate change? Provide examples.
2. Regarding climate change, are organisms with "specific microhabitat preferences" at greater risk? Provide evidence.
3. Do you think that spiders that spin webs are more vulnerable to threats than the wolf spider that hunts without a web? Explain.

For Discussion
Make a list of the positives and negatives. How would you convince a homeowner to allow wolf spiders to remain on and around their property? Would you do so?

Additional Resources:

- Wolf Spiders
- National Geographic
- 110 Million Year Old Spider Eyes Still Glow in the Dark Discovered
- *Tapetum lucidum*

Click here to read more about the New Jersey Department of Education's new K-12 mandatory climate change curriculum, this article involves NJ First Lady Tammy Murphy's announcement. New Jersey is the first state in the United States to incorporate climate change curriculum as a requirement for public schools.

For more information about how the topic of wolf spiders can be used in a multi-disciplinary manner including for the topic of climate change, contact Kate Reilly, Manager of Education, Duke Farms at kreilly@dukefarms.org