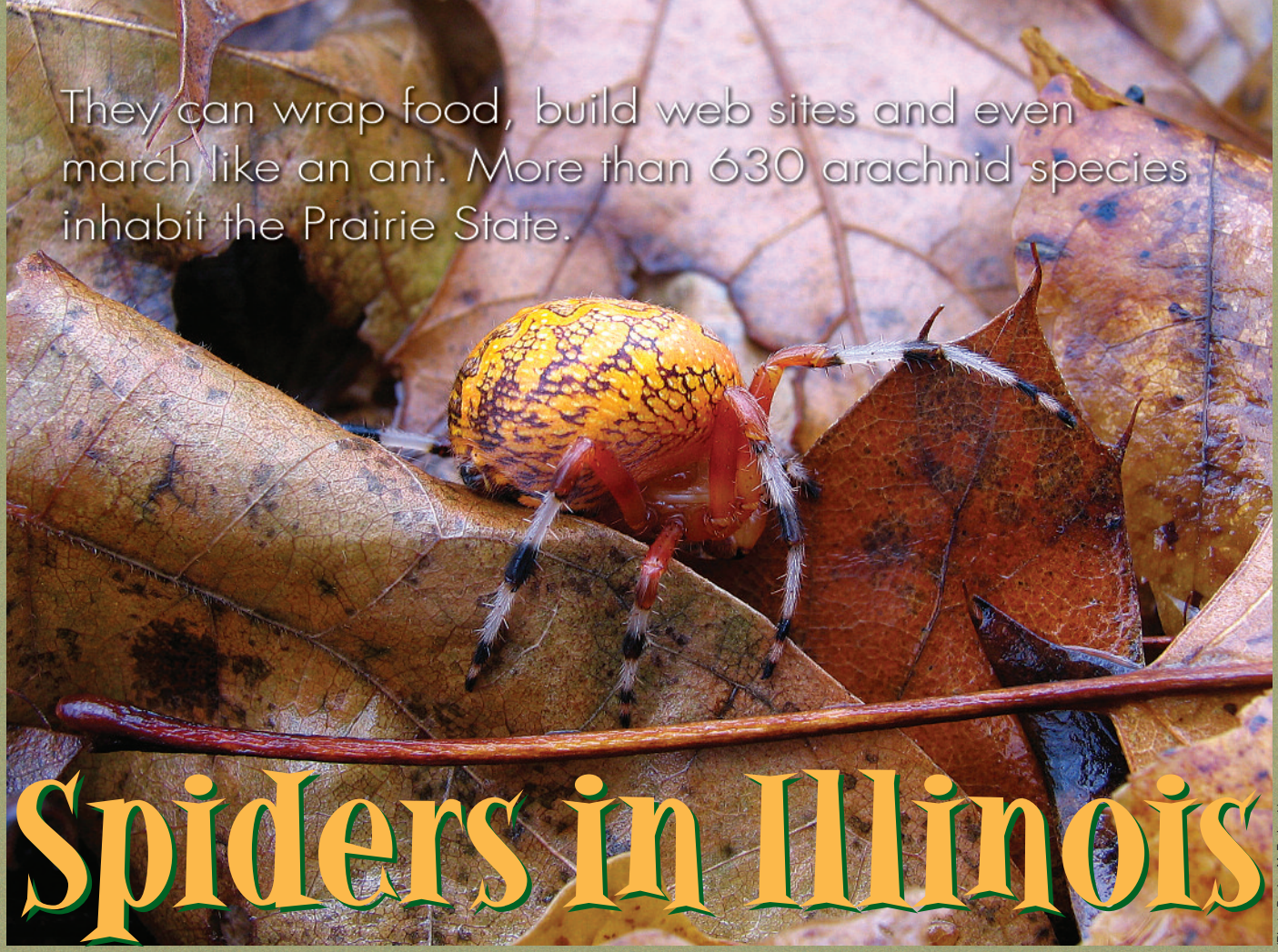

They can wrap food, build web sites and even march like an ant. More than 630 arachnid species inhabit the Prairie State.

Spiders in Illinois

(Photo By Joe McFarland.)

Story and Photos By
Hank Guarisco

Goldenrod Crab Spider

Characteristics all spiders share include having eight jointed legs, an exoskeleton and spinnerets at the end of their abdomen.

Spiders are a diverse and interesting group of creatures found almost everywhere in the state of Illinois. Their ubiquitous nature, ability to spin complex webs and the habit of some species to frequent homes and gardens often alert us to their presence.

Currently, more than 630 different species are known to inhabit the state. Spiders come in many shapes, sizes and colors and make their living in a variety of ways.

Any living organism can measure success in life by the number of offspring it has produced that grow up to pass on their genes to future generations. In order to do this, a spider must gain enough energy to maintain itself and to produce a large number of eggs, while avoiding death at the hands of a diverse array of enemies or succumbing to harsh environmental conditions. Through time, the forces of natural selection have led to the astounding diversity of spiders we see today.

Food Habits

Whether actively hunting their prey, waiting in ambush among vegetation or

Web-building spiders, such as the common house spider, will eat their old web, converting the protein into new silk in as little as 30 minutes.

Common House Spider

Sixspotted Fishing Spider

Black and Yellow Garden Spider

constructing intricate webs to ensnare their victims, spiders are consummate predators. They are able to overcome a wide variety of insects, arachnids and even some vertebrates with the use of silk and their venomous bites. Although the diet of the black and yellow garden spider, *Argiope aurantia*, consists mainly of insects, one individual captured and consumed a skink. Members of the hunting spider genus *Dolomedes* are commonly called "fishing spiders" because several species regularly eat small minnows and tadpoles. Before closely approaching an ensnared, potentially dangerous prey item, web builders, such as the common house spider, *Achaearanea tepidariorum*, will securely wrap its intended victim with silk, then deliver one or more bites once the prey is rendered immobile. Many years ago, I observed a large black and yellow garden spider which had built a web in my college dorm room overcome a paper wasp (*Polistes* sp.) that had become entangled in her web. The wasp repeatedly attempted to sting the spider as she wrapped it in silk from a safe distance. Once it was fully wrapped, she cut it out of her web and let it fall to the floor below.

Illinois spiders exhibit a range of feeding habits. Fishing spiders (above) can stay under water up to 40 minutes to capture small minnows and tadpoles. The diet of the black and yellow garden spider is mostly insects.

Although they are predators, spiders are opportunists. Some wolf spiders and jumping spiders will readily scavenge dead insects when they encounter them. One researcher recently discovered that the brown recluse spider, *Loxosceles reclusa*, actually prefers dry, dead insects over live ones. Some spiders occasionally feed on nectar and pollen as they actively wander over vegetation in search of prey. Several species have become more specialized. Pirate spiders (family Mimetidae) creep into spider webs and pluck the silk strands, mimicking the signals of prey or a potential mate. When the host spider approaches, it is immediately attacked by the pirate which delivers a paralyzing bite.

The small cobweb spiders in the genus *Argyrodes* are called "klepoparasites," but actually make a living in several ways. They can build their own cobwebs and catch insects, they can live in the webs of larger spiders and steal their food, or they can kill and consume the host spider.

Longlegged Sac Spider

Avoiding Predators

While going about the business of life, spiders must avoid being eaten. One way to avoid predators, which include birds, mammals, lizards,

A member of the pirate spider family, longlegged sac spiders sneak into the webs of other spiders to gain a meal.

amphibians, fish, insects and even other spiders, is to blend into the background or gain protection by resembling some formidable creature, such as an ant.

Although some of the colors, shapes and patterns of spiders are quite striking, their owners are virtually invisible in their respective habitats. One example is the white-banded crab spider, *Misumenoides formosipes*, which waits patiently among flower petals to ambush insects that come to feed on nectar. The contrasting stripes of the diurnal zebra spider, *Salticus scenicus*, break up its outline as it hunts for insects on rocks. Wolf spiders (family Lycosidae), which are usually found in leaf litter and on tree trunks, generally have a striped or mottled brown coloration.

Zebra Jumper

Several kinds of Illinois jumping spiders (family Salticidae) gain protection by resembling ants. In addition to looking like ants, these spiders run rapidly in the company of ants while tapping the ground with their first pair of legs which are held in the air like ant antennae. The imitation is good enough to fool even experienced spider collectors. Of course, this defense may backfire in the presence of some jumping spiders which prefer to feed on ants. In this case, the ant-mimics often are attacked more readily than other spiders which did not resemble ants.

Spiders use a variety of techniques to avoid predators, including coloration, patterning, mimicking ants, and, in the case of jumping spiders, jumping 20 times its own body length.

White-banded Crab Spider

Senses

With the exception of jumping spiders, which possess good vision, most spiders rely mainly upon chemical, tactile and vibrational cues from their environment. There are long hairs (trichobothria) on spider legs which detect air movements. The legs also possess organs that can sense different chemicals, such as pheromones, and slit-sense organs that are sensitive to different frequencies of vibration. Web-builders use vibrational signals transmitted by their webs to discriminate among prey, enemies and potential mates.

The rear, middle pair of eyes of some ground spiders (Gnaphosidae) can detect polarized light from the sky which helps them orient in the landscape as they hunt during twilight hours.

As visually oriented organisms ourselves, we can more easily relate to jumping spiders, which have binocular vision and can see colors via a pair of large, frontally directed eyes. Up to a distance of about 1 foot, these spiders have the visual acuity of cats. So when *Phidippus audax*, a jumping spider often found in homes, turns toward you and seems to be watching you, it is not your imagination!

Bold Jumper

Good vision also explains why many jumping spiders are brightly colored. They engage in elaborate courtship behavior in which the males perform stereotypic "dances" that display brightly colored parts of their anatomy to the female. In this way, jumping spiders are the invertebrate equivalent to birds. These courtship displays enable males and females of the same species to recognize one another, and may even relate information concerning their good qualities as prospective mates.

To ensure reproductive success, many female spiders construct intricate egg sacs which they guard until the young are ready to disperse. Nursery-web spiders (family Pisauridae) carry the egg sacs in their jaws until the young are about to emerge. At this time, the mother places the egg sac in understory vegetation and constructs an elaborate, dome-shaped web around it, then stands guard. Spider eggs have a host of insect predators and parasites, and protection by the mother increases the chances of her offspring's survival.

Surviving Winter

Another challenge facing spiders in Illinois is winter survival. Particularly brutal winters can devastate populations, so choosing a good hibernation site is critical.

Many spiders pass the cold months as juveniles or adults. Jumping spiders find sheltered locations out of the wind and rain in which to construct thick, silken hibernacula. Rock crevices and leaf litter can provide good winter retreats, especially if the latter is blanketed with a layer of snow. South-facing slopes which are exposed to the sun are ideal sites.

Barn Funnel Weaver

Most of the more than 600 spiders found in the Prairie State do not bite humans. Only bites of the brown recluse (below) and black widow can be considered dangerous.

Some spiders, including many orb-weavers such as the yellow and black garden spider, spend the winter inside egg sacs. Although they may be protected from the cold due to physiological changes that enable them to withstand freezing temperatures, the spiderlings in these egg sacs often fall victim to birds which discover a ready winter meal. In some areas, more than 98 percent of the egg sacs are torn open during the winter by birds.

Spinning Silk

Silk is a fibrous protein that assumes its final shape as it is pulled from the silk-spinning organs (spinnerets) located at the rear end of the spider. As spiders move about in their environment, silk lines are played out and periodically attached to objects. These function in much the same manner as a mountain climber uses a rope to rappel down cliffs and to prevent accidental falls.

Silk also is used in the construction of resting sacs and hibernacula. Under appropriate weather conditions, small spiders let out silk which become small parachutes that their owners board to be carried off with the wind. Ballooning spiders have been found up to 10,000 feet high and many miles away from land. This effective dispersal mechanism allows spiders to colonize remote areas.

Some spiders construct webs to capture prey. The typical orbweb consists of a framework attached to supporting objects, such as vegetation and tree limbs, radii which form the spokes of the wheel-like web, and the spiral which has sticky, drops of silk used to ensnare prey. The web's owner can easily maneuver about, by climbing on the framework and radii which are not sticky.

Cobweb spiders, such as the common house spider, the black widow (*Latrodectus*), and the false widow (*Steatoda triangulosa*), make a tangle web with glue droplets on the lowest silk strands which anchor the web to the ground. Should an ant wander into the web, these strands are under tension and snap and curl around the prey, suspending it in the web.

Brown Recluse

Other spider families produce additional types of webs to catch prey, including sheetwebs, funnelwebs and hackle-bandwebs.

Because natural silk fibers are very strong, recent attempts have been made to produce artificial silk.

Reason for Concern

Although spiders sometimes invoke fear and loathing, only two species in Illinois are considered dangerous to people. These are the black widow and the brown recluse. A black widow bite is very painful, interferes with nerve transmission, and occasionally causes death due to heart and lung failure. There is a very effective antivenin and recovery is almost certain with proper medical treatment.

False Widow

Most brown recluse bites cause local tissue damage which heals after several weeks or months. Sometimes the damage becomes extensive and skin grafts are required. Antivenin is not presently available for this type of bite.

Of course, some individuals may have an allergic reaction to any kind of foreign protein, and therefore may react to the bites of harmless spiders as well.

Aside from these few examples, spiders in Illinois are harmless, interesting creatures that are interesting to observe and understand.

Illinois Spiders

For supplementing lessons about spiders, the DNR Division of Education offers the Illinois Spiders poster for teachers. Twenty-five types of spiders found in Illinois are depicted and information about their life history also is provided. Order this item at www.idnrteachkids.com.

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Hank Guarisco is adjunct curator of arachnids at the Sternberg Museum of Natural History in Hays, Kansas and research associate of the Florida State Collection of Arthropods in Gainesville, Florida.