

SPIDERS



SPIDERS (Arachnids)

Physical Identification

Spiders (order Araneae) are air-breathing arthropods that have eight legs and chelicerae with fangs that inject venom. They are the largest order of arachnids and rank seventh in total species diversity among all other orders of organisms.

Spiders are found worldwide on every continent except for Antarctica, and have become established in nearly every habitat with the exceptions of air and sea colonization.

As of November 2015, at least 45,700 spider species, and 113 families have been recorded by taxonomists. However, there has been dissension within the scientific community as to how all these families should be classified, as evidenced by the over 20 different classifications that have been proposed since 1900.

Anatomically, spiders differ from other arthropods in that the usual body segments are fused into two tagmata, the cephalothorax and abdomen, and joined by a small, cylindrical pedicel. Unlike insects, spiders do not have antennae. In all except the most primitive group, the Mesothelae, spiders have the most centralized nervous systems of all arthropods, as all their ganglia are fused into one mass in the cephalothorax. Unlike most arthropods, spiders have no extensor muscles in their limbs and instead extend them by hydraulic pressure.

Their abdomens bear appendages that have been modified into spinnerets that extrude silk from up to six types of glands. Spider webs vary widely in size, shape and the amount of sticky thread used. It now appears that the spiral orb web may be one of the earliest forms, and spiders that produce tangled cobwebs are more abundant and diverse than orb-web spiders.

Spider-like arachnids with silk-producing spigots appeared in the Devonian period about 386 million years ago, but these animals apparently lacked spinnerets. True spiders have been found in Carboniferous rocks from 318 to 299 million years ago, and are very similar to the most primitive surviving suborder, the Mesothelae. The main groups of modern spiders, Mygalomorphae and Araneomorphae, first appeared in the Triassic period, before 200 million years ago.

A herbivorous species, *Bagheera kiplingi*, was described in 2008, but all other known species are predators, mostly preying on insects and on other spiders, although a few large species also take birds and lizards. It is estimated that the

world's 25 million tons of spiders kill 400–800 million tons of prey per year. Spiders use a wide range of strategies to capture prey: trapping it in sticky webs, lassoing it with sticky bolas, mimicking the prey to avoid detection, or running it down. Most detect prey mainly by sensing vibrations, but the active hunters have acute vision, and hunters of the genus *Portia* show signs of intelligence in their choice of tactics and ability to develop new ones.

Spiders' guts are too narrow to take solids, so they liquefy their food by flooding it with digestive enzymes. They also grind food with the bases of their pedipalps, as arachnids do not have the mandibles that crustaceans and insects have.

To avoid being eaten by the females, which are typically much larger, male spiders identify themselves to potential mates by a variety of complex courtship rituals. Males of most species survive a few matings, limited mainly by their short life spans. Females weave silk egg-cases, each of which may contain hundreds of eggs. Females of many species care for their young, for example by carrying them around or by sharing food with them.

A minority of species are social, building communal webs that may house anywhere from a few to 50,000 individuals. Social behavior ranges from precarious toleration, as in the widow spiders, to co-operative hunting and food-sharing. Although most spiders live for at most two years, tarantulas and other mygalomorph spiders can live up to 25 years in captivity.

While the venom of a few species is dangerous to humans, scientists are now researching the use of spider venom in medicine and as non-polluting pesticides. Spider silk provides a combination of lightness, strength and elasticity that is superior to that of synthetic materials, and spider silk genes have been inserted into mammals and plants to see if these can be used as silk factories.

As a result of their wide range of behaviors, spiders have become common symbols in art and mythology symbolizing various combinations of patience, cruelty and creative powers. An abnormal fear of spiders is called arachnophobia.

Feeding

Their usual food is insects and other spiders but some of the larger species have been seen to eat other small animals such as millipedes, wood lice (slaters), and even small lizards, frogs, and birds. But one kind of food that spiders normally do not eat is plant material.

Lifecycle

All spiders, from the tiniest jumping spider to the largest tarantula, have the same general life cycle. They mature in three stages: egg, spiderling, and adult. Though the details of each stage vary from one species to another, they are all very similar.

The spider mating ritual also varies and males must approach a female carefully or he may be mistaken for prey. Even after mating, many male spiders will die though the female is very independent and will care for her eggs on her own. Despite the rumors, the majority of female spiders do not eat their mates.

Egg – Embryonic Stage

After mating, female spiders store sperm until they are ready to produce eggs. The mother spider first constructs an egg sac from strong silk that is tough enough to protect her developing offspring from the elements. She then deposits her eggs inside it, fertilizing them as they emerge.

A single egg sac may contain just a few eggs, or several hundred, depending on the species. Spider eggs generally take a few weeks to hatch. Some spiders in temperate regions will overwinter in the egg sac and emerge in spring.

In many spider species, the mother guards the egg sac from predators until the young hatch. Other species will place the sac in a secure location and leave the eggs to their own fate.

Wolf spider mothers carry the egg sac with them. When they're ready to hatch, they will bite the sac open and free the spiderlings. Also unique to this species, the young spend as many as ten days hanging onto their mother's back.

Spiderling – Immature Stage

Immature spiders, called spiderlings, resemble their parents but are considerably smaller when they first hatch from the egg sac. They immediately disperse; some by walking and others by a behavior called ballooning.

Spiderlings that disperse by ballooning will climb onto a twig or other projecting object and raise their abdomens. They release threads of silk from their spinnerets, letting the silk catch the wind and carry them away. While most spiderlings travel short distances this way, some can be carried to remarkable heights and across long distances.

The spiderlings will molt repeatedly as they grow larger and they're very vulnerable until the new exoskeleton forms completely. Most species reach adulthood after five to ten molts.

In some species, the male spiders will be fully mature as they exit the sac. Female spiders are always larger than males, so often take more time to mature.

Adult – Sexually Mature Stage

When the spider reaches adulthood, it is ready to mate and begin the life cycle all over again. In general, female spiders live longer than males; males often die after mating. Spiders usually live just one to two years, though this does vary by species.

Tarantulas have unusually long life spans, with some female tarantulas living 20 years or more. Tarantulas also continue molting after reaching adulthood. If the female tarantula molts after mating, she will need to mate again since she sheds the sperm storage structure along with her exoskeleton.

Harbourage

Most spiders are nocturnal and only appear during the day if they have been disturbed in some way. Different species share different characteristics, habitat and prey techniques.

Those which depend solely on webbing to snare their prey seldom move very far and mostly hide in a crevice, curled leaves or camouflaged as twigs. Hunting spiders are a lot less dependent on webs and mostly travel for food.

Males seek out the females at mating time and drop their sperm on the ground, bark or in webs specially made for this purpose. The male picks up his sperm with his long palps alongside his jaws (specifically used for this purpose) and places it into the female spiders genitalia. After mating the male is usually caught and consumed by the female.

Health Risk

While most species are harmless, even helpful, some poisonous varieties can pose a risk to your health.

Spiders rarely bite humans. Instead, they tend to flee danger. Most of the time, when they bite, it is because the spider accidentally gets stuck between a person's skin and another object (such as sheets, clothing or shoes) or when people try to catch or handle them with their bare hands.

Almost all spiders produce venom to paralyze their prey before they eat it. However, if a spider does bite, only around 30 of the 40,000 known species of spiders produce venom that is dangerous enough to pose a threat to human health. None of these species live in Quebec.

Certain people can develop symptoms of allergies to spiders. However, this phenomenon is rare and varies from one person to another. Reactions to bites are not associated with the venom itself, but the allergenic proteins in the spider's saliva. Allergic reactions can also be caused by inhaling hairs, scales or other small parts of the spider. These arthropods do not transmit diseases.

South Africa's venomous spiders



Black Widow



Brown Button Spider



Violin Spider



Baboon Spider



Six-eyed Sand Spider