

“Spider Behavior – Why They Do What They Do!” Student Guide

Geologic Timeline:

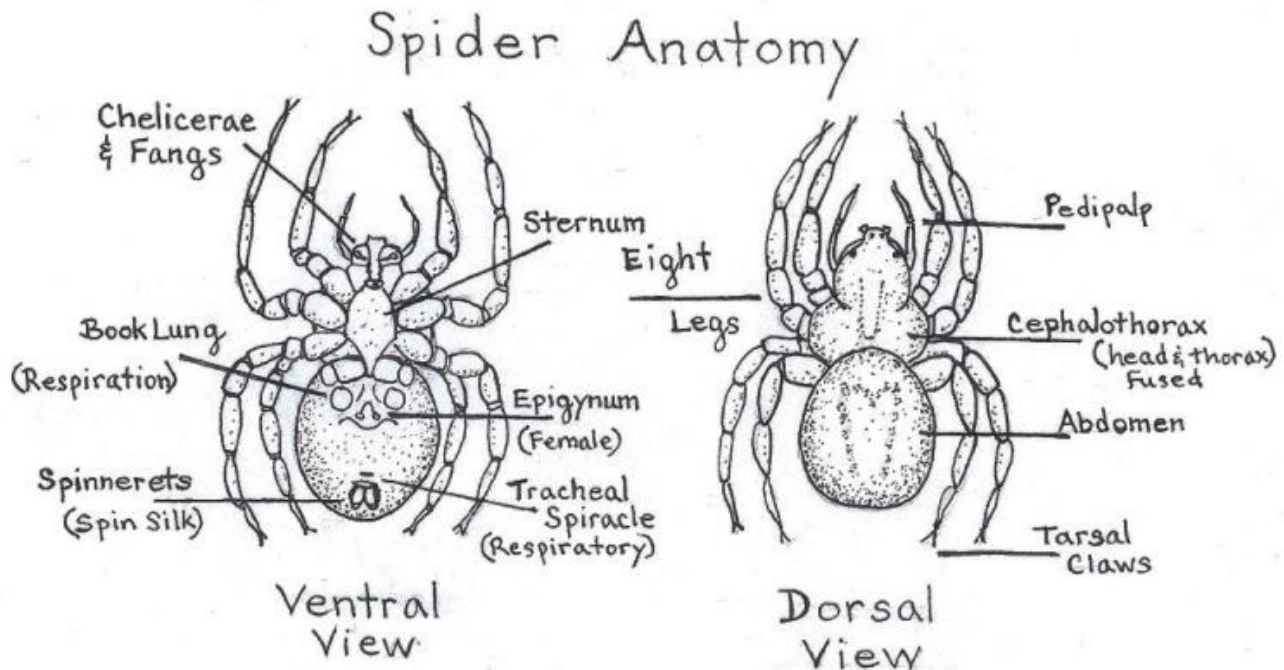
Time Period		Key Developments
443 – 419 Mya	Silurian	<ul style="list-style-type: none"> • Diversification of Fish • Life Began to Colonize the Land • Earliest Arachnids
~439 Mya	1st Mass Extinction	86% of all LIFE extinct!
408 – 360 Mya	Devonian	<ul style="list-style-type: none"> • Age of Fish! • Some fish evolved into tetrapods then into land vertebrates • Scorpions, Spiders & Wingless Insects • Early plants created extensive marshlands & forests
~364 Mya	2nd Mass Extinction	75% of all animal SPECIES extinct 20% of all plant SPECIES extinct
~300 Mya		<ul style="list-style-type: none"> • Spiders lived in burrows • Silk used as protective cover for eggs and burrow lining • Predators of primitive arthropods • Lived in giant clubmoss & fern forests
~251 Mya	3rd Mass Extinction	96% of all SPECIES extinct
250 Mya		<ul style="list-style-type: none"> • Mygalomorphs & Araneomorphs • Sheet webs & Maze Webs capture prey on ground and in foliage • Silk safety drag line
199 – 214 Mya	4th Mass Extinction	>50% of all SPECIES extinct
110 Mya		<ul style="list-style-type: none"> • Spider webs preserved in Amber
~65 Mya	5th Mass Extinction	75% of all SPECIES extinct

The timeline is approximate. It is meant to show the evolution of our modern spiders. They have survived and thrived in spite of 5 Mass Extinction Events.

Key Identifying Characteristics of Spiders:

- Exoskeleton
- 2 Body Parts
- 8 Legs
- 2 Modified Legs – Pedipalps
- Chelicerae with Hollow Fangs to Inject Venom
- 8 Eyes usually
- Spinnerets

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Vocabulary:

Setae / Trichobothria – Specialized hairs on the bodies of spiders that help them feel vibrations and air movement.

Mygalomorph – Most primitive spider group. Distinguished by chelicerae that are straight and parallel. Usually large, heavy bodied spiders. Breathe with 2 sets of book lungs. Tend to have a low metabolism and long lives. Usually live underground in silk lined burrows. Other uses for silk are covering for egg sac and trip wires near burrow. Include the tarantulas, trap door and funnel web spiders.

Book Lungs - Most primitive type of lungs used by spiders. Oxygen enters the hemolymph (spider blood) and Carbon Dioxide leaves through diffusion.

Fossorial – a creature that lives underground for most or all of their life.

Terrestrial – a creature that lives on the surface.

Arboreal – a creature that lives in trees, above the ground.

Urticating Hair - Special defensive hairs on the bodies of “New World” tarantulas. These hairs may be loosened by rubbing the back legs against the abdomen. They are extremely irritating to skin, eyes and mucous membranes. (Feel much like fiberglass exposure.) Believed that this defensive adaptation is why their venom is less toxic than “Old World” tarantulas.

New World Tarantulas – Tarantulas native to North, Central and South America and nearby islands.

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Araneomorph – All the other spiders that are not Mygalomorphs. Distinguished by scissor-like chelicerae. May have book lungs with trachea or all trachea. Usually live about a year. Much higher metabolism and many more uses for silk.

Trachae – More modern way that spiders may breathe. Air enters the trachea tubes. Oxygen is absorbed into the cells deep in the body. Works more efficiently than book lungs and allows for a higher metabolism and more movement.

Diurnal – Active during the day.

Nocturnal – Active at night.

Pompilid or Spider Wasps – Wasps that hunt spiders to feed their offspring. The wasp delivers a paralyzing sting, then flies or drags the spider to a hole in the ground. A single egg is laid on the abdomen and the hole is sealed. The egg will hatch, with the larva entering the abdomen and consuming the spider as it grows. Vital organs such as the heart and the nervous system are saved until the larvae is ready to pupate into an adult wasp.

Cribellate Silk – Very thin strands of silk that are extruded by a series of spigots. These strands are combed by special spines on the back legs of certain spiders. As result, the silk has a wooly appearance and can stretch or ensnare prey without glue.

Envenomation – Bites where venom is injected. Dry bites occur commonly with defensive bites,

Necrotic Venom – Venom that tends to destroy tissue. Brown recluse spiders have a necrotic venom.

Myrmecomorphs – Spiders that have evolved to look like ants and mimic ant behavior. Usually a method to prevent predation. Can also be used to safely approach and prey on ants.

Myrmecophages – Spiders that have evolved to prey on ants. They can process the many chemicals that ants use for communication and defense.

If you have additional questions or would like to schedule a seminar for your chapter or group, contact me at:

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There will be additional Spider Training Programs and live Spider Walks later in the year. I welcome other Texas Master Naturalists, Master Gardeners and the public to join me.

Thank you for attending my seminar on Spider Behavior!

Melanie Hollenshead