



Venomous MOUNTAINEERS

By Karen McClure

The brown streak down the back of these timber rattlesnakes illustrates the great variation in coloration among these snakes.

Photo by Paula Waggy

Venomous animals are often referred to as poisonous. Many scientists make a distinction that venomous describes an animal that injects a harmful substance, while poisonous refers to something that is harmful if ingested. Most dictionaries indicate the words are synonymous. In this article, venomous will reflect an injectable harmful compound.

In West Virginia, it seems like the most commonly discussed venomous animals are the timber rattlesnake, the northern copperhead, and the black widow spider. Only one cottonmouth, also known as a water moccasin, has been documented in the Mountain State. It was on a barge which had come up the Ohio River from the Mississippi River. We do host plenty of water

snakes, and although they can be pretty defensive, none are venomous. Similarly, we have plenty of harvestmen, otherwise known as daddy or granddaddy longlegs, which are nonvenomous. The urban legend goes like this: these arachnids have venom that is extremely deadly to humans, but our skin protects us from their tiny fangs. The truth is that animals don't waste their energy producing venom they can't use to subdue their prey. Harvestmen do prey on tiny insects and other small animals in addition to eating some plant material.

With those common misconceptions straightened out, let's explore the real venomous West Virginians. Many folks will be surprised to learn that venomous mammals

exist. Northern short-tailed shrews (see **Wildlife Diversity Notebook**, page 19) have many teeth that can inflict a wound and allow venomous saliva to flow into the opening. This process is used to immobilize relatively large prey, such as mice and frogs. The venom is not potent enough to be a serious threat to the health of large animals like humans.

Reptiles can strike fear in the heart of some Mountaineers. Venomous snakes can deliver a dry bite that is venom free, saving it to kill their prey. In humans, dry bites are said to occur about 40 percent of the time. These snakes can also deliver a bite that has less venom than the maximum available. That said, you can't ask a snake what it has in mind before it bites you. In the United States, venomous snake bites result in approximately 10 fatalities a year. The reaction to the same bite is different for different people. Larger, healthier people without specific allergies stand a better chance than small folks with allergies and health problems. Both of our venomous snakes are pit vipers, meaning they have heat-sensing pits above their mouths.

The timber rattlesnake, the only rattlesnake species in West Virginia, is quite reluctant to bite humans. They swallow their prey whole and we are way too big for that. If a snake is stepped on or picked up, it might bite in self-defense. If venom is injected, exposed red blood cells are killed, and pain, swelling, breathing problems, blood coagulation and shock may follow. Skin near the bite may begin to slough off, greatly increasing the chance



While almost never fatal, the bite of a female black widow spider can cause serious symptoms.

Ronald F. Billings, Texas Forest Service, Bugwood.org

of infection. It is comforting to know that very few people have ever died from a timber rattlesnake bite.

Contrary to popular belief, rattlesnakes do not grow a rattle every year. Rattlesnakes grow a new rattle with every shed, and sheds occur when the snake is well fed and healthy enough to grow. Therefore, the number of rattles is food and health dependent. Rattles can break off, so you can't even tell how many times the snake has shed by counting the rattles.

Northern copperheads are more likely to bite than timber rattlesnakes if a person just walks near the animal. Death from a copperhead bite is extremely rare, but its venom will make people quite sick. The venom from both rattlesnakes and copperheads contains a similar mix of compounds which can lead to hemorrhaging, pain, swelling, breathing problems, headache, nausea, gangrene and possibly unconsciousness. Antivenin is usually produced with horse serum. Many people are allergic to it, and all patients must be tested before it is used. Antivenin is only used if the life of the patient is truly threatened.

The copperhead, one of two venomous species of snakes in West Virginia, is a pit viper. Note the slit-like pupil and the heat-sensing pits between the eye and nostril.

Allen Bridgman, South Carolina Department of Natural Resources, Bugwood.org



Many a nonvenomous northern water snake has been killed by people thinking they were protecting themselves from copperheads. Water snakes have round pupils compared to the elliptical pupils of copperheads. Copperheads have a more triangular-shaped head. The copperhead is appropriately named, as the top of the head is an unmarked copper color. When looking at a snake in the field without binoculars, it is hard for most people to see the pupil of a snake at a safe distance. The shape of the snake is a much better indicator. In general, a fat snake describes one of our pit vipers, while skinny snakes are nonvenomous. In the heat of the moment, this easy to remember rule might serve “snakaphobes” (officially known as Ophidiophobiacs) better than color, markings or pupil shape.

Scientists think that almost half of all catfish species are mildly venomous, and the ones known as madtoms are famous for their “stings.” Glandular cells in the skin covering the spines (one in the dorsal fin and one in each pectoral fin in catfishes) hold the venom. When a person is “pricked” by one of these spines, the venom in the skin is released into the wound and inflicts pain. I’ve seen a madtom “sting” make an adult cry.



Courtesy of Ohio DNR Division of Wildlife

The stonecat belongs to a group of catfish known as a madtoms. Careful handling is advised.



WV Dept. of Commerce

Now for the truly dangerous animals – invertebrates. About 500 people die from bee stings each year in the United States, which is 50 times the rate for snakes.

It seems though that more people are afraid of spiders than bees. This could be due to the common misconception that spiders bite people voluntarily. Spiders in West Virginia eat other invertebrates. Many folks grow up learning mistakenly that small itchy spots on their skin are spider bites. This is highly unlikely. Spiders will bite defensively if sat on, stepped on, or if a person puts a foot or hand in a shoe or glove that houses a spider. We have only two species of spiders that have venom that is of any concern to humans.

The well-known black widow is most commonly found under things like rocks or logs, or in dark outbuildings. It pays to be careful when moving objects that have been on the ground. The venom of the black widow is one of the most toxic to humans. For this reason, antivenin is produced for black widow bites. This antivenin carries the same dangers of allergic reaction that the snake antivenin does, so it is used with caution. Calcium gluconate can help relieve symptoms.

Bites can cause severe abdominal pain, muscular pain, and pain in the soles of the feet. The victim’s mouth alternates between being dry and having copious saliva. The victim might sweat profusely and their eyelids may swell. Symptoms peak approximately three hours after the bite, with complete recovery



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A millipede, (far left) which doesn't sting, has two pairs of legs per body segment. A centipede, which does sting, has one pair of legs per body segment and the legs extend more horizontally out from the body than on a millipede.

Centipedes have a pair of claws near their heads that can inject venom. These claws are used to subdue their invertebrate prey. People usually get bitten when handling a centipede.

within 48 hours. Female black widows are up to ½ inch long, black, with a red hourglass on the underside of the abdomen. Adult males, which don't bite or even eat, are about one-eighth inch long with white and red marks on the side. Females can live more than three years. It is extremely rare for a human to die from a black widow bite.

The brown recluse spider, also known as the violin spider, is not native to West Virginia. This spider has a natural habitat of brushy areas, but they can be found in closets, on bookshelves, under furniture, and in dark areas of barns, outbuildings and houses. The few documented individuals in the Mountain State were found near items that were recently transported here from another state. Adult females are three-eighths inch long and males are one-quarter inch long. They are grayish brown, with no easily observed markings. Although a bite from a brown recluse may be harmless, the bite often results in black necrotic (dead) tissue, sometimes causing a crusty red wound that takes months to heal and leaves a scar.

The yellow sac spider is native to the Mountain State. These small yellow-green spiders are found all over the continental United States. Females are one-fifth to two-fifths inch long. Males are even smaller, one-fourth inch long at most. The bites of these spiders are slower to show any reaction, but can result in dead tissue that is slow to heal.

Yellow sac spiders rarely use their venom on humans.

No records exist of someone dying from a centipede bite in the United States. Bites from certain large species in the Southwestern states can cause swelling, intense pain, fever, nausea and sometimes death of living tissue. In West Virginia, the reaction is usually similar to that of a bee sting. Centipedes can be confused with millipedes, which are nonvenomous herbivores, harmless to handle. Both animals have long, caterpillar-like bodies. Centipedes have one pair of legs per body segment, generally move faster than millipedes, often have flatter bodies, and have the claws mentioned above. Centipedes are nocturnal. Millipedes have two pairs of legs per body segment, often have rounder bodies, but are sometimes flat, and lack claws. When threatened, millipedes often roll up, and can exude hydrogen cyanide, which smells like almonds. This is released in a liquid compound that



Joseph Berger, Bugwood.org

Painful Attraction

These strange-looking moth caterpillars have hairs which can inject venom when touched. Clockwise from center: puss moth, saddleback moth, IO moth, and hag moth.



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will stain a handler's skin. Some millipedes can live more than seven years.

Beware of petting hairy caterpillars. Stinging caterpillars of some moths have hairs on their bodies that contain venom, which can be injected when a person touches the caterpillar. The severity of the sting depends on the individual, but the puss moth caterpillar has been documented to cause pain, rash, fainting, nausea and vomiting. Other species that sting include caterpillars of the gypsy moth, hag moth, IO moth and saddleback moth. To play it safe, it is best to avoid touching any hairy caterpillar.

Hymenoptera is the scientific order that includes ants, bees, wasps, hornets and their kin. These insects usually have two pairs of wings, chewing mouthparts,

and some have tongue-like structures for drinking. Bees, ants and wasps have a narrow "waist" between their abdomen and thorax. The stinger is actually a modified ovipositor, which explains why only the females sting. An ovipositor is used by many insects to lay eggs. Some hymenopterans, including sawflies and horntails, do not sting. Most are solitary, but ants, and some bees and wasps, live in colonies, with sterile (yet stinging) female workers, and a few fertile males and females (called reproductives). Although numerous

Bumble bees (left) are big and look menacing but rarely sting. Honeybees are much smaller and are known for their nectar product.

*Bumblebee by David Cappaert, Michigan State University, Bugwood.org
Honeybee by Susan Ellis, Bugwood.org*



species of hymenopterans live in West Virginia, only a few are described here.

Bumblebees are stout, hairy bees marked with bold black and yellow stripes. These bees are reluctant to sting, but will defend by stinging if handled, stepped or sat on, or if their underground nest is threatened.

Honeybees are not native to North America, but were brought here from Europe to pollinate crops and provide honey. Honeybees are brown to yellow-orange with yellow bands on the abdomen, and are about ½ inch long. Since their hives are usually above ground in beekeepers' apiaries, accidental disturbance of the nest is rare. Sometimes honeybees will swarm to create a new hive, and could nest in a hollow tree. Honeybees will defensively sting if stepped or sat on, or handled.

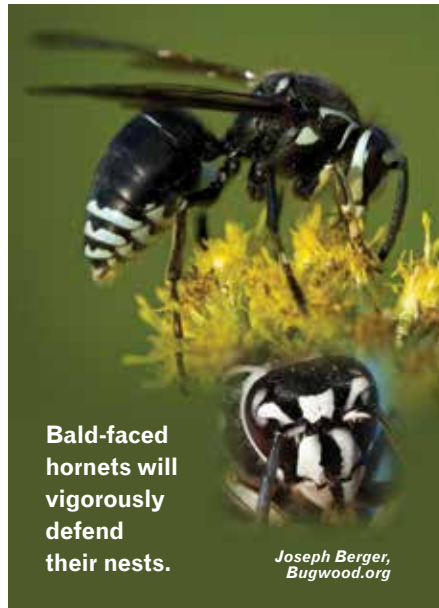
Bald-faced hornets, velvet ants, paper wasps and yellow jackets are all considered wasps by entomologists (scientists that study insects). Wasps sting using two lancets that are worked into the victim. After the lancets are in deep enough, the poison duct, located between the lancets, opens to release a complex blend of chemical compounds.

Bald-faced hornets are marked in black and white on all three body segments, and are approximately one-half inch long. Females build gray-brown nests that hang down from a tree branch, fence railing, porch, or similar structure. People often confuse them with paper wasp nests. Bald-faced hornet nests are often large and conspicuous, with a large hole in the bottom



Johnny N. Dell, Bugwood.org

Although the female velvet ant is wingless, the less beautiful male has wings.



David Cappaert, Michigan State University, Bugwood.org

Bald-faced hornets will vigorously defend their nests.

Joseph Berger, Bugwood.org

for a doorway. Females readily defend the nest, and can sting multiple times.

Velvet ants are actually wingless female wasps that look like large, red, velvet-covered ants, up to one inch long. They are also called cow killers in reference to the severity of their sting. Velvet ant stings are one of the most painful of North American wasp stings. A female crawls into another solitary bee's nest and kills it with a sting. She then lays her eggs on the host's eggs. The velvet ant larvae will eat the host's larvae after hatching. The males of these species have wings, which they use during courtship, taking the female for a ride. Males do not sting.

Paper wasps are brownish-bronze with long legs, and a larger waist than many other wasps, up to 1¼ inches long. Females build a nest made from chewed wood and saliva, and hang it from a tree branch or structure such as a fence railing, gutter or porch. Paper wasps are not as defensive as bald-faced hornets, but can inflict a painful sting.

It is a rare West Virginian that has not seen a mud dauber at work. These wasps are in a group of mud



Pottery wasps make a unique little vase-like nest for their young and the young's food.

Photo by Jan Yuschok, Bugwood.org

Many people get stung by yellow jackets when they accidentally step on the opening to the bees' underground nest. These defensive wasps also get into food and sugary drink cans at picnics, particularly in the fall.

Photo by Jim Baker,
North Carolina State University,
Bugwood.org



Gary Alpert, Harvard University, Bugwood.org

wasps that includes pottery wasps, which make clay pot-like nests, and mason wasps, which build their mud nests underground. Mud wasp females sting an insect or spider and lay the egg on it, then close up the cell. The prey item provides food for the wasp larvae.

Yellow jackets are well known for multiple stings when a person steps on an underground nest. Yellow jackets are around one-half inch long, with yellow (sometimes white) and black bands on the abdomen. Unlike other wasps, the body is wider than the head. Females will sting repeatedly with little provocation. Yellow jackets are attracted to and eat both meat (or carrion) and sweets. Yellow jackets usually build softball- to basketball-sized underground nests, but they can be much larger, as large as a small car.

The best way to avoid allergic reactions from the hymenoptera is sting prevention. Do not go out of your way to attract these creatures. Flowering plants look colorful and smell wonderful in order to attract pollinators. So, dressing in flowery shirts or blouses and applying attractive scents is a good way to confuse these insects, resulting in dangerous stings. If you are allergic, your doctor can prescribe automatically injecting epinephrine devices that do not require refrigeration. These are safe and easy to use and can be reassuring and life-saving.

Desensitization to hymenoptera venom is possible and effective.

An increased awareness and appreciation of how all of our native wildlife has an important job in our habitat can make a simple walk in the yard more enjoyable. It is this complex web our fellow mountaineers weave with us that makes West Virginia one of the best places on earth to live and play outside.

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