

Venomous and Poisonous Animals in Arizona: A Quick Reference

Randall D. Babb, Biologist, Arizona Game and Fish Department

First, a quick note about the difference between “venomous” and “poisonous”. Venom is injected via a bite or sting. Poisons are ingested or absorbed. Therefore snakes, bees, scorpions, spiders, etc. are venomous, and toads, mushrooms, and household chemicals are poisonous. Remember, venom = active, poison = passive.

Arizona is the home to many species of venomous creatures. The same tropical influences that make this state one of the most biologically diverse areas in the nation has given us one of the most diverse venomous faunas to be found in North America. Arizona is, with all probability, the venomous animal capitol of the United States. Most species of venomous animals use their venom primarily for subduing and killing prey. Therefore, a bite or sting from most of these animals represents more of a physical inconvenience than a medical emergency. Some species do have powerful venoms that may be life threatening. It is important to remember that many factors play a role in how severe a bite or sting will be. An individual's personal chemistry has a great bearing on how they will react to any foreign substance introduced into their body. The amount of venom, the location of the bite or sting, the species of animal, and even the geographical origin of the animals that have given the bite all may play a role in the severity of the bite.

INVERTEBRATES

Perhaps more species of potentially dangerous invertebrates inhabit Arizona than any other state in the United States. Scorpions and spiders are probably the most familiar of these, but a variety of bizarre looking arthropods also present threats, mostly minor, of varying degrees. Many strange looking arthropods are supposed to be dangerous, but in fact are harmless.

Spiders: All spiders are venomous. Spiders bite to deliver their venom. Two criteria are generally considered when determining whether a species of spider is dangerous to humans: “Are its jaws strong enough to penetrate human skin?”, and “Is the venom virulent enough to cause any serious effects on humans?” Spiders are primarily predators on other invertebrates. Larger species or those with very strong webs occasionally take small vertebrates. As a general rule spiders that use webs to capture prey have poor vision, while those that hunt actively (wolf and jumping spiders) may have much better image defining abilities. Tarantulas however, have poor vision and use mechanoreceptors (special structures on their bodies) to locate prey. Only two varieties in Arizona are generally considered dangerous to humans: Black Widow (*Latrodectus spp.*) and

Brown spiders (*Loxocles spp.*). There are about five species of brown spiders and one species of black widow known from Arizona. Severe pain, respiratory distress, cramping, etc. can be associated with the bite from a black widow. There is a very effective antivenin available. Brown spider bites may go undetected for long periods of time (in excess of 8 hours) and the perpetrator is seldom seen. Local pain and swelling may ensue and eventually result in a necrotic ulcer that is slow to heal and may require reconstructive efforts. Contrary to popular belief, many invertebrates referred to as daddy long legs or harvestmen (*Opiliones spp.*) are not spiders and they are not venomous.

Scorpions: There are approximately 56 species of scorpions in Arizona. All scorpions are venomous, though only one species in Arizona is considered a threat to human health. All scorpions sting to deliver their venom. The stinger (aculeus) is located on the terminal segment (telson) of the postabdomen (tail). The claws or pinchers are used only to hold prey. Scorpions are nocturnal and active during the warmer months of the year. They prey on other invertebrates, including other scorpions. Larger Arizona species have been documented taking small vertebrates. All scorpions are thought to have poor vision and use mechanoreceptors to locate prey. Scorpions give live birth and have variable gestation periods depending on species. Some species are very long lived - the giant hairy scorpion in Arizona has been documented as living for 25 years. Size and color have nothing to do with how toxic a scorpion is. Some species of Arizona scorpions seldom exceed ½ inch in length. The bark scorpion (*Centruroides exilicauda*), a very common species in Arizona, is considered the most toxic species in the United States. Bark scorpion stings present the greatest risk to children less than four years of age. The bark scorpion was historically responsible for many child deaths. All other species of scorpions are considered mildly venomous and present little threat to human health.

OTHER INVERTEBRATES

Centipedes, conenose bugs, blister beetles, wasps, ants, bees, and some caterpillars have nasty bites or stings. Some can be very painful and cause medical complications. The bites or stings of these animals are seldom considered life threatening. Medical problems result when a person is allergic or hypersensitive to the sting or bite. For bees and wasps this is 1 to 2 people out of a 1,000.

Bees: Many of the bee species native to Arizona are solitary and present no threat. European honeybees and Africanized bees occasionally are

responsible for attacks on humans. This occurs when bees perceive a threat to the hive. Unlike the animals discussed above, bees have defensive venom that is used to defend the hive. Bees seldom sting while foraging. Africanized bees have an exaggerated defense response and are easily irritated. 8.6 stings per pound of body weight may result in death to humans. Bees can sting only once in their lifetime. Remove the stinger from the victim as soon as possible to reduce the amount of venom received.

Wasps and Velvet Ants: Most wasps are solitary and have painful, but not life threatening stings. Female velvet ants (*Mutillids*) are wingless wasps, not ants, and have very painful stings. Colonial wasp species generally occur in numbers far less than those of colonial bee species or have less exaggerated defensive behaviors and therefore present less of a threat. Wasps can deliver multiple stings.

Ants: Ants may sting, bite, or both. They are colonial and typically live in nests in the ground, rotting logs or some similar location. Ants generally become aggressive when disturbed at their nest and they perceive a threat to the colony. Ants use their venom both defensively (protection) and offensively (subdue prey).

Centipedes: Arizona centipedes are generally small in size and present little threat to people. One Arizona species, the giant desert centipede (*Scolopendra heros*), may obtain lengths of 8 inches or more. The bite from these large invertebrates is very painful, but does not generally require medical attention. The area of the bite has been known to remain hypersensitive for weeks. Centipedes deliver venom via a modified pair of legs beneath the head called gnathopods.

Centipedes are most active when conditions are warm and moist. They are found in a wide variety of habitats. They prey on other invertebrates, but larger species can take small vertebrate prey.

Conenose Bugs: Also called kissing bugs or Hualupai tigers, conenose bugs are blood-sucking true bugs, which feed at night on a variety of animals. They have been documented feeding on reptiles and a wide variety of mammals, including man. They are common residents in woodrat nests. Adult conenose bugs typically disperse during the summer rainy season and are often attracted to porch lights. People are generally bitten while resting or asleep and do not usually awake while being fed upon. These insects feed by inserting a proboscis beneath the skin and sucking blood. Bites may become painful and swollen, but are typically not serious. Repeated bites may lead to hypersensitivity and result in an anaphylactic reaction requiring hospitalization.

Blister Beetles: Blister beetles are active during the spring, summer, and fall months, especially after wet winters or good summer rains. They feed on succulent vegetation and flowers. These beetles possess a chemical defense called cantharidin, which is excreted from the joints, typically when the animal is restrained. This chemical is absorbed through the skin and causes blistering. Symptoms are very similar to poison ivy. Cantharidin is a urinary tract irritant causing engorgement and swelling. Blister beetles are ground up for ingestion in Europe to make the aphrodisiac, Spanish fly. Ingestion by livestock of beetles trapped in feed is often a problem.

Caterpillars: Many species of larval butterflies and moths possess urticating hairs (small defensive spines that have a venom gland at the base). These are administered when the animal is handled or brushed against. Generally these hairs produce an unpleasant burning or stinging sensation much like a bee sting or worse. Some species (puss caterpillar, *Megalopyge spp.*) have powerful venom and may cause nausea, headache, respiratory distress, and may require medical attention. The sting site may remain irritated for several days.

VERTEBRATES

Venoms and poisons in vertebrates are relatively rare. Only a handful of snake species, one lizard species, and a variety of amphibians in the U.S. are venomous or poisonous enough to present a threat to humans.

SNAKES There are currently 13 recognized species of rattlesnakes in Arizona (17 in the US and about 36 species worldwide). There is one species of coral snake found in AZ and several species of rear-fanged snakes. Neither the rear-fanged snakes nor coral snake have been responsible for a human death in Arizona and



Mark Kostich

Randall D. Babb



in the world (cobra, mamba, tipan, etc.). Like all elapids, it possesses short, fixed (non-movable) fangs. Due to this snake's small size, generally 15-18 inches, its fangs are very short and penetrate human skin with difficulty. Additionally, the gape of the snake is small and the venom yield low. However, it is a mistake to assume the mouth is too small to bite humans. No human deaths are attributed to this species.

Rear-fanged Snakes: Most of Arizona's rear-fanged snakes have mild venom and are small. Only the lyre snake and vine snake are large enough to be capable of delivering a venomous bite to humans. The mild venom and relative scarcity of these snakes presents no threat to people. No deaths have been attributed to these animals.

LIZARDS Only two species of venomous lizards are found in the new world today; the Mexican beaded lizard and Gila monster. Of these two, only the Gila monster is found in the United States.

Erik Bettini



are not considered a real threat to human health. All species of venomous snakes in Arizona possess offensive venom used for subduing prey.

Rattlesnakes: Rattlesnakes feed on small mammals, birds, reptiles, amphibians and invertebrates. Venom glands are modified salivary glands and are located in the "cheek" area of the upper jaw. Rattlesnake venom toxicity varies greatly from species to species and even geographically amongst a particular species. Rattlesnakes possess the most advanced venom delivery system in the snake world. They have folding, hollow fangs, which inject the venom deep into the victim. The western diamondback rattlesnake is responsible for most of the bites in the United States and therefore most of the deaths. It is the largest species of rattlesnake in Arizona and the most commonly encountered. The Mojave rattlesnake, another common species in Arizona, is considered to be the most toxic species of rattlesnake in the United States. Bites from rattlesnakes are not uncommon, but deaths resulting from their bites are. Rattlesnake bites are typically very painful and may cause severe swelling. Jewelry or other restrictions should be removed from the victims before the onset of swelling and they should be transported to a medical facility as soon as possible.

Gila monsters: These are the largest species of lizard native to Arizona. They are very secretive, giving most people the impression they are rare. Gila monsters are predatory specialist on the nest of mammals, birds and reptiles.

They have venom that is believed to be of a defensive nature, as they do not require it to subdue their prey.

There is also some indication that the venom may also aide the lizard in digesting prey. Venom is delivered by a powerful bite during which venom moves up grooved teeth in the lower jaw into the wound. The venom causes severe pain and hospitalization is often required for treatment. Unlike rattlesnakes, it is nearly impossible to be accidentally bitten by a Gila monster. Arizona poison centers treat 12-16 Gila monster bites a year. In 2000, the Tucson poison center consulted on 13 Gila monster bites (7 bites involved dogs, one involved a cow, and 5 involved humans). No fatalities attributed solely to the bite of a Gila monster have been documented in the past 100 years. Gila monsters have very strong jaws and tend to hang on when biting.

Coralsnake: This small, retiring snake presents no real threat to human health. They feed primarily on other smaller snakes and are most active in the evenings in the early spring and during the summer rainy season. It belongs to the family elapidae, which contains some of the deadliest snakes

TOADS True toads possess a poison gland (parotoid gland) located behind the eye on the top of the head. These glands secrete milky, neurotoxic venom called bufotenine. This poison must be ingested to create problems. It cannot be absorbed through the skin. Some species of toads become active with the spring runoff, but most of Arizona's species breed with the summer rains.