Venomous Snakes

Relatively few snakes are venomous. Of over 2,500 species of snakes in the world, only about 375 are venomous. Of about 116 species of snakes native to the U.S., only 19 are dangerous. Bites of a few species of the rear-fanged snakes sometimes cause harm, but the effects vary.

Basic snake biology, behavior, and control strategies (for those native to the U.S.) are covered in the Fact Sheet on Non-Venomous Snakes. Despite movies and folktales, a venomous snakebite will not always kill, or permanently disable you. Based on reports from the Center for Disease Control and Prevention (CDC), over the past several decades, honeybee stings have killed about twice as many people as have died from snake bites in the U.S. each year.

How to Tell if a Snake is Venomous

As with other animals, the shapes, numbers, and locations of physical structures are important keys used to correctly identify (ID) a species or higher taxonomic group. All venomous snakes do have at least one pair of specialized teeth used to introduce their venom into their prey. These "fangs" are usually distinctly larger or longer than most of that snake's other teeth. The presence and location of "fangs" is very important to ID a snake as venomous. Other characters may also be important for a geographic area. For example, in the U.S., all pit vipers have only a single row of scales on the underside of their tails; vertically elliptical pupils; and a pair of pits between their nostrils and eyes. **Although these characters are common to all pit vipers, there are some very venomous snakes that DO NOT have them.** For example, coral and sea snakes have round pupils. Other characters like color patterns or behaviors are often used to ID species or subspecies, and may be important for alerting potential prey, warning away predators, or communicating between members of the same snake species (especially in courtship and mating).

Tooth (Fang) Arrangement

Snakes have four basic general tooth arrangement patterns.

1. **Non-Venomous Snakes** - have rows of small, recurved teeth, usually all about the same size and length. There are usually at least four (4) rows, one along each side of their mouth on the upper and lower jaws. Many nonpoisonous snakes have six (6) rows of teeth, with four rows in their upper jaw. These include the vast majority of all snakes in the world. Examples include the garter snakes and corn snakes.

2. **Front-Fanged (Proteroglyph)** Snakes - have a pair of rigid (fixed) fangs which stick down from the front of their upper jaw. Most of these have venom with a potent neurotoxic main component, but some have other strong components too (e.g., myotoxins). Examples of this group include coral snakes of the Americas; cobras of Africa and Asia; kraits of Asia and Australia; and sea snakes in all the oceans (mainly tropical; rare in polar seas).

3. **Folding-Fanged (Solenoglyph)** Snakes - have a pair of fangs attached at the front of their upper jaw. These relatively long fangs fold back against the roof of their mouth when it is closed, but can be quickly erected as the snake prepares to strike. Partly developed replacement fangs grow in a row behind each primary fang (hidden under a flexible sheath). If a main fang is lost or broken, the next one will move down and grow to replace it in 5-6 days. Most of these have venom with a potent hemotoxic main component, but venoms of many tropical species contain other strong components (e.g., neurotoxins, myotoxins). Examples of these include rattle snakes, copperheads, and cottonmouths in the U.S.; fer-de-lance's of South America; Russet's Viper of Asia; and the River Jack of Africa.

4. **Rear-Fanged (Opisthoglyph)** Snakes - have at least one pair of distinct fangs, larger than their other teeth, attached near the rear of their upper jaw. Venoms of these snakes have not been well studied. They are generally rather weak, causing only a progressive "numbing," or mildly paralytic, effect on nerves of the local body area or organs nearest the bite site. In humans, sensation returns to affected tissues slowly (hours to days). Major exceptions are the Boomslangs of southern Africa, which have very potent paralytic venoms. Examples in the U.S. include the cat-eyed snake and the black-headed snake. The Brown Tree Snake, *Boiga irregularis*, is a major pest, which has caused extinction of many bird species of Guam since it was introduced there in 1952, probably in cargo from Australia or Indonesia. A large joint international effort was started in 1990 to prevent this pest from becoming established in Hawaii and other Pacific islands.
Loreal Pits (Containing Heat-Seeking Organs)

Pit Vipers get their common name from the pair of sensory pits in their loreal scales, one between each nostril and eye. These forward directed pits are very sensitive detectors of infrared radiation (heat) and very weak air vibrations. They can pinpoint warm-bodied prey in full darkness, detecting temperature differences as small as 0.003° C. They may be important in aiming the snake's strike.

Enemies

Even the most venomous snakes have natural enemies, including: predatory mammals (e.g., foxes, badgers), birds (e.g., hawks, roadrunners), and other snakes (e.g., king snakes, racers). Venomous snakes feed on rodents and other small mammals, but they almost never kill or eat enough to have much effect on even moderate populations of such pests.

Movement

Snakes move around on land in four basic ways. Large species, such as anacondas, alternately stretch out and then contract their bodies along their length, which causes their belly scales (scutes) to catch against the ground. This lets them push themselves forward in a slow direct (rectilinear) "crawl."

Most snakes move in a side-to-side, "S-shaped" (serpentine) path, pushing against rocks, plants, or other structures as their muscles contract in waves. Nearly all snakes can swim and usually use serpentine movements to do so.

Some snakes alternately stretch part of their body forward, then pull the rest forward, in a concertina movement. On very smooth surfaces, like fine sand or glass, nearly all snakes will extend their bodies forward at some angle to the direction they seem to intend to travel, then lift their head and move their body forward in a series of "sideways" loops. They will usually have only two or three small parts of their body in contact with the surface at any given time. This is called side-winding. Some species move this way routinely, such as the sidewinders, small rattlesnakes in some southwestern U.S. desert areas.

Snake Bites

Snakes have very good voluntary control of their strike, whether or not venom is injected, and how much venom is injected. Many strikes and bites, which occur when a snake is disturbed ('provoked' bites), are strictly defensive ('dry') and very little or no venom is injected. Factors such as the way in which the snake was disturbed, how recently it has fed, and its health can all influence the amount of venom injected during a bite. Unprovoked bites are rare and usually result when a hungry snake mistakes a person's hand or leg, or a pet, for its normal prey (usually a small animal). Most snakes can only strike for 1/3 to 1/2 of their body length (except for a few "jumping" vipers), so their size is important to note. The longer the snake, the farther it can strike.

First Aid

If bitten by any venomous snake (except a coral or sea snake) a person will usually feel pain and have swelling at the wound site immediately or within a few minutes.

1. The best first aid for a venomous snakebite is to get the victim to medical aid (such as a hospital emergency room) as soon as possible. Keep the victim reassured, calm and warm until then. If possible without risking another bite, try to kill the snake and take it along with the victim. That could be helpful in case antivenin treatment is needed.

2. **Do not cut the wound.** That seldom does any good, often causes worse tissue damage, and greatly increases the risk of infection. Applying suction immediately and for the first few minutes may help, but nearly all snake venoms contain chemical factors which cause them to spread quickly (in seconds) and adsorb strongly to the victim's tissue cells.

3. Do not give the victim alcohol; or use ice, cold packs, or other cooling agents on the wound.

4. If a victim is several hours from the nearest medical care, apply a light-restricting band on the bitten limb 2-4 inches (5-10 cm.) above the bite, between the bite and the heart. This should not be a tourniquet. You should be able to easily insert a finger under the band. Loosen the band if swelling occurs beyond it.

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