

POISONOUS AMPHIBIANS AND REPTILES

RECOGNITION and BITE TREATMENT

This intelligently constructed,
reliably accurate, readable
little volume is the outcome of
a careful and considered
combing of the literature,
evaluated on the one hand by a
physician having daily contact
with college first-aid classes and
on the other by a herpetologist
of some twenty-five years of
experience in his field.


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The collaboration has pro-
duced a highly desirable,
balanced perspective not
evident in the somewhat
similar but far less inclu-
sive surveys written by
herpetologists alone or by
physicians alone.

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And Reptiles**

P R E F A C E

The present account of venomous reptiles and amphibians is restricted in scope to those species inhabiting the United States and Canada. Much of the basic information reviewed is applicable to situations existing in other parts of the world, but it is of importance to emphasize that our primary concern is with the problems existing in North America.

It is recognized that in the geographic area with which we are here primarily concerned, the United States, relatively few persons in their lifetime will ever be exposed to the immediate danger of being bitten by a snake of any kind, and that, statistically speaking, the first aid problem of snake bite is not particularly significant. However, since an individual bitten by a poisonous snake is in serious danger of death, the problem becomes one of great personal importance to any individual so victimized.

Although the primary intent of this treatise is to discuss snakes, since these animals include most of the commonly encountered poisonous vertebrates, a general and brief survey of other poisonous animals is included in order to place snakes and their significance as venomous animals in proper perspective.

This summary is necessarily introductory and incomplete. Its perusal, nevertheless, should assist interested students in looking up more detailed supplementary reading, and in becoming better versed about the more *practical* facts relating to first aid procedure in snake bite cases. It is believed that the material presented is accurate as far as it goes, and that, in its synthesis of zoological and medical approaches, it represents a unique contribution to the extensive literature of this field.

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F.B.
H.M.S.

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PART I

TAXONOMY (CLASSIFICATION) OF VENOMOUS ANIMALS

A. MEANING OF THE TERMS VENOMOUS AND POISONOUS

A *venomous* animal is one possessing venoms of one or more kinds. A venom is a body fluid that contains one or more poisonous ingredients, and that is used primarily in exploitation of its deadly properties. Most animal venoms are highly complex, containing numerous poisonous as well as harmless biochemical fractions. Venoms are sometimes used aggressively, for the most part by biting, scratching, and stinging, and sometimes they are used passively, as for example the venomous hairs on certain caterpillars.

A *poisonous* animal is one that produces a poison by normal bodily processes. A poison is defined as any substance chemically producing an injurious or deadly effect when introduced into an organism. All venomous reptiles, including certain snakes as well as one species of lizard, are properly referred to as poisonous, since their venoms contain one or more poisons. Many other vertebrates, however, possess no venom as such, but are still poisonous, having body fluids which prove noxious when ingested by other animals. It may thus be said that all venomous animals are poisonous, but that not all poisonous animals are venomous. So far as snakes are concerned, either term is appropriate. The two are used interchangeably in this work. Nevertheless, the term venomous is more strictly accurate

for the poisonous snakes and lizards, and is thus, other factors being equal, the more preferable of the two terms.

B. OCCURRENCE OF POISONS IN ANIMALS

1. Invertebrates

Almost every phylum of invertebrates contains one or more species of animals poisonous in one way or another. Familiar examples are certain ticks, spiders, scorpions, flies, leeches, earthworms, jellyfish, beetles, wasps, bees, centipedes, and anemones.

2. Vertebrates

In all classes of vertebrates (birds excepted), certain species possess poison of some sort. Reptiles rank at the top of the list primarily because they include snakes, many species of which are notoriously venomous. Amphibians come next, followed in order by fishes and mammals. Venom is found among mammals in the saliva of shrews, and also is associated with the spur on the hind legs of the male of one primitive Australian mammal (duckbilled platypus). Venomous fishes include certain rays and catfishes, which possess bony spines associated with venom sacs in the skin.

A few vertebrates are known to be poisonous if eaten, but they are not venomous. A number of sharks, rays, ratfish, and bony fishes, both marine and freshwater, are poisonous when eaten. So also are marine turtles in certain regions. The liver of certain seals and bears is deadly poisonous, apparently because of a high concentration of vitamin A (Halstead, 1956: 23). The latter author provides an impressive account of the symptoms and treatment for all known poisonous marine animals. There is an astonishing and sobering array of animals dangerous to use as food.

C. CLASSIFICATION OF AMPHIBIANS AND REPTILES

1. Amphibians

Three orders of living amphibians are recognized:

- a. *Order APODA*—legless, earthwormlike animals (caecilians).

Of no interest to First Aiders. These amphibians are not seen in North America.

- b. *Order CAUDATA*—tailed, and with 2-4 legs (salamanders, newts).

Of no importance to First Aiders in the Western Hemisphere, because no species has a significantly strong skin poison. Some Eurasian forms do have powerful epidermal secretions.

- c. *Order ANURA*—no tail, always 4 legs (frogs, toads).

Many anurans have a strong skin poison capable of affecting humans. These shall be discussed later.

2. Reptiles

Living reptiles represent four orders:

- a. *Order RHYNCHOCEPHALIA*—the tuatara (a lizardlike animal) of New Zealand, the sole survivor of this Order.

This creature is of no interest to First Aiders as the reptile is not encountered in North America, and is not venomous.

- b. *Order CHELONIA*—turtles, terrapins, and tortoises.

No venom occurs in chelonians, although bites may be mechanically and infectiously dangerous. A very few species are dangerous through possession of a poisonous property to be discussed later.

- c. *Order CROCODILIA*—crocodiles, alligators, and caimans.

Most First Aiders will never be called upon to treat people bitten by members of this Order. Bites by these animals are dangerous mainly because of the dirty, severe wounds they may produce. In such rare instances, a First Aider would have to treat for massive hemorrhage, severe shock, etc. No venomous material *per se* is introduced into the victim.

- d. *Order SQUAMATA*—a group containing four suborders, three of which are still in existence.

Suborder LACERTILIA—lizards

The only member of this group in the world which First Aiders need be specifically concerned with, except for certain large species producing lacerations by their teeth, is the famed Gila Monster of Western North America. This species is discussed further in Part IV.

Suborder OPHIDIA—snakes

These reptiles are the most important animals for the First Aiders to study, as certain snakes constitute the bulk of venomous creatures known to attack and poison humans. Most of the following discussion pertains to this group.

Suborder AMPHISBAENIA—worm lizards

Of no interest to First Aiders. These animals are restricted to tropical and subtropical regions of the world, occurring in the United States only in Florida. They are not venomous, and are too small to bite humans painfully.