A CASE OF POISONING IN THE COTTON-MOUTH MOCCASIN

(Agkistodon piscivorus)

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Until recently, most authorities believed that poisonous snakes were immune to their own venom. The occasional story of a rattlesnake committing suicide was classified as a myth and grouped with the stories of the hoop snake and of snakes charming their prey. Karl P. Schmidt, Curator of Reptiles and Amphibia at the Field Museum, in his publication *The Truth About Snake Stories* said, "All available information . . . indicates that snakes are immune to their own venom and in experiments I have made personally, causing a rattler to bite himself, there was no visible effect." Certainly he did not stand alone in his opinion. Many herpetologists had seen rattlesnakes strike themselves or other rattlers with no ill effects.

To demonstrate the killing power of snake venom to a few sportsmen, a white mouse was put into a cage of nine baby cotton-mouth moccasins of the Illinois Natural History Survey collection. The snakes became wild. They struck at the mouse and then at each other. The mouse died after about seven minutes. The snakes, however, continued to strike at and bite each other. There wasn't a snake that wasn't bitten at least once. Two had been bitten badly enough to draw blood. Later crystallized venom was found on the head of one of the snakes and on the back of another. The snakes apparently suffered no ill effects and to all present, it appeared to be conclusive proof that poisonous snakes could not kill each other.

The first published account of the poisoning of snakes by venom was by Dr. H. K. Gloyd (1933). He published an account of the killing of a diamond-backed rattlesnake by a cotton-mouth moccasin. Death occurred seventy-one hours after the rattlesnake was bitten. Dr. Gloyd referred to other cases of self-inflicted bites or bites by nearly related species that were not fatal.

Almost immediately there appeared accounts of other cases of snake poisoning. There was a case of a rattlesnake poisoned by a self-inflicated bite: death occurred in a few hours (Wooster, 1933). In a case of two rattlesnakes killed by a cotton-mouth moccasin (Conant, 1933) death occurred in six and a quarter hours and in nine and a quarter hours.

To study the immunity of rattlesnakes to their venom, Nichol, Volney, and Peck (1933) made two rattlesnakes bite themselves. One died in two hours and forty minutes; the other lived for more than six hours. Four rattlesnakes were injected with five minims of venom. One died forty-five hours later and the other three survived after showing local swellings. To the experimenters, this indicated a high but not complete immunity.

On July 27, 1938, some tadpoles were put in the water bowl of a cage containing three of the cotton-mouth moccasins that were mentioned earlier. Two snakes immediately went to the bowl and started to fish for the tadpoles. One snake grabbed the other by the head. This occurred at 2:20 P. M. The head of the victim was almost hidden in the jaws of the attacker. The fangs apparently entered the head of the victim just below the eye. Both fangs seemed to be well imbedded. There was a furious tussle, both pulling and lashing their tails. At the end of eight or nine minutes, the snakes were still fighting. The struggle was finally ended when the attacker was tapped on the head with a pencil. The victim came to the front of the cage and climbed part way up the glass. She, for it proved to be a female, remained there for some time. She was bleeding from a single wound in the lower jaw. The bleeding soon stopped and by 4 P. M. the snake appeared to be all right.

The next morning, however, she was apparently lifeless, but moved when touched. She was sensitive in the region of the neck, which for a length of about one inch had swollen to almost double the normal size. There was a watery substance oozing from the neck. The

lower jaw was swollen posterior to the bite. The entire body appeared to be slightly swollen, but this was probably due to inhaling a great amount of air, as a normal appearance was assumed when she exhaled. Respiration was slower than normal.

That afternoon the swelling was slightly reduced. She kept her head flat against the bottom of the cage, something unusual for this species. The snake was still alive at 4:30 P. M., July 28.

On July 29, at 9:00 A. M. the snake was dead. Dissection showed two clots; one in the lower jaw just below the right eye, the other on the neck about a half inch posterior to the eye. The region around each clot was highly discolored. There was a great extravasation of blood and there was an accumulation of lymph in this region. There was also a degeneration of muscular tissue. All of these are symptoms of snake bite.

There was no evidence of the fangs having hit any part of the nervous system. It is true there was some bleeding but death could not be attributed to loss of blood. As the temperature was 85° to 95° F. in the cage where the snake was kept, it was suggested that there was plenty of time (twenty-six to forty-one hours) for the snake to die from infection. The appearance of the wound, however, was not like that of infections I have observed in snakes.

The fact that the snake held on for some time, and that there was a tussle while he was biting, might be an explanation as to why this bite was fatal and previous ones were not. The longer time of holding would allow more time for the venom to be injected. The fighting would cause increased pressure on the venom sacs resulting in a greater flow of venom.

From available data, it appears that venomous snakes are not immune to venom in large quantities.

LITERATURE CITED

Conant, Roger, Two rattlesnakes killed by a cotton-mouth moccasin. Science 80, 1934.

Gloyd, H. K., On the effect of a moccasin venom upon rattlesnakes. Science 78:13, 1933.

Nichol, A., Volney, D., Peck, L., On the immunity of rattlesnakes to their own venom. Copeia No. 4, p. 211, 1933.

Schmidt, Karl P., The truth about snake stories. Zoology Leaflet 10, Field Museum of Natural History, Chicago, 1929.

Wooster, L. D., Rattlesnake poisoning by self-inflicted bite. Science 78:79, 1933.