

OBSERVATIONS ON PTEROIS VOLITANS (L.) AND ITS VENOM.-

A recent note (Ray and Coates, Copeia 1958 (3): 235) concerning the dangerous effect of the lion fish, *Pterois volitans* (Linnaeus), induces me to publish, for comparison, the observations I made after having been stung by a specimen of the same fish, on November 29, 1955, at Eylath (Gulf of Aqaba), Red Sea. My original notes were written down 2 hours and 40 minutes after the incident. While I could keep track of the events, from looking at my watch, I was unable to make written notes before that time. I use this opportunity to report also on an interesting aspect of the behavior of this species.

While swimming just a few meters off the beach, over a depth of about 2 to 3 meters, I saw a young *Pterois volitans* (about 10 cm. long), quietly swimming nearby. *P. volitans* is a common fish in the area, but rather rare over sandy bottom remote from rock formations. It is also rare to find it swimming in mid-water. When I stretched out my arm toward the fish, trying to seize it by the pectoral fin, the fish abruptly rotated about its axis, thereby bringing its dorsal fin spines close to my fingers. Evading the fish's dorsal spines, I quickly tried to approach its ventral side while it was still "lying on its side." However, after a sudden half turn of the animal, its dorsal spines once more almost touched my fingers, while the fish was now lying on its other side. I had previously observed numerous individuals of this species, but had never noticed a reaction similar to this, when they were resting on the bottom. I was, therefore, interested to see how regular this response was. I repeated my approaches several times, and it became clear that the fish, while suspended in mid-water, reacts to an object moving closely towards it from the side, by confronting it with its dorsal spines. This is brought about by rotation of the body about 90 degrees from the normal position (dorsal side up) or, by a 180 degrees' rotation starting from the lateral side-up position.

However, although the fish was in an exceptional situation, it still had some advantage in-as much as it moved more rapidly than I was able to, and, worse, more rapidly than I had calculated. My experiments came to a sudden end when I saw, rather than felt, that I had been stung by tips of two of the dorsal spines in the distal phalanx of my right forefinger. The act of stinging was scarcely appreciable, and by no means painful. But from the volar side of the phalanx, near to its tip, at once, two fine threads of blood could be seen running down into the water. I squeezed out more blood. Then I left the water to look for my clothes. I had to walk for some hundred meters and, meanwhile, pains set in, but remained very moderate. However, about 10 minutes after I had been stung, the pain in-creased rapidly; it was now a sharp cutting pain, throughout the whole finger, but particularly heavy along its dorsal side. Very soon, the middle finger became involved. It was conspicuously pale compared with the unaffected fingers of the hand, but at the same time the forefinger had reddened beyond the color of the rest of the fingers. The forefinger now began to swell and the pain still grew. About half an hour after the sting had occurred, pains were almost unbearable. At this time even the thumb of my right hand was involved, but in it pains were intermittent and remarkably less strong. I noticed a few more symptoms. The skin of the terminal phalanx of the forefinger was almost insensitive to touch, and the slightest touch on the inter-mediate and basal phalanx was extremely un-pleasant. Likewise hyperalgesic was the radial side of the third finger; less but still appreciably hyperalgesic was the dorsal and the volar side of the thumb.

Since I had no specifically analgesic drug with me, and medical assistance was unavailable, all I could do was to swallow the last 1?/ headache pills I found (In this case, this amounted to 0.38 g. acetylsalicylic acid, 0.38 g. phenacetin, and 0.015 g. codeine phosphate).

I was not aware of any other local or general symptom. The pulse was entirely normal, no headache or nausea. Under these circumstances, I was certain that the process was strictly limited, but the local condition appeared

nonetheless unbearable. I was tortured by pains beyond measure, and yet the pain was still growing more intense. It sent me running. I tried to sit down, to lie on the ground, to stand still. The pain would not let me. I had to move on, to run about. It is a strange experience recognizing quite lucidly that nothing fatal has happened to oneself, and feeling at the same time, that this was much worse than anything previous. In fact, it is just short of driving oneself completely mad.

This state of affairs lasted for some time. About 1/2 to 2 hours after the sting (it was impossible to determine the onset of the next phase any better), pains began to subside slowly. Gradually the thumb became painless, and after it, the third finger. The forefinger was still very painful at that time, but quite obviously less than before. Shortly afterwards, the third finger could be moved freely, only occasionally was it painful. Almost 3 hours after the sting, the forefinger was not yet normal, but pain was fair; the terminal phalanx was swollen and very warm, the swelling preventing even slight movement; the mid-phalanx was markedly less swollen. Further recovery was fast so that 3 hours after the sting the pain was negligible.

In the note on Pterois sting, referred to above, we find several details particularly interesting in their similarity to what has been reported here, although it is obvious that the accident and its consequences were, on the whole, of a more serious character. There was pain described "as almost unbearable" in both cases. Likewise, there was reddening and swelling of the region involved, and insensitivity to touch developed over the whole or part of the area.

The restlessness exhibited in both cases may also be significant, although it is open to question whether this was a symptom of the direct involvement of the central nervous system, or whether it should be interpreted as a voluntary attempt of the sick person to fight against the intense pain. It is probable that a fast spreading factor exerting a strong action upon the sensory nerves of the area is involved. It also appears that this factor is relatively short-lived, being destroyed or otherwise eliminated after about 3 hours. Subsidence of the pain can hardly be attributed to the headache pills taken in the one case, or the epinephrine administered in the second. It is obvious that the factor affecting the nerves, or an admixed one, promote hyperemia and edema. It is, however, not certain the Pterois venom attacks the central nervous system causing excitation of the motor centers.

The overall effect of the Pterois sting appears to depend on the amount of venom injected. Stings from 3 spines of a specimen of 12.5 cm. length, penetrating for about 3 mm., resulted in pains attaining greatest intensity 10 minutes after the accident, in a heavily swollen hand 15 minutes after the sting, and pains reaching up to neck and chest. However, stings from 2 spines of a smaller specimen, penetrating certainly less deep, resulted in pains reaching their height 30 minutes after the sting, never extending beyond part of the hand, and moderate swelling restricted to one finger.

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#### A CASE OF POISONING BY THE LION FISH, PTEROIS VOLITANS.

At 9:00 AM, December 12, 1957, Edward Dols, an employee of the New York Aquarium, was cleaning a 100-gallon tank in which are kept three 5-7 inch lion fishes, *Pterois volitans*, with a small golden-striped bass, *Grammistes sexlineatus*, and a hawkfish, species unidentified. The movements of the rather nervous hawkfish seemed to frighten the smallest lion fish and as a result three dorsal spines of the latter penetrated Dols' right thumb above the second phalange to a depth of at least 1/8 inch. As he withdrew his hand from the water he noticed that the wounds were bleeding, and felt a burning sensation that almost immediately became extremely painful. Within

three minutes from the time of the sting his hand had become very hot and red, and had started to swell noticeably. Five minutes after the sting he could not feel cold water running over his hand. Ten minutes after the sting, when on his way to the hospital, the pain had increased to the point of being almost unbearable. Dols could not sit still and there was a definite tendency to want to roll on the ground. He thrashed about and hit the floor boards of the car with his feet violently. At the hospital, 15 minutes after the sting, his hand had swollen to twice normal size and it could not be touched with-out considerable pain. The entire arm was sore and some pain was noticeable in the neck and pectoral region. Penicillin, epinephrine and toxoid were administered and within 15 minutes the pain began to subside to the point of being bearable. By 9:40 AM, Dols returned to the Aquarium, though still in considerable pain. Although most of the swelling was gone by 10:00 AM, deep pain and stiffness of the thumb persisted until the next day. Some pain was noted six days later. It is clear the Pterois is a dangerous fish. Were it not for very prompt treatment, Dols' condition might have become critical. He re-ported that he had brushed against the spines of this fish before and had not felt anything more serious than a mild stinging sensation, similar to the sting of a long-spined sea urchin, *Diadema*, which disappeared in a few minutes. There has been a tendency to underestimate the seriousness of the poisonous nature of this fish. Some ichthyologists and dealers in marine tropi-cal fishes report, irresponsibly we believe, that the sting is not serious. However, stings may range from scratches from a single spine to deep wounds from several spines. In the latter case, we believe that this fish is capable of causing death to humans, either directly or through shock. The symptoms recorded here are in close agreement with those produced by the Stonefish, *Synanceja*, as reported by Smith (1951, COPEIA (3): 207-9). In Smith's case in-tense pain began 5-10 seconds after the puncture and unbearable pain and swelling, and a desire to "roll on the ground" was manifest in 5-10 minutes. Perhaps the promptness and nature of treatment saved Dols from long-range ef-fects like those reported by Smith.

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Above Note: A Case of Poisoning by the Lion Fish, *Pterois volitans* Author(s): Carleton Ray and Christopher W. Coates Source: Copeia, Vol. 1958, No. 3 (Aug. 28, 1958), p. 235 Published by: American Society of Ichthyologists and Herpetologists