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AN INTERESTING CASE OF FISH ENVENOMATION

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ABSTRACT

Aquariums are very popular and keeping fish tanks in homes and business places is a very common practice. Spotted scat is a popular aquarium fish and it is also used commonly as an edible fish in Indo-pacific region. Its envenomation can occur accidentally and most cases go unreported. Scat fish sting can produce severe pain, swelling, redness, fever, partial paralysis and throbbing sensation in the inflicted site. There is no much information about the venom constituents, pharmacology and venom antagonist. Except for a few symptomatic treatments, no specific treatment is available to treat the patient.

KEYWORDS: Fish Envenomation, Scat, Scatophagus.



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INTRODUCTION

The Spotted Scat *Scatophagus Argus* was described by Linnaeus in 1766. The name *Scatophagus Argus* originates from Greek (*Scatophagus*=feeding upon dung, *Argus*=hundred eyed giant because of many spots in the body)^{1,2}. The species have a large distribution; they are commonly found throughout the Indo-Pacific region and in India. Most seen for sale have been collected in or near Thailand. This fish is commonly known as Argus Fish, Red Scat, Spotted Butter Fish, Green Scat, Ruby

Scat, Common scat, Leopard scat and Spadefish. Scats have a distinctly quadrangular and laterally compressed body and are greenish brown in colour with white belly and black dots of varying sizes all over the body. The average length of *S. Argus* is about 200 mm, and they can grow up to a length of 350 mm³. The beautifully spotted rhombic body makes it as an attractive aquarium fish, while the taste and quality ranks it as a good edible fish. Scats are well adapted to live in a fluctuating environment.



Case presentation

A 25 year male presented with complaints of severe excruciating pain in the left hand, following accidental injury while cleaning the fish tank containing spotted scat. On examination, the patient had a small prick mark in the left palm with redness around it. There was a diffuse swelling of the dorsum of the hand. The pain was very severe and it radiated up to the left shoulder. He also complained of dizziness. His vitals were stable. Patient's pain didn't respond to phenaramine injection, pain killers and ice packs. The pain lasted for almost 2 hours. Then the hand was immersed in hot water for few minutes, he got relieved of pain gradually. Swelling decreased gradually and mild pain at the site of prick persisted for two days.

DISCUSSION

Scats are venomous fishes and the venom apparatus comprises of 11 dorsal spines, 4 anal spines and a pair of ventral spine, elongated venom glands and an integumentary sheath enveloping all. The spines are very sharp and pointed, accommodating the paired venom glands in each spine⁴. Scats are not aggressive and they do not attempt to inflict a wound actively. However the fishermen get stung accidentally and more frequently while handling them. The envenoming appears within 5-10 minutes as persistent and excruciating local pain disproportionate to the size of the injury, swelling, redness and throbbing sensation that extend to the limbs

followed by dizziness⁵. The severity of the presentation varies depending on the amount of venom injected, and the size of the fish. Larger, the fish, more amount of venom can be injected⁶.

VENOM PROPERTIES

In an event, the spine erects and punctures the skin. The pressure exerted on the spine causes the venom to be released into the wound. Fish venoms present in the spine are predominantly large proteins and are not life threatening. These molecules get dissociated with changes in temperature & pH⁷. The biochemical nature of the venom of *S. Argus* found to cause hemolysis in human erythrocytes. In addition, when tested on mice, the venom appears to be "cytolytic, oedematic, nociceptive, myotoxic and proteolytic leading to tissue damage and pain^{8,9}. Phospholipase C in the venom is considered responsible for edema and hemolysis¹⁰. Edema in mouse pads persisted even after 24 hours of injection. Venom induced a rapid increment in serum creatine kinase (CK) and lactate dehydrogenase (LDH) showing the myotoxicity of venom. The other proteins found to be in the venom are phosphodiesterase, acid phosphatase, alkaline phosphatase, proteinase and low concentrations of acetyl choline¹¹. Acetyl choline causes local vasodilatation and produce pain by direct effect on sensory neurons. All fish venoms produce profound cardiovascular changes, both in vitro and in vivo, including the release of nitric oxide from endothelial cells,

smooth muscle contraction, and differing effects on atria. They also possess neuromuscular activity¹²

MANAGEMENT

Currently, there is no antidote to the toxin. Venomous fish sting can be relieved by immersing the wound in hot water (~105–115F). These toxins are heat labile and immersing in hot water causes denaturation of the venom^{13, 14}. Most of these cases won't respond to

analgesics. In an animal study, cyproheptadine and indomethacin was found to be effective for the treatment and relief for pain, edema, and redness against *S. Argus* sting⁸. Further, studies are needed to find the nature of the toxin and the neutralizing agent.

CONFLICT OF INTEREST

None

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