Laboratory and field observations of *Scorpaena porcus* (Teleostei, Scorpaenidae)

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December 1998

Abstract

The present study describes the predation of the scorpionfish *Scorpaena porcus* based on observations in its natural habitat and on video recordings using a high-speed shutter. Additionally, observations of some of the most important skull elements, involved in the predation process were made using bleached whole-mount preparations, light microscopic and electron microscopic images.

1. *Scorpaena porcus* uses a “sit-and-wait” strategy i.e. it lurks at one spot at night and sucks prey into its mouth by opening it very quickly when it is swimming by (“suck-snapping”).

2. If the distance to the prey is not too long, the scorpionfish chases it by swimming and/ or by using its pectoral fins.

3. The process of “suck-snapping” takes about 0.08 s, which is too fast for an adequate and detailed resolution with the high-speed shutter.

4. The comparison of different sequences, recorded with an exposure time of 1/10000 s allows a statement about the speed of approaching, the acceleration and about how far the mouth is opened when the pray is attacked.

5. While approaching and striking the prey, *Scorpaena porcus* reaches speeds up to 75 cm/s and accelerations of up to 1875 cm/s^2.

6. While opening the mouth, mainly premaxilla, dentary and the extremely strong maxilla are involved.

7. Teeth of *Scorpaena porcus* are found on the following bones: praemaxilla, dentary, vomer and palatina, as well as two ventral and two dorsal tooth plates in the pharynx. Depending on where they are located, the teeth are singly cusped and more or less bent.

8. The oral cavity, as well as any other area carrying teeth, is rich in taste buds. These are often found as aggregations in between the teeth.

9. Dental replacement appears to be regulated by the oral epithelium in the upper mouth region. Tooth germs are linked to the oral epithelium over a short epithelium strand.