Mantis Shrimp

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Q. I have a question regarding the mantis shrimp (Odontodactylus scyllarus). Pet store owners seemed unwilling to answer my questions about this animal, and I'm wondering why so little is known about this species and why it seems to be so disliked in the salt water hobby? As far as I can tell from my research, the mantis shrimp is very colorful and interesting. I would like it very much if you had some information regarding it.

A. I can understand your interest in these incredible creatures, and I think if aquarists knew more about the biology and behavior of the mantis shrimp, more hobbyists would be dedicating tanks to displaying them!

The peacock mantis, Odontodactylus scyllarus, belongs to the subphylum Crustacea, along with barnacles, copepods, isopods, ostracods, opossum shrimp, crabs, shrimp and lobsters. Although they are refereed to as "shrimp," they are not closely related to the shrimp we often keep, and are, in fact, in an entirely different order.

There are more than 350 species of mantis shrimp, grouped into four families. The most famous, or infamous, characteristic these animals posses is their modified fore limbs. These appendages have evolved into lethal weapons that are used to capture prey, defend territories and ward off predators. These large limbs, which are known as the raptorial appendages, fold-up against the body in the same way as the forelimbs of the praying mantis, hence the common name.

When they strike at a prey item or a rival, these appendages are thrown forward with incredible speed. In some species the striking movement takes only 4 to 8 milliseconds, while the appendage moves at a velocity of 390 inches per second! This makes it one of the fastest animal movements known to science!

The physical appearance of the raptorial appendage and how it functions can be divided into two groups — spearers and smashers. In the spearers the last joint of the raptorial appendage is adorned with from three to 17 sharp spines that are used to impale soft-bodied prey organisms. Most of the spearers are ambush predators that construct burrows in the sand in which they wait for prey to pass. Some species will also dig a trench in soft substrates and cover themselves so that only their eyes are exposed.

When a fish or shrimp moves to close, the appendages explode out of the substrate and spears it. More mantis shrimp are spearers than are smashers. In fact, all the members of the families Bathysquillidae, Lysiosquillidae, Squillidae and members of several genera within the family Gonodactylidae spear their prey. There are only a few genera in the family Gonodactylidae that are smashers, including the genus that contains the peacock mantis shrimp.

In the smashers, the last joint of the raptorial appendage has a greatly enlarged heel, and few or no spines. The appendage remains folded during the strike and the blunt heel is brought into contact with the prey item. Rather than soft bodied prey, these species typically feed on snails, crabs, hermit crabs and clams (preferred by some larger mantis shrimp because of the abundance of edible tissue). The incredible impact of the strike, which can be equivalent to that of a small-caliber bullet, is used to crush the shells of these armored invertebrates.

Unlike most spearing species, the smashers usually live among rubble or hard corals, and stalk their prey rather than ambushing it. After incapacitating its quarry, a smasher will often drag it back to its favorite hole, where it will batter it with its raptorial appendages until it gains access to the soft tissues inside the shell. The shells, and other hard parts of its victims, are then dumped at the entrance of its lair.

Mantis shrimp are solitary, territorial animals. Because they are so well armed, fights between mantis shrimp could be lethal. In some species, individuals try to kill their rivals, but in most species the territorial contests consist of ritualized displays and selective striking with the raptorial appendages to decrease the likelihood of severe injury to the combatants. For example, spearers will usually attack each other with the raptorial appendages folded-up, so the sharp spines are not brought to bare, while smashers often direct blows towards their rival's heavily armored tail section.

Some smashers even adopt a defensive posture in which they roll on to their back, curl their head and tail off the bottom and direct their tail toward their opponent. When the peacock mantis shrimp does this, it displays the colorful eye-spots on its tail, which may scare off predators or allow another species of mantis shrimp to recognize it is a different species.

The reason most aquarists, especially those keeping reef tanks, detest the mantis shrimp is because of their predatory prowess. These crustaceans are frequently introduced with live rock, and are often blamed for mysterious fish and shrimp deaths that occur in reef aquariums. What makes matters worse is that once a mantis is introduced to a tank full of live rock, it is often difficult to extract.

But, there is a place for the mantis shrimp in the aquarium hobby, especially the larger, more ornately colored species, like the peacock mantis shrimp. This mantis is a larger species, attaining a maximum length of around 7 inches. I would suggest that you keep it in a tank of 30 gallons or more. It can be housed in smaller aquarium, but it will be much more interesting to observe if it has more room in which to exhibit its daily activities.

The bottom of the tank should be covered with several inches of sand and coral rubble, and pieces of live rock that can be used as a roof for its den. With a glass tank I recommend placing an undergravel filter plate or piece of acrylic on the aquarium bottom before adding substrate. This will help to prevent the mantis shrimp from breaking the glass bottom as it digs under aquarium decor. Although not a common event, individuals as small as 3 inches have been known to break the side panels of a glass tank, while larger specimens (e.g., 9 inches long) have broken tanks with a double wall of safety glass! Thus, an acrylic tank is a more suitable home for a mantis shrimp.

This mantis shrimp should be kept on its own. If you keep two peacock mantis shrimp together, it is highly likely that they will fight to the death.

In nature, the peacock mantis feeds on other crustaceans, worms, mollusks and fishes. It is reported to be nocturnal, but I have seen it roaming about the reef, and possibly foraging, during the day as well. It should be fed a variety of fresh seafood, like scallop, squid and shrimp, which can be offered on the sharpened end of a piece of rigid airline tubing. To observe the natural feeding behavior of this efficient predator, add a ghost shrimp, a fiddler crab, an Astraea, Turbo or even freshwater snail.

You should be very careful when working in a tank that contains a large mantis shrimp. They can strike with amazing speed and can cause considerable damage to a finger or a hand. Mantis Shrimp Videos>>

References

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