Sea Cucumbers

This quarter we are featuring holothuroids or "sea cucumbers." Sea cucumbers, along with sea stars, sea urchins, brittle stars (ophiuroids), and sea lilies (crinoids), are members of the phylum Echinodermata. The name echinoderm in Greek means "spiny skin," and was originally used to describe sea urchins which have large obvious spines. Most sea cucumbers are soft and squishy, so why might they be part of this phylum? Sea cucumbers have small bone-like structures in their skin called ossicles. These ossicles come in many different shapes and sizes (from rod-shaped to button-shaped) and are often used to tell different species apart from one another. Along with ossicles, sea cucumbers are unique in that they have a bone-like ring around their mouth where their tentacles attach.

Spotted Sea Cucumber (*Bohadschia argus*) releasing white sticky Cuvierian tubules.

Sea cucumbers come in all shapes and sizes. They can be "L"-shaped, "U"-shaped, flask-shaped, web-like, tailed and – even – "pig"-shaped (such as the deep-sea Scotoplanes species). Most coral reef sea cucumber species are either thick and round or long like a rope. Some are microscopic, while some can grow to over 9.8 feet!

Along with their many forms, sea cucumbers also display a variety of unusual defensive mechanisms. Some sea cucumbers release white, sticky, anally-discharged filaments called Cuvierian tubules when they are disturbed. It is believed that sea cucumbers uses these Cuvierian tubules to entangle predators when they are attacked. Other sea cucumber species can shed large pieces of their body wall to escape predators. "Anal teeth" are another unique defensive adaptation that some sea cucumbers have developed; the small hard "teeth" which line the cloacal (posterior) opening are believed to have evolved as a response to certain parasitic fish, known as pearlfish.

Sea cucumbers that live in warm water are commonly dioecious meaning that there are two distinct sexes. At certain times in the year females and males will 'spawn' or release their eggs or sperm into the water, where they will unite and develop into larvae. Some sea cucumber larvae are non-feeding, while others will feed while they drift or swim around in the water. After a certain amount of time, these larvae will transform from a bilateral (two-sided) to a pentaradial (five-sided) body plan and settle to the bottom as tiny adults. A few warm-water sea cucumbers will sometimes split in half to reproduce.

There are over 2,000 species of sea cucumbers in the ocean with many more yet to be discovered. So get out to your coral reef and look for some sea cucumbers!

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Pearsonothuria graeffei getting reading to spawn (release either eggs or sperm into the water).