

Sea Stars

Growing New Arms

Some species of sea star have the ability to regenerate lost arms or even regenerate a whole new sea star from a single arm attached to a portion of the central disc. Regeneration is possible because each of the arms contains parts of the vital organs including the digestive tract and reproductive organs. Regeneration is a slow process and may require a year for complete reformation.

Dinner Inside the Shell

Sea stars are ravenous carnivores with a special adaptation for consuming prey outside their bodies. Their stomach can be extended out through their mouth to engulf and digest prey. This feature allows sea stars to consume a variety of prey larger than their mouth. To eat shellfish, they use their powerful suckers to pry open a clam or oyster shell, then push their stomach out through their mouth and insert it inside the shell where they digest and absorb the soft inner tissues leaving an empty shell behind.

Classification

Class: Asterozoa

Orders: Seven different orders - Brisingida, Forcipulatida, Paxillosida, Notomyotida, Spinulosida, Valvatida and Velatida

Species: Over 1800 known species

Distribution

Sea stars occur throughout the world in all the earth's oceans.

Habitat

Ranges from tropical coral reefs to kelp forests to deep sea floor.

Physical Description

- Sea stars range in size from three-fourths of an inch (2 cm) up to three and a half feet (one meter) in diameter.
- Most sea stars have five arms but they can have up to 50 arms arranged around a central disc.
- Some are dull yellow or orange in color but many are bright red, orange, blue, purple, green or a combination of colors.
- The mouth is located in the center of the underside of the central disc.

Diet

What Does It Eat?

In the wild: Most sea stars are generalist predators that eat clams, oysters, arthropods, small fish and mollusks. Some species eat decomposed animal or plant material and others eat coral polyps, sponges and plankton.

At the zoo: ??

What Eats It? Birds like sea gulls, sea otters, crabs, bottom dwelling fish and humans.

Social Organization

Sea stars are generally solitary. They may gather for spawning.

Life Cycle

Individual sea stars are either male or female but they are capable of both sexual and asexual reproduction. Fertilization occurs outside the body when eggs and sperm are released into the water. To increase the chances of fertilization sea stars gather in groups when they are ready to spawn. It is believed that environmental and chemical signals coordinate spawning. Fertilized eggs form into tiny swimming larvae that develop bilateral symmetry. Once the larvae settle on the bottom they undergo metamorphosis changing into the radially symmetrical adult form. A single female may produce over two million eggs per spawn. However since many marine animals feed on both eggs and larvae, few survive to adulthood. Asexual reproduction occurs by fragmentation when the animal breaks into two parts and each half forms a complete new sea star or by regeneration of parts of the animal. Life span is 3-5 years.

Adaptations

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Grip and Pull Movement

Sea stars have a groove extending from the mouth into each arm. Along the groove there are 2-4 rows of small tubular projections called tube feet tipped with muscular suction cups. The tube feet are used for locomotion, feeding, respiration and sensory functions. A network of water vessels in each arm draws in water and channels it to the tube feet enabling them to move. During locomotion the tiny tube feet perform a coordinated "grip and pull" action. The arms can bend and twist allowing sea stars to move over irregular surfaces, grasp prey or even flip themselves over.

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Conservation Connection

Sea stars are not endangered and in fact they are a serious threat to mussel and oyster beds as well as coral reefs. One sea star can devour over 50 young clams in a week. Sea stars also compete directly with commercial and recreational fishermen. Sea stars may be harvested, ground up and sold for fertilizer and poultry feed.

Fun Facts

- Sea stars, also called starfish, are named for their resemblance to stars.
- Fishermen used to try to kill starfish by chopping them in half. Since each half could regenerate into another sea star, the fishermen were ultimately doubling the sea star population
- Sea stars are not fish, they are echinoderms meaning "spiny skin".
- The size of a sea star depends on the amount of food it eats not on its age.
- Sea stars have a complex nervous system but no brain.
- Sea stars detect light with a small eyespot located at the end of each arm.