



Department of Planning and Natural Resources
Division of Fish and Wildlife
U.S.V.I. Animal Fact Sheet #13
Long-Spined Sea Urchin
Diadema antillarum



Description

To the casual observer, the long-spined sea urchin, *Diadema antillarum*, appears to be little more than a collection of sharp black spines protruding from the seafloor. And the unwary swimmer will not soon forget a close encounter - the spines can easily penetrate the skin and break off, leaving a painful reminder. Despite this sea urchin's treacherous spines, it is a remarkable marine creature that plays a vital ecological role on the reefs of the U.S. Virgin Islands.

All those spines are attached to a hard shell known as a "test." The urchin's internal organs are located inside. The test of an adult is round, slightly flattened from top to bottom, and about 4 inches (10 cm) in diameter. True to its name, the spines can be very long – over 12 inches (30 cm) – and help defend the urchin against predators. The spines are movable, and urchins will wave its spines in the direction of anything that disturbs it. Among all those spines, and harder to see, are thin tube feet tipped with suckers that grasp the bottom. Urchins use their delicate tube feet and spines to move about, to gather food, and to maintain a firm grip. This enables the urchins to avoid being swept away by currents and surge in shallow wave-exposed waters.

On the underside of the test lies the urchins' mouth. The jaws of the mouth are made from 5 teeth held in a muscular sling. Together these jaws form a five-pointed beak called Aristotle's lantern that is very effective at scraping algae from rocks and other hard surfaces.

Identification

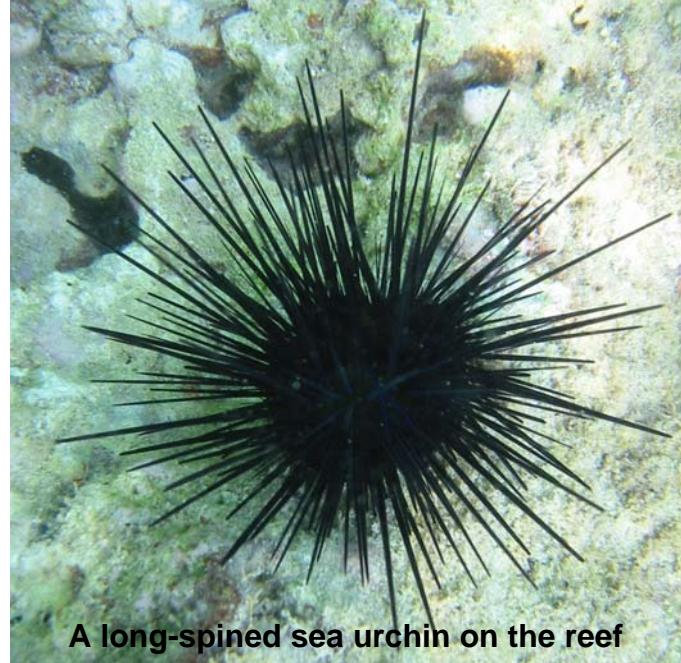
There are 5 different sea urchin species that commonly occur in coastal waters of the U. S. Virgin Islands. The long-spined sea urchin is easily recognized by its long slender spines and by its coloration. Adult long-spined sea urchins are usually completely black, although some adults may have a few gray or white spines. The young have white bands on their black spines.

Common Names

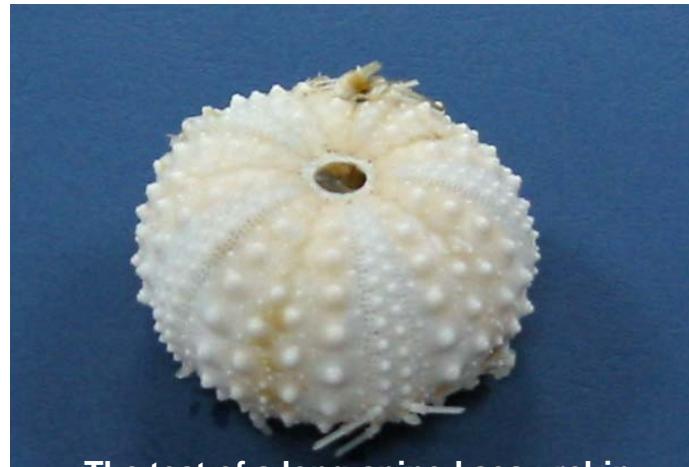
In the U.S.V.I., locals refer to all urchin species as *sea eggs*. The long-spined sea urchin is also known as the black urchin and erizo negro (Spanish).

Classification

Sea urchins are marine animals that belong to the phylum Echinodermata (meaning "spiny skin") – a group that includes sea stars, sea feathers, brittle stars, sea cucumbers and sand dollars. All sea urchins are in the class Echinoidea. Long-spined sea urchins belong to the genus *Diadema* and the species *antillarum*.



A long-spined sea urchin on the reef



The test of a long-spined sea urchin

Distribution & Habitat

Long-spined sea urchins occur throughout most of the tropical Atlantic Ocean. In the Western Atlantic, they range from Florida and Bermuda, southward throughout the Caribbean, to Brazil. In the eastern Atlantic, they occur in the Azores, Cape Verde Islands, Madeira Islands, and also in the Gulf of Guinea (Coastal Africa). They are not found in the Mediterranean Sea.

Long-spined urchins occur in almost all nearshore marine habitats, including rocky areas, coral reefs, mangroves, sea grass beds, and sand flats. They are most common in shallow waters (usually less than about 30 feet deep) but may also occur in deeper habitats.

Ecology

The long-spined sea urchin is perhaps the single most important herbivore (plant-eater) on Caribbean reefs. These urchins move about grazing rather unselectively upon a variety of different algae. Their feeding has two important consequences. First, urchin grazing reduces the total amount of algae on a reef, similar to a lawnmower keeping the grass short. This enables corals (which compete with algae for space and sunlight) to grow better. Second, when urchins scrape algae from rocks, they create vacant spaces that can then be colonized by the larvae of other marine animals (corals, sponges, gorgonians). This helps to keep the diversity of reef animals high. In the absence of urchin grazing, coral reefs may become overgrown with algae, and the diversity of reef animals may be reduced.

Scientists learned about the important ecological role of the long-spined urchins following a catastrophic die-off. During 1983-84, a disease outbreak struck the wider Caribbean and killed over 93% of the long-spined sea urchins. During the following years, corals decreased and reefs were covered with unprecedented levels of algal growth. Now after almost 20 years, the long-spined urchin appears to be making a recovery on reefs in the U. S. Virgin Islands and elsewhere in the Caribbean. Their comeback bodes well for our reefs.

By their nature, long-spined urchins are gregarious – that is, they occur in dense clusters. It is not uncommon to find groups of more than 100 urchins crowded into a space of about 5 square meters (roughly 16 square feet).

During daylight hours, long-spined urchins tend to remain in the protection of reef crevices or around coral heads. At night, they move out to forage over relatively small areas. Their nocturnal activity is thought to result from the threat of predation during daytime.

Several fish species eat long-spined sea urchins. For example the queen triggerfish (*Balistes vetula*, also known as the oldwife) can “blast” the urchins off the bottom. By overturning the urchin, the fish exposes its vulnerable underside. Porgies, grunts, wrasses, and one type of snail (the king helmet snail, *Cassis tuberosa*) also eat long-spined urchins.

Reproduction & Growth

Scientists can determine size and age of sea urchins by measuring the diameter of the test. Long-spined sea urchins reach a maximum size of about 4 inches (10 cm) test diameter. The urchins reach this size after about 4 or 5 years, and this is thought to be their maximum life expectancy.

Urchins begin reproducing during their 2nd year of life, when they reach a size of 1-2 inches (3-6 cm) test diameter. Urchin mating involves something known as *mass spawning*. During the late winter through early summer, all the urchins in an area will respond to some unknown trigger, simultaneously releasing their gametes (eggs or sperm) into the surrounding seawater. On occasion, the fortunate diver may observe clouds of whitish sperm (released by males) and yellow eggs (released by females) oozing from the tops of the urchins. The

eggs are fertilized by sperm as they drift above the adults. Fertilized eggs develop rapidly into small swimming larvae that drift freely in the ocean for over a month.

Eventually, currents bring some of the sea urchin larvae back to the reefs. At this point, the young urchins are still very small (only about 1/8 inch long). They settle to the hard bottom, abandoning their ocean-going lifestyle, to take refuge in small crevices. There, they adopt the lifestyle of adult urchins, grazing on plants such as algae and seagrasses.

Precautions

Urchins don’t attack people. But people can be injured if they accidentally come into contact with the spines of an urchin. Avoidance is the best precaution, especially in shallow waters with rocky bottoms. Look where you walk. Avoid walking or wading in shallows where sea urchins are plentiful. Wearing sneakers, slippers, or aqua socks may offer some protection, but beware - urchin spines are capable of penetrating the soles of shoes! When swimming, wear a mask or goggles – you will be able to see the urchins and avoid brushing against them.

What to do about an urchin injury

If you are “spined”, the tips may break off under the skin. Remove the exposed spines with tweezers, but do not dig excessively into the skin to get at spine fragments. Instead, treat for infection, which is a bigger concern. Your tissues will naturally dissolve the spines over several weeks. Applying a weak acid, like vinegar, lemon juice, or ammonia may help. A purple color (pigment from the urchin) may linger under the skin but it is harmless. The spines carry a weak toxin that does not affect most people, but allergic reactions are possible. Seek medical attention if the injury is extensive or if signs of shock develop.

For more information on this and other animals in the Virgin Islands please visit our web site at:

www.vifishandwildlife.com

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