The Abundance of *Diadema antillarum* at Rodney's Rock

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ABSTRACT

At Rodney's Rock, the population of *Diadema antillarum*, the long spined sea urchin, was surveyed. Two randomly selected habitats on the face of Rodney's Rock were compared to two habitats on the sea floor. Each sample plot was 28 m^2. Through these surveys, it was determined that there were 1.32 *D. antillarum* per square meter on the rock face and .71 per square meter on the boulders on the sea floor These findings will provide a baseline for future research on the *D. antillarum* at Rodney's Rock.

INTRODUCTION

Coral reefs are shallow water environments that offer a variety of habitats for marine plants and animals. A prime example is Tarou Point, also known as Rodney's Rock. Situated approximately 2.9km north of Roseau, the capital of Dominica, Rodney's Rock is known for its variety of hard corals and sponges, and the abundance of schools of fish (Evans 1997). A commonly encountered invertebrate is the long spined sea urchin, *D. antillarum*. As implied by the name, the long pointed spines on the spherical body can puncture the skin and act as miniature fish hooks (Humann 1992). Past research has been conducted on the basic distribution surrounding Rodney's Rock (Lehman 2001), however, the current study focuses on comparing the abundance of *D. antillarum* on the rock face to the sea floor by determining the ratio of the number of holes to the number of sea urchins in each selected location. This information can serve as a reference for any further research done on the *D. antillarum* at Rodney's Rock. It can also aid in the monitoring of the sea urchin population along with the cause of any such changes.

METHODS AND MATERIALS

Two 4.6 x 6.1 meter sections on the north face of Rodney' Rock were randomly selected, along with two 4.6 x 6.1 meter boulders on the sea floor approximately 12-15 meters north of Rodney's Rock. Measuring was conducted with a 6.1-meter string, marked every 1.5 meters with a piece of tape. The string was spooled on a stick and tied to a weight at the opposite end. The first habitat evaluated was the rock face. The weighted end of the string was dropped to the sea floor and the height of the plot was measured at 4.6 meters from the sea floor. The string was then extended out horizontally to delineate a 4.6 x 6.1-meter area (28.06 m^2). The total number of *D. antillarum* in the area was then

counted and recorded on a waterproof tablet. Next, the total number of holes in the area, including those occupied with *D. antillarum*, were counted and recorded on the same tablet. This procedure was repeated on a second randomly chosen section of the rock face, west of the first. For the second location, measurements were taken about 12-15 meters north of the rock face, this time measuring a boulder on the sea floor that was 4.6 meters wide and 6.1 meters long. The number of *D. antillarum*, along with the total number of holes was counted and recorded on the tablet. This was repeated at another randomly chosen boulder. Observations were then made of all the *D. antillarum*, looking for any pattern in where and how they occupied sites.

RESULTS

Table 1 Distribution pattern of Diadenia antillarum in two habitats at Rodney's Rock

Location	# of Urchins	# of holes	% Occupancy	Urchins/m^2
Rock Face 1	35	56	62.5	1.32
Rock Face 2	39	52	75	
Boulder 1	29	31	93.5	0.71
Boulder 2	11	15	73.3	

A larger number of *D. antillarum* were located on the face of Rodney's Rock, along with a larger number of holes (Table 1). They were also found to be heavily concentrated around the fire coral, at least half a meter from the surface, and more abundant near the eastern side of Rodney's Rock.

DISCUSSION

Diadema antillarum, the long spined sea urchin, lives in rocky depressions during the day and feeds on algae at night (Humann 1992). According to the data in Table 1, more *D. antillarum* were found on the rock face, but there were also a larger number of holes there. This suggests that there are more sea urchins on the rock face than on boulders, but possibly because there are more opportunities to seek shelters. They also appeared to be more abundant near the base of Rodney's Rock. There were considerably fewer sea urchins as the west tip of the rock was approached.

There were also many distinct placement patterns noted; though some of which may prove to be coincidental. Most of the *D. antillarum* were at least .5 meter from the

surface, which could be because of the change in tide. In order to remain submerged in their depressions they attempt to stay below the low tide line. Another observation was the fact that they were heavily clustered around fire coral. Although this could be for extra protection against predation, there were no obvious reasons found to explain this. Most clusters consisted of six to eight *D. antillarum* and occurred frequently on the rock face, along with an abundance of fire coral. When looking at their placement on the sea floor, they were generally not in clusters unless around fire coral.

The data presented here can serve as a reference for any future studies of *D. antillarum* at Rodney's Rock, including the relationship between *D. antillarum* and fire coral. More importantly, these data can serve as a baseline for long-term monitoring of population sizes.

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