

Algal Survey of Rodney's Rock

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Abstract

A survey of Rodney's Rock was executed and algal species were observed and identified. Sample areas were studied to determine species present and percent coverage. All species identifiable in the area were recorded. Thirteen algal species were identified. In sample area 1 the two dominant species were an unidentifiable brown algae and a green alga, *Bryopsis pulmosa*. In sample area 2, the two dominant algae were both red algae, *Coelothrix irregularis* and *Galaxaura oblongata*.

Introduction

Marine plants are limited in the depth to which they can grow by the amount of light penetration through the water. Most algae occur within the intertidal zone down to 30 meters, although in very clear water some can occur deeper (Littler et al., 3). Our survey focused on an area of Rodney's Rock from the shore to 4m out, which included the intertidal area. This area ranged from a depth of 10cm to approximately 1.3m.

The algae of the Caribbean are grouped into six phyla. The name of each phylum is taken from the color of the dominant photosynthetic pigments. Of these six, green algae (Chlorophyta), red algae (Rhodophyta), and brown algae (Phaeophyta) are the most obvious phyla present. The other three phyla include forms of blue-green algae (Cyanophyta), diatoms (Chrysophyta), and the dinoflagellates (Pyrrhophyta). Our survey of Rodney's Rock only includes the three main phyla, green, red, and brown algae.

Some algal species require the aid of a microscope to identify them however, the species that were collected on Rodney's Rock were identified by macroscopic characteristics. Some visible characteristics that were helpful in identification were the air bladders present on *Sargassum*, branching patterns, growth habit and color of the species being identified.

Materials and Methods

Algal samples were collected and identified from the intertidal area on the north side of Rodney's Rock, located on the west side of the island in the Caribbean Sea. To encompass the intertidal zone, this survey included all algae within 4m of the shoreline. This area ranged in depth from 10cm to approximately 1.3m. Algae was also recorded from two randomly chosen quadrants (2m x 2m) to estimate percent coverage by dominant algal species. The 2m x 2m sample areas were marked using twine tied together to form a square. Sample area 1 was 7.6m from shore and at a depth of 0.8m. Sample area 2 was 3m from shore and ranged from 30cm to 60cm deep. Depth and

distance from shore were measured in feet using a pre-marked weighted line and then converted to meters. Data and specimens were collected on four snorkeling trips lasting for approximately three hours. Collected algal samples were stored in sealable plastic bags filled with salt water to aid in short-term preservation and identification. The book Marine Plants of the Caribbean (Littler et al. 1989) aided in identification of species collected.

Results

From our observations and sampling done at Rodney's Rock, we identified 7 red algae, 3 green algae, and 3 brown algae, for a total of 13 algal species. A list of the species found is in table 1.

Table 1: Algal species identified at Rodney's Rock

Type of Algae	Scientific Name
Red	<i>Gracilaria spp.</i>
Red	<i>Galaxaura marginata</i>
Red	<i>Hydrolithon boergesenii</i>
Red	<i>Coelothrix irregularis</i>
Red	<i>Gelidiella acerosa</i>
Red	<i>Acanthophora spicifera</i>
Red	<i>Galaxaura oblongata</i>
Green	<i>Bryopsis plumosa</i>
Green	<i>Codium intertextum</i>
Green	<i>Ventricaria ventricosa</i>
Brown	<i>Dictyota cervicornis</i>
Brown	<i>Sargassum spp.</i>
Brown	<i>Sargassum platycarpum</i>

Table 2: Percent coverage of algal species in sample area 1.

Type of Algae	Scientific Name	% Coverage
Green	<i>Bryopsis plumosa</i>	30
Brown	unidentifiable	30
Red	<i>Galaxaura oblongata</i>	15
Red	<i>Gracilaria spp.</i>	10
Other	(coral, urchins, tubeworms, etc.)	10
Green	<i>Ventricaria ventricosa</i>	5

Sample area 2 was measured in the same way as area 1. The sample area was 3m from shore and ranged from 30cm-60cm deep. Results are given in Table 3:

Table 3: Percent coverage of algal species in sample area 2.

Type of Algae	Scientific Name	% Coverage
Other	(coral, urchins, tube worms, etc.)	40
Red	<i>Coelothrix irregularis</i>	30
Red	<i>Galaxaura oblongata</i>	15
Brown	unidentifiable	10
Red	<i>Gracilaria spp.</i>	5

Sample area 1 was dominated by *Bryopsis plumosa*, a green alga, and an unidentifiable brown alga (Table 2). Sample area 2 was dominated by *Coelothrix irregularis*, a red alga (Table 3). Ninety percent of the rock surface of sample area 1 was covered by algae, but only 60% of sample area 2 was algal encrusted. Sample area 1 was almost equally dominated by types of green, brown, and red algae. *B. plumosa*, a green alga, and an unidentifiable brown alga covered equal parts of the rock surface (30%); *Galaxaura oblongata*, a type of red alga, covered a slightly lower percentage of the rock surface (15%). This codominance differs from what was seen in sample area 2.

Sample area 2 was dominated by a type of red alga, *Coelothrix irregularis*, and was codominated by another red alga, *Galaxaura oblongata*. Only 60% of the rock surface in sample area 2 was covered with algae. Also, there were no green algae found in sample area 2.

Discussion

In our experiment we found there was a high diversity of algal species, but that in most areas several species dominated. Also, most of the growth occurred between 3 to 5 meters from shore at a depth of 2 meters or less. Sea urchins and grazing fish species contributed to a lower abundance of certain species, and further reduced the area at which those species occurred.

Sample area 1 was dominated by types of green and brown algae. Sample area 2 was dominated by a red alga. This difference of species representation and abundance could be contributed to factors such as depth and grazers. The full impact of these factors could be determined by further experimentation.

This project could be further continued by increasing the area studied, or by measuring the affects of grazers on algal diversity and abundance. Also these data could be compared to another site with different environmental conditions or pressures, such as higher populations of grazers or different topographical features.

Acknowledgements

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Works Cited

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