Biogeography and population connectivity of hydroids in the Sargasso Sea

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Abstract

The Sargasso Sea is bound on all sides by currents, and is ecologically important because it provides habitat for many commercially harvested fish stocks [1].

Sargassum constitutes the most significant mobile ecosystem in the oligotrophic Sargasso Sea [2,3].

The Sargasso Sea biota is composed of pelagic and neustonic epibionts, which make it a unique ecosystem for population connectivity studies.

The Sargasso Sea is a barrier to dispersal to hydroids.

A good understanding of biodiversity and population connectivity is essential for determining areas for protection in order to better encompass a variety of organisms and ecosystem services.

Introduction

Objectives

BIOGEOGRAPHY:

To investigate the distribution of hydroids in the Sargasso Sea

To investigate the hydrodynamics affecting hydroid biodiversity

POPULATION CONNECTIVITY:

To investigate population connectivity in hydroids and how it may be influenced by the Subtropical Convergence Zone

Methods

• Clumps of Sargassum were collected via opportunistic dip netting and twice-daily noon and midnight Netton Net tows along the Sargasso Sea transect.

• Each clump was examined by light microscopy to identify all hydroids present to species level. Species were photographed and samples were collected and kept in ethanol as voucher samples. 41 samples of C. noliformis and 20 samples from an array of other morphologically identified species were sent to Operon for genetic analysis.

Results and Discussion

Figure 1: Sampling locations of Sargasso Sea transect. Red circles indicate locations where morphologically identified species were photographed and samples were collected and kept in ethanol as voucher samples. 41 samples of C. noliformis and 20 samples from an array of other morphologically identified species were sent to Operon for genetic analysis.

Figure 2: Photographs of six common hydroid taxa collected during this study: (a) Aglaeophenia, (b) Plumularia, (c) Clytia, (d) Cyta, (e) Hymenostomum, and (f) Dynamena. Scale bar in all photos is 1 mm.

Figure 4: Percentage of clumps from which at least one hydroid of the specified genus was found, separated by Sargassum variety. Clyta was the most frequently occurring genus on Sargassum natans IV, and Aglaeophenia was the most frequently occurring genus on Sargassum natans VIII. Only two clumps of S. fluitans II were examined, the genera common on the other two Sargassum varieties occurred also on S. fluitans II.

Figure 5: Haplotype network of 16S ribosomal gene sequences of 41 C. noliformis samples collected from S. natans I between San Juan, Puerto Rico, and New York, USA, and one sample collected off the coast of Brazil (Accession number DQ964792). (10). Cylindros occur in groups that have little to no population structure or haplotype grouping between the north and south Sargasso Sea (Fig. 5).

Works Cited


Acknowledgements