REGULATION OF MORTALITY RATES IN JUVENILE QUEEN CONCH

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Progress report. We have examined the effects of various conch and habitat features upon mortality rates of juvenile queen conch, Strombus gigas, with field experiments. Experiments were conducted during the summer and early fall of 1987 and 1988 in seagrass beds and adjacent sand flats near Lee Stocking Island, Exuma Cays, Bahamas. Factors examined included conch size (80-140 mm shell length), conch density (approximately 0.1-1 per square meter), and presence or absence of vegetation and conch. The experimental technique involved tethering of juvenile conch in circular plots, and subsequent weekly monitoring of mortality rates for 2-5 months.

In our 1987 experiments mortality rates of conch differed significantly by habitat among two seagrass beds and one sand flat. Mortality rates were also inversely density-dependent at the high range of densities tested in this experiment. There was little effect of conch size.

In our 1988 experiments seagrass beds in general had lower mortality rates than sand flats or areas with sparse vegetation. In addition, a seagrass bed with resident conch had lower mortality rates than one without conch, suggesting a positive feedback between population-level conch densities and survival. In the seagrass bed with resident conch mortality was density-dependent in the low range of densities tested; there was no effect of density where population density was low. Smaller conch suffered lower mortality rates than larger conch in the populated seagrass bed.

We conclude that various factors act interactively to produce habitat-specific mortality rates in queen conch due to predation. These include (1) habitat type, whereby seagrass beds offer some protection; (2) population density, such that populated seagrass beds appear to exert a positive influence on conch survival; (3) in some seagrass beds, mortality is positively or inversely density-dependent as a function of population and local densities; (4) conch size, depending on the specific type of habitat; (5) predation intensity and predator guilds, which likely differ across habitats, producing habitat-specific mortality rates.