The Effect of Putative Beneficial Microorganisms for Coral (pBMC) in the Prevention of Disease and Bleaching (Year Two)

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This experiment is attempting to manipulate the coral associated microbiome by adding a collective amount of native putatively beneficial microorganisms for corals (pBMCs). Currently there is no treatment to reduce or stop coral bleaching and death. This would be the first effort to take the common use of bacteria consortia typically used in plants and humans to corals. This process is meant to try and reduce the effect of coral bleaching and disease. Bacterial samples were taken from Acropora coral and streaked onto marine agar plates. The plates were incubated and a catalase test was performed to determine which bacteria on the coral produced the most catalase. Catalase is an enzyme that breaks down hydrogen peroxide, a chemical that causes coral bleaching. The bacteria on the coral that produces 100% catalase breakdown was used to form the probiotic. The probiotic was then swabbed from the plate and swabbed onto the Acropora coral. Four tanks were set up and labelled “1. Heat control”, “2. Heat”, “3. Disease Control” and “4. Disease”. The control groups underwent the same conditions as the experimental trials, but the control did not have the probiotic of beneficial microorganisms. After a week, the coral with the probiotic performed better in the disease and heat trials as the polyps in the coral lost much less of their color. On average 42.7% of polyps were bleached on the heat trial with the probiotic, compared to the control without the probiotic where 91.8% bleached. The disease trials with the probiotic had 16% bleached whereas the disease control without the probiotic was 83.3% bleached on average. This supports the original research hypothesis that beneficial microorganisms for coral can be used to reduce coral bleaching and disease.

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