Probiotics in the Fight Against Stony Coral Tissue Loss Disease

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The purpose of this project was to analyze and screen culturable bacteria associated with corals of the Florida Keys for antimicrobial properties and determine the phylogenetic characterization of the isolated microbial communities. It was predicted that if bacteria from healthy corals associated with Stony Coral Tissue Loss Disease (SCTLD) produce antibacterial properties against known pathogens, then such inhibition activity would be observed in lab assays. Coral mucus collected from healthy and diseased corals in the Florida Keys were sub-cultured for bacteria, with purified isolates cryopreserved at -80° Celsius in 96-well microliter plates to create bacterial culture libraries. The bacterial culture libraries were screened for antimicrobial properties against Bacillus subtilis, Serratia marcescens, Vibrio shiloi, Vibrio parahaemolyticus, Vibrio vulnificus to isolate and characterize bacteria from this endemic. The data supported the hypothesis as the coral isolates associated with SCTLD exhibited antibacterial properties against all pathogens with a 4.52 mm average zone of inhibition, low variability and standard deviation of 3.78. Greatest antibiotic activity stemmed from the Middle Keys showing 28% of inhibitory activity from “Unaffected” samples of diseased colonies, 22% from “Healthy” samples and 15% from “Diseased” samples. Lower Keys results indicate a lack of inhibitory activity against marine pathogens likely due to loss of beneficial bacteria from increased temperatures on coral reefs. Isolated bacteria of interest will be identified using 16S rDNA sequence analysis. SCTLD may be slowed or halted completely by identifying and applying beneficial coral probiotics, not only for the Florida Reef, but for the marine habitat’s entire biodiversity.

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