Anti-microbial activity of *Pseudopterogorgia americana* associated microorganisms against the coral pathogen *Vibrio coralliilyticus* and closely related phylotypes

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Vibrio coralliilyticus (ATCC BAA-450) is a temperature-dependent coral pathogen originally isolated from a coral reef off the coast of Zanzibar in the Indian Ocean. This coral pathogen has been found to induce coral-bleaching in *Pocillopora damicornis* through lysing of the zooxanthellae and coral tissue at temperatures higher than 24.5°C. Currently, the genome of this coral pathogen is being sequenced and on-going studies are using proteomics to examine the influence of temperature on the virulence of this organism. In this study, we compare the ATCC strain of *V. coralliilyticus* with related strains isolated from the surface mucopolysaccharide layer (SML) of visually-diseased *Pseudopterogorgia americana* corals off the southern coast of Puerto Rico. First, using 16S rDNA sequence analysis from the samples analyzed thus far, we identified five bacterial strains from the diseased *P. americana* samples (PaD1) that phylogenetically clustered with *V. coralliilyticus*. The healthy samples (PaH1) did not have any bacterial isolates that clustered with this coral pathogen. Second, a genomic profiling technique, REP-PCR, revealed that one of the five strains was similar to ATCC BAA-450, while four of the strains were different. Third, we examined whether the bacteria isolates from both healthy and diseased *P. americana* are able to inhibit the growth of ATCC BAA-450 when grown at two different temperatures, one where *V. coralliilyticus* is not pathogenic (24°C) and one where pathogenicity has been observed (27°C). We used a modified agar-overlay anti-microbial assay to screen *P. americana* bacterial isolates against *V. coralliilyticus* for their ability to inhibit the coral pathogen. We will also examine whether the five PaD1 coral isolates that are homologous to *V. coralliilyticus* show similar results in the anti-microbial assay. This study, as well as future studies that will incorporate additional strains of *V. coralliilyticus* found in the Caribbean, will contribute to our understanding of this coral pathogen and its role in the coral disease process as seawater temperatures increase.

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