

Molecular Microbial Ecology of a Gorgonian Coral, *Pseudopterogorgia americana*

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Corals harbor an active microbial community in their surface mucopolysaccharide layer that is potentially specific to the host coral over spatial and temporal scales. These epibiotic microbial communities likely play important roles in coral health and disease processes, however, very little information is known on the compositions and interactions of these microbial communities. In this study, we compared different methods of extracting microbial community DNA directly from the mucopolysaccharide layer of a gorgonian coral, *Pseudopterogorgia americana*. We developed an optimized DNA extraction protocol using a combination of cell lysis and purification steps, and tested this protocol's efficiency and application for further molecular analyses through the use of denaturing gradient gel electrophoresis. This is the first attempt to use a molecular based approach to characterize microbial communities associated with a gorgonian coral.

Characterization of Microbial Isolates from a Gorgonian Coral and Evidence for Autoinducer Signal Production

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Coral reefs are the most diverse marine ecosystem, although much of the diversity associated with reefs remains uncharacterized in the form of microorganisms. Corals harbor an active microbial community in their surface

mucopolysaccharide layer that is potentially specific to the coral host over spatial and temporal scales. These epibiotic microbial communities likely play important roles in coral health and disease processes. The majority of microorganisms associated with corals appear to be members of the Gram-negative Proteobacteria that are commonly associated with eukaryotes in symbiotic or pathogenic relationships. These bacteria are widely known to participate in a cell density dependent gene regulation system known as quorum sensing. The genes regulated by quorum sensing are often crucial to the colonization or infection of a eukaryotic host. Currently, very little is known about microbial diversity and the relationships between microbial communities and hosts in the marine environment. We have isolated and characterized bacteria associated with a gorgonian coral, *Pseudopterogorgia americana*, and screened the isolates and extracts of the coral mucopolysaccharide layer for the production or presence of quorum sensing signaling molecules using an autoinducer induction bioassay and gas chromatography-mass spectrometry.