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Seawater Chemistry and Microbial Communities Associated with Healthy Tissues of Caribbean Reef Corals

The variation in microbial communities inhabiting the coral surface microlayer (CSM) of the dominant reef-building corals *Diploria strigosa* and *Montastraea annularis* was evaluated. Variations in microbial community diversity and inferred metabolism were linked to natural and human-induced factors contributing to a large-scale environmental gradient along the southern coast of Curaçao, Netherlands Antilles. These studies, which concentrated on the back reef depositional environment (facies) of the reef tract, have focused on: (1) determining the variation in bacterial communities inhabiting the CSM through the use of Terminal Restriction Fragment Length Polymorphism (T-RFLP), (2) water-column studies to assess the affects of elevated nutrient concentrations, and (3) Nitrogen-isotope analyses of coral tissues to assess potential sources of elevated nutrient concentrations, such as human sewage. By linking variations in microbial communities' diversity and inferred metabolic activity with an understanding of processes and causes that operate at various spatial scales, this study provides a sensitive assessment of those factors immediately and directly impacting reef health. In addition, this work is establishing what microbes live on healthy coral tissue and thus creates a comparative baseline for future studies of microbially-mediated mechanisms of coral mortality such as coral disease.