

Life and Death of Coral Reefs: A Microbial View

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Abstract: Until recently, the influence of microbes on coral reef function has been under-appreciated, even though it is widely recognized that bacteria, archaea, and unicellular eukaryotes are vital components of all marine ecosystems. A number of studies have begun to use modern microbial ecology methods to study coral reefs and examine the microbes living with reef organisms. These new avenues of research are changing our views of how coral reefs function. The microbial communities associated with corals are extremely diverse and mostly novel. In addition, there appear to be specific relationships between corals and certain bacterial

species or groups. These specific associations are maintained over space and time, demonstrating that coral species have distinct microbiota. It has become clear that coral reefs represent landscapes of ecologically structured prokaryotic communities. Identifying coral-associated microbes and characterizing their interactions with the coral host is critical for understanding the biology of coral reefs. Here I present models explaining how microbes structure healthy coral reefs, as well as propose mechanisms by which microbialization is destroying these ecosystems.