

Ex-vivo Coral microbiome: Design, Extraction and Exploration

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Abstract

Corals are marine invertebrates; acquire their energy and nutrients mostly from photosynthetic unicellular organisms of the genus Symbiodinium called dinoflagellates which live within their tissues. Corals also associate with a variety of other microorganisms like viruses, fungi, archaea and bacteria. The larval and early recruits possess more varied microbiomes than later life stages of corals. This indicates a winnowing process in the course of coral maturation. Corals provide nutrients (promoting growth) and release antimicrobials (inhibiting growth) for the symbiont. Studies have shown that environmental stress reduce evenness and increase beta - diversity of microbiomes associated with corals. There are various extrinsic and intrinsic factors that determine the shaping of these host-bound microbial communities. Environmental factors and the interactions between different microbes act together on the structure of microbial community, making the microbiome dynamics difficult to foretell. Like plants and humans beings, corals associated microbes also colonize in different compartments of the coral colony. These compartments include gastrovascular cavity, mucus, skeleton and tissue. The presence and diversity of microbes in different coral compartments can be studied by 16S rRNA probing or gene profiling methods. The acellular layer in between gastrodermis and epithelium, called as mesoglea has been found to have minimum habitation of microbes with an occasional observation of cyanobacterial trichomes which are responsible for the black band disease. The maximum colonization of microbes has been observed in the surface mucus layer of polyps and also in the skeleton. The corals release substantial amount of dissolved organic carbon making the mucus a nutrient rich medium.

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Biography

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