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Short Communication

Major Role of Marine Microbiology and Its Various Types of Marine Bacteria

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DESCRIPTION

The study of microorganisms (bacteria, archaea, viruses, and microbial eukaryotes) in the marine environment, including their biodiversity, ecology, and biogeochemistry is known as marine microbiology. The application of metagenomics has been critical in determining the abundance and composition of marine microbial ecosystems [1].

Marine microorganisms have been estimated to account for approximately 70% to 90% of the biomass in the ocean. They form the marine microbiome when combined. This microbiome has evolved many life styles and adaptations over billions of years and has come to participate in the global cycling of almost all chemical elements. Microorganisms, which act as decomposers, are critical to nutrient recycling in ecosystems. They are also in charge of nearly all ocean photosynthesis, as well as the cycling of carbon, nitrogen, phosphorus, and other nutrients and trace elements. Marine microorganisms sequester large amounts of carbon while also producing a large portion of the world's oxygen [2].

In the late 1970s, the discovery of hydrothermal vent fauna piqued the interest of scientists all over the world, including some at scripps. As a postdoctoral fellow with Scripps professor George N. Somero in 1981, Scripps scientist "Horst Felbeck" reported that the tissues of hydrothermal vent tube worms contained key Calvin-Benson cycle enzymes and could produce carbon compounds from carbon dioxide and hydrogen sulphide oxidation [3].

Felbeck and Somero (now the director of the Hopkins Marine Station) made important contributions to the physiology and biochemistry of hydrothermal vent symbiotic bacteria that contain these enzymes and live in the tissues of hydrothermal vent animals. According to William T. Sedgwick, by virtue of the discoveries upon which it was founded, to which it has led, and upon which it now rests illustrious and secure, mankind has been enabled for the first time to arrive at an adequate comprehension and understanding of the microscopic world, as well as of many important and familiar natural phenomena hitherto either not understood or misinterpreted. These processes biochemical and molecular biological foundations were established in the twentieth century. Work with microbes has resulted in the discovery of restriction enzymes, the elucidation of biochemical pathways, the identification of bioenergetic mechanisms, and the understanding of a variety of processes essential to all life. Marine sediments range from the most shallow to the deepest trenches, from dimly illuminated to completely dark, and from the most recent sediment to material millions of years old. The age and temperature of such sediments are determined by their proximity to geologically active areas [4].

Cyanobacteria are a type of marine bacteria and they are a type of phytoplankton .That is, they grow their own food. However, nitrogen is used instead of carbon dioxide. Cyanobacteria play a critical role in the nitrogen cycle[5]. They convert nitrogen into a form that can be used by other marine organisms. Marine bacteria also contribute to ocean cleanliness. Some assist in the decomposition of dead marine animals. Some marine bacteria emit bioluminescent light. And some of them have symbiotic relationships with other sea creatures. The relationship is frequently mutualistic [6].

CONCLUSION

Trichodesimium is a genus of colonial cyanobacteria that is one of the most important and well-studied nitrogen-fixing organisms found in open-ocean environments such as Station ALOHA. *Trichodesmium* employs a nitrogenase enzyme to convert nitrogen gas into more biologically useful compounds (a process known as "nitrogen fixation"). Nitrogenase, on the other hand, is inactivated in the presence of oxygen (which is produced by many photosynthetic organisms as a by product of photosynthesis). As a result, most nitrogen-fixing microbes separate nitrogen fixation and photosynthesis either spatially (using different types of cells for each process) or temporally, performing photosynthesis during the day and nitrogen fixation at night. *Trichodesmium*, on the other hand, employs neither of these strategies. It is capable of fixing nitrogen during the day,

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but lacks the necessary specialised cells. Researchers are particularly interested in determining how *Trichodesmium* can fix nitrogen during the day.

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