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Perspective

Analysis on Marine Microorganisms for their Biological Activities

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DESCRIPTION

Marine biotechnology ("blue biotechnology"), exploits the diversity found in marine environments in terms of the form, structure, physiology, and chemistry of marine organisms, in ways, which enable new materials to be realized. It includes process biotechnology techniques (such as bioprocessing, bioharvesting, bioprospecting, bioremediation, using bioreactors, etc.,) aquaculture gene, protein, or other molecule based techniques encompassing different applications that include health, food, cosmetology, aquaculture & agriculture, fisheries, manufacturing, environmental remediation, biofilms and corrosion, biomaterials, research tools, etc., for all of which the marine environment is providing the resources. Microbes were the only form of life for two-thirds of the planet's existence from about 3.5 billion years ago. The development and maintenance of all other forms of life depend absolutely on the past and present activities of marine microbes.

Microbial life and the earth have evolved together and the activities of microbes have affected the physical and geochemical properties of the planet. Indeed, they are actually the driving forces responsible for major planetary processes like changes in the composition of the atmosphere, oceans, soil, and rocks. The marine environment and its habitats harbor a diverse range of microbes in huge numbers that form a major component of biomass on Earth. The co-evolution and symbiotic relationships between them provide unique conditions. For microbial growth and secondary metabolite expression that are not found in the terrestrial ecosystem which resulted in the development and elaboration of unique microbial biosynthetic pathways.

Microorganisms are fully adapted to survive in extreme marine environments from the frigidity of sub-zero Antarctic waters to deep-sea hydrothermal vents, where temperatures are greater than 100 °C and highly acidic conditions exist, thereby dictating the flow of the marine energy and nutrients. Much of the continental shelf and slope is covered with unconsolidated organic and inorganic particles of mud, abyssal clays, oozes, gravel and sand accumulated on the floor of the ocean derived from biological, chemical processes within the ocean, terrigenous or lithogenous sediments. Much of the carbon is recycled during its descent, but some material reaches the deep ocean floor, where it is consumed by benthic organisms or leads to the formation of sediments that covers 70% of the Earth's surface forming the largest global reservoir of organic carbon.

The microbiology of deep marine sediments and subsurface rocks is an area of current active investigation using deep-core drilling and microbes have been detected to a depth of 1.6 km in porous rocks that were laid down as sediments tens or hundreds of million years ago. Marine sediments have long been overlooked for the presence of the diverse microbial communities. Recent studies on the diversity and activity of microbial life in the various types of sediment are yielding many new insights, mainly because of the application of molecular techniques.

CONCLUSION

Therefore, with respect to the exploration of the marine microbial life, we are still at the infancy stage, and much effort is required to explore their culturable and metagenomic diversity. Actinomycetes having characteristics of both bacteria and fungi. Actinomycetes were originally considered to be an intermediate group between bacteria and fungi, sometimes called as fungi-like bacteria produce branching mycelium. Actinomycetes are biotechnologically valuable bacteria which are well exploited for secondary metabolites. Screening, isolation, and characterization of promising strains of actinomycetes producing potential secondary metabolites have been a major area of research by many research groups worldwide for many years.

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