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ISSN: 2167-7662
Bioenergetics: Open Access

Commentary

Brief Note on Environmental Microbiology and Metabolism Growth

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DESCRIPTION

This chapter outlines a book focusing on environmental microbiology. This book describes important microorganisms involved in environmental microbiology, the various environmental properties in which they may exist, the methods used to monitor microorganisms and their activity, and the effects of microorganisms on human activity. It defines the potential impact. This book addresses new challenges in modern environmental microbiology, where pathogens and bioremediation continue to be the cornerstones of this field. However, in both cases, the application of molecular genetics and biotechnology tools has greatly expanded our discipline.

Environmental microbiology is the study of the composition and physiology of microbial communities in the environment. The environment in this case means the soil, water, air, and sediments that cover the earth, and may include the flora and fauna that inhabit these areas. Environmental microbiology also includes the study of microorganisms found in artificial environments such as bioreactors. Molecular biology has revolutionized the study of microorganisms in the environment, improving understanding of microbial community composition, phylogeny, and physiology. The current Molecular Toolbox contains a variety of DNA-based technologies and new methods for studying RNA and proteins extracted from environmental samples. Currently, the main focus is the application of an "omics" approach to determine the identity and function of microorganisms that live in diverse environments. The life of microorganisms is surprisingly diverse, and they literally cover the earth. It is estimated that less than 1% of the microbial species on Earth are known. Microorganisms can survive in some of the most extreme environments on earth, often at temperatures above 100°C, such as those found in geysers, black smokers, and wells. Some are found in very cold habitats, while others are found in high salinity, acidic or alkaline waters. An average of 1 gram of soil contains about 1 billion (1,000,000,000) microorganisms, probably thousands of species. They are the backbone of the opaque zone ecosystem. Chemotrophic bacteria exist in such zones, where they supply energy and carbon to other organisms. Some microbes are decomposers with the ability to recycle nutrients.

Microbial world: classification, metabolism, and growth

Microorganisms are the basis of all life on earth. They differ in appearance, ability to perform different biochemical transformations, ability to grow in different environments, and interaction with other organisms. Due to the wide variety of organisms on Earth, a systematic approach to classify these organisms is needed. The science of classifying organisms is called taxonomy, and the groups that make up the taxonomic hierarchy are called taxa. Nomenclature refers to the actual nomenclature of an organism. For microorganisms, the nomenclature binomial nomenclature is used.

Classification of the bacterium *Escherichia coli*

Escherichia coli is a member of the genus Escherichia. It is named after Theodor Escherich, the first insulator and descriptor. The name of the species comes from the place where it was found, in this case the human intestine. The classification is as follows:

Domain: Bacterial phylum: *Proteobacteria* Class: Gamma *Proteobacteria* Order: *Enterobacteriaceae: Enterobacteriaceae,* genus: Escherichia genus: *Escherichia coli*

Microbial diversity in the environment

Microbes live in terrestrial and aquatic ecosystems, including geographic locations that are considered to be extremely dangerous to life. Above all, they are required for the cycle of carbon, nitrogen, phosphorus and sulfur (biogeochemical cycle), which are all essential components of living organisms. Microorganisms are global biomass recyclers, and without their recycling activities, life on Earth would soon cease. Some fungi attack and break down artificial materials such as paper, leather and aviation fuel. The terrestrial environment varies from rainforests to deserts and is the richest and most complex, but all soils contain a wide variety of microorganisms. Soil is a three-phase system consisting of:

(A) Inorganic phase of solid or mineral often associated with organic matter.

(B) Contains almost all essential minerals that are the major sources of plant root mineral nutrients.

(C) Gas phase or atmosphere. The density and composition of soil microbial species are affected by environmental conditions. The aquatic environment occupies more than 70% of the earth's surface, and the main types are surface water (springs, streams, rivers, lakes), marine environment and groundwater. There are many types of sources (low temperature, heat, high temperature, special-iron, sulfur, radioactive).

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Received: 03-Jan-2022, Manuscript No. BEG-22-15541; **Editor assigned:** 05-Jan-2022, PreQC No. BEG -22-15541 (PQ); **Reviewed:** 20-Jan-2022, QC No BEG -22-15541; **Revised:** 24-Jan-2022, Manuscript No. BEG -22-15541 (R); **Published:** 07-Mar-2022, DOI:10.35841/BEG -22.07.159

Citation: Morgan S (2022) Brief Note on Environmental Microbiology and Metabolism Growth. J Bio Energetics. 10:159

CONCLUSION

We can use advances in environmental health science and technology to prevent irreparable damage from long-term disasters and neglect of the environment, and the harmful effects of chemicals are prevented or at least minimized by research, education, and increasing. I am confident that we can limit it. You can be conscious of the people. At CRI, we are proud to contribute to this important purpose. There is an urgent need for governments to address these new issues and develop future preventive plans. Therefore, in developing countries, human resource development and capacity building in biotechnology at all levels is very important. Implementation of such programs requires support from governments and international organizations and cooperation with international partners. Organize the use of resources and expertise by establishing an efficient network of communication channels between scientists, policy makers, researchers and business people.