Applied Microbiology: Open Access
ISSN: 2471-9315
OPEN ACCESS Freely available online
Perspective

Note on Soil Microorganisms and its Types

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DESCRIPTION

The study of soil microorganisms, their roles, and how they affect soil elements is known as soil microbiology. The first ancient bacteria and microbes are thought to have appeared in Earth's waters between two and four billion years ago. These bacteria were able to fix nitrogen, multiply, and release oxygen into the environment as a result. More evolved microbes resulted as a result, which are essential because they influence soil structure and fertility. Bacteria, actinomycetes, fungus, algae, and protozoa are all types of soil microorganisms. Each of these groupings has distinguishing traits that help to characterise them and their roles in the soil. The rhizosphere, which is found in and around plant roots, contains up to 10 billion bacterial cells per gram of soil. The rhizobiome's makeup can shift quickly in response to changes in the surrounding environment.

In agricultural soils, soil microorganisms play an important role in nutrient cycling and nitrogen availability. In order to better understand these effects, we're using molecular approaches to measure and identify microbes involved in nutrient cycling in agricultural soils, such as bacteria, fungus, archaea, and nematodes. Changes in the number of genes essential for particular microbial processes, such as nitrogen cycling, are also being studied. We can draw assumptions about how management practises like crop rotation or nitrogen fertiliser affect microbial ammonia oxidation by studying functional genes like ammonia monooxygenase, which catalyses the initial stage of the conversion of ammonia to nitrite.

Different types of soil microbes

Bacteria, actinomycetes, fungus, protozoa, and nematodes are the five categories of soil microbes. Each of these microbial kinds contributes to soil and plant health in a different way.

Bacteria: Bacteria are the crucial workforce of soils. They are the final stage of breaking down nutrients and releasing them to the root zone for the plant. In fact, the Food and Agriculture Organization once said "Bacteria may well be the most valuable of life forms in the soil." It is the smallest organism in the soil. Bacteria are the most abundant microorganism in the soil. Bacteria serve many important purposes, one of those being nitrogen fixation among other biochemical processes.

Actinomycetes: Previously categorised as fungus, actinomycetes behave similarly in the soil. Some actinomycetes, on the other hand, are predators and will harm the plant, while others found in the soil might work as antibiotics. Antibiotics are produced by actinomycetes. It resembles bacteria as well as fungi.

Fungi: Fungi, like bacteria, lives in the rootzone and aids in the delivery of nutrients to plants. Mycorrhizae, for example, are fungi that help roots and plants absorb water and nutrients, providing sugars, amino acids, and other nutrients. It is a food source for other organisms. Fungi maintain beneficial symbiotic relationship with plants or other organisms.it reduces crop residues. It biochemically processes nutrients to improve the soil. Fungi split into different species based on size, shape and color of their spores, which are used to reproduce.

Protozoa: Protozoa are larger germs that enjoy consuming bacteria and being in their company. When bacteria devour protozoa, nutrients are released. Eukaryotic creatures include protozoa. In soil bacteria, protozoa keep everything balanced.

Nematodes: Nematodes are small worms that dwell in or around plants. Some nematodes are predators, while others are useful to the plant, feeding on pathogenic nematodes and secreting nutrients. By transporting living and dormant microbes on their surfaces and in their digestive systems, nematodes aid in the distribution of bacteria and fungi through the soil and along roots. A source of food Higher-level predators, such as predatory nematodes, soil microarthropods, and soil insects, eat nematodes.

Scientists that study soil microbiology, ecology, and biochemistry can contribute to and benefit from an ecological approach to the soil and species they investigate. By causing harm to systems before fully comprehending how they work, society has placed a heavy burden on scientists.

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Received: December 8, 2021, **Accepted:** December 22, 2021, **Published:** December 29, 2021

Citation: Tohamy W (2021) Note on Soil Microorganisms and its Types. Appli Microbiol Open Access. 7:223