



Role of Different Kinds of Microorganism in Sustainable Agriculture

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The role of microorganisms in agriculture is simple to make the soil the best it can be, for effective and sustainable crop production. Because microbes in the soil supplies nitrogen, other useful soil air and as well as pulverize the soil for easy germination. Microbes are essential for decay organic matter and convert waste into reusable material of old plant material. Some soil bacteria and fungi form relationships with plant roots that provide important substance that provides nourishment essential for the maintenance of life like nitrogen or phosphorus.

Some of their vital functions described

- Soil microbes help to recycle nutrients
- Some microbes breakdown organic matter
- Soil microbes create humus
- Soil microbes create soil structure
- Soil microbes fix nitrogen
- Soil organisms promote plant growth
- Soil microbes control pest and diseases.

Some of the microorganisms and their agricultural importance is listed below

- **Rhizobium:** Rhizobium is a class of symbiotic bacteria which fix approx 80-200 k.g atmospheric nitrogen per hectare depending on the efficiency of bacteria. It usually forms association with the plant and fix atmospheric nitrogen.
- **Mycorrhiza:** It is the association of fungi with root of higher plants. The fungus assists in the absorption of minerals and water from the soil and defend the roots from other fungi, while the plant provides carbohydrates to the fungus.

Some plants have an obligate association with the Mycorrhiza like:- Pinus seeds cannot begin to grow and establish without the presence of mycorrhiza.

- **Mould:** Mould like mucus are some of the fungi which help in the decomposition of organic matter.
- **Actinomycetes:** Play a major role in decomposition of organic residue they prefer alkaline and well aerated soil for their growth and development.

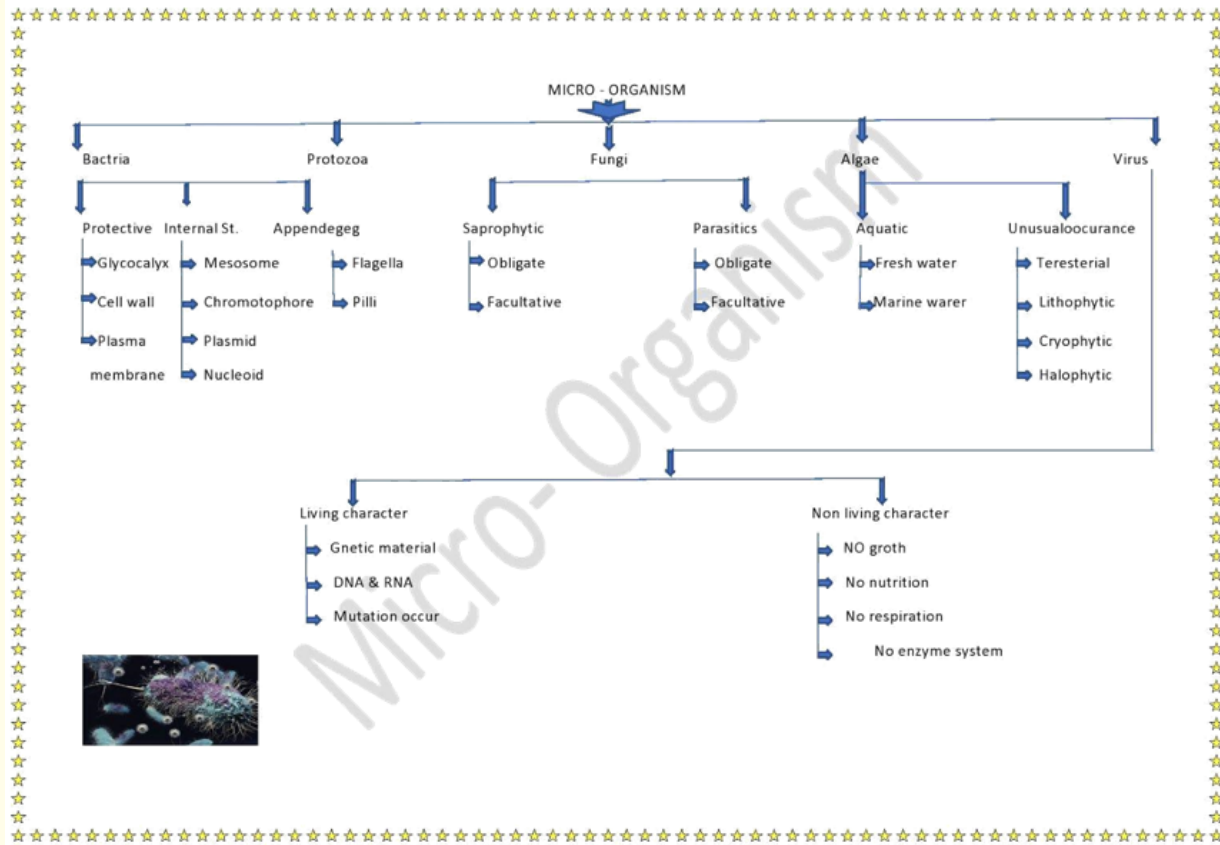
Actinomycetes, which were structure through to be fungal, are true bacteria with long, branching filaments performing a similar function but having a different evolutionary origin to fungal hyphae.

- **Soil bacteria:** They may be autotrophic or heterotrophic and derive carbon dioxide and energy by oxidation of inorganic compounds like ammonia, sulphides...etc. They are important in several soil processes like nitrification, sulphur oxidation, denitrification and mineralization etc.
- **Soil algae:** Soil algae like Blue green algae helps in nitrogen fixation. Why are the microorganism and bacteria found in laetrile soil

Microorganisms are present in almost all natural and artificial habitats. Soil is one of the most richest nutrient sources on earth Laetrile soil contains a lot of organic as well as inorganic nutrients and may receive moisture because of rain or by human activities. This makes the soil favourable for the growth of a no. Of microorganisms.

Also, some microorganisms produce certain growth promoting substances. Thus microorganism is found in laetrile soil.

Flow chart of microorganisms



Figure

Function

Fungi

- Nucleus - Eukaryotic
- Plastids - Absent
- Endoplasmic Reticulum, dictyosomes, mitochondria, Ribosome etc present.
- Reserve food: Not starch

Virus

- Inside the living host cell behave as living of living host cell behave as non-living
- Regarding reproduction the virus is obligate intracellular parasite.

Bacteria

- Protect bacteria from less of water and loss of nutrient
- Prevent aggregation of bacteria
- Protect bacteria from bacteriophage by preventing their attachment.

Algae

- Uninucleated thallus get enlarged to from a non-septate multinucleated sec like or tubular structure.
- Cell divide in all plane to form multi-layered.

Conclusion

Now we conclude that microorganism is play a vital role in maintaining the nature. They keep nature clean by removing toxins from water and soil, and degrade organic matter from dead plants. It can also help to enhance the plant and agricultural yield. It is essential tools in biotechnology, biochemistry, genetics and molecular biology. We know that microorganisms have provided many beneficial themes to agriculture as they are responsible for increasing the fertility of the soil. It can also help to control the ecology.

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