

Micro-Organism in Action

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Micro-Organism in Action classnotes.ng

Micro-organisms are very small living things which are normally not visible to the naked eye but can be seen with the help of a microscope.

Types of micro-organisms

Micro-organisms include the following:

- Viruses e.g. Poliovirus, Smallpox virus, etc.
- Bacteria e.g. Salmonella, Clostridium, Treponema, Escherichia coli, etc.
- Protozoans e.g. Plasmodium, Trypanosoma, etc.
- Fungi e.g. Rhizopus (mould) and Yeast (e.g. Saccharomycetes).
- Algae e.g. diatoms, dinoflagellates, etc.

Micro-organisms live everywhere, in water, air, soil, and are so numerous there are many more microorganisms than visible plants and animals in the world.

Growth in micro-organisms

Micro-organisms, like all living things, grow; this means they do increase in size and multiply in the number of cells. This can be done using either the culture medium where an enabling environment is provided or any suitable surface such as moist bread as a source of food. Micro-organisms can also increase in mass. Such an increase in size, mass or number of cells is regarded as growth in micro-organisms.

If environmental conditions of growth such as food, adequate temperature and humidity are being met, micro-organisms will increase in size and mass. Such an increase in mass, size and number of cells of the colony is an indication of growth and an index for measuring the growth of micro-organisms.

Ways of measuring growth in micro-organisms

There are two major ways of measuring growth in micro-organisms. These are:

First method:

A bacterial sample is inoculated into a nutrient agar (a clear liquid culture medium). As the bacterial population increases, the clear liquid medium becomes cloudy and turbid. Progressive increase in turbidity indicates a related increase in the number of bacterial cells.

This property is used to measure bacterial growth.

Second method:

In this method, small samples of bacteria are taken from the nutrient agar at regular interval of time. Each sample is diluted several times.

Each diluted sample is inoculated on to another nutrient agar medium in a petri-dish and incubated. The number of colonies formed in each petri-dish is counted. As each colony is formed by the multiplication of a single bacterium, the number of colonies indicates the number of living bacterial cells in the diluted sample. From this, the actual number of bacteria in the original sample can be calculated.

Beneficial effects of micro-organisms

Micro-organisms, especially bacteria and fungi are known to be quite beneficial to man in many ways, which can be categorized into three: nature, medicine and in industries.

In nature:

- They Maintain soil fertility: Most saprophytic bacteria, during the process of decomposition, release nutrients into the soil which aid its fertility through the nitrogen cycle.
- Decomposition: Micro-organisms, especially saprophytic bacteria also aid the decomposition of the dead plants and animals thereby releasing nutrients to the soil.
- Decomposition also rid the earth of waste and free up space.
- Digestion of cellulose: Some bacteria living in the rumen of ruminant animals like cattle, sheep and goat help such animals to digest cellulose in the rumen
- Compost formation: Micro-organisms especially bacteria aid compost formation through the decay of dead organisms and humus
- Nitrogen fixation: Certain bacteria (Rhizobium Leguminosarium) aid nitrogen fixation into plants through the root nodules of leguminous plants.
- Silage making: Some bacteria are also useful in silage making which involves the preservation of pasture crops for future use.
- Sewage treatment: Bacteria are also involved in the decomposition of sewage into harmless substances.
- Fight diseases: Microbes are involved in processes like our metabolism, and help keep us healthy by fighting off harmful intruders,

In medicine:

microorganisms, such as bacteria and fungi, to produce medicines, vaccines and to develop disease testing techniques.

- Antibiotics are natural substances that can be used to fight bacterial infections. They are produced and secreted naturally by bacteria and fungi.
- Bacteria and viruses are the key components of the vaccines that prevent the spread of once-deadly diseases like smallpox.

- Microorganisms allow us to artificially grow helpful substances such as insulin and human growth hormones,

In industry:

- They are crucial for the production of a variety of metabolites, such as ethanol, butanol, lactic acid and riboflavin.
- Through fermentation, microbes are used in the production of alcohol and alcoholic beverages.
- They are used in making bread and cheese.

Harmful effects of micro-organisms

Bacteria:

Causes various diseases such as typhoid, diarrhoea, and cholera.

Fungi:

Causes a large number of diseases in plants and animals such as rust diseases in plants, fruit rot in apple, red rot in sugar cane and ringworm disease in human beings.

Algae:

Algal bloom in water (rapid growth of algae)

causes poisonous effect after they die, which in turn results in the death of aquatic organisms.

Protozoa:

Causes Amoebic dysentery, pyorrhoea and sleeping sickness etc.

Virus:

Cause small pox, common cold, influenza, herpes, hepatitis, polio and rabies.

They bring about food spoilage.

ASSIGNMENT

1. What do you understand by Micro-organisms in action?
2. State five (5) economic importance of micro-organisms.