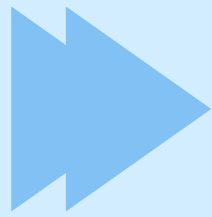


MICROORGANISMS: FRIEND OR FOE

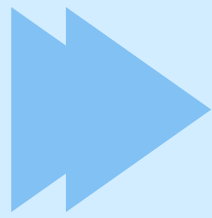
Grade 8 NCERT Science



WHAT ARE MICROORGANISMS?



Microorganisms are tiny living organisms that cannot be seen with the naked eye. They are found everywhere – in air, water, soil, and even inside our bodies. They can only be observed under a microscope.



There are five major types of microorganisms: Bacteria (single-celled organisms), Fungi (like yeast and mushrooms), Protozoa (single-celled animals), Algae (plant-like organisms), and Viruses (which reproduce only inside host cells).

MICROORGANISMS AS FRIENDS

Food Production: Microorganisms play a vital role in making many foods we eat daily. Lactobacillus bacteria convert milk into curd. Yeast is used to make bread rise and ferment alcohol. These beneficial microbes have been used in food preparation for thousands of years.

Medicine: Microorganisms are essential in healthcare. Antibiotics like penicillin are produced from fungi and bacteria to fight infections. Vaccines are made using weakened or dead microorganisms to protect us from diseases like polio, cholera, and hepatitis.

Agriculture: Certain bacteria like Rhizobium fix atmospheric nitrogen into the soil, making it fertile for plants. Decomposers break down dead organic matter into humus, enriching soil nutrients. Blue-green algae also help in nitrogen fixation in paddy fields.

COMMERCIAL APPLICATIONS



Medicine Production: Microorganisms are used in large-scale production of antibiotics like penicillin and streptomycin. Bacteria and fungi are cultivated in industries to manufacture vaccines, vitamins, and enzymes that save millions of lives.

Environmental Cleaning: Microorganisms play a vital role in bioremediation – cleaning up oil spills and toxic waste. Bacteria decompose sewage in treatment plants, making water safe. They help in composting and recycling organic matter back into the soil.

MICROORGANISMS AS FOES



Disease-Causing Pathogens: Some microorganisms are harmful and cause diseases in humans, animals, and plants. Bacteria like Salmonella cause food poisoning, while viruses cause diseases like common cold, flu, and COVID-19. In plants, fungi and bacteria cause diseases like citrus canker and wheat rust, destroying crops.



Food Spoilage: Microorganisms are responsible for spoiling food items. When food is left uncovered or stored improperly, bacteria and fungi grow on it, making it unfit for consumption. Spoiled food develops bad smell, taste, and can cause food poisoning. This is why food preservation methods like refrigeration and pasteurization are important.

KEY CONCEPTS

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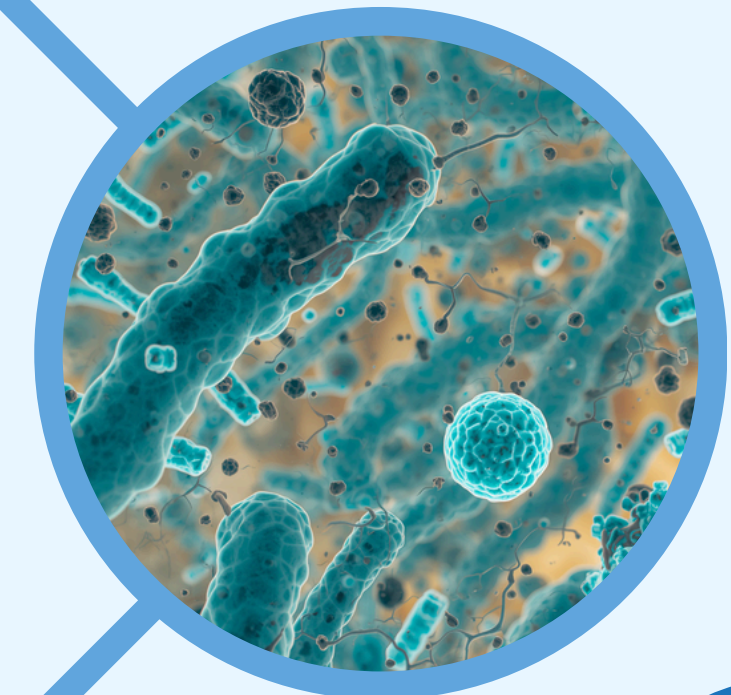
Microorganisms can spoil food, but we use various preservation methods to protect it. Chemical preservatives like sodium benzoate prevent microbial growth. Salt and sugar reduce moisture, inhibiting bacteria. Oil and vinegar create unfavorable conditions for microbes. Heat treatment (pasteurization) kills harmful organisms, while cold storage slows their growth.



CONCLUSION

Microorganisms play a vital role in the nitrogen cycle by converting atmospheric nitrogen into usable forms for plants. Nitrogen-fixing bacteria in root nodules of legumes and free-living bacteria in soil help maintain soil fertility naturally.

The balance between beneficial and harmful microorganisms is essential for ecosystem health. While some cause diseases, many more work silently to decompose waste, recycle nutrients, and support plant growth – making them true friends of nature.



THANK YOU!

Microorganisms – Essential for life when understood properly

