SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)

COIMBATORE-35.

Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A+' Grade

Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai.

DEPARTMENT OF AGRICULTURAL ENGINEERING

19AGE302ORGANIC FARMING

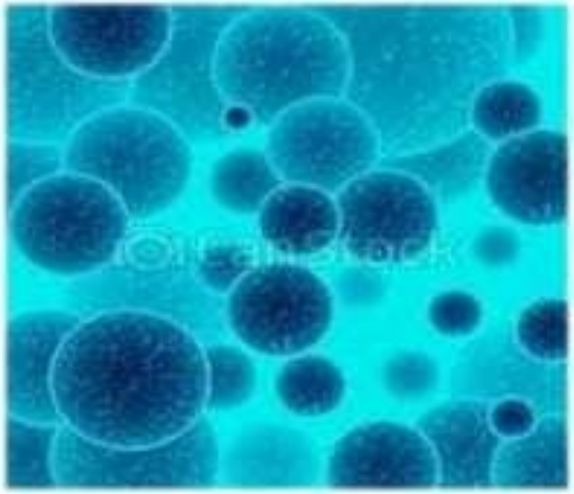
III YEAR- V SEMESTER

Introduction-Need of Microorganism

MICROORGANISMS

- **Microorganisms** are very small organisms which cannot be seen with the unaided eye. They can be seen only with a magnifying glass or microscope.

- Microorganisms may be unicellular or multicellular.
- Microorganisms may be single-celled like bacteria, some algae and protozoa, or multicellular, such as many algae and fungi.
- Microorganisms may exist alone or in colonies.



WHERE DO MICROORGANISMS LIVE..??

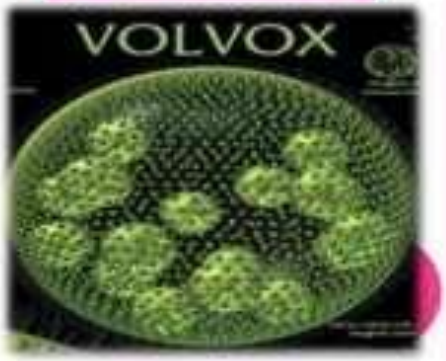
- Microorganisms live in all types of environment, ranging from ice cold climate to hot springs; and deserts to marshy lands.
- They are also found inside the bodies of animals including humans.
- Some microorganisms grow on other organisms while others exist freely.

TYPES OF MICROORGANISMS

- There are four main types of microorganisms. They are:
  - **Bacteria** (Examples- Streptococcus, Staphylococcus etc.);
  - **Fungi** (Examples- Penicillium, Yeast etc.);
  - **Algae** (Examples- Nostoc, Volvox etc.);
  - **Protozoa** (Examples- Amoeba, Paramecium etc.)
- Viruses are also considered as microorganisms.

Eg. of virus- Coronavirus, Hepatitis etc.

Penicillium



MICROORGANISMS AND US

- Microorganisms play an important role in our lives. Some of them are beneficial in many ways whereas some others are harmful and cause diseases.

FRIENDLY MICROORGANISMS

- Microorganisms are used for various purposes. Some of them are:

Making Curd:

The bacterium called *Lactobacillus* reproduces in milk and helps to convert milk into curd.

Making Bread:

The fungus called yeast reproduces in flour dough and produces carbon dioxide during respiration which makes the dough soft.

Making Alcohol:

The fungus called yeast reproduces in sugar solution and convert it into alcohol. This process is called **fermentation.**

Making medicines:

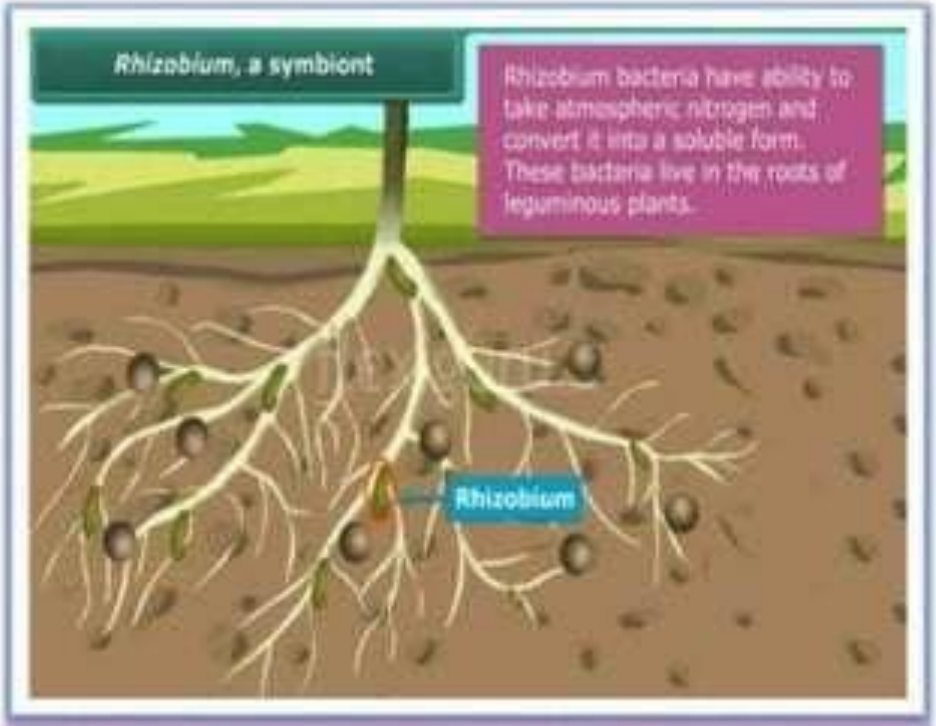
Some bacteria and fungi are used to make medicines which kills or stops the growth of disease causing microorganisms. Such medicines are called **antibiotics**. Eg:- Streptomycin, Penicillin, tetracyline, erythromycin etc.

Vaccines:

Vaccines are dead or weakened microbes introduced into the body to produce antibodies. These antibodies protect the body from disease causing microbes. Diseases like Polio, cholera, typhoid, small pox, hepatitis etc. can be prevented by taking medicines.

Increasing Soil Fertility:

Some bacteria like (*Rhizobia, Nostoc*) are able to fix nitrogen from the atmosphere to enrich soil with nitrogen and increase its fertility. These microbes are commonly called Biological nitrogen fixers.



Cleaning the environment:

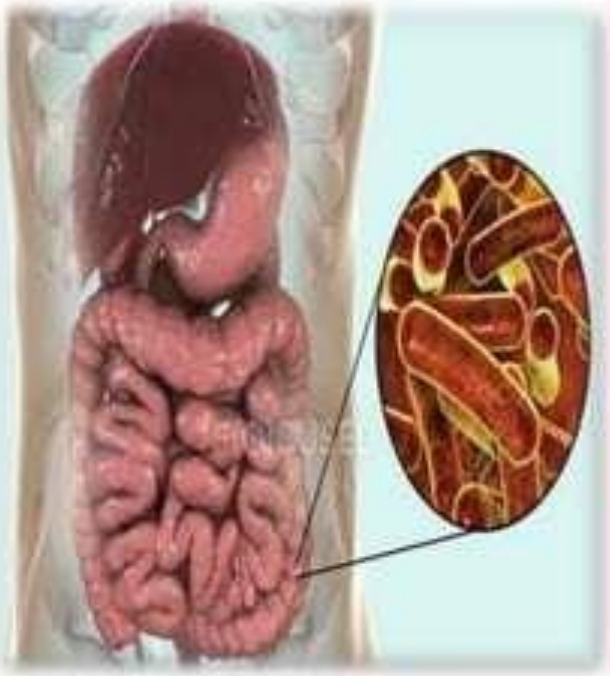
Microorganisms can be used to degrade the harmful and small substances and thereby cleanup the environment. Example-*Pseudomonas putida*

Microbes Help in Sewage Treatment:

Sewage treatment is a process in which the pollutants are removed. Microbes are used to degrade organic matter while producing water and byproducts consistent with the type of bacteria grown.

Microbes in Human Gut:

Lactobacillus is a type of bacteria found in human intestines. Its name gives an indication of what it produces — lactic acid. It does this by producing an enzyme called lactase. Lactase breaks down lactose, a sugar found in milk, into lactic acid. ***Lactobacillus*** can help us break down food, absorb nutrients, and fight off "unfriendly" organisms that might cause diseases such as diarrhea.



HARMFUL MICROORGANISMS

- Microorganisms are harmful in many ways. Some of their harmful activities are:

- **Disease causing Microorganisms in Humans:**

a) Disease causing microorganisms enter our body through air, water, food, contact or insects. These microorganisms are called **pathogens**.

b) Disease which can spread from an infected person to a healthy person are called communicable diseases. Eg- **Cholera, Tuberculosis** etc.

c) Some insects can also act as carrier of disease causing microbes.

Example- **House fly, Female anopheles mosquito (Malaria).**

Female Aedes mosquito
(Causes Dengue)

Female Anopheles mosquito
(Causes Malaria)

Disease causing Microorganisms in plants:

Several microorganisms cause diseases in plants like wheat, rice, potato, sugarcane, orange, apple and others. The diseases reduces the yield of crop.

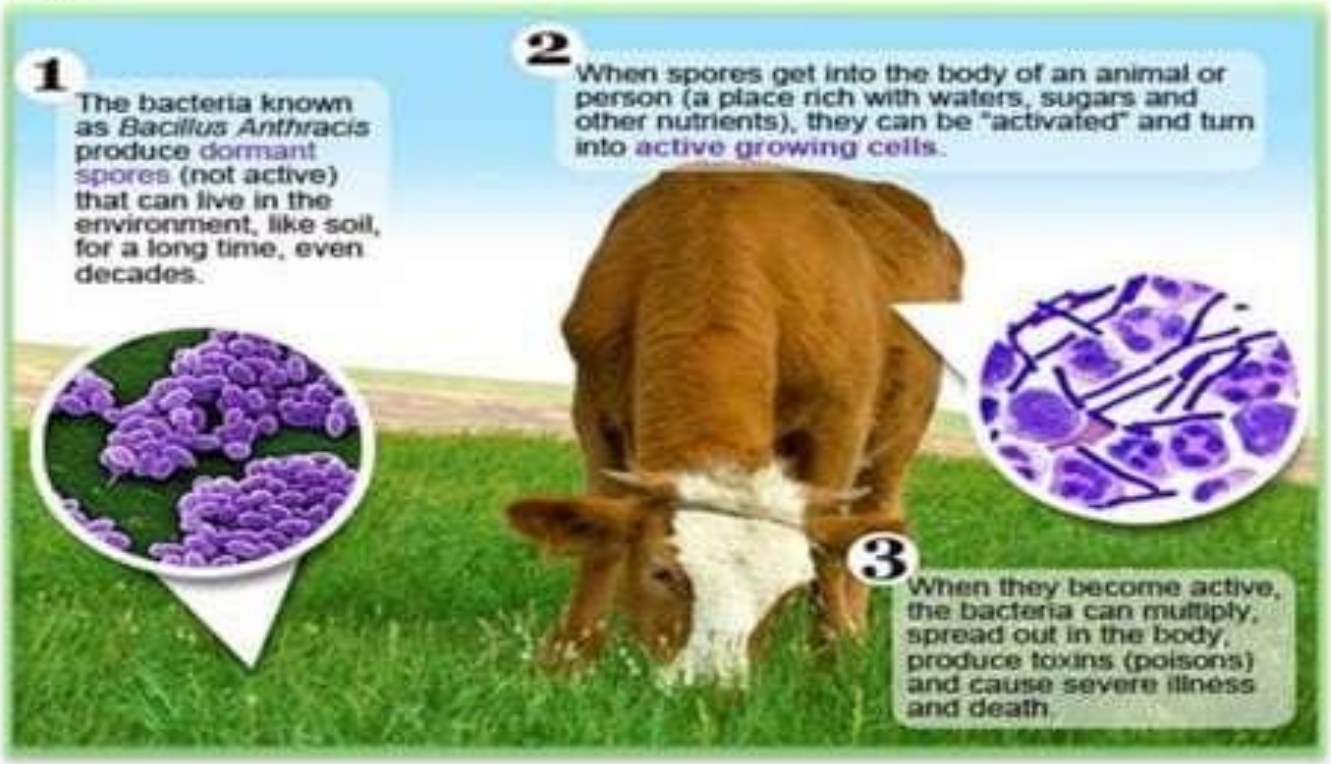
Plant Diseases	Microorganism	Mode of Transmission
Citrus Canker	Bacteria	Air
Rust of Wheat	Fungi	Air, Seeds
Yellow vein Mosaic of *bhindi* (Okra)	Virus	Insect

Table showing some plant disease causing microorganisms.

Disease causing Microorganisms in Animals:

Several microorganisms not only cause diseases in humans and plants, but also in other animals.

- **Food and mouth disease** of cattle is caused by a virus.
- **Anthrax** is a dangerous human and cattle disease caused by a bacterium.



FOOD POISONING:

- It can be due to the consumption of food spoilt by some microorganisms.
- Microorganisms that grow on our food sometimes produce toxic substances, these make the food poisonous causing serious illness and even death.
- So it is very important that we preserve food to prevent it from being spoilt.

BIOLOGICAL WARFARE:

- Biological weapons include living organisms and biologically produced toxins to injure people, animals and destroy crops. These include harmful microbes such as Bacteria, Viruses and spores. Toxins are produced by these microbes. This causes mass destruction of populations.

BIODETERIORATION OF MONUMENTS:

Cultural heritage **monuments** may be discolored and degraded by growth and activity of living **organisms**. **Microorganisms** form biofilms on surfaces of stone, with resulting aesthetic and structural damage.

TOOTH DECAY

- Tooth decay, also known as dental caries or cavities, is a breakdown of teeth due to acids made by bacteria.
- ***Streptococcus*** is the main cause of dental

ALGAL BLOOM

- Increase growth of algae in water systems leads to decrease in oxygen in water bodies and this can be threat to aquatic life.

CONCLUSION

- **Microorganisms** are very small organisms which cannot be seen with the unaided eye. They can be seen only with a magnifying glass or microscope.
- Some of them are beneficial in many ways whereas some others are harmful and also causes diseases.


THANKS