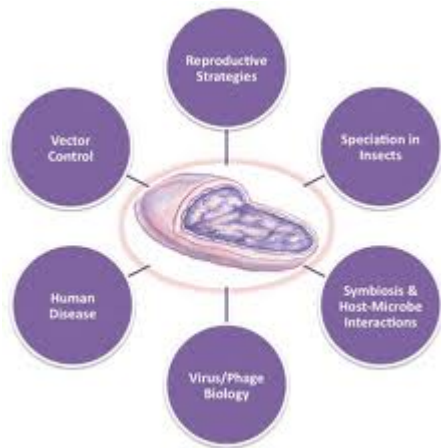


# Important Microbes in Ecosystem

Created: Thursday, 14 July 2011 07:07 | Published: Thursday, 14 July 2011 07:07 | Written by [Super User](#) | [Print](#)

We can see the plants and animals of the ecosystem. But we cannot see the microbes. They live in all parts of the [biosphere](#). Have you ever seen moist bread covered with patches of grayish white? Because of this the bread becomes not suitable for eating. What's that white stuff? These are the microbes. They can be called as microorganisms, too.



## Role of Microbes in Ecosystem

We cannot see them with the naked eye. With a help of electron microscope we can observe the small tiny structures. Microorganisms are classified into four major groups. [Bacteria](#), [Fungi](#), Protozoa & Virus

# Bacteria

- [Bacteria](#) are found everywhere in [biosphere](#) like water, soil, and even air.
- They are small [prokaryotic](#) cells
- 0.2 to 1 um in length
- Capable of living in all extreme climates like boiling water, frozen ground, acid volcanoes, etc.
- Can reproduce by doubling with a generation time of 20 minutes
- In a resting stage survive for many years.
- Some has the capable of [locomotion](#).
- Composed mostly of carbon, oxygen, nitrogen, hydrogen, phosphorus, and sulfur.



Types of Bacteria

# Fungi

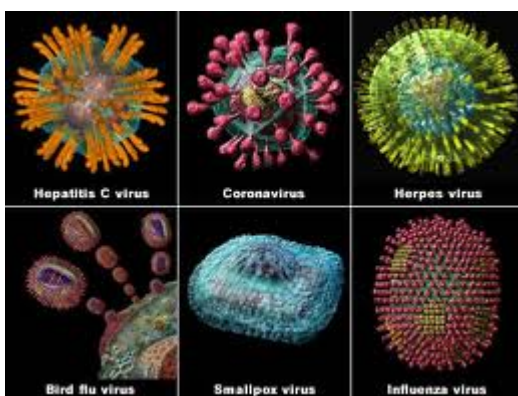
- Grow in the form of a hyphae (finely-branched network of strands)
- 5-10 um in diameter
- Hyphae helps to take up nutrients and they also release digestive enzymes
- Can absorb sugars or peptides like small molecules only.
- Sporangia are the reproductive organ.
- Sporangia are sacs that contain the fungi spores.
- Uncommon in aquatic environments.



Types of Fungi

# Virus

- Small [infectious agent](#)
- Microscopic
- Reproduce only inside the cells of the host.
- Infects bacterium, plant or animal.
- The study of viruses is known as [virology](#)

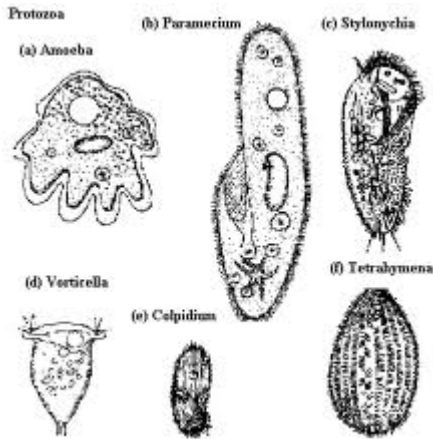


Types of Virus

# Protozoa

- [Single-celled eukaryotes](#)
- Not photosynthetic
- Move by flagella or cilia.
- Microscopic
- Usually from 10 to 52 [micrometers](#) is size but grow up to 1mm.

- Flagellates are small with 2-10 um long
- Defined as single-cell protists with animal-like behavior



Types of Protozoa

### Uses of Microbes

- Involved in the production of food or are directly edible.
- Many bacteria are harmless, and they actually help us by providing some useful materials. For example, gut bacteria synthesize vitamins such as folic acid and vitamin K.
- Used in cleaning up of the environment like the organic wastes broken down into harmless and usable substances
- Used in the preparation of medicines like the production of genetically engineered insulin and many antibiotics are being produced from bacteria and fungi
- Used for the production of alcohol since the early ages of humanity
- Used in the preparation of yogurt, bread and other foods
- Used to increase soil fertility by fixing nitrogen.

Want to know more about the diseases created by the microbes? [Click here](#) to schedule live online session with e Tutor!

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### Reference Links:

- <http://en.wikipedia.org/wiki/Microorganism#Bacteria>
- <http://en.wikipedia.org/wiki/Virus>
- <http://en.wikipedia.org/wiki/Protozoa>
- <http://www.molecular-plant-biotechnology.info/use-of-microbes-in-industry-and-agriculture/use-of-microbes-in-industry-and-agriculture.htm>

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