

Relationship between microorganisms and macroorganisms

Microorganisms

A microorganism is a unicellular, microscopically visible organism of plant or animal origin. It often forms colonies, clusters and can live in symbiosis with other organisms. Microorganisms vary in size. Microorganisms play a very important role in nature. They help maintain the nutrient cycle and are food for many organisms. In humans, they can cause infectious diseases. Such organisms include mainly yeasts, prokaryotes, protozoa and fungi.

Applications: food processing, distilling, industrial composting, mechanical and biological treatment of waste, biogas production.

Microorganisms and the human organism

Medical microbiology deals with pathogenic microorganisms that can cause infectious diseases in humans. An infection is a disease state in which a host macro-organism is damaged by a micro-organism that disrupts its internal environment in order to obtain an environment conducive to its own growth and reproduction. However, pathogens don't always have to cause disease. In most cases, infection proceeds without clinical signs.



E.coli (microorganism)

Macroorganisms

Macroorganisms are visible to the naked eye. They are ubiquitous. Most of them are in the soil, in water, or in the air but also in and on the bodies of other organisms. They are also found in extreme conditions where other life forms cannot be found.

Relationship between microorganism and macroorganism

The relationship between two biological species can be a symbiotic relationship. According to the relative position of the two symbionts, we distinguish between ectosymbiosis, where one of the symbionts is located on the surface of the body, and endosymbiosis, where one of the symbionts is located inside the other. An organism that lives on the surface of body cavities, such as the lining of the gut or the surface of the pericardium, can sometimes be considered an ectosymbiont, but this type is more often classified as an endosymbiotic association. One symbiotic relationship is commensalism, which is a relationship that benefits one organism and neither harms nor benefits another. In humans, this may be the microflora of the oral cavity and skin. Another relationship is mutualism, which is a mutually beneficial relationship between two organisms. An example would be a human and the bacteria of the gut flora. A relationship where microorganisms live side by side with a macroorganism without harming each other is called saprophytism. The opposite is parasitism, or mutualism, in which one organism (the parasite) uses the other organism (the host) as its food source as well as its permanent or temporary habitat, thus harming its host directly or indirectly. Parasitic bacteria that do not have the ability to establish an equilibrium with their host are called pathogenic. Pathogenicity is the ability of a particular species of microbe to cause harm and disease and is dependent on the species characteristics of the host. The degree of pathogenicity of a particular microbial strain is called virulence.



Human, dog (macroorganisms)

Most bacteria behave passively in contact with the surface of a macroorganism because they do not find the required conditions for their growth and multiplication. Some bacterial species have the ability to colonize, that is, to colonize a body surface without adverse action. If a bacterium enters the body and multiplies in it, we speak of an infection.

Classification of microorganisms by environment

Microorganisms and their activities are dependent on the external environment. This is influenced by various physical, chemical and biological factors. They can adapt to changes in the environment to some extent but these adaptations have a limit, beyond which growth stops or death follows. In relation to environmental temperature, microbes can be divided into psychrophilic requiring temperatures of 15-20 °C, mesophilic requiring temperatures of 35-37 °C and thermophilic growing at temperatures of 50-60 °C.

According to their relationship to oxygen, microorganisms are divided into aerobic, which grow only in the presence of oxygen, anaerobic, which grow without oxygen, and facultatively anaerobic, which have the ability to live in both oxygen and non-oxygen environments. Thus, due to the wide variety of metabolic pathways, the rate of reproduction and the ability to survive adverse conditions for long periods of time, microorganisms can be said to be found almost everywhere. Microbiology and its many sub-disciplines are concerned with their study.

References

Related articles

- Bacteria
- Prokaryote

Literature used

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