

## FUNGI AND RELATED MIROORGANISMS

Soatova Maqsuda

*Tashkent State Medical Academy, a student of the Termiz branch*

**Abstract:** *This article is devoted to the scientific classification of fungi and their associated microorganisms, highlighting the similarities and differences between the morphology of fungi and plants.*

**Keywords:** *Mycology, fungi, palynology, some similarities and differences between plants and fungi.*

Mycology is the branch of biology that studies fungi, including their genetic and biochemical properties, taxonomy, and human applications, including tinder, traditional medicine, as a source of food, and entheogens, as well as their hazards. Their effect on the human body is manifested as toxicity or infection.

*Mycology* the term is traditionally attributed to M.J. Berkeley in 1836[1]. Although mycology has historically been considered a branch of botany, the discovery of the close evolutionary relationship of fungi to animals in 1969[1] led to the reclassification of the study as an independent field.[2] Pioneering mycologists included Elias Magnus Fries, Christian Hendrik Persoon, Anton de Bary, Elizabeth Eaton Morse, and Lewis David von Schweinitz. Beatrix Potter, the author of «The Tale of Peter Rabbit» also made a great contribution to this field. Pier Andrea Saccardo developed a system for classifying imperfect fungi based on spore color and shape, which became the primary system used before classification by DNA analysis. He is famous for his «Sylloge», a comprehensive list of all the names used for mushrooms.

Palynology is the scientific study of plant pollen, spores, and some microscopic plankton organisms in living and fossil form. This field is closely related to plant science as well as geological sciences, especially stratigraphy, historical geology and paleontology.

Palynology is also used in archaeology, forensics and crime scene investigation, as well as in allergy research. Accordingly, the field of palynological research is very broad and examines issues from the analysis of pollen morphology using electron microscopes to the study of organic microfossils (palynomorphs) isolated from ancient coals[8].

Heinrich Anton de Bary (January 26, 1831, Frankfurt am Main [Germany] - January 19, 1888, Strassburg, Ger. [now Strasbourg, France]), German botanist. The scientist is known for his research on the role of fungi among fungi and other agents that cause plant diseases. Especially GA de Bary is famous as the founder of modern mycology and plant pathology[3].

Study of the diversity of fungi, biology, ecology, geography of macro- and micromycetes of mycobiota of Uzbekistan by the Institute of Botany of UzFA, natural and cultivated plants, that is, in technical, medicinal, fodder and food plants Identifying disease-causing pathogenic fungi and developing measures to protect them, creating an electronic database and GIS maps of mushrooms, identifying promising types of medicinal and edible mushrooms rich in biologically active substances, extracting pure cultures and laboratory advances have been made to develop methods for their cultivation in an artificial environment.

Aydar-Arnasoy lakes at 12 observation posts under the practical project «A7-FA-0-17178 Study of biodiversity (algae, high water and marsh plants) of the Aydar-Arnasoy lake system (eastern part)» (2012-2014) 431 algal samples were taken from reservoirs in the system (Lake Arnasoy, Lake Tuzkon), and as a result, 495 species and subspecies of algae were identified. As a result of the taxonomic analysis of aquatic and swamp plants and charophytes, 67 species belonging to 45 genera and 27 families were identified. The found species are distributed according to ecological groups as follows: hygrophytes 35, hydrophytes 22, hydatophytes 10. As a result of the processing of herbarium materials, a very rare aquatic plant *Aldrovanda vesiculosa* L. from the family Droseraceae Salisb was discovered for the flora of Uzbekistan[5].

Mycology belongs to the field of phytopathology, which studies plant diseases, and this is a reference to the close relationship between the two disciplines, since the majority of plant pathogens are fungi.

Mycology is the study of fungi, a group that includes fungi and yeasts. Many mushrooms are used in medicine and industry. Mycological research led to the development of antibiotics such as penicillin, streptomycin, and tetracycline, as well as other drugs, including statins (cholesterol-lowering drugs).

At first, when the specific characteristics of fungi were not yet discovered, scientists included fungi in biology under the name of general plants. As a result of the creation of modern electron microscopes, fungi were separated into a separate department in the era when science flourished. Below are their differences:

Plants	Fungi
They are producers in the food chain <sup>*1</sup>	Reductants in the food chain <sup>**2</sup>
The cell wall is composed of cellulose	The cell wall consists of chitin
Food contains starch	Contains glycogen
Has chlorophyll	Does not have chlorophyll

There are some similarities between plants and fungi - both fungi and plants are eukaryotes. In addition, both plants and fungi have membrane-bound nuclei. The differences are observed in the following: plants are autotrophs - they produce their own energy, but fungi are heterotrophs - they get energy from available organic matter. Insect exoskeletons are also similar to fungi in that they contain complex polysaccharides called chitin and glucans, which provide structural strength to fungal cell walls.

There are different types of fungi in nature, such as yeast, rust, decay, mold, fungus. Of these, cap fungi are: 1) fungi, 2) molds, and 3) yeasts - the three main categories. The habitats of fungi include soil, water, and organisms that may contain highly nonreproductive fungi,

<sup>1</sup> Organic matter generators.

<sup>2</sup> Decomposers decompose organic residues into mineral substances.

which may outnumber plants by at least 6 times. Recent estimates show that there are 5.1 million species of fungi in nature.

Together with bacteria, fungi are responsible for breaking down organic matter and releasing carbon, oxygen, nitrogen and phosphorus into the soil and atmosphere. Mushrooms are essential for many domestic and industrial processes, in particular for the preparation of bread, wine, beer and some cheeses.

The medicinal use of mushrooms is extremely effective in the treatment of bacterial diseases.

Penicillin, derived from fungi, was first used effectively to treat bacterial disease. Many diseases associated with previously deadly bacteria are treated with it:

**Griseofulvin**, a commonly used antifungal drug, is made from fungi. Dermatophytes are treated with griseofulvin. After local treatment, it accumulates in the hair and skin.

Another complex chemical with limited activity against yeasts and yeast-like organisms is sordarin. The chemical blocks protein production and has proven to be a popular therapy for various human fungal diseases.

Several fungi produce cyclosporine A as a metabolite. It is a potent immunosuppressant in animals and is widely used in humans after bone marrow and organ transplantation.

**Statins** has proven to be effective in reducing low-density lipoproteins (LDL), «bad» cholesterol, from the blood vessels and reduces the risk of arterial blockage, heart attack and diabetes.

Mycorrhizal interactions between fungi and plant roots are essential for agricultural land production. 80-90% of trees and grasses will die if they do not have a fungal companion in their root system.

Mushrooms play an important role in human nutrition. Delicacies include a) morels, b) shiitake mushrooms, c) chanterelles, and d) truffles. *Agaricus campestris* or meadow mushroom is used in various cuisines.

In the late 1850s, Louis Pasteur discovered a stable brewer's yeast, *Saccharomyces cerevisiae*, for the French brewing business[4].

About 200 species of mushrooms are poisonous to humans. Ingestion or other exposure can cause mild complications such as rash or nausea, but can lead to more extreme complications, organ failure, and even death. Some fungi produce spores that cause a form of meningitis, an inflammation of the tissues around the brain or spinal cord.

Fungi cause damage by spoiling food, destroying wood, and causing disease in crops, livestock, and humans. Fungi, mainly molds such as *Penicillium* and *Aspergillus*, spoil the composition of long-stored foods. Fungi cause most of the plant-specific diseases, which in turn cause serious economic losses. The most dangerous ones belong to the «dangerous group», which includes only four fungal pathogens: *Cryptococcus neoformans*, *Aspergillus fumigatus*, *Candida albicans* and *Candida auris*.

Fungi have a kingdom structure, but are closer to animals than to plants.

A fungus has been discovered that can break down plastics in weeks instead of years. Some of them can even turn ants into zombies.

Fungi are one of the most diverse organisms on Earth and play a role in many aspects of life as we know it. About 5.1 million fungi have been identified worldwide, but more than



90% of them are currently unknown to science. In science, it is known that royal mushrooms breathe like humans and animals, and some of them even eat meat[6].

So, fungi have their own beneficial and harmful properties for mankind and form a wonderful «family» of beautiful nature.

#### LITERATURE:

1. Ainsworth GC (1976). Introduction to the History of Mycology. Cambridge University Press.
2. Khalida Mirfayoz's daughter Makhkamova. Botany. - Tashkent, «Teacher» 1995.
3. Kudryashova Z. N. Phytopathology is the basis of mycology. – Minsk, 1968.
4. Geison G. The private science of Louis Pasteur. – Princeton, NJ: Princeton University Press, 1995. – 378 p.
5. <https://botany.uz/en/ozbekcha-mikologiya-va-algologiya-laboratoriyasi/>
6. <https://www.bbcearth.com/>
7. <https://en.wikipedia.org/wiki/Mycology>
8. <https://www.britannica.com/>