
BIOLOGICAL ACTIVITY OF THE SOIL

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Abstract:

The role of microorganisms in biogeocenosis is incomparable. The article provides information about soil microorganisms, their activity and role in increasing soil fertility.

Keywords: Fixation, enzyme, bacteria, fungus, humus, aerobic, anaerobic, biomass

INTRODUCTION

Microorganisms interact with environmental factors and play a key role in regulating nutrient cycling. Microorganisms play an important role in nitrogen fixation, phosphate solubilization, carbohydrate and sulfur metabolism, and control the biogeochemical cycle. Amount of microorganisms in the soil differs in its abundance and diversity. In it, rotting, butyric acid bacteria, fungi, etc. are especially common. Although the number of microorganisms varies in different layers of the soil and in climatic conditions, in the surface layers of the soil the most The number of microorganisms is insignificant in places with low temperature and increases in temperate, subtropical and tropical regions. Soils rich in organic matter have more microorganisms than soils lacking humus. Of all natural environments, soil is the most favorable for the development of microorganisms. It always contains necessary nutrients, moisture, oxygen; it protects microbes well from the harmful effects of direct sunlight and from drying out. Different types of soils differ in their chemical composition, structure, moisture and air, and the reaction of the environment. Therefore, the composition and number of microorganisms living in them are not



the same. The composition and number of microorganisms in the soil are also affected by climatic conditions, season, plant cover and other factors. In the surface layer of the soil (except for the thinnest layer) at a depth of 1-2 cm, there are 10-20 times more microorganisms than at a depth of 25 cm. The upper layers are rich in plant and animal remains and well supplied with air, capable of breaking down complex organic compounds. microorganisms dominate. In the deep layers of the soil, there are less organic compounds and less air, as a result, anaerobic organisms dominate. The development and vital activity of microorganisms depend on their environment. The more favorable the living conditions, the more intensively the microorganisms develop, and vice versa, in less favorable conditions, their development slows down.

RESEARCH METHODS AND RESULTS

Knowing the basic conditions of the interaction between the environment and microorganisms allows to successfully fight against it or to develop measures for the effective use of microorganisms in production processes. By regulating the external environmental conditions, it is possible not only to manage the vital activity of microorganisms, but also to bring about the necessary changes in them, to obtain new, more useful forms of microorganisms. The development of microorganisms is influenced by physical, chemical and biological factors. A characteristic feature of soil microorganisms is their ability to break down the most complex high molecular compounds into simple final products: gases (carbon dioxide, ammonia, etc.), water and simple mineral compounds. Each soil type, each soil difference has its own profile distribution of microorganisms. At the same time, the number of microorganisms and the composition of their species reflect the most important characteristics of the soil: the reserve of organic matter, the amount and quality of humus, the composition of nutrients, reaction, moisture supply, and the level of ventilation.

Microorganisms actively participate in the following processes:

1. Humus formation;
2. Destruction and new formation of soil minerals;
3. Nitrogen-containing compounds (nitrification), changes in sulfur, iron and manganese (soil formation, salinization);
4. Soil breathing.



The main part of microorganisms is concentrated in the upper part of the soil profile in the 0-20 cm layer. The highest microbiological activity is observed at a temperature of 25-35 ° C and a humidity of 60% of the total moisture capacity. All soil microflora are most active when the reaction of the environment is close to 4 neutral.

Biomass of fungi and bacteria reaches 5 t/ha. The number of bacteria in 1 gr of soil reaches billions of cells. Microorganisms keep the nitrogen content in the soil at a certain level. Due to uneven losses (washing with water, flying into the atmosphere), if microorganisms do not constantly return molecular atmospheric nitrogen to the soil as a result of the process of nitrogen fixation, the amount of nitrogen in the soil will be greatly reduced. The decomposition of organic residues and the synthesis of new compounds that make up the soil occur under the influence of enzymes released by various associations of microorganisms. Neither minerals nor organic substances are converted into digestible forms for plants by themselves. This function is performed by soil microflora and primarily by microorganisms. They not only decompose organic residues into simple organic and mineral compounds, but also take an active part in the synthesis of high molecular compounds of humic acids, which supply nutrients to the soil.

CONCLUSION Soil microorganisms play an important role in humus formation; breaks down various residues, creates structural components of plant origin, humic substances. In addition, they themselves, during their life activity, separate substances that are components of humus. Microorganisms deliver a large amount of organic matter to the soil, which greatly contributes to the formation of humus. Under anaerobic conditions, they actively ferment complex organic compounds into simple molecular compounds that are easily absorbed by plants. Antagonistic microbes are of great importance in increasing plant productivity and soil fertility. This is a special group of bacteria, fungi and other microorganisms that produce various biologically active substances (BAS), primarily antibiotic substances that suppress the growth and development of pathogenic microflora. Microorganisms also participate in changes in the structure and chemical composition of the organic fraction of the soil. . Thus, all processes of formation of new substances and biological mineralization occur due to a long chain of sequential and closely related reactions carried out by microorganisms. In addition to beneficial forms of microorganisms, there are also harmful representatives that reduce the supply of



nutrients, destroy nitrogen in the soil or affect the root system. The development activity of microorganisms depends primarily on the presence of organic residues in the soil, soil temperature and humidity, the presence of oxygen in the air, and other factors. Not all soils contain a large number of microorganisms. In some soils, the number of microorganisms is so insignificant that it is necessary to resort to bacterial fertilizers containing azotobacterial, phosphorobacterial and silicate bacteria to increase productivity.

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