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THE IMPORTANCE OF MICROORGANISMS IN THE SALINE SOILS OF THE BUKHARA OASIS

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Annotation

Bacteria accumulate around the root system of plants, most of which are aerobic, rod-shaped spores. Bacteria of this generation assimilate carbohydrates, organic acids and synthesize a number of vitamins. This article discusses the importance of microorganisms in the saline soils of the Bukhara oasis.

There are more bacteria in the soil than in the air and water, and the soil is the main source of microorganisms, from which microorganisms fly into the water and air. The soil is rich in various bacteria, actinomycetes, yeasts, algae and simple animals. Up to 3-5 tons of bacteria can be found in a layer of arable land to a depth of 25 cm. The spread of bacteria in the soil depends on the nature of the soil. Microorganisms multiply due to the remains of plants and animals in the soil. The number of microorganisms in the soil varies depending on the type of soil, physicochemical properties and climatic conditions. There are more microbes on the surface of the soil, and their number decreases as they go down. Microorganisms are abundant in the 10-15 cm layer, as sunlight does not fall on them, and there is enough food and moisture. In the deeper layers, however, these are rare. This is because the soil acts as a natural filter and reduces the transfer of bacteria to groundwater. Aerobes, anaerobes, saprophytes, nitrifiers, nitrogen fixers, cellulose breakers, sulfur bacteria, spore-forming and non-spore-forming representatives of various physiological groups are widespread in the soil. The number of microorganisms in the soil also varies with the seasons. Bacteria accumulate around the root system of plants, many of which are aerobic and do not produce rod-shaped spores. Bacteria of this generation assimilate carbohydrates, organic acids and synthesize a number of vitamins. These vitamins are assimilated by plants GM Shavlovsky's work shows that pseudomonas synthesizes thiamine, nicotinic acid, vitamin B6 and biotin. According to E.N. Mishustin, the biocenosis (community) of bacteria changes when the organic matter in the soil decomposes. Initially, when there are substances in the soil that decompose quickly and easily, mainly non-spore-forming rod-shaped bacteria spread, and then they are replaced by spore-forming aerobic bacteria.

To calculate the number of microorganisms in the soil, S.N. Vinogradsky developed a new method, which is to take a certain amount of soil suspension and prepare a solution, which is then stained with erythrosine dissolved in carbolic acid (phenol) and counted under a microscope. FN Germanov further improved the bacterioscopic method and treated the soil fragments with salt. As a result, calcium from the soil and bacteria inside and above the soil particles are released. When the soil is well tilled, an increase in the number of bacteria is observed. Bacteria, fungi, infusoria, plant roots, and a number of animals play a vital role in the formation of soil.

Rhizosphere bacteria: The area of soil under the influence of plant roots is called the rhizosphere. Rhizosphere microorganisms thrive on the surface of roots and in soil that comes in direct contact with plant roots. According to NA Krasilnikov, the number of microorganisms in the rhizosphere of corn, sunflower, soybean and other crops is 5-10 times higher than in the control area.

There are three zones in the rhizosphere:

1. the surface of the roots, which is extremely rich in microorganisms;
2. a thin layer of soil that touches the roots;
3. A true rhizosphere zone 0.5-1 mm away from the roots. This area is rich in nutrients for microorganisms.

Microorganisms are abundant in the rhizosphere, and their number varies depending on the developmental stages of the plant. Generally, the number of microorganisms increases during the period from seed germination to the flowering phase, and decreases during the flowering period. The number of fungi, actinomycetes, and cellulose-degrading bacteria increases during flowering. Pseudomonas, mycobacteria, and radiobacteria are the most common non-spore-forming species in the rhizosphere. Bacteria produce physiologically active substances for plants, break down residues and affect higher plants. Rhizosphere bacteria use substances derived from plant roots.

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