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Geological Activity of Microorganisms

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Abstarct:
This article describes several processes such as the formation of soil as a result of the life of the activity of microorganisms, increasing soil fertility, obtaining high yields from plants.

Keywords: Saprophytes, biohumus, complex, macro and micro elements, activation, rhizosphere, agricultural technology, microorganisms, aerobes.

Introduction

Before life appeared on earth, all substances were dissolved and accumulated in the body of algae until a certain amount was reached. In this way, the micro-organisms in the water used P, S, C, Ca to build their bodies, and also used other macro and micro elements. After these plants died out, they formed layers such as oil, limestone, coal. While one group of microorganisms formed rocks and stones, another group destroyed them. For example, small granites have been dissolved by water or other chemical factors and form water-soluble K or Na carboxylic salts. A small amount of organic matter that falls on graphite particles also causes the appearance of saprophytic bacteria. Carbon dioxide is formed as a result of the vital activity of saprophytic bacteria. Carbon dioxide quickly destroys rocks. Saprophytic bacteria are followed by some blue-green algae, then lichens, mosses and gradually higher plants begin to appear. Thus, the necessary rocks are destroyed and a humus layer of the soil is formed, since saprophytic microorganisms, which are natural orderlies, break down plant residues and form humus.

Humus is the Latin name for soil. Humus is a complex of organic substances formed as a result of physical, biological and biochemical changes in dead plants and animals. The soil contains a large number of microorganisms, or rather, 1 gram of soil contains billions of different types of bacteria, yeast, mold, algae and simple animals.

Microbiological analyzes

1. Number of bacteria - meat peptone agar
2. The number of fungi - in Czapek's medium
3. The number of actinomycetes - starch-ammonia agar
4. Number of nitrogen fixers - in Ashby's medium
5. Amount of ammonifiers - Meat peptone agar
6. Number of denitrifiers - in Giltay medium

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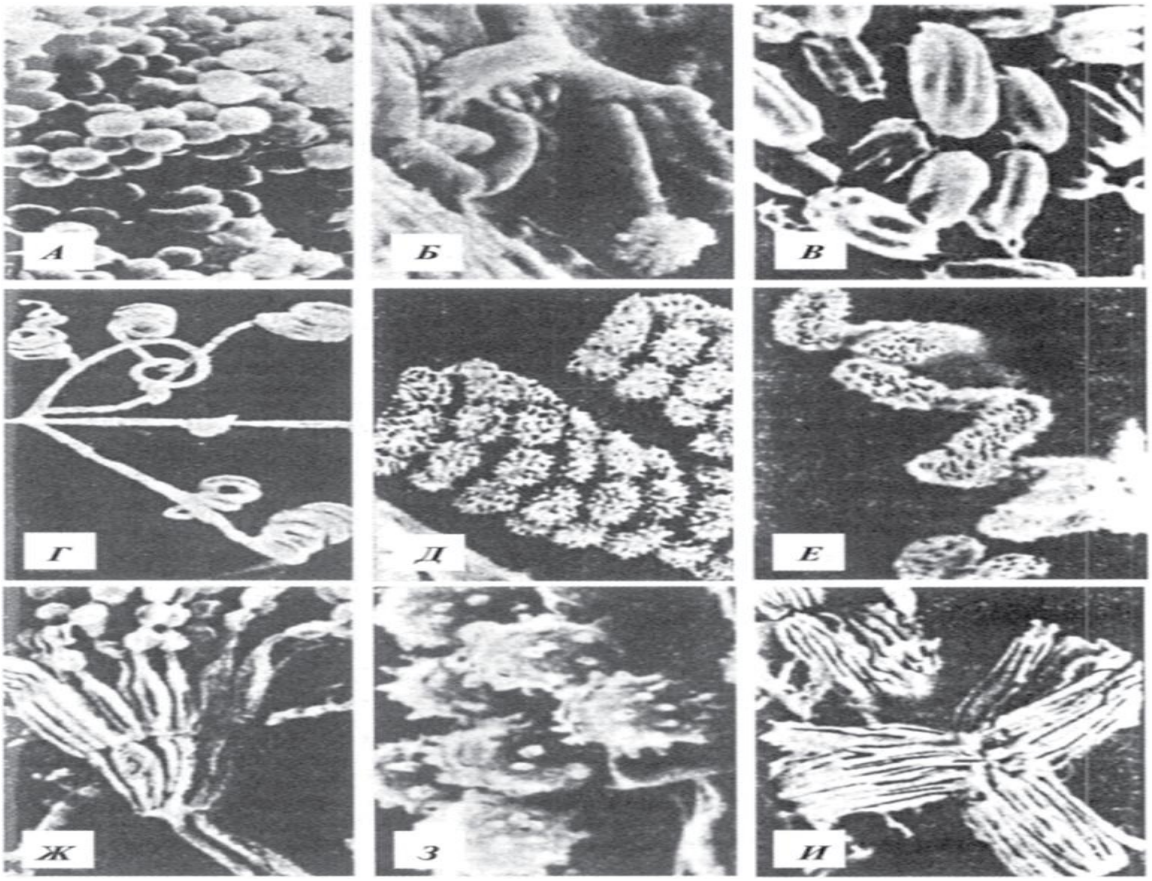
7. Nitrifiers - on Winogradsky's plate

The distribution of microorganisms in the soil depends on the characteristics of the soil, for example, on factors such as the physical and chemical properties of the soil, climatic conditions. Microorganisms multiply strongly due to the remains of plants and animals that enter the soil. Microorganisms are especially numerous in the upper part of the soil, and their number decreases as they go down, the reason is that the upper part of the soil is fertile, and it has enough nutrients and moisture. There are many bacteria, especially around the root system of a plant, most of which are aerobic, regenerate organic matter and synthesize vitamins that plants need to live and which they can absorb.

There are many types of soil analysis, and the simplest and most common of the bottom is direct electron microscopy. For direct analysis of the soil microflora, a scanning electron microscope is also used, which gives a three-dimensional image of the analyzed objects (Fig. 1). Direct methods give an idea of the total number of microorganisms in the soil. However, the appearance of microorganisms, as a rule, does not allow one to judge their species and functions. It is possible to determine the belonging of microscopic creatures found in the soil to different systematic and physiological groups using a variety of methods.



Soil microorganisms in a scanning electron microscope: A - non-spore-forming bacteria; B - spore-forming bacterium; B - spores of the bacillus; D - Streptomyces sp. D, E - spore-bearing with sgrsitomiists; G - Penicillium conylyenossi; 3 - PeniciIlium conidia: I - Aspergillus conidioses (according to: V. S. Guzev et al.) Suspension on various solid nutrient media, where colonies of microorganisms of various groups then develop. In practice, agarized or gelatinized, and sometimes silica gel nutrient media are usually used.

In our country, a number of works are being carried out aimed at increasing soil fertility and improving the natural state of lands, but there are also a number of unresolved tasks. When solving these problems, the use of a complex of rhizospheric microorganisms is highly effective, which positively affects the accumulation of nutrients for plants in the soil and plant growth. As a result of the further development of agricultural production in recent years, various highly toxic mutagenic preparations have been applied to the earth. An environmentally friendly, absolutely harmless to human life, economically cheap solution to such problems can be found with the help of biological preparations and, most importantly, biotechnological methods. Currently, microbiological preparations are widely used to obtain high yields of agricultural crops, improve soil fertility and protect plants from various diseases. Such drugs are mainly produced and used in large quantities in countries such as Russia, Japan and the Czech Republic. When using microbiological preparations, an increase in plant yield by 10-15% was achieved. Currently, microbiological preparations are widely used to protect children from various diseases.

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