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METHODS OF DETECTING FUNGAL DISEASES FOUND IN SOIL

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ABOUT ARTICLE

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Abstract: In this article, it is described the methods of identifying disease-causing microorganisms in the soil in the fields where potatoes are grown in our country.

INTRODUCTION

One of the most important factors in improving soil fertility and obtaining abundant harvests from agricultural crops is the comprehensive study of soil microorganisms and their rational use.

Most of the biochemical changes that occur in nature and soil occur with the participation of microorganisms. No matter what process takes place in the soil, we are sure that they are closely related to the activity of microorganisms. Microorganisms are of great importance in the process of natural soil formation in arable lands, in the processes related to soil cultivation and fertilizing or all other agrotechnical measures (irrigation, draining of soil water, etc.) and in the processes of preparation, storage and use of organic fertilizers. The root environment of plants is rich in various microorganisms, these microorganisms absorb the substances secreted by the plant roots and change various organic and mineral substances around the roots, and have a great impact on the growth and nutrition of plants. Fungi, along with other microorganisms, play an important role in improving soil fertility, many of which are actively involved in decomposing plant residues.

Microorganisms, especially fungi, play an important role in maintaining soil fertility, the metabolism of all substances, the accumulation of mineral nutrients necessary for plants, and the synthesis of organic matter in the soil take place with their active participation (Egorova, 1986; Belyuchenko, Kurakov, 1990; Iutinskaya et al., 1990).

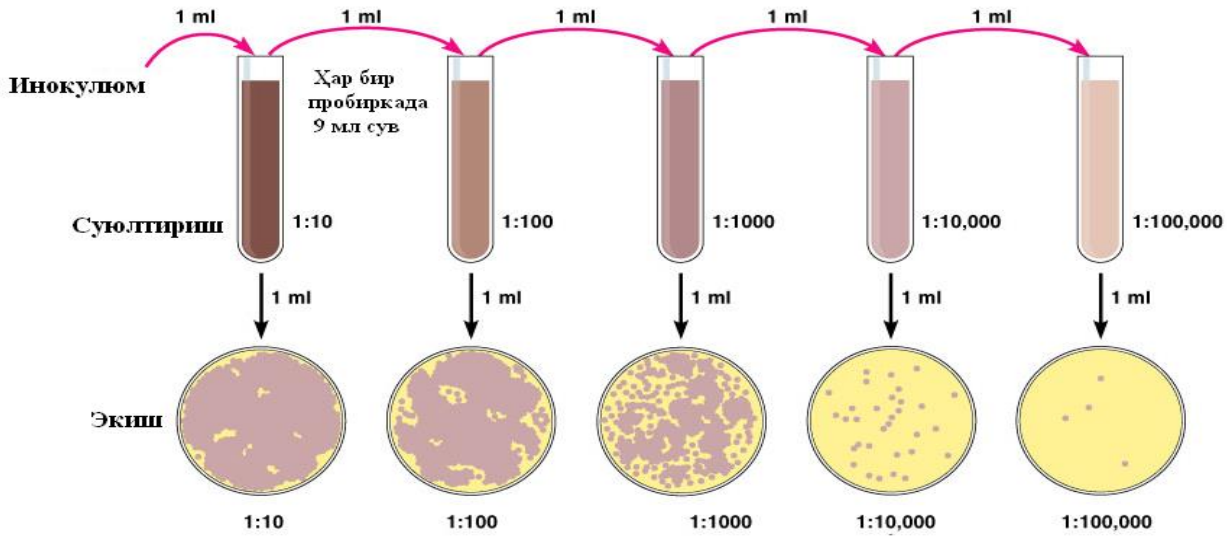
A.Yu.Lugauskas, A.I.Mikulskene, D.Yu.Shlyaujene (1989) showed the importance of the role of soil micromycetes in the accumulation of organic compounds in the soil, decomposition of organic residues and enrichment of the soil with organic substances.

Sources of soil samples

In carrying out research, Shakhrisabz (meadow sierozem soil), Kitab (light sierozem soil) and Karshi (typical sierozem soil) of Kashkadarya region were taken from the fields occupied by potato crops. Soil samples were taken from 0-10, 10-20, 20-30 cm depth layers (in sterile conditions) in all seasons (Litvinov, 1969).

Soil Dilution Method

Dilution of the soil was carried out the day after the sample was taken based on the method accepted in general microbiology and mycology (Litvinov, 1969). To calculate the total amount of microorganisms, 10 g of soil was dissolved in 90 ml of water in a sterilized flask for 5 minutes. Using a sterilized pipette, 1 ml of the suspension was added to water in a 9 ml sterilized test tube. This process is reversed. The liquid from the third and fourth test tubes was inoculated into the plate nutrient medium (1:1000, 1:10000). For this, 0.5 ml of the obtained suspension was evenly spread on the surface of the agar nutrient medium placed in a Petri dish using a spatula. This process was repeated three times.



Pure separation of microorganisms using the dilution method

In addition, in order to separate the fungi, small particles of the soil were evenly sprinkled on the surface of the agar nutrient medium in Petri dishes. After 3-7 days, a colony of various fungi appeared around the pieces of soil. Germinated fungi were planted on agar nutrient medium in a test tube using a mycological hook. Then, to determine the amount of fungi in 1 g of absolute dry soil, 1 g of soil was weighed and dried from the obtained soil sample together with the soil taken for the experiment at the same time. The amount of fungi in 1 g of soil was determined according to the following formula:

$$a = \frac{\mathrm{b} \times \mathrm{v} \times \mathrm{g}}{d},$$

a - the amount of cells in 1 g of dry soil, in piece

b - the average number of colonies in the plate, in piece

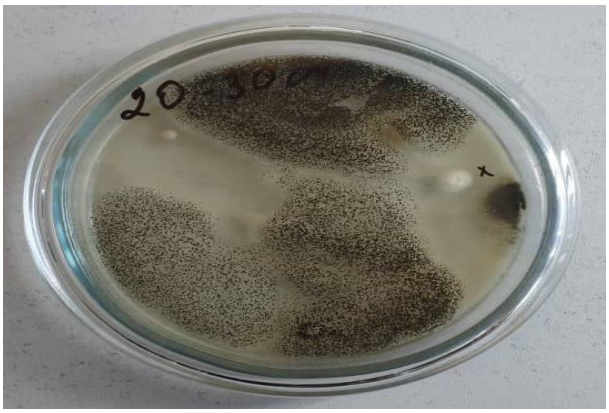
v - amount of planted liquid, in ml

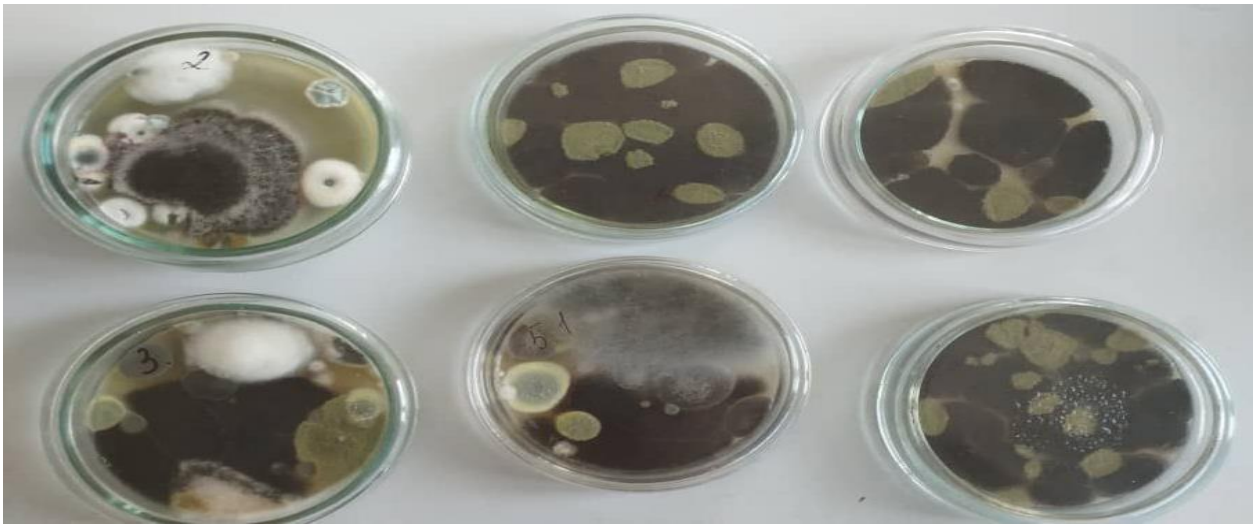
g - the amount of 1 ml of suspension, at the expense of a drop

d - weight of dry soil taken for testing, g (Zvyagintsev, 1980)

The method of creating a humidity chamber

A humidity chamber method was also used to seperate soil fungi (Bilay, 1973). For this, the soil was placed in a sterilized Petri dish with filter paper and placed in a thermostat with a temperature of +24-26 ° C for growth. Fungi germinated from the soil were seperated in pure form as described above, and the total number and systematics were determined.





Fungi seperated from soil

The method of planting and separating fungi

To determine the total amount of fungi, suslo-agar, Chapek with agar, potato agar and only with agar food, as well as food conditions used for the seperation of Verticillium Nees et Lk (Gulomova, 1975) were used. In order to prevent the growth of bacteria, adding citric acid or streptocide to the agar nutrient condition, the pH index of the nutrient condition was equal to 4.5. Taking into account the development of some fungi in a neutral and weakly alkaline environment, the agar nutrient condition was cultivated in parallel with a pH of 6.5-7. Petri dishes were stored in a thermostat at a temperature of + 26-28 ° C for up to 15 days.

The sown plates were periodically checked from the 3rd day, and fast-growing fungal colonies were inoculated into test tubes containing agar conditon. The observation lasted up to 15 days. To calculate the amount of fungi, samples with a certain amount of dilution, that is, with the number of colonies in Petri dishes from 20 to 100, were selected. In this case, each colony was assumed to be formed from a spore or a piece of hyphae. To identify the type of fungus in each colony, they were sown onto tubes containing solidified agar condition.

CONCLUSION

In summary, it can be said that studying the methods of identifying disease-causing microorganisms in the soil of the potato fields in our country will allow to prevent or fight against the spread of these diseases in the potato crop.

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