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INFLUENCE OF OIL ON THE NUMBER OF DIFFERENT GROUPS OF MICROORGANISMS INVOLVED IN THE NITROGEN CYCLE

Abstract. In oil-polluted ecosystems, nitrogen is one of the main biogenic elements. Maintenance of its level in the environment provided by the active activity of various microorganisms participating in its cycle. In this connection, the problem of the influence of oil pollution on the transformation of nitrogen in the soil is of interest, which closely related to practical issues of biodegradation. In all periods of the study, the number of azo-fixing microorganisms and oligonitrophils in polluted soil was higher than that of uncontaminated soil. An increase in the intensity of nitrogen fixation in contaminated soil may be due to an increase in the content of readily available organic substances – alcohols, organic acids, amino acids and other compounds. It correlates with an increase in the number of groups of anaerobic nitrogen fixers of the genus Clostridium. It is possible that nitrogen-fixing microorganisms can use metabolic products of hydrocarbon oxidizing microorganisms.

Key words: microorganism, nitrogen, soil, oil, pollution, gasoline, bacterium.

Introduction. All periods of the study, the number of azo-fixing microorganisms and oligonitrophils in polluted soil was higher than that of uncontaminated soil. An increase in the intensity of nitrogen fixation in contaminated soil may be due to an increase in the content of readily available organic substances - alcohols, organic acids, amino acids and other compounds. It correlates with an increase in the number of groups of anaerobic nitrogen fixers of the genus Clostridium. It is possible that nitrogen-fixing microorganisms can use metabolic products of hydrocarbon oxidizing microorganisms. An increase of nitrogen-fixing microorganisms in oil-polluted soil noted by a number of researchers [1]. According to some data, oil in various concentrations stimulates the development of oligonitrophils and nitrogen-fixing microorganisms both in gray forest soil and in leached chernozem during the whole period of research. The intensification of nitrogen fixation in oil-contaminated soil explained by the low partial pressure of oxygen. It is likely that an increase in the number of nitrogen fixing microorganisms is a kind of "compensatory" mechanism necessary to preserve nitrogen compounds in the soil. The most sensitive to oil pollution are nitrifying bacteria, which are an agronomically important group of microorganisms. Their abundance fell with increasing oil concentration and did not return to the background level after a certain time and when contaminated soils, fertilizer complex, activated sludge and other stimulants used for reclamation. The decrease in the number of nitrifying microorganisms in contaminated soil is due to the fact of that an unfavorable air regime created in the soil. However, under the same conditions, an increase in the activity of ammonifying and aerobic nitrogen fixators observed. Nitrifiers in normal soil do not meet a large amount of easily digestible organic matter. Hydrocarbon oils themselves are relatively easily digestible organic compounds. On the other hand, studies showed that biodegradation of oil in the process of self-purification accompanied by an increase in the content of organic substances. Hydrocarbons used in certain doses that do not exceed the phytotoxicity of the soils, as a "stabilizer" of the conversion of nitrogen, an inhibitor of the nitrification process, to prevent nitrogen loss. Microorganisms carrying out the process of denitrification are widely distributed in nature. In general, denitrifying agents represent a