

# THE USE OF BACTERIA OF THE GENUS *PSEUDOMONAS* AND *BACILLUS* BIOTECHNOLOGY TO CLEAN SOIL FROM PETROLEUM HYDROCARBONS

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An important issue is the creation of new biologics, the main components of which are native strains of microorganisms- destructors genus *Pseudomonas* and *Bacillus*, which are adapted to the harsh living conditions in a particular region.

In this regard, the aim was the development of biotechnology clean soil from petroleum hydrocarbons using bacteria of *Pseudomonas* and *Bacillus*, isolated from petroleum contaminated soil Zmyiny Island. The material for the study of microorganisms was isolated from soil samples taken on Serpentine.

The paper used the classical bacteriological methods, automatic identification system microorganisms MIDI Sherlock (MIDI, USA) based on the Agilent 7890 gas chromatograph method of infrared (IR) spectrometry,

With oil-contaminated soil Zmyiny Island isolated 2 strains of microorganisms able to grow on the agar medium with added oil MCD 17, 22. According to obtained fatty acid composition decrypted using the Library Database Library studied microorganisms identified as bacteria of the genus *Bacillus* and *Pseudomonas*.

Investigated strains of microorganisms had oil oxidizing activity. After 90 days of exposure degree of biodegradation of oil hydrocarbons when using a strain of *Pseudomonas fluorescens* 17 reached 76.4%, the strain *Bacillus megaterium* 22 - 63.5%.

In order to develop biotechnology clean soil Zmiiny Island of oil in terms of forwarding we isolated and delivered to the laboratory soil samples from the area most influenced by chronic pollution. The initial oil content was  $41,54 \pm 2,23$  g / kg soil. In the laboratory at 25° C experiment was laid on cleaning soil from oil.

We used included the use of biological technology, which is a cell bacteria *Bacillus megaterium* and *Pseudomonas fluorescens* 22 17 immobilized by a special biotechnology to turf and straw.

Laboratory tests have shown that the use of immobilized substrates to natural bacteria *Bacillus megaterium* and *Pseudomonas fluorescens* 22 17 helps cleanse the soil of petroleum products. After 150 days after the start of testing oil content in soil decreased to  $4,005 \pm 0,11$  g / kg soil (96.42%) from baseline  $41,54 \pm 2,23$  g / kg soil.

Based on our research we can conclude that the use of adapted to the harsh living conditions on the island. Zmiiny native strains of bacteria destructors of oil hydrocarbons *Bacillus megaterium*, *Pseudomonas fluorescens* 22 and 17 is a perspective when creating modern biotechnology plumb effective cleaning soil from oil.