



BIOTECHNOLOGY OF USING BACTERIA-DESTRUCTORS FOR REMEDIATION OIL CONTAMINATED LANDS OF ZMIINYI ISLAND

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Zmeinyi island is a unique historic and archeological object of a distant past. Zmiinyi's strategic and geopolitical importance is defined by its extraordinary location as border south-west plot of the territory of Ukraine protruded in the sea.

The part of the island and adjacent shelf is a National Zoological Reserve. The island is included into the list of geological monuments of Ukraine due to its unique geological origin. Economic developing of Zmeniy Island started in 30-s XIX century together with the beginning of lighthouse construction. Within the course of decades oil products were delivered to the island to maintain machinery. Oil pumping to island and long-term storage was accompanied by spills which resulted in chronic oil land contamination of considerable area. Water permeability of contaminated area changes sharply owing to hydrophobization, moisture is changing. As a result – falling out of one of the main cenosis chain – vegetation.

Natural land renewal at the island runs very slowly, much longer than in the case of other anthropogenic contaminations. Microbial destruction of oil contamination – one of the main processes promoting elimination of oil products from land ecosystems. Bacteria use oil hydrocarbons in the process of energy and structural metabolism. This can assimilate all existing organic substances, necessary enzymes are being synthesized in their cells.

Therefore it is very important to develop effective methods of elimination of oil contamination of land using microbiological preparations of new generation – sorbents and destructors of oil hydrocarbons which ensures full reduction of harmful biological effect of oil pollution, stimulate natural process of self-purification, biocenose recovery and land restoration.

As a result of researches four biochemical active cultures of bacteria-destructors of oil hydrocarbons adopted to the island's conditions had been isolated from contaminated lands of Zmeinyi Island. There biological qualities of them had been studied, optimal terms and ability of oil hydrocarbons biodegradation had been determined.

The method of bacteria immobilization on complex carrier of natural origin had been developed. It contains vegetative and mineral components. Carriers content provides long-term storage of immobilized bacteria-destructors in physiologically active conditions as well as water permeability of land.

Within the framework of expeditions to Zmeinyi Island developed technology of oil contaminated land remediation had been tested and proved effective.

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