

**STRAINS *PSEUDOMONAS FLUORESCENS* ONU541,
BACILLUS MEGATERIUM ONU542 ARE PROMISING
PRODUCERS OF SURFACE-ACTIVE METABOLITES
AND DESTRUCTORS OF PETROLEUM PRODUCTS**

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Methods for eliminating oil pollution, based on their decomposition by non-pathogenic microorganisms, are recognized as effective and ecologically safe. The degree of purification is increased in the case of the production of biosurfactants by microorganisms. The urgent task of ecobiotechnology remains the search for new oil-oxidizing microorganisms capable of producing biosurfactants on a cheap nutrient medium. The purpose of the work is to screen microorganisms isolated from the oil-contaminated soil of Zmiiny Island, promising in the biotechnological plan for the production of surface-active metabolites and the destruction of petroleum hydrocarbons.

Screening of microorganisms is carried out to reduce the equilibrium value of surface tension (Wilhelmi method) of liquid bacterial cultures and the appearance of emulsified capacity of their supernatants, by ability to destroy petroleum hydrocarbons. The ability of microorganisms to produce biosurfactants is evaluated depending on the presence of organic components (peptone, yeast extract, glucose) in M-9 medium. Biotechnologically promising non-pathogenic strains of microorganisms for the comparative analysis of their fatty acid profiles using the Sherlock MIDI system are identified as *Pseudomonas fluorescens* ONU541, *Bacillus megaterium* ONU542. The residual content of petroleum hydrocarbons in bacterial suspensions is determined by

IR spectrometry in the wave number range of 2700-3200 cm⁻¹. Results. Strains *P. fluorescens* ONU541, *B. megaterium* ONU542 in medium M-9 in the absence of peptone and yeast extract in its composition for five days produce metabolites with surface-active properties to a greater degree than in the presence of these organic components. This ability for soil strains of *P. fluorescens* ONU541, *B. megaterium* ONU542 increases from 12.1 to 28.9% and from 17.2 to 28.0%, respectively. It has been established that the strain *P. fluorescens* ONU541 produces both cell-bound and extracellular biosurfactants, *B. megaterium* ONU542 strain is mainly extracellular biosurfactants. The emulsified properties of the supernatants obtained, estimated by the emulsification index (E24,%), are high and in relation to sunflower oil make over 50%. An experimental test of the ability of selected strains to utilize petroleum hydrocarbons with an initial concentration of 1000 mg/l showed that both strains, when cultured in M-9 medium, decompose oil hydrocarbons for 30 days at 30 °C by 60.3-74.6% taking into account the correction for control samples.

The isolated non-pathogenic strains identified by the fatty acid composition of cellular lipids as *P. fluorescens* ONU541, *B. megaterium* ONU542, can be recommended for use in biotechnologies of environmental purification from chronic oil contamination.