

DETERMINATION OF MICROBIOLOGICAL CHARACTERISTICS OF SEDIMENT POLLUTED WITH PETROLEUM HYDROCARBONS AT THE SITE OF HEATING PLANT "NOVI BEOGRAD"



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Objectives

Determination of different physiological-biochemical groups of microorganisms from sediment on general and selective medium.

Conclusion

High number of hydrocarbons degrading microorganisms is present in the tested samples. The use of selective medium has made it possible to isolate pure cultures that will be identified in molecular methods in the next steps. It is planned that these cultures are used for biodegradation experiments.

Introduction

Pollution with petroleum and petroleum products poses a high risk to the human environment, thus affecting all life. Pollution may occur during the exploitation, transportation and storage of petroleum, but also in accidental spills. Bioremediation technology- using microorganisms as an agent for removing pollution, sediment and water can be restored to its original state. Before the bioremediation process, it is necessary to determine the number of autochthonous microorganisms in the sediment. Preliminary research carried out at the site of heating plant "Novi Beograd" confirmed the existence of petroleum pollution both in sediment and in groundwater.

Methods

In this work we used sediment from three points at the site of heating plant "Novi Beograd". For the determination of number of microorganisms next medium were used: Nutrient agar (Torlak) for bacteria; Malt agar (Torlak) for fungi; mineral base medium containing 2 g of standard D2 diesel fuel in 1 L of medium for microorganisms degraders of hydrocarbons, Pseudomonas isolation agar for bacteria of the genus *Pseudomonas*, M3 for bacteria of the genera *Nocardia* and *Rhodococcus*. In addition to microbiology, we determined content of the total petroleum hydrocarbon.

Reference

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Results and discussion

Number of microorganisms (CFU/g) was determined:

Microorganisms	Number (CFU/g)
Total bacteria	1,0-4,0x10 ⁶
Yeasts and molds	2,5x10 ² -1,2x10 ⁵
Bacteria of the genus <i>Pseudomonas</i>	2,2x10 ³ -5,5x10 ⁴
Microorganisms that degrade petroleum	2,2x10 ⁴ -1,2x10 ⁵
Bacteria of the genera <i>Nocardia</i> and <i>Rhodococcus</i>	2,3x10 ³ -3,6x10 ⁵



Figure 1. Mixed cultures of microorganisms on various media.

The total content of hydrocarbons varies between 2760-28865 mg/kg of dry substance.