Express-Diagnosis of Microbial Communities of Soil Polluted with Oil Products

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Neutralization of hydrocarbon contamination of soils by natural microbial populations is one of the primary mechanisms. Its intensity and direction to a large extent depends upon the quality of oils getting into soil and the microbial status of soils. Development of new effective, easy to use in situ approaches for estimating soil microbial parameters under pollution and during remediation is of key importance. The objective of my research was to design ecological stress and self-remediation stage assessment via measuring indices of microbial communities' status in soils polluted with oil and oil products. I took two types of soil and polluted with oil and diesel. I measured enzyme activity, respiration, substrate induced respiration and toxicity of each sample during two weeks. I found out that microbial communities of two soils behave different. Chernozem microorganisms slightly change their activity and functional structure, but podzolic ones changed sharply their parameters. Then I took the same soil types, but added oil from another deposit, in two concentrations. I measured the same parameters for 45 days. "Soil type effect" was confirmed, I think it's due to higher "buffer properties" of Chernozem. After this period I estimated Pollution Induced Community Tolerance (PICT-effect) via cultivating fungi on specific for oil-degraders medium. Through activity and respiration measuring in gradient of oil pollution I've determined the "RED LINE" (crucial in ecological management). In my research I used my modification of substrate induced respiration method, which is much `more expressive and cheaper, what makes it available in field studies. Microbial block plays the key role in ecosystem homeostasis, my results are useful in environmental management.

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