## SUMMARY

## Wolicka D. Bioremediation *in situ* of soil contaminated by petroleum products by autochthonous microorganisms.

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Pollution of the environment by oil-derived products still remains an unsolved issue, what is most probably linked with its multi-aspect nature. This results, e.g. from the common application of oil-derived products, their hazardous influence on living organisms and specific abilities linked with the distribution and long-term durability in the environment.

Crude oil is a mixture of about a thousand different compounds. The most important groups can be distinguished: hydrocarbons (aliphatic and aromatic), resins and asphalts. Moreover crude oil and petroleum products contains sulphur, oxygen, nitrogen and heavy metal ions, such as lead, tin, arsenic, mercury, germanium, antimony, thallium, vanadium, iron, aluminium, nickel, calcium, and magnesium. The most toxic components with mutagenic and carcinogenic activity include aromatic compounds – benzene, toluene, ethylobenzene and xylene (BTEX), which easily pass into groundwater and may pose hazard to organisms using it.

It is commonly known that BTEXs are biodegradable in aerobic conditions with a very highly effective in the remediation of many oil spills. Many soil microorganisms are able to transform oil hydrocarbons into non-toxic compounds or mineralize them to  $\rm CO_2$  and  $\rm H_2O$ . Hydrocarbons are degraded in soil mainly by bacteria and fungi.

In this paper, the effectiveness of BTEX biodegradation in cultures of autohtonous bacterial communities was studied. Aerobic bacterial communities were isolated from soil contaminated by petroleum products. Benzene, toluene, ethylobenzene and xylene (BTEX) in the concentration of 0.5 g/L were applied as the sole carbon source. Selected bacterial communities were able to utilize 100% of BTEX in lab. Next these microcosms were used as an inoculum to biodegradation *in situ* area contaminated by petroleum products. After bioremediation process concentration of BTEX in soil decreased about 99%.