SOIL CONTAMINATION WITH OIL DERIVATIVES AND BIOLOGICAL METHODS OF PURIFICATION

Summary

During the last two decades numerous investigations were performed to determine the persistence of poly-aromatic hydrocarbons (PAH) in different natural environments and a possible role of indigenous microflora in the degradation of these contaminants. It is estimated that more than 90% of the total burden of PAH's resides in the surface layer of soils.

There are known many biological methods of soil reclamation from oil pollution. Bioremediation of PAH's-contaminated sites has largely been carried out either by stimulation of microorganisms already present in the contaminated site or through bioaugmentation. Successful bioaugmentation requires not only a catabolically active inoculum but also a microbial strains or consortium that can survive in the target environment. PAH's are often present in the form of a mixture of compounds, so that their degradation may involve various interactions among PAH-degrading bacteria, such as co-metabolism, inhibition, induction. Rhizodegradation (also called enhanced rhizosphere biodegradation, phytostimulation, and plant assisted bioremediation) is the breakdown of organic contaminants in the soil enhanced by soil dwelling microbes living in the rhizosphere. Phytoremediation (phytoextraction, phytostabilization, phytotransformation) - the use of green plants able to grow in polluted sites was found to be a feasible approach for in situ clean-up of surface soils with from PAH's and diesel fuels.

Results of many comparative investigations suggest that biological methods of soil reclamation from oil pollutants look as very promising owing to their low costs.