

## 5<sup>th</sup> WSES 2012

### Sustainability project: Biodegradation of organic pollutants and remediation of long-term contaminated sites

Monika Čvančarová, email: monikacvancarova@seznam.cz  
*Institute for Environmental Studies, Faculty of Science, Charles University in Prague,  
Albertov 6, CZ-128 43 Prague 2, Czech Republic*

#### Introduction

I would like to introduce a part of interesting and specific activities which are practically solved in the Institute for Environmental Studies (Charles University in Prague). Generally, organic pollutants are widespread, often persistent and toxic and their degradation is needed. It is not easy to find out environmentally friendly, effective and “cheap“ methods for decontamination especially soils and water. Research in the Institute is therefore focused on biodegradation of hydrophobic pollutants and study of different remediation techniques.

#### Methods

Various organisms particularly bacteria have a potency to degrade organic pollutants. The pollutants can enter the organisms where can be metabolized and utilized as a source of energy or cometabolized. Basic treatment of contaminated soils is based on stimulation of native soil-living bacteria or inoculation of specific consortium of bacteria. Biodegradation by composting is another relatively effective process which employs a large group of various microorganisms (e.g. thermophilic bacteria, fungi). An interesting approach to remediation offer ligninolytic fungi (white-rot fungi). These fungi degrade lignin in wood by extracellular enzymes. The enzymes are nonspecific and can participate in biotransformation of organic pollutants. We also study bioavailability, ecotoxicity, metabolites and degradation pathways of the pollutants which are important parameters for risk assessment.

#### Education

The University supports young people in this wide and complicated area of biodegradation and remediation techniques. Students in the Institute can enrol for special courses about decontamination, degradation environmental analysis, ecotoxicity, etc. The Institute for Environmental Studies also cooperates with the Institute of Microbiology, v.v.i., ASCR. Very useful are courses for secondary school teachers and seminars which are recommended not only for students, scientists, foreign guests but also for the public.

#### Conclusions

Sustainability should not be focused only on protection of the environment. Very important are treatment and restoration already contaminated sites. Bioremediation techniques have a potency and represent environmentally friendly methods for decontamination purposes.

