

9th Edition of International Conference on **Environmental Science & Technology**
&
48th World Congress on **Microbiology**
&
50th International Congress on **Nursing Care**

June 24-25, 2019 Moscow, Russia

The microbial degradation of obsolete pesticides in burial soils of Kyrgyzstan

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The Kyrgyz Republic has never produced pesticides. However 50 storage facilities of obsolete pesticides exist, which store about 5000 of these hazardous chemicals that were used for plant protection from pests. They pose a serious threat to the people, livestock living there and to the environment. Degradation caused by organisms (biodegradation) could help decrease considerably pesticide persistence in the environment. Microorganisms are vital for the bioremediation of pesticides. In soil where the innate microbial population cannot manage pesticides by themselves, the external addition of pesticide degrading microflora is recommended. The main purpose of this research is to study the microbial structural complexes of pesticide contaminated soils in dumping zones and to search and select microorganism destructors with cytochrome P450 genes for pesticide degradation, the use of selected bacteria for the bioremediation of heavily polluted soils around the burials sites in model experiments. *In vivo* experiments blend of bacteria: *Micrococcus flavus*, *Bacillus cereus*, *Bacillus megaterium*, *Pseudomonas fluorescens* and *Flavobacterium* sp, and single culture of *Pseudomonas fluorescens* were used for biodegradation in soils contaminated with obsolete pesticides. Six months later, following the incubation of the soil containing high concentrations of pesticides with active destructive bacteria, heptachlor-epoxide pure and dieldrin were fully degraded and their concentration was almost reduced to zero values (0.382 mg/kg and 0.096 mg/kg respectively) by the blend of bacteria. The concentration of B-BHC was decreased by 5.5 times and that of Endosul-sulf + 4.4 DDT by 27.5 times within six months using the blend of bacteria.

Biography

Doolotkeldieva T D is a Head and Professor of Plant Protection Department of Agriculture Faculty at Kyrgyz-Turkish Manas University, Kyrgyzstan. She has expertise in Soil Microbiology, Bioremediation of Environment Pollution, Plant-Microbe interactions, Agricultural Biotechnology using molecular tools and management of plant health by using biocontrol agents. She has published more than 220 papers in reputed journals. She is a member of American Association for Microbiology, Molecular Plant-Microbe Interaction Society, British Plant Pathology Society and Society for Invertebrate Pathology and Global Avalon network on organic agriculture and others.

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