Rup Lal, J Pet Environ Biotechnol 2012, 3:7
http://dx.doi.org/10.4172/2157-7463.S1.007

OMICS Group Conferences
Accelerating Scientific Discovery

Global Biofuels & Bioproducts Summit

November 19-21, 2012 Hilton San Antonio Airport, USA

Using Genetics, Genomics and Metagenomics for developing bioremediation technology for the decontamination of hexachlorocyclohexane (HCH) contaminated sites

Rup Lal
University of Delhi, India

Technical hexachlorocyclohexane (HCH) and lindane have been extensively used as pesticide for the control of agricultural pests and in public health programs. HCH is synthesized by the chlorination of benzene in the presence of UV which results in formation of five HCH isomers α- (60-70%), β- (5-12%), γ- (10-12%), δ- (6-10%) and ε- (2-3%). Among these isomers only γ-HCH (lindane) possesses insecticidal property. Purification of one ton of γ-HCH results in the production of 8-12 tons of 'HCH muck', comprising of rest of the four isomers. The HCH muck is usually discarded in landfills, chemical waste sites and dumpsites. In the muck α-HCH is most abundant and carcinogenic while β-HCH and δ-HCH are most stable and estrogenic and persist in the environment for decades. The decontamination of this HCH waste is a major challenge. Due to presence of a large number of HCH degrading microorganism's bioremediation seems to be a feasible and cost effective option. We have been working on this problem for the past several years and have isolated several HCH degraders from the dumpsite. The genetics, physiology and biochemistry of HCH degradation has been explored by our group (Lal et al., 2010. *Microbiol. Mol. Biol. Rev.*74: 58-80). Additionally, we have also sequenced the genome of a HCH degrader *Sphingobium indicum* B90A and metagenome from the HCH dumpsite. These efforts will be discussed in relation to the development of a bioremediation technology for the decontamination of the HCH from dumpsite using the approaches of biostimulation, bioaugmentation and enzymatic bioremediation.

Biography

Rup Lal did his Ph.D. from the University of Delhi in 1980. Rup Lal is a Professor in Molecular Biology at the Department of Zoology, University of Delhi. He is the awardee of Alexander von Humboldt Fellowship, DBT Overseas Fellowship, ASM Indo-US Professorship and a visiting scientist at the University of Cambridge. He has nearly 120 publications in peer-reviewed journals attracting over 1100 ISI citations along with h-index 18. He also has a US patent to his credit for the development of first effective series of cloning vectors for different strains of A. *mediterranei*. He is the Fellow of National Academy of Sciences, India (FNASc), Fellow of National Academy of Agricultural Sciences (FNAAS) and Fellow of Association of Microbiologists of India (FAMI). He is a member of the Review Committee for the ASM-IUSSTF Indo-US Professorship in Microbiology (2009-2012). He will be taking over as ASM Ambassador from July 2012 for the Indian Ocean Region. Rup Lal is also Editor-in-Chief of the Indian Journal of Microbiology (INJM) and Associate Editor of BMC Biotechnology & BMC Biochemistry and President Elect (2013), Association of Microbiologists of India. He is the General Secretary of Indian Network for Soil Contamination & Research (INSCR).

ruplal@gmail.com