OMICS Group Conferences
Accelerating Scientific Discovery

International Conference on
Biodiversity &
Sustainable Energy Development

September 14-15, 2012 Hyderabad International Convention Centre, India

Bacterial community structure and role of microbes in arsenic mobilization in ground water, West Bengal

Dhiraj Paul
Indian Institute of Technology, India

The groundwater arsenic contamination is considered to be the largest poisoning of a population in history. Though, microbes are known to play critical roles in arsenic biogeochemistry, their diversity, community composition and specific functions within subsurface environments remain largely unexplored. The present work describes microbial diversity within arsenic rich ground waters from two highly affected areas of West Bengal using both culture independent and dependent approaches. Metagenome study revealed that the abundance of β- and γ- Proteobacteria within the samples. Within Proteobacteria members of genera Actinobacteria, Sphingobacteria and Bacteroidetes were found in high As-contaminated samples while Cyanobacteria and Actinobacteria was detected in moderately contaminated samples. Samples with less As content showed members of Pseudomonas, Actinobacteria and Flavobacteria. In culture dependent study more than 100 strains were isolated as pure culture. Taxonomic identity revealed predominance of Pseudomonas, Rheinheimera, Stenotrophomonas followed by Herbaspirerlum, Acidovorax, Hydrogenophaga, Rhizobium and Brevundimonas. Physiological and metabolic characterization study indicated that most of the strains are moderate to highly resistant to toxic As3+ and As5+ concentrations, capable of both oxic and anoxic metabolism, use diverse carbon sources (C1-C6) and can utilize arsenate and sulphate as alternate electron acceptor. Ability to use iron as electron acceptor is also frequently detected. Compared to arsenate reductase activity found in most of the strains arsenite oxidase activity is less prevalent. The study explores bacterial diversity within a gradient of As concentration and bacterial metabolic potential useful for deciphering their role in As mobilization in ground water.

Biography

Dhiraj Paul has complited his M.Sc in the year 2008 from university of Kalyani in first class second position. Then he decided to pursue a career in academics and joined IIT Kharagpur as a research scholar in the Department of Biotechnology in the year 2008. By that time he have bagged UGC fellowship and simultaneously qualified GATE examination. In 2010 he ranked 28th in India in Joint CSIR-UGC National Elegibility Test examination. He has published one paper and one book chapter.