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Microbial diversity of a remote aviation fuel contaminated sediment of a Lentic ecosystem in Ibeno, Nigeria

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Environmental pollution due to oil and gas exploration and production (O&G E&P) wastes disposal and oil spills following several decades of irresponsible practices and neglects by the operating companies and over-dependence of government on the oil sector remains the major problem in the oil-producing communities in Nigeria. Studies to ascertain the ecological status of a remote Aviation fuel-contaminated sediment of a lentic ecosystem in Ibeno, Nigeria, have been carried out using standard microbiological culture - dependent methods which captures only <1% of all microorganisms present in a sample. The results from these studies were therefore inaccurate and grossly misleading. In this study, sediment samples from this lentic ecosystem in Ibeno, Nigeria previously polluted by Aviation fuel in 2001 (about 14 years ago) were collected and analyzed to assess its microbial diversity using standard microbiological culture - dependent techniques as well as the use of metagenomic techniques involving community DNA extraction, sequencing and bioinformatics analyses. Standard microbiological culture - dependent techniques revealed the presence of only six (6) genera of bacteria and four (4) genera of fungi. The results of metagenomics studies of same sample revealed that the ecosystem harbors complex microbial consortia as shown by the phylogenetic dendrogram to include members of the bacterial, archaeal and eukarya genera. These results corroborate the 'great plate count anomaly' principle and demonstrate that the use of metagenomic techniques will redefine the actual ecological status of the environment.

Biography

I R Udotong has received his Ph.D in Applied / Environmental Microbiology from the Rivers State University of Science & Technology, Nkpolu, Port Harcourt, Nigeria in 2000. He has worked in multi-national Oil & Gas Industries and participated in some professional training programs in Europe and Nigeria. His current research interest includes Metagenomics of the Niger Delta environment, Environmental monitoring and Waste management in the oil & Gas Industries. He is currently a lecturer in the Department of Microbiology, University of Uyo, Nigeria, having risen through the ranks to the rank of a Professor of Environmental Microbiology in 2007. He is a member of the Nigerian Society of Microbiology (NSM); Nigerian Institute of Food Science and Technology (NIFST) and Nutrition Society of Nigeria (NSN).

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