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Biodegradation of tributyltin chloride by bacteria isolated from coastal econiches of Goa-India

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Abstract

Tributyltin chloride (TBTCl) is an important biocidal ingredient of antifouling paints which is extensively used worldwide to control biofouling of boats and ships. This biocide ends up in the marine environment as a result of hydrolytic leaching and poses serious threat to aquatic biota due to its lethal, immunosuppressive, endocrine disruptive, carcinogenic and teratogenic effects on target as well as non-target marine organisms. TBTCl is highly toxic to several aquatic organisms. At concentrations of 1µg/L or less TBTCl has shown to be toxic to certain planktonic species including copepods and mussel larvae. Long term toxicity to adult mussel and fish has also been documented at 1µg/L. Organotin compounds at 200 mM also decrease the viability of lymphocytes in blood. Although production, use and export of TBTCl is prohibited in developed countries since 1990's developing countries are continuously using it as an antifouling agent. TBTCl still persists at toxic levels in the marine water columns as well as sediments. It is interesting to note that bacteria resistant to TBTCl, predominate in surface waters and sediments of shipyards, docks and harbors and even on coatings of TBTCl containing antifouling paint. Although bacterial strains from these specialized econiches are slow degraders, they may prove to be potential natural agent for bioremediation of marine environment contaminated with the biocide. We have screened and biologically characterized several TBTCl resistant bacterial strains from coastal environments of Goa. The findings of this research work on TBTCl resistant bacteria will be presented during the conference.

Biography

Dnyanada Khanolkar is pursuing her Ph.D in Microbiology at Goa University. She is persuing her doctoral studies under the guidance of Dr. S. K. Dubey, Professor and Head of Department of Microbiology, Goa University who has several publications in reputed journals in the field of environment microbiology and marine microbiology. She has research experience of working with several heavy metal resistant bacteria as well as bacteria having industrial applications. She is also a member of American Society for Microbiology.