

Characterization of Novel Microorganisms from Hexachlorocyclohexane (HCH) Dumpsites

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Abstract—DDT, Endosulfan and HCH were the extensively used pesticides all over the world from 1950s to 1980s. The use of these pesticides brought enormous benefit in our country, India by protecting the crops from pests, eradication of vector borne diseases and also assisted to some extent in bringing green revolution. Extensive and indiscriminate use coupled with unregulated production has now created a serious problem of environmental pollution along with various health hazards. Residues of DDT, HCH and Endosulfan are reported predominantly from soil and groundwater and almost from all parts of the ecosystem. Until recent there are no reports of organisms available that have the ability to degrade DDT and endosulfan and thus, these pollutants still remain a cause of serious concern. In contrast large number of bacteria chiefly sphingomonads have been reported to degrade HCH isomers. At the HCH dumpsites microbes get evolved to face the challenge and start degrading HCH isomers. It is this aspect that compels us to believe that there is a greener hope to remediate this toxic waste. Over the years, the possibility of remediating HCH residues by way of microorganisms has proved to be feasible at various dumpsites, especially reported from India, Germany, Spain, The Netherlands, Portugal, The United States, Eastern Europe and South Africa. These bacterial strains have not only paved the way for remediating HCH by biological means but have also given a deeper understanding of the biochemistry and genetics of degradation of HCH isomers. In an attempt to better understand the diversity of microbes at these dumpsites we attempted to isolate bacteria from HCH contaminated soil in India as well as Spolana Neratovice, former Czech producer of Lindane and characterized them by polyphasic approach. These studies are the basis for successful bioremediation technologies against the most pernicious pollutant.