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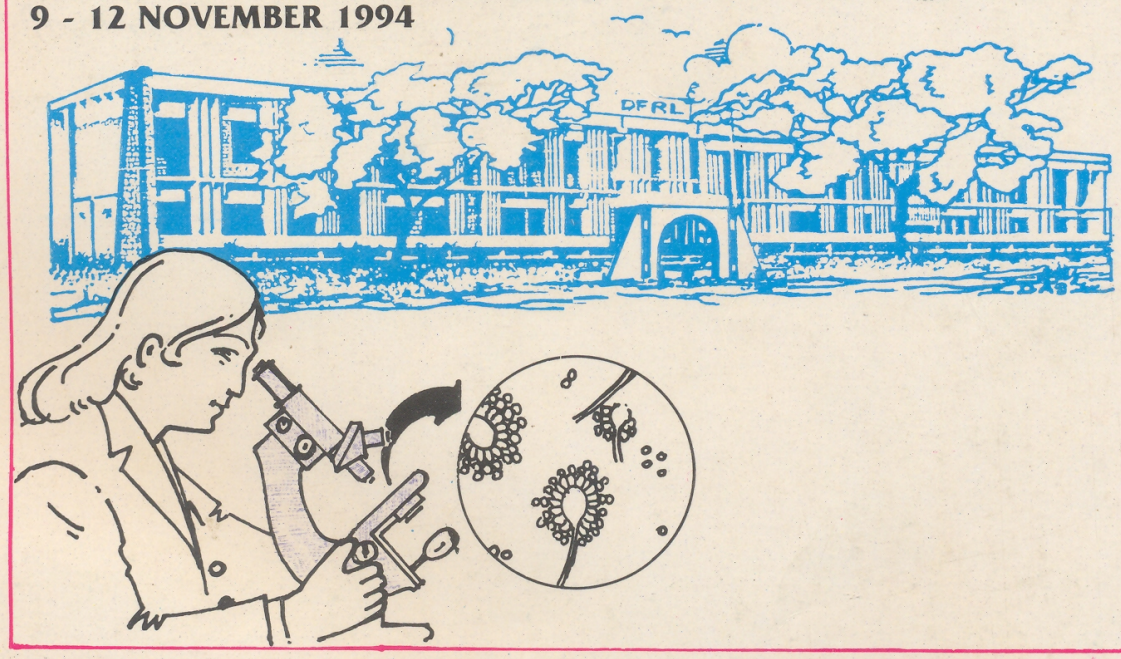

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EMB-88

BIOMINERALIZATION OF α–β–ϒ AND δ–ISOMERS OF HEXACHLOROHEXANE BY MICROBIAL CONSORTIA

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Detection of high levels of HCH and other organochlorine pesticide residues in food and human adipose tissues in India and other developing countries have been a matter of great concern. It is highly necessary to develop treatment techniques to eliminate these recalcitrant and toxic chemicals from the environment and industrial effluents. Microbial consortia capable of degrading α–β–ϒ and δ-isomers of HCH have been developed in the laboratory by long term enrichment of soil and sewage samples using different isomers of HCH (separately) as the sole source of carbon and energy. The consortia designated as AHR, BHR, GHR and DHR degraded α - HCH (upto 50 ppm), β-HCH (10 ppm), ϒ - HCH (25 ppm) and δ–HCH (10 ppm), respectively both under shaken and stationery conditions. In all the cases stoichiometric amounts of chloride was released indicating complete mineralization of the compounds. Addition of auxiliary carbon source such as glucose, cellulose and saw dust improved the rate of degradation of α-HCH by AHR. Tho optimal temperature and pH were 30°C and 7.5 respectively. About 10 different bacterial strains were observed in the consortia.

EMB-70

ESTIMATION OF BASIC KINETIC PARAMETERS IN THE MICROBIAL DEGRADATION OF ALPHA-HEXACHLOROCYCLOHEXANE

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Microbial degradation of α– Hexachloro - cyclohexane (HCH) is of great importance in pollution control. This study deals with the determination of kinetic parameters during α–HCH degradation by a microbial consortia on which no literature is available. By the application of the simple growth, Monod's and logistic models μ_{max}, K_δ K_d and degradability have been determined as a preliminary approach to more complex modelling required in the future. μ_{max} values ranged from 0.469 to 0.214 day^{-1} for α-HCH concentration range of 5.0 to 50mg/L with the corresponding K_δ ranging from 1.96 to 15.88 mg/L. The substrate degradation rate K_d ranged from 0.197 to 0.326 day^{-1} with α-HCH alone, while, in the presence of glucose, cellulose and sawdust (co-substrates) it increased to 0.425, 0.413 and 0.383 day^{-1} respectively.