International Symposium on Industrial Biotechnology

November 18-20, 1990

Organised by

Department of Microbiology
&
University College of Technology

Osmania University, Hyderabad, India

under the auspices of
Association of Microbiologists of India
&
Indian Women Scientists Association, Hyderabad

ABSTRACTS

CP - 5

ISOLATION AND CHARACTERIZATION OF MICROORGANISMS DEGRADING CHLORINATED AROMATIC COMPOUNDS

P.V. Ajith Kumar and A.A.M. Kunhi

Microbiology and Sanitation Discipline
Central Food Technological Research Institute,
Mysore — 570 013, INDIA

Synthetic compounds particularly the chlorinated compounds constitute a formidable bulk of toxic environmental pollutants. The best way to eliminate these recalcitrant compounds is their degradation in soil by using microorganisms. Though microbial degradation of organic compounds takes place in nature the process is extremely slow and inefficient. Hence, it is necessary to isolate potent microorganisms with xenobiotic degradative abilities and improve their performance in the laboratory by genetic manipulation.

39 bacterial, 7 fungal and 3 yeast strains have been isolated by enrichment technique using HCH, DDT and endosulfan (separately) as the sole carbon source. However, individual organisms were unable to grow on these substrates. Out of these 12 bacterial strains were selected and their catabolic potentials on different aromatic compounds including chlorinated compounds were studied. All the 12 organisms utilized sodium benzoate, catechol, protocatechuic acid and salicylic acid efficiently. A few strains transformed 3-chlorobenzoic acid (3-CB) to a dark brown coloured substance. 4-chlorobenzoic acid, 1,3-dichlorobenzene, 1,4-dichlorobenzene (1,4-DCB), 2, 4-D and 2,4,5-Trichlorophenoxy-propionic acid did not support any growth. 7 strains were tentatively identified to be Pseudomonas aeruginosa (3 strains), P. fragi (1 strain) and Pseudomonas spp. (3 strains). 8 strains which were growing very well on sodium benzoate were mixed, grown on the same substrate and the substrate was gradually replaced by 3-CB acid and then with 1,4-DCB as the sole carbon source. The culture got stabilised and was capable of utilising 1,4 DCB as the sole carbon source. Plasmid profiles of the evolved strain as well as the original isolates were studied with a view to find out whether the degradative genes are borne by the plasmids.

CP - 6

STRUCTURAL CHARACTERIZATION OF WHEATSTRAW LIGNIN AND BIODEGRADATION OF WHEATSTRAW LIGNOCELLULOSE BY STREPTOMYCES VENEZULAE

V.M. Kaluskar, S.J. Pathak, and S.M. Pandya,

Department of Biosciences,
Saurashtra University,
Rajkot — 360 005, INDIA

The wheatstraw lignin was isolated and purified according to the procedure of Boucholtz et al. The isolated lignin was characterised by analysing on IR, $13_{C\text{-}NMR}$, $1_{H\text{-}NMR}$, UV-Visible absorbance maxima and gel fractionation. The $13_{C\text{-}NMR}$ of this lignin showed the little difference between wheatstraw lignin and the heardwood