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PROGRAMME AND ABSTRACT

Association of Microbiologists of India

33rd Annual Conference

November 5-7, 1992

GOA UNIVERSITY

TALEIGAO PLATEAU

GOA - 403 202

BCP 18

Degradation of Phenols by Pseudomonas Strain CP4.
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Phenol and its derivatives that originate from petroleum refineries, coke and coal gasification plants, wood preservation industries, etc., contribute a formidable bulk to the chemical pollution of environment. Even minute levels of phenol in drinking water causes abnoxious odour and taste and become toxic during chlorination. The permissive level of phenol residue in potable water as given by ICMR is 0.001-0.002 mg/L. Microbial degradation of such compounds are believed to be the most efficient way of their elimination. In this paper, data on isolation and characterization of a Pseudomonas strain and degradation of phenol, cresols and creosote by this organism are presented. Strain CP4 could mineralise 1.5 g/L of phenol within a short period. Phenol is utilized through a meta fission pathway forming 2-hydroxy muconic semialdehyde as an intermediate. Most efficient growth was at pH 6.0-7.0 and temperature 25-32°C. Optimum inoculum size was an equivalent of 160-200 mg cells (dry weight) per litre. Strain CP4 could also efficiently degrade cresols in the order m-> o-> p- isomers. Creosote also could be utilized but at a slower rate. This strain, however, was not able to utilize any chlorophenols or other chloroaromatics.

BCP 19

Oil Degradation by Nitrogen Fixing Bacteria,
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Azotobacter is well known for its nitrogen fixing capability and is used as a biofertilizer. The Azotobacter strain isolated from oil contaminated soil has been studied for its oil and hydrocarbon degrading capabilities, which has not been exploited until now in detail. The other bacterial strains studied so far, for oil degradation require nitrogen source to be added externally while, this strain does not require any external addition of a nitrogen source. This strain emulsifies crude oil in nitrogen free mineral media. Degradation of crude oil was studied by column and gas chromatographic techniques. At 32 ± 1°C temperature and sea salinity Azotobacter gave 18.8, 39.9 and 11.7% reduction in the aliphatic, aromatic and asphaltic fractions respectively when compared with the uninoculated crude oill having 53% aliphatics, 23% aromatics and 17% asphaltene fractions. It also attacks the high boiling point aromatics like napthalene, anthracene and phenanthrene which otherwise are tough hydrocarbons to degrade. The results are encouraging, therefore the potential of Azotobacter to degrade crude oil and hydrocarbons under marine conditions can be exploited to counteract the limitation of nitrogen in the marine environment.