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Studies on Degradation of Haloaromatics By Yarrowia Lipolytica NCIM 3589

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Abstract The present investigation was carried out at Institute of Bioinformatics and Biotechnology, University of Pune, India during 2011-2012. As tropical marine yeast, *Yarrowia lipolytica* 3589, is able to grow aerobically on halogenated xenobiotics using them as the major source of carbon and energy. These compounds can bio accumulate in the environment and can cause various health problems and skin diseases. They also induce mutagenicity and carcinogenicity in organisms. Utilization or degradation of these compounds by marine tropical yeast, *Yarrowia lipolytica* is associated with formation of cell mass with concomitant release of halide and increase in extracellular dehalogenase activity. During an experiment the chemicals with different concentration were treated with 10^9cells and incubated for 96 hours. Dichlorovos, Hexabromocyclododecane and Bromadiolone were used in the study. Maximum halide release at 5mM of dischlorovos was 1700µM/ml, for HBCD at 2µM it was 400µM/ml and for Bromadiolone at 100µM it was 125 µM/ml.

Dichlorovos is widely used as pesticide in controlling pests, and in protecting food grains. It gets readily absorbed through skin and it is an acetylcholinesterase inhibitor. Hexabromocyclododecane (HBCD) is used in brominated flame-retardants. HBCD is listed in Substance of very high concern (SVHC) list by European Chemical Agency due to its persistent, bioaccumulative and toxic nature. Bromadiolone is an anticoagulant, and is vitamin K antagonist. It is used to kill rats and is absorbed via skin and inhalation.

Yarrowia lipolytica 3589 has the ability to degrade these pollutants and it can be extrapolated to degrade other pollutants too. It provides a safe method to get rid off these chemicals from environment.