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BIODEGRADATION OF CHLORPYRIFOS AND 3,5,6-TRICHLORO-2-PYRIDINOL BY FUNGAL CONSORTIUM ISOLATED FROM PADDY FIELD SOIL

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Abstract

Pesticides are considered among the most serious environmental pollutants, frequently used in the control of agricultural and domestic pests. Biodegradation of chlorpyrifos and its 3,5,6-trichloro-2-pyridinol (TCP) derivative was studied in mineral medium and soil with fungal consortium consisting of JAS1 and JAS4 strains which were isolated from paddy field soil. The fungal consortium was spiked with 300 mg l⁻¹ chlorpyrifos which was degraded completely within 12 h of incubation in the mineral medium along with the major metabolite TCP. The course of the degradation process was studied using HPLC and FTIR analyses. Two experiments were carried out in soil which included the addition of nutrients (Carbon, Nitrogen and Phosphorous) with fungal consortium and fungal consortium without addition of nutrients. In both the experiments, chlorpyrifos (300 mg kg⁻¹ soil) and its metabolite TCP were degraded within 24h and 48 h, respectively. These results showed that the chlorpyrifos degrading fungal consortium had the potential to degrade the pesticide from contaminated soil.

Key words: biodegradation, chlorpyrifos, 3,5,6-trichloro-2-pyridinol

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