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OPTIMIZATION OF METHYL PARATHION BIODEGRADATION AN DETOXIFICATION BY CELLS IN SUSPENSION OR MOBILIZED ON TEZONTLE EXPRESSING THE OPD GENE

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ABSTRACT

The goal of this study was to optimizemethyl parathion (*O,O-dimethyl-O-4-p-nitrophenyl phosphorothioate*) degradation using a strain of *Escherichia coli DH5α* expressing the *opd* gene. Our results indicate that this strain had lower enzymatic activity compared to the *Flavobacterium* sp. ATCC 27551 strain from which the *opd* gene was derived. Both strains were assessed for their ability to degrade methyl parathion (MP) in a mineral salt medium with or without the addition of glucose either as suspended cells or immobilized on tezontle, a volcanic rock. MP was degraded by both strains with similar efficiencies, but immobilized cells degraded MP more efficiently than cells in suspension. However, the viability of *E. coli* cells was much higher than that of the *Flavobacterium sp.* We confirmed the decrease in toxicity from the treated effluents through acetylcholinesterase activity tests, indicating the potential of this method for the treatment of solutions containing MP.