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Biodegradation of malathion with indigenous acclimated activated sludge in batch mode and in continuous-flow packed-bed reactor

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ABSTRACT:

Acclimated activated sludge was examined for its ability to degrade malathion with and without the presence of glucose as a potential cometabolite substrate. In this study, a packed-bed reactor (PBR) using three kinds of biofilm carriers was employed for efficient degradation of malathion. The results obtained indicate that microorganisms tested were able to degrade malathion. The observed degradation rate of the pesticide in the presence of glucose was the same as without glucose. The activated sludge was found to be able to use malathion as the sole phosphorus source. In contrast, the degradation ability of the activated sludge was lost when the pesticide was used as the sole source of sulfur. The degradation capacity of the PBR was higher than the performance obtained with the batch reactor. The reactor packed with crushed olive kernels exhibited the best performance, allowing a total removal of malathion (10 mg/dm^3) within 12 h.