Thesis Title	Degradation of Methyl Parathion in an Aqueous Medium by Soil Bacteria
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ABSTRACT

Soil enrichment cultures were prepared by repeated additions of methyl parathion (MP) to agricultural soil which were inoculated in a basal mineral medium (BMM), with and without glucose (0.5 mg/ml). Two mixed bacteria cultures and four pure bacterial cultures, isolated from soil, were able to degrade MP (50 μg/ml) in BMM. Three pure bacterial cultures, *Bacillus* sp. and two unknowns, isolated from the mixed culture in BMM with glucose, were able to degrade only commercial grade MP in BMM with glucose (0.5 mg/ml), but did not degrade analytical grade MP in BMM without glucose. Only *Pseudomonas stutzeri* was MP-degrading bacterium, which was isolated

from the mixed culture in BMM without glucose, and it was the best MP-degrading bacterium, too.

This culture was tested for MP-degrading ability in BMM at different conditions : pH values (pH4, 5, 6, 7, and 8), salinity levels (0, 0.1, 0.5, 1.0, 2.0 and 3.5% NaCl), inoculum sizes ($\times 10^6$ and $\times 10^7$ cells/ml), with and without glucose (0.5 mg/ml), and initial concentrations of MP (50, 100, and 150 μg/ml). *Pseudomonas* sp. was able to degrade MP and grew in BMM at all pH values and salinity levels. The addition of glucose (0.5 mg/ml) was not effective to increase the MP-degrading ability of *Pseudomonas* sp.. Population of *Pseudomonas* sp. at 6×10^7 cells/ml degraded MP at 50, 100, and 150 μg/ml in standard BMM rapidly. Half-life values of MP at 50, 100, and 150 μg/ml in standard BMM, inoculated with *Pseudomonas* sp. (6×10^7 cells/ml), were 0.55, 0.58 and 0.87 hour, respectively. Furthermore, *p*-nitrophenol (PNP), hydrolyzed product of MP, was degraded by *Pseudomonas* sp. completely. Methyl parathion and PNP were used as a sole source of carbon for growth of *Pseudomonas* sp., too.