

Supapan Mungmanakij 2007: Carbofuran Degradation by *Bacillus* sp. Isolated from Soils. Master of Science (Microbiology), Major Field: Microbiology, Department of Microbiology. Thesis Advisor: Mrs. Surang Suthirawut, D.Agr. 81 pages.

Carbofuran degradation by soil microorganisms was studied under laboratory condition. Two ginger cultivated soils collected from Prachuap Kiri Khan province were treated by carbofuran repeatedly for 3 months under laboratory condition. The total number of culturable microorganisms and carbofuran degrading microorganisms were enumerated on Plate Count Agar and minimal medium supplemented with carbofuran. It was found that carbofuran decreased soil microorganisms in soil A and B. However, the result from minimal medium containing carbofuran indicating that carbofuran did not affect the population of the carbofuran degrading bacteria. Sixty two isolates characterized as *Bacillus* sp. were obtained from soil A 31 isolates and soil B 31 isolates. They were characterized by morphological, physiological, biochemical properties as 17 isolates of *B. megaterium*, 1 isolate of *Bacillus* sp. closed to *B. megaterium*, 17 isolates of *B. thuringiensis*, 15 isolates of *B. amyloliquefaciens*, 6 isolates of *Bacillus* sp. closed to *B. brevis*, 1 isolate of *Bacillus* sp. closed to *B. circulans*, 1 isolate of *B. sphaericus* and 4 isolates of unidentified *Bacillus* sp. The degradation abilities of these microorganisms were determined under laboratory condition. It was found that 28 isolates i.e., 8 isolates of *B. megaterium*, 10 of *B. thuringiensis*, 4 of *B. amyloliquefaciens*, 3 of *Bacillus* sp. closed to *B. brevis*, 1 of *B. sphaericus* and 2 of unidentified *Bacillus* sp. showed carbofuran degrading capability higher than 50% in 7 days. Four of 28 isolates, *Bacillus* sp. closed to *B. brevis* (P004), *B. thuringiensis* (P027 and K031) and *B. amyloliquefaciens* (K025) were determined for the effect of light, pH and inoculum size. It was found that pH 8 stimulated the rate of degradation more than pH 5. Light affected to the reduction of carbofuran and inoculum size did not affect the degradation of *Bacillus* sp. closed to *B. brevis* and *B. thuringiensis* but affected to *B. amyloliquefaciens* which its degradation rate increased remarkably when applied the microorganism at 10^8 as inoculum size. The most effective isolates, *B. megaterium* K004 and *B. thuringiensis* P027, were examined for metabolites occurred during the carbofuran degradation process. It was found that phthalic acid or 1,2- benzenedicarboxylic acid was the metabolite substances occurred at day 7 process.

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