

Gittiphat Jaisaue 2011: The Efficiency of Diuron Degradation by Bacteria Isolated from Soil. Master of Science (Soil Science), Major Field: Soil Science, Department of Soil Science. Thesis Advisor: Associate Professor Thongchai Mala, Ph.D. 69 pages.

Isolation of soil bacteria capable on growing and tolerating to diuron from ten soil sources were collected for bacteria isolation. Sk01, Sk02 and Sk03 represented the soils from cassava field in Kanchanaburi province, Ss04 and Ss05 represented the soils from cassava field in Suphanburi province, Sn06 and Sn07 represented the soils from sugar cane field in Nakhonpathom province, Ss08, Ss09 and Ss10 represented the soils from sugar cane field in Suphanburi province. The population of bacteria in various soils was studied on NA, R-medium, modified NA and R-medium. The results revealed that total bacteria of various soils were not significant, but those of diuron tolerated bacteria were significant. The highest population of diuron tolerated bacteria was found in Ss10, while the lowest one was found in Sn06. The diuron tolerated bacteria found in various soils were divided to 6 groups. Bacteria in group 1 and 4 were classified as *Bacillus* sp., but, group 2, 3, 5 and 6 were *Pseudomonas* sp. The capability on diuron degradation of selected bacteria in modified R-medium was studied. The completely randomized design with 4 replications was operated together with 5 strains of *Bacillus* sp. and 15 strains of *Pseudomonas* sp. The concerning bacteria strains were grown in modified R-medium containing 10 mg/l of diuron. The results showed that the strains of *Pseudomonas* sp. had higher efficiency on diuron degradation than those of *Bacillus* sp. The highly effective strains of *Pseudomonas* sp. on diuron degradation were SK01, SK13, SK12 and SK06 which degraded the diuron as much as 3.36, 3.06, 2.92 and 2.82 mg/l, respectively. The highest ability on diuron degradation of bacilli strain was found in *Bacillus* sp. S04 with the degraded diuron at 2.82 mg./l, while the lowest one was *Bacillus* sp. S03 which degraded the diuron as much as 2.00 mg/l. The 5 strains of bacteria, higher efficiency on diuron degradation, was selected to determine the diuron degradation in soil. The 6x5 factorial in completely randomized design with 4 replications was operated which consisted of 6 bacteria strains (*Pseudomonas* sp. SK01, *Pseudomonas* sp. SK06, *Pseudomonas* sp. SK12, *Pseudomonas* sp. SK13, *Bacillus* sp. S04 and non-inoculation) and 5 levels of diuron (0, 5, 10, 15 and 20 mg/kg). The result demonstrated that the diuron degradation ability of various bacteria strains was significant. The highest ability on diuron degradation was found in *Pseudomonas* sp. SK01 which degraded the diuron as much as 5.00, 7.18, 5.99 and 3.94 mg/kg of the rate at 5, 10, 15 and 20 mg/kg soil, respectively. *Bacillus* sp. S04 had the highest ability on tolerating the diuron.

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Thesis Advisor's signature