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JARURATANA EAMSIRI : SELECTION OF NITROGEN FIXING BACTERIA ON

RICE PHYLLOSPHERE. THESIS ADVISOR : ASSOC. PROF. PRAKITSIN SAEHANONTH,

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Selected fifteen nitrogen fixing bacterial strains were isolated from rice phyllosphere from various sources in Thailand. Three strains were identified as *Azomonas insignis*, *Azotobacter chroococcum* and *Azomonas agilis*, gave the high efficiency of nitrogen fixing activity were 0.3762, 0.7095 and 0.4048 ethylene $\mu\text{mole/mg cell dry wt/hr}$, respectively. The carbon sources, pH of media and incubation temperature affected on the efficiency of nitrogen fixation and the growth rate efficiency of these 3 strains of bacteria. We also found that *Azomonas insignis* and *Azomonas agilis* had high growth rate and nitrogen fixing efficiency when cultured in nitrogen free medium with glucose as a carbon source with optimum pH of 7 and temperature of 30°C . Moreover, *Azotobacter chroococcum* had high growth rate and nitrogen fixing efficiency when cultured in nitrogen-free medium with mannitol as a carbon source.

The effect of nitrogen fixation by these three strains of bacteria on rice growth rate was also studied by comparing with the usage of nitrogen fertilizer with amounts of 5, 10 and 12 kg/Rai. It was found that rice sprayed with *Azotobacter chroococcum* gave significantly higher growth rate than those sprayed with other two strains, and gave average growth rate close to the usage of nitrogen fertilizer with 12 kg/Rai.

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