

Arunee Kongsorn 2010: The Study on the Efficiency of Appropriated Medium for the Culturing of *Azospirillum brasilense* and *A. lipoferum*. Master of Science (Soil Science), Major Field: Soil Science, Department of Soil Science. Thesis Advisor: Associate Professor Thongchai Mala, Ph.D. 75 pages.

The study on the efficiency of appropriated medium for the culturing of *A. brasilense* and *A. lipoferum* was separated into two experiments. The experiment 1, study the effect of various carbon sources on growth *A. brasilense* and *A. lipoferum* in both solid and liquid N-free MPSS medium, was designed in 4 x 4 factorial experiment in completely randomized design with 4 replications. The first factors consisted of 4 types of carbon source (glucose, sucrose, malic acid and succinic acid), while, the another was the quantity of each carbon source (1, 5, 10 and 20 g/l). The result showed that malic acid is the best carbon source for enhancing growth of *A. brasilense* and *A. lipoferum*. Colonies of both species on MPSS medium were circular, entire, white color and convex with the size of colony diameter were 1.62 and 2.06 mm., respectively. The cell characteristic was Gram negative with the size at 0.8-1.0 and 1.0-1.4 μm respectively. General cell morphology of both species were rod, little curve with a polar flagellum. The population of *A. brasilense* and *A. lipoferum* detected in liquid medium for 24 hours were 3.89 and 194.88 $\times 10^7$ CFU/ml, respectively. The generation time of them were 60.6 and 48 min and the nitrogen fixing activity of *A. brasilense* and *A. lipoferum* were 5.63 and 4.82 $\mu\text{g}/100 \text{ ml}/\text{day}$, respectively. The characters of *A. lipoferum* in glucose-MPSS medium was studied. The results showed that the bacterial colony was circular, entire, white color and convex with the size at 2.31 mm. The cell was Gram negative, little curve and with a polar flagellum. The population of *A. lipoferum* in liquid medium at 24 hours were 3.89 $\times 10^5$ CFU/ml, however, the population was not different from that in malic acid as carbon source. The second experiment was the study of various levels of malic acid and glucose suitable for growth of *A. brasilense* and *A. lipoferum*. This experiment was completely randomized design with 4 replications. The levels of glucose and malic acid (1.0, 2.5, 5.0, 7.5, 10.0, 12.5, 15.0, 17.5 and 20.0 g/l) were studied in liquid MPSS medium. The result found that quantity of malic acid at 2.5 g/l is appropriated for growth of azospirillum. The population of *A. brasilense* and *A. lipoferum* were 91.20 and 74.10 $\times 10^7$ CFU/ml with the generation time at 48.6 and 49.2 min., respectively. The appropriated medium for *A. brasilense* and *A. lipoferum* may be composed of malic acid 2.5 g/l, $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$ 1.0 g/l, $\text{FeCl}_3 \cdot 6\text{H}_2\text{O}$ 0.002 g/l, and $\text{MnSO}_4 \cdot \text{H}_2\text{O}$ 0.002 g/l., while, the appropriated glucose level for isolation of *A. lipoferum* may be at 12.5 g/l that showed high growth of bacteria at 30.19 $\times 10^8$ CFU/ml. The generation time of bacteria in this medium was at 45.6 min. Then, the appropriated selective medium of *A. lipoferum* may be composed of D-glucose 12.5 g/l, $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$ 1.0 g/l, $\text{FeCl}_3 \cdot 6\text{H}_2\text{O}$ 0.002 g/l and $\text{MnSO}_4 \cdot \text{H}_2\text{O}$ 0.002 g/l.

Student's signature

Thesis Advisor's signature