Gunyanat Kundee 2009: Effects of Nitrifying Bacteria (PondProtect) on Ammonia, Nitrite and Some Water Parameters in Pacific White Shrimp (*Litopenaeus vannamei*) Ponds. Master of Science (Fisheries Science), Major Field: Fisheries Science, Department of Fishery Biology. Thesis Advisor: Associate Professor Chalor Limsuwan, Ph.D. 118 pages.

Efficacy of nitrifying bacteria for controlling ammonia (NH_3) and nitrite (NO_2^-) in both laboratory and cultured ponds was studied. Ammonia and nitrite were prepared by mixing sludge from a shrimp pond with shrimp feed for 3 days. After that the experiments were divided into four groups: group 1, with no bacteria, served as control and for groups 2, 3 and 4, nitrifying bacteria were added at 0.1, 0.5 and 1 mg/l, respectively. The same dosage of bacteria was added into each group again at day 7. The average ammonia in all treatment groups reduced to the lowest concentration on the fifth day at the values of 2.30±0.21, 0.90±0.12, 0.88±0.10 and 0.80±0.12 mg/l, respectively. Moreover, the lowest concentrations of nitrite were observed on the sixth day as 3.10 ±0.15, 1.99±0.07, 1.96±0.05 and 1.94±0.09 mg/l, respectively. Later on, ammonia and nitrite concentrations simultaneously increased again. However, both ammonia and nitrite dropped again on day 2 after the second application and remained lower than the control group throughout the experiment. This result indicated that nitrifying bacteria at 0.1 mg/l could reduce the amount of ammonia and nitrite. This dosage of bacteria was used to study the effects on the water quality and production of farm-reared Pacific white shrimp (*Litopenaeus vannamei*) in low salinity water. Three experimental ponds with an area of approximately 8,000 m^2 (5 rai) each and three control ponds of the same size were used. *L. vannamei* postlarvae 12 (PL 12), were stocked at the density of 100,000 shrimp/rai (63 PL/m^2). Nitrifying bacteria were prepared by mixing the bacteria with water and adding into the ponds at days 30, 85 and 110 post stocking at a rate of 1 kg/pond or 0.2 kg/1,600 m^2 (0.1 mg/l). For the control ponds, PL 12 were stocked at the same density without adding nitrifying bacteria. The salinity during the culture period ranged from 5 -8 ppt. Results showed that the average ammonia in all treatment ponds at days 30, 85 and 110 post-stocking was reduced and significantly different ($p<0.05$) from the control ponds on the fifth, third and third day respectively after bacteria were added. The average nitrite in the treatment ponds at days 30, 85 and 110 was reduced on the seventh, seventh and fifth day respectively after adding bacteria. Shrimp were harvested after 123 days. The average yield, weight and survival rate of shrimp from the experimental ponds were 1,211±190.15 kg/rai, 15.61±1.21 g and 60.37±1.98%, respectively, which was significantly ($p<0.05$) higher than in the control ponds of 1,183±265.09 kg/rai, 14.26±1.97 g and 62.27±4.60%. The average net profit in the experimental ponds was 46,648 baht/rai which was significantly higher than the control ponds' 35,852 baht/rai. The use of nitrifying bacteria for rearing Pacific white shrimp could reduce ammonia and nitrite concentration.

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