

Pajaree Jueliang 2011: Application of Spore-forming Bacteria for Controlling Pathogenic Bacteria *Vibrio harveyi* in *Litopenaeus vannamei* Culture. Master of Science (Fisheries Science), Major Field: Fisheries Science, Department of Fishery Biology. Thesis Advisor: Associate Professor Chalor Limsuwan, Ph.D. 89 pages.

Effect of spore-forming bacteria for controlling *Vibrio harveyi* and survival rate of *Litopenaeus vannamei*, was carried out by re-isolated the *Bacillus* from the product. Five strains of *Bacillus* spp. were isolated and identified as follows; *Brevibacillus parabrevis*, *Bacillus velezensis*, *B. amyloquifaciens*, *B. subtilis*, *B. megaterium*. Individual strain and product was used to test against pathogenic bacteria (*Vibrio harveyi*) on agar plate, using agar plate diffusion method. The results showed that each stain of spore-forming bacteria as well as a product could inhibit *V. harveyi* within 48 hours. Competitive growth between individual strain of *Bacillus* sp. and combination of spore-forming bacteria with *V. harveyi* was studied *in vitro*. Each species of *Bacillus* and combination of spore-forming bacteria were culture in Nutrient Broth supplemented with 1.5% NaCl. The initial concentration of experiment *Bacillus* spp. and *V. harveyi* was 10^6 CFU/ml in both monoculture and co-culture. Total *Bacillus* and *Vibrio* counts were measured at 0, 24, 48, 72, 96 and 120 hours. The result at 120 hrs post inoculation showed that combination of spore-forming bacteria, *B. velezensis*, *B. amyloquifaciens*, *B. subtilis*, *B. megaterium* and *Brevibacillus parabrevis* could decreased *V. harveyi* by 98.42, 87.37, 86.58, 85.79, 72.37 and 71.58 % respectively.

The effects of probiotic on survival and growth of juvenile *L. vannamei* (7-8 g) in laboratory conditions were also tested. Shrimp were divided into two groups. Control group was fed with the pelleted feed (no probiotic) and the treatment group fed with feed mixed with probiotic at rate of 5 g/kg of feed. At the end of 60-day culture period, the survival rate of shrimp in treatment group was 75.00 ± 1.92 % and significantly higher ($p < 0.05$) than control group which was 63.33 ± 2.72 %. However, average weight of treatment and control group was not significantly different which was 21.55 ± 1.98 g and 23.70 ± 1.57 g, respectively. And the effect of probiotic for control *Vibrio* spp. was also studied at commercial farm. The result showed that probiotic could reduce the *Vibrio* spp. count in shrimp haemolymph from 10^4 CFU/ml to 10^2 CFU/ml within 90 days while the count remained at 10^4 CFU/ml through out the 90 days culture period in the haemolymph of shrimp in the control ponds. After 90 days, average weight of shrimp in treatment ponds and control ponds were not significantly different which was 16.14 ± 1.58 g and 15.41 ± 0.80 g, respectively. Survival rate of shrimp in treatment and control ponds was also not different which was 81.73 % and 80.40%, respectively.

Student's signature

Thesis Advisor's signature