

Songsub Arungamol 2009: Application of *Schizochytrium limacinum* for Nursing Pacific White Shrimp (*Litopenaeus vanamei*, Boone) Larva and Its Effects on Immune System and Stress Tolerance. Master of Science (Aquaculture), Major Field: Aquaculture, Department of Aquaculture. Thesis Advisor: Associate Professor Nontawith Areechon, Ph.D. 67 pages.

Partial replacement and supplementation of *Chaetoceros* sp. by *Schizochytrium limacinum* during zoea stage 1 to 3 of Pacific white shrimp (*Litopenaeus vannamei*, Boone) was conducted. There were four experimental groups consisting of control (100% *Chaetoceros*), Treatment 2: 50% *Chaetoceros* and 50% *S. limacinum*, Treatment 3: 75% *Chaetoceros* and 25% *S. limacinum* and Treatment 4: 100% *Chaetoceros* and supplemented with 25% *S. limacinum*. *Artemia* was applied from mysis to postlarval stage and survival and growth rates were statistically compared. Stress tolerance by formalin and salinity shock and disease resistance against *Vibrio harveyi* of P15 were also compared. The result indicated that *L. vannamei* larva from zoea 1 to PL1 of Treatment 3 and 4 did show significantly better survival rates and stress tolerance than the control ($P < 0.05$). However, the resistance against pathogenic *V. harveyi* of control and treatment groups were not significantly different ($P > 0.05$). Another experiment was conducted by mixing the spray-dried form of *S. limacinum* as a source of highly unsaturated fatty acid in shrimp commercial pellet feed. *L. vannamei* were fed with experimental feed for 30 days and normal feed for 20 days and non-specific immunity from shrimp blood were monitored and compared at every 10 days. Shrimp that were fed with *S. limacinum* at 15 g/kg did show significantly higher values of total haemocyte count, phenoloxidase activity and bactericidal activity than the control ($P < 0.05$). However, no significant differences were detected from phagocytic activity and growth of control and experimental shrimp ($P > 0.05$). This result indicated the potential application of *Schizochytrium limacinum* as a feed supplement for the higher survival rates of *L. vannamei* nursing stage and also as an immunostimulant for grow-out pond stage.

Student's signature

Thesis Advisor's signature

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