

Jariyavadee Suriyaphan 2008: Study of Benthos, Plankton and Epiphytes in Rearing of Black Tiger Shrimp (*Penaeus monodon* Fabricius) with *Ulva intestinalis* Linnaeus. Master of Science (Fisheries Science), Major Field: Fisheries Science, Department of Fishery Biology. Thesis Advisor: Associate Professor Chalor Limsuwan, Ph.D. 178 pages.

Black tiger shrimp (*Penaeus monodon* Fabricius) culture with gut weed (*Ulva intestinalis* Linnaeus) was studied in three growout ponds (4 rais). After harvesting the shrimp, the ponds were dried without removing the sludge before water was pumped into the ponds. *U. intestinalis* was added into each pond and propagated for 50 days until it covered approximately 30% of the water surface area before stocking postlarvae (PL) 15 at a density of 25 PL/m². No pelleted feed was used until no gut weed remained in the ponds which took approximately 50 days. Three control ponds without adding *U. intestinalis* and stocking PL 15 at the same density as the experimental ponds were used. Soil and water samples to determine the abundance of plankton, benthos and soil quality were collected every 10 days. Gut weed samples for epiphyte studies and the stomach contents of the black tiger shrimp were also collected. Results showed that plankton growth in the control ponds was significantly higher than that in the experimental ponds ($P < 0.05$). *Microcystis* and *Oscillatoria* were the predominant genera throughout the culture period. The abundance of plankton in the experimental ponds was related to the biomass of *U. intestinalis* in which phytoplankton numbers decreased when the biomass of *U. intestinalis* increased, while the benthos in the experimental ponds was significantly higher than in the control ponds ($P < 0.05$). The predominant organisms were bivalves and chironomids which increased in numbers when the biomass of *U. intestinalis* increased. Epiphytes found on *U. intestinalis* belonged to phytoplankton in the Division Cyanophyta, Chlorophyta and Chromophyta; zooplankton found belonged to the Phyla Protozoa, Rotifera, Arthropoda, Mollusca and Nematoda, and especially pennate diatoms followed by dinoflagellates. Larval and mature stages of the bivalves which were the predominant benthos were also found on *U. intestinalis*. Parts of gut weed were observed from the stomach contents of the black tiger shrimp indicating that shrimp consumed this algae even though it was not a main food as the biomass of *U. intestinalis* slightly decreased after stocking PL. Water quality parameters from both the experimental and control ponds were suitable for shrimp culture; total nitrogen and phosphorus in the soil increased slightly at the late stage of culture especially at the feeding area and in the middle of the ponds. At shrimp harvest, the average yield and survival rate from the experimental ponds were 807 kg/rai and 69 % respectively, which were significantly higher than the control ponds' results of 678 kg/rai and 59 %. This study showed that black tiger shrimp culture with *U. intestinalis* could increase benthic organisms which significantly improved the survival rate and growth of the shrimp.

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