The Experiment I, 10-20 ×104 Cell Per Ml Feeding For Larval Rearing Index of Black Tiger Shrimp (Penaeus Monodon)

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Abstract- ***This research, the possible role of two different algal species as live food in larval rearing of black tiger shrimp (P naeus monodon Fabricius) had been investigated under laboratory conditions. The experimental study on the growth and survival of larvae was conducted with two different stocking densities of 1000 pieces per tank and 2500 pieces per tank in concrete tanks of 100 liters culture media for 16 days. During the larval rearing experiments feeds and feeding were conducted with two different types of algal species as live food, namely, Tetraselmis chuii and Dunaliella salina for early iarval stages of zoea and zooplankton (Artemia nauplii) for iate larval stages of mysis onwards. At the end of the experiment, the results of post larval stages 6 to 7 (PLu-t) were obtained at 63.2% survival rate in tank No. 1 fed with Tetraselmis chuii and 66 5% survival rate in tank No. 2 fed wrth Dunaliella salina respectively in experiment I. For the experiment II, the survival rates were obtained as 55 3% in tank No. 3 fed with Tetraselmis chuii and 60.0% in tank No. 4 fed with Dunaliella salina respectively.***

Indexed Terms- ***Algal, zoea, iarval stages, tank, Tetraselmis chuii***

I. INTRODUCTION

PREPARATION OF LARVAL REARING EXPERIMENT

Hatchery operation room and area were disinfected with chlorine water of 100 ppm concentration and kept dry for 2-3 days. Before the research experiment, the materials used for operation were disinfected through the different ways of Sterilization methods.

a. Preparation of Tanks Facilities

Before the experiment on the larval rearing of black tiger shrimp (Penaeus monodon) tank facilities, such as water storage tank, spawning tank, hatching tank, lawal rearing tanks were washed with soap and cleaned with freshwater. Then rinsed with formahn at 250 ppm concentration and kept dry for 4-6 hours. After dry, filled with desired amount of disinfected seawater pass through a filter bag of 3-5 pr mesh aperture.

b. Air Supply System

The main air distribution pipe line, sub distribution pipe lines were disinfected with the smell of formalin pass through from the air inlet of voltex blower for 2-3 hours. The plastic tubing and air stones were sterile with chlorine solution of 25 ppm concentration for 24 hours and washed with clean freshwater and treated with thiosulphate solution for dechlorination.

c. Water Supply System

The main water distribution line and plastic hoses of various sizes used in water supply system were rinsed with dilute hydrochloric acid (10% HCI) and washed with clean freshwater and kept dry for 3 days.

d. Tools and Equipment

The glass wares and plastic wares such as petri dishes, test tubes, beaker, measuring cylinder, plastic basin, plastic bucket, plastic pail, were ringed with dilute hydrochloric acid (10 %HCI) and washed with clean freshwater. During the operation period, the materials used in operation were disinfected with potassium permanganate solution.

II. EXPERIMENT I FOR LARVAL REARING INDEX OF BLACK TIGER SHRIMP (PENAEUS MONODON)

This experiment was conducted in 120 liters concrete tanks with 100 liters of culture medium. In each tank, the stocking rate was conducted with 10 pieces per liter and stocking density was conducted 1000 pieces per tank.

Before the stocking of larvae, the prepared tanks were filled with 28 ppt salinity of disinfected seawater, passed through a filter bag of 3-5 micron mesh aperture.

Firstly, the culture tanks were filled with 60% of culture capacity of the tanks and provided with continuous aeration. After stocking larvae in the required amount of water were added daily until the desired capacty of 100 liters. After five to six days of culture experiments, daily were exchanged with l0-20% of culture medium from the concrete tank.

During the experiment, the feeds and feeding was conducted with three different types of organisms, namely, photoplanktons (Tetraselntis chuii and Duneliella salina) for early larval stages of zoea and zooplankton (Artemia nauplii) for late larval stages of Mysis onwards as live food. Tetraselmis chnii was fed in tank No. I and Dunaliella salind was fed in tank No. 2 wrth the feeding density of 10-25× 10^4 cells per ml. Feeding of Arternia nauplii was started at Mysis stage 1 (M1) with the feeding of 1 -3 pieces per ml of culture medium. Feeding frequency of live food organisms was conducted two times per day at morning and evening.

During the larval rearing experiment, the physio-chemical parameters of culture tanks were monitored daily and recorded. The survival, chronological growth stages and health of the larvae were checked daily by crude observation and random samples examination at morning and evening. For the good water quality, the rearing water were regularly treated with chemicals, such as EDTA, ox tetracycline and oxygen powder for buffering activity, prevention of general pathogens and higher concentration of dissolved oxygen.

After 16 days of culture experiment, the larvae of black tiger shrimp at post larval stages 6 and 7 (PL6-7) were harvested and counted individually. Then, calculated the survival rates ofnost larvae from each culture tanks.

III. EXPERIMENTAL RESULTS FOR LARVAL REARING INDEX OF BLACK TIGER SHRIMP (PENAEUS MONODON)

In this experiment, the black tiger shrimp (Penaeus monodon) larvae at the nauplii stages N+-Ns from WINNER BROTHER Co., Ltd. were transported by car to the hatchery. After arrlal to the hatchery, acclimation of water temperature, water pH, water salinity were conducted for the stability of larvae in new environmental conditions. After acclimation, the larvae were stocked in the prepared larval rearing tanks and provided with conditions aeration.

For the lawal rearing experiment, there were conducted with two different stocking densities of 1000 pieces for experiment I. After 16 days of larval rearing experiments, the results were recorded as follows.

a. Tank No. 1 (Experiment I)

In this experiment I, estimated counted numbers of 1000 pieces nauplii at the stages of N_4-N_5 were stocked in the tank and the stocking density was at the rate of 10 nauplii per liter. The larvae were fed Tetraselmis chuii and Artemia. Nursery and larval rearing experiment was conducted for 16 days from the date of (2.1.2019) to (18.1.2019). After larval rearing experiment 630 pieces of 6-7 days old post larvae (PLo-z) were harvested. During the larval rearing experiment, the chronological development of the metamorphosis growth stages, type of feed and feeding rate and survival rate were found as follows.

Table 1. Type of feed and feeding rate and survival rate

Larval Stage	Larval Density(pcs)	Type of feeding and feeding rate		Tank 1
		Tetraselmis chuii(cell/ml)×10^4	Artemia nau	Survial

			plii (pcs /ml)	rate %
N_4-N_5	1000	-	-	100.0
N_6-Z_1	990	10	-	98.2
Z_1	950	15	-	95.3
Z_1- Z_2	930	20	-	92.6
Z_2- Z_3	900	25	-	90.0
Z_3	880	25	-	87.8
Z_3-M_1	840	25	-	84.4
M_1-M_2	820	25	-	81.7
M_2-M_3	800	20	1-2	80.0
M_3-PL	780	15	2-3	77.8
PL_{1-2}	750	10	2-3	74.5
PL_{2-3}	730	10	1-3	73.2
PL_{3-4}	710	5	1-3	70.6
PL_{4-5}	690	5	1-3	69.0
PL_{5-6}	680	3	1-3	68.4
PL_{6-7}	670	3	1-3	66.5

According to the above data, the gradually decrease of survival rate was shown as 63.2%. It may be due to entirely on the stocking density feed and feeding management and the water cluality management.

During the 16 days of larval rearing experiment period, the water temperature in larval rearing tank was recorded as the minimum of 26°C and maximum of 28.5°C. The air temperature of culture room was 27oC to 35oC. The range of pH in larval rearing tank was 8.2 to 8.5 and salinity was 28-30 ppt respectively. The detail recorded data of water parameters were shown in Table 1 and Figures.1and 2.

b. Tank No. 2 (Experiment l)

In this experiment, estimated counted numbers of 1000 pieces nauplii at the stages of N_4-N_5 were stocked in the tank and the stocking density was at the rate of 10 nauplii per liter. The larvae were fed Dunaliella salina and Artemla. Nursery and larval rearing experiment rvas conducted for 16 days from the date of (2.1.2019) to (18.1.2019). After larval rearing experiment 670 pieces of 6-7 days old post larvae (PLo-z) were harvested. During the larval rearing experiment, the chronological development of the metamorphosis growth stages, type of feed and feeding rate and survival rate were found in table 1. According to the age of culture period, the gradually decrease of survival rate was shown as 66.5%. The larvae were fed Dttnaliellq salina and Artemia nauplii. Higher survival rate of tank No. 2 than tank No. 1 may be due to entirely on the stocking density feed and feeding management and the water quality.

During 16 days of larval rearing experiment period, the water temperature in larval rearing tank was recorded as the minimum of 26.5°C and maximum of 29.0°C. The air temperature of culture room was 27oC to 35oC. The range of water pH in larval rearing tank was 8.2 to 8.5 and salinity range was 28-30 ppt respectively. The detail recorded data of water parameters were shown in Figures 3 and 4.

Table 2.Type of feed and feeding rate and survival rate

Larval Stage	Larval Density(pcs)	Type of feeding and feeding rate		Tank 2
		Tetraselmis chuii (cell/ml)× 10^4	Artemia nauplii (pcs/ml)	Survial rate%
N_4-N_5	1000	-	-	100.0
N_6-Z_1	970	10	-	97.3
Z_1	900	15	-	89.8
Z_1- Z_2	870	20	-	86.6
Z_2- Z_3	850	25	-	84.9
Z_3	820	25	-	82.0
Z_3-M_1	780	25	-	77.7
M_1-M_2	750	25	-	75.3
M_2-M_3	740	20	1-2	73.6
M_3-PL	720	15	2-3	72.4
PL_{1-2}	700	10	2-3	70.0
PL_{2-3}	680	10	1-3	68.8
PL_{3-4}	670	5	1-3	67.2
PL_{4-5}	650	5	1-3	65.0
PL_{5-6}	640	3	1-3	63.8
L_{6-7}	630	3	1-3	63.2

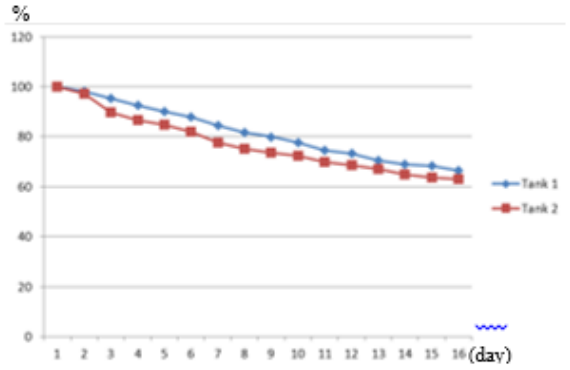

Fig.1. Culture period (day) Survival rate % Penaeus monodon Larvae in Culture Tanks

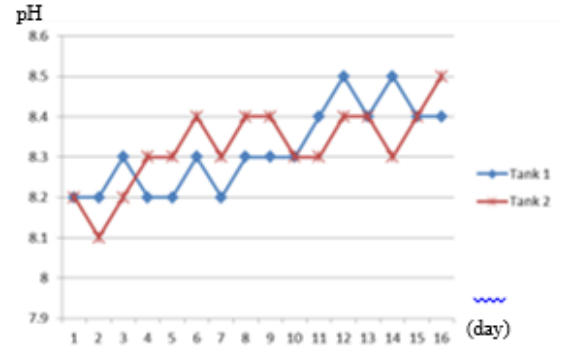

Fig.2 Culture period (day) & Water pH Penaeus monodon Larvae in Culture Tanks

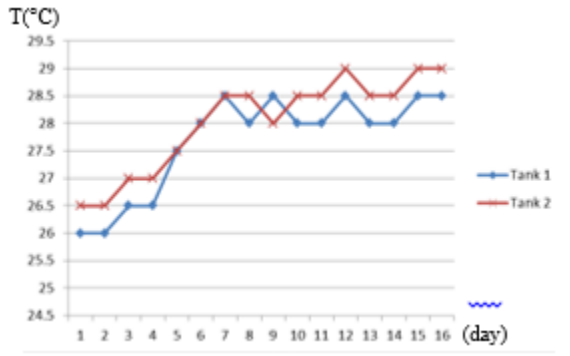

Fig.3. Culture period (day) & Temperature(°C) Penaeus monodon Larvae in Culture Tanks

IV. CONCLUSION

The results and information obtained from the larvicul-ture experiments, there were learned that the technology know-how in the effect of different type of algal feeds, namely Dunaliello salina and Tetraselmis chuii on the growth and survival of black tiger shrimp larvae and showed accepted the different types of algal feeds and grew well. Also, there were learned that the technology know-how on the stocking densities dependence of the lawal stages of black tiger shrimp. From the results, there may be confirmed that the lower in stocking density may obtained higher in survival rates and the higher in stocking density may lower in survival rates of black tiger shrimp post larvae.

Finally, from the obtained results and information of the experiments, it may be confirmed that research works were achieved successfully for the technology know-how in larvi-culture of black tiger shrimp.

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