International Journal Of Scientific And University Research Publication

ISSN No 301/704

Listed & Index with
ISSN Directory. Paris

Multi-Subject Journal

Volum : (13) | Issue : 205 |

INTERNATIONAL JOURNAL OF SCIENTIFIC AND UNIVERSITY RESEARCH PUBLICATION

Research Paper

GROWTH OF CULTURED WHITE LEG SHRIMP LITOPENAEUS VANNAMEI (BOONE, 1931) OF BRACKISH WATER CULTURE SYSTEM IN WINTER SEASON WITH ARTIFICIAL DIET

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ABSTRACT **The White leg shrimp Litopenaeus vannamei culture was conducted from three ponds each one of 0.5 ha for the study. Semi-Intensive culture system was selected under brackish water sh water conditions. Stocking densities (post larvae) were taken from 3 samples; each one contains 50 Numbers/m2. In winter season in month of November to February, the water quality parameters were measured fortnightly in a month at 7 a. m. The production was 3200, 3318 and 3459 kg and FCR was 1.43, 1.51 and 1.46 and the final growth was 16.50, 17.00 and 17.50 g /90, 92 and 94 days for P1, P2 and P3, respectively.**

KEYWORDS :L. vannamei; Temperature; Salinity; Density; Feed; Growth and

INTRODUCTION

Because of the high demand for shrimps in Japan, the United States and Europe, shrimp aquaculture has expanded rapidly in all around the world, especially in tropical areas, such as Southeast Asia and Latin America [1]. Among all species of shrimp, L. *vannamei*, which represent over 90% of shrimp culture in the Western hemisphere, is the most commonly cultured shrimp in Central and South American countries, China, and Thailand [2-4]. India has the one of the longest line of 8118 km.

Material and Methods

The shrimp 15 days old post larvae L.*vannamei* at beginning the study collected from BMR hatchery. The winter season experiments the species L.*vannamei* survival were 82, 84 and 86%, respectively. Water depth maintained 8 ft. The water takes from creek pumped to 3 ponds by PVC pipe (size 2½ inch). The PH, temperature, salinity and DO ranges up to 7.0-8.2, 13.0- 16.5ºC, 6.0-12.5 ppt and 3.4-4.2 ppm/day for P1, P2 and P3. The artificial diet was given made by Manamei feed (protein% 35 (Feed No. 1, 2, 3 and 3S) and 34(Feed No. 3M)).

Results

In the experiment the water quality parameters are presented (Table 1). The species *L.vannamei* well grow, the body weight increased 3.0-3.5 g and ADG 0.18 g (P1, P2 and P3)15 days in Indian climate conditions, which is better than other countries. In the culture system the growth rate increased due to the artificial feed supplementation in the season. The mean average weights of the shrimp at harvest were 16.5, 17.0 and 17.5 g (Tables 2, 3 and 4) and production was 3200, 3318 and 3459 kg and FCR was 1.36, 1.40 and 1.46/90, 92 and 94 for P1, P2 and P3, respectively.

Discussion

A large number of shrimp could be assembled on the aquaria bottom from the artificial substrates [5]. Many studies have illustrated that artificial substrates could increase shrimp growth and survival [6,7]. Abiotic factors such as temperature and salinity may also affect the protein requirement [8]. “Booster” mineral is given to 3 ponds depending on biomass for development the minerals. “Opti oxygen” controls the DO. “AQ lite” for bottom clears. The shrimp maintained at 35ºC had the highest rate of food consumption Arenda et al. [9] recorded the average growth rate of 0.38 g/wk in the 90 shrimp/ m2 and lowest in the 180 shrimp/m2 (0.33 g/wk). My observation at 7-8.2ºC the shrimp highest growth rate 4 g/fortnightly (50 shrimp/m2) and lowest growth 3.5 g/fortnightly (50 shrimp/m2) /94 and 92 days.

Parameters	P1 range	P2 range	P3 range
PH	7.0-7.5		7.5-8.2
Temperature (ºC)	13.0-16.0		13.5-16.5
Salinity (ppt)	6.0-12.0	6.0-12.5	6.5-12.5
DO (ppm)	3.4-4.0	3.5-4.0	3.5-4.2

Table 1: Average water quality parameters

Pond						
	15	30	45	60	75	
P1	2.00	4.00	7.00	10.00	13.00	

Table 2: Fortnightly growth performance (g)

Pond						
	15	30	45	60		75
P2	2.00	4.50	7.50	10.50		13.50

Table 3: Fortnightly growth performance (g)

Pond						
	15	30	45	60	75	94
P2	2.00	4.50	7.50	10.50	13.50	17.50

Table 4: Fortnightly growth performance (g)

Details	Pond 1	Pond 2	Pond 3
Area (ha)	0.5	0.5	0.5
Initial stocking (Numbers)	2,50,000	2,50,000	2,50,000
Density/m^2	50	50	50
Stocking Date	02/11/2012	02/11/2012	02/11/2012
PL stocking (Days)	PL	PL	PL
Harvest Date	02/02/2013	04/02/2013	06/02/2013
Harvest size (gm)	16.50	17.00	17.50
Count (numbers/kg)	60.6	58.8	57.1
Doc	95	98	101
Survival (%)	82	84	86

		FCR	1.36	1.40	1.46
ADG (g)	0.18		0.18		0.18
Production (kg)	3200		3318		3459
Total feed (kg)	2352		2359.40		2486.70
Seed cost/kg shrimp	Rs 20.50		Rs 20.50		Rs 20.50

Table 5: Average Cost Analysis

Early morning Dissolved Oxygen concentration was between 3 and 5 mg1-1; salinity was above 15% during the first week of grow out pond, which is preferable for post larvae [10-15]. In early morning I reported Dissolved Oxygen concentration was between 3.4-4.2 ppm and salinity was between 6-12.5 ppt. For each pond cost analysis was worked out. Production cost for 1 kg shrimp (60.6, 58.8 and 57.1 counts) was calculated as Rs 300, 350 and 380. The feed cost was Rs 71.84/kg, followed by seed cost Rs 20.50/kg. Totally feed was used 2352, 2359 and 2359 kg. According to Danya Babu Ravuru and Jagadish Naik Mude, in summer season better production (kg) and profit (Rs) was 8337, 8932 and 9450; 218.34, 243.63 and 272.66/P1, P2 and P3 for 120, 123 and 126 days and 3200, 3318 and 3459; 102, 152 and 182/ P1, P2 and P3 for 90, 92 and 94 days (Table 5).

CONCLUSION

In the present study, it has been observed, Temperature, Salinity, Dissolved Oxygen, Density and Survival. The shrimp *L.vannamei* culture is successful in brackish water and shrimp growth was increased with artificial feed.

Acknowledgement Authors are thankful to the Farmer and Owner of the culture ponds K. Ramana (Neeli Aqua Pvt Ltd) in Chinaganjam Village, Prakasakm District, for their encouragement and provided facilities up to harvest.

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