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Experiment on larval rearing of *Penaeus monodon* fed with cultured diatom *Chaetoceros calcitran* and fermented vegetable trash

H. Motoh

A gravid *Penaeus monodon* obtained from the wild was placed in a one-ton Fiber Reinforced Plastic (FRP) tank located outside the Wet Laboratory, Tigbauan on June 4, 1978. Complete spawning occurred at night.

The following morning, the eggs were counted using one-liter beakers, getting a total of 15 random samples. The seawater was stirred to keep the eggs in suspension to have even distribution before each sampling. Total number of eggs approximated 418,000. The eggs hatched late in the afternoon. Prior to stocking, the larvae (N_{3-4}) were counted, numbering approximately 253,000. Six one-ton FRP tanks were stocked at densities varying from 24.6 to 48.8 larvae/L.

On June 7, some larvae molted to zoea (Z_1) so that to tanks 1 to 4 were added diatom, *Chaetoceros* sp. and to tanks 5 and 6 added fermented kitchen trash. Trash included fruits and their peels, vegetables, rice, etc. Oily materials as well as cigarette butts were removed before feeding. Fermentation was done by strongly aerating the materials in a bucket filled with water for around one week until they disintegrated and dissolved.

Larval survival and development were monitored daily. Starting from the first zoea stage (Z_1) water was changed every morning from 1/4 to 1/3 of the total volume to avoid pollution. Two to 4 liters of fresh water was added every day to compensate for water loss due to heavy evaporation. However, voluminous amounts of fresh water were added starting from the first mysis stage (M_1), since larvae thrive better at lowered salinity. Feeding was done every morning and afternoon, and at intervals, when rearing water appears transparent.

Rotifer, *Brachionus plicatilis*, was added starting from M_1 . Brine shrimp was not added due to its inavailability.

Water temperature was approximately 28°C at around 0830 hours in the morning throughout the experimental period.

Larvae fed with kitchen trash exhibited late stage development and smaller size compared to those fed with diatom. This may be accounted for by the low protein content or shortage of other nutrients from said feed (as can be judged by the kind of material used), which may not have sufficed for the requirement of the larvae.

Eventually, this deficiency may be the cause of low survival and inability to survive until postlarva, reaching only the second stage of mysis (M_2).

However, with the use of trash materials of high protein content, larvae may reach postlarva, and, be a substitute especially for local fishermen.

Table 1. Record on comparative survival of *Penaeus monodon* larvae fed with cultured diatom, *Chaetoceros calcitrans*, and fermented kitchen trash, June 1978.

Date	Average temp. (°C)	Average salinity (%)	Larval stage		A. Diatom (<i>Chaetoceros calcitrans</i>)								B. Vegetable trash			
			A	B	Tank 1		Tank 2		Tank 3		Tank 4		Tank 5		Tank 6	
					Larval count	Survival rate (%)	Larval count	Survival rate (%)	Larval count	Survival rate (%)	Larval count	Survival rate (%)	Larval count	Survival rate (%)	Larval count	Survival rate (%)
June 6	30.5	34.0	N ₅₋₆	N ₅₋₆	27,400	(100)	26,400	(100)	48,800	(100)	27,800	(100)	29,200	(100)	24,600	(100)
7	28.2	33.0	N _{6-Z₁}	N _{6-Z₁}	25,400	(92.7)	21,800	(82.6)	39,800	(81.6)	18,000	(64.7)	23,800	(81.5)	13,800	(56.1)
8	28.0	32.3	Z ₁	Z ₁	24,200	(88.3)	22,000	(83.3)	38,800	(79.5)	19,400	(69.8)	21,200	(72.6)	19,000	(77.2)
9	28.1	33.5	Z ₁	Z ₁	16,600	(60.6)	22,600	(85.6)	35,800	(73.4)	22,600	(81.3)	17,400	(59.6)	16,000	(65.0)
10	27.0	33.0	Z ₂	Z ₁₋₂	15,600	(56.9)	17,400	(65.9)	20,000	(41.0)	9,800	(35.3)	11,600	(39.7)	16,400	(66.7)
11	27.0	32.0	Z ₂	Z ₂	14,000	(51.1)	7,800	(29.5)	35,400	(72.5)	9,600	(34.5)	6,000	(20.5)	7,600	(30.9)
12	28.00	32.0	Z ₃	Z ₂₋₃	10,800	(39.4)	4,000	(15.2)	26,600	(54.5)	8,800	(31.7)	4,000	(13.7)	1,800	(7.3)
13	28.1	32.0	M ₁	Z ₃	14,400	(52.6)	3,400	(12.9)	33,000	(67.6)	6,200	(22.3)	5,400	(18.5)	2,800	(10.6)
14	28.0	30.1	M ₁₋₂	Z ₃ -M ₁	14,000	(51.1)	2,600	(9.8)	31,800	(65.2)	6,800	(24.5)	6,200	(21.2)	2,800	(11.4)
15	27.7	30.1	M ₂	M ₁	9,000	(32.8)	1,200	(4.5)	7,800	(16.0)	4,200	(15.1)	4,400	(15.1)	4,200	(17.1)
16	27.2	30.1	M ₂₋₃	M ₁₋₂	6,800	(24.8)	1,800	(6.8)	5,000	(10.2)	3,600	(12.9)	800	(2.7)	1,000	(4.1)
17	27.8	30.1	M ₃	M ₂	5,000	(18.2)	1,000	(3.8)	800	(1.6)	2,600	(9.3)	400	(1.4)	200	(6.8)
18	27.0	30.0	M ₃ -P ₁		1,600	(5.8)	1,000	(3.8)	200	(.4)	2,400	(8.6)	D I E D		D I E D	

Note: The discrepancy on estimated number of larvae was probably due to sampling error.