Internship Experiment in the Bang la hatchery of Fisheries Do Son – Hai Phong, Vietnam

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INTRODUCTION

Sea crab (*Scylla serrata*) one quarter of seafood, with high economic value, are cultured in the coastal province in Vietnam.

In recent years, by demand in domestic and commercial crab exports increased, with fishing natural crab and culture farming has also grown in many places in the country, but source of seed is not sufficient to farmers. In order to solve the same problem, many studies on artificial reproduction of seed production crab, Nguyen Co Thach, 2001 artificial reproductive success of blue was opening for the research and production of seed. Survival rate from Zoae period to fry increasingly improved from 4.09% (Nguyen Co Thach, 2001) has gained 7.5%. However, the production process is not stable like crabs, larval survival rate, and low survival difference in the hatchery.

The survival rate of crab larvae to crab stage zoae quite low and flour together in the same camp, one of the causes of the problem is nutrition for the development stages of crab larvae has not been completed. Natural food is considered to provide adequate nutrition for the larvae of a particular period, and Zoae to Megalop. Using always the same, rotifer and copepod nauplii and larvae of Artemia was research by several authors in the world and proved experimentally. However, adoption is always the same biomass, copepod larvae fed to the crabs are not the production facilities due to lack of technical application, and most of them use the food industry (Lansy, fripark) and Artemia eggs.

To assess the current status of crab seed production techniques and experiments are used to use rotifer and copepod nauplii larval stage zoae to improve seed production in some camps have produced significant and indeed necessary. We plan to select a hatchery Bang La - Son. The owner of the farm are a doctor and a masters names Tran Van Dan and Dang Minh Dung, a staff of Research Institute of Marine Fishsery, they have experienced and professional in production marine fish. This is the basis equipped facilities is relatively modern, the annual farm has produced millions seed of crab, prawn, shrimp and tens of thousands of four eye sleeper *(Bostrichthys sinensis)* seed.

Purposes subject:

Understanding and evaluating the production of crab basis propose solutions to enhance the development of efficient production facilities.

The meaning of science:

- Support some new information about seed production technology in Vietnam
  Practical significance: To help students better understand the current state of technology in production facilities like private hatchery.

PART II: CONTENT AND METHODS

2.1. Location and time and study subjects

2.1.1. Location:

This study is expected to produce fish at Bang La Hatching Fisheries in Do Son - Hai Phong.

2.1.2. Implementation period

From March - 8 / 20102.

2.1.3. Audience research

Aquatic breeding farm Bang La - Do Son - Hai Phong.

2.2. Content research

- Learn crab seed production techniques
- Experimental use of rotifers, copepod nauplii as feed for Zoae period.
- Propose some solutions for improving production efficiency

2.3. Research Methodology

2.3.1. Data collection

- Interviews with staff members in the hatchery, which in the situation of production and business establishments.
- Allocation of experimental data collection

2.3.2. Experimental layout.

2.3.2.1. Breeding experiments clapping her mature crabs in tanks: 03 Disposition wife of her aquarium with a capacity of 2 - 3m3

- The regime of care: a pat Feed squid, shrimp settlement signed

Change the water daily rate (50-100%)

The monitoring indicators: environmental conditions, the rate of maturation, hatching rate.

2.3.2.2. Experimental larvae hatching

- Arranging the system level in the tank with a capacity tich5 - 6m3, Zoae hatching larvae.
- Megalop larvae hatching in outdoor tanks system with capacity 8 - 10m3.
- Use Food: The larvae feed Zoae Rotifers, copepod nauplii, Artemia nauplii Vinh Chau, food industry (Fripark, Lansy). Megalop fed Artemia biomass, homemade food (mostly meat, egg yolk cooked minced)

General Food .- (Lansy effect, Frippak), divided equally four meals per day from Z1 - Z5.

- Fresh Food to eat before determining density, to supplement.

2.4. Processing method and data analysis

- Data is processed on Excel software

PART III: RESULT AND DISCUSSION

3.1. The technical reproduction of mud crab in Bang la hachtchery

3.1.1 Broodstock

<u>Choosen of broodstock</u>: Healthy individual, not to hew, foot and leg swim fully assigned latitude, ovarian development from stage 2 to stage 4
<u>Broodstock technical</u>

a) Tank for culture: Mother made crab aquarium cement capacity of 2 - 3m^3. Mother crab aquarium bottom layer is designed as water filtration systems, including third bottom of aquarium with sand thickness from 10 - 15cm.

Bang la hatchery of fisheries

b) Density: 2 - 3 individual/m^2
c) Feeding and managerment:
+ Feed : Ingredient of food :
- Gazza minuta 60 - 70% diet.
- Shrimp, squid, molluss: 30 - 40% of diet.
- Food been enriched because of high mineral and vitamin before you eat your mother.
+ Feed: eat crab every day for 2 times as bright from 5-7 hours and afternoon feeding at 17-18 hours, before each meal to remove excess food.
+ Water exchange: Daily instead third old water, add new water, after 3 - 5 days old instead of 100% of the water supply.
When crab developed ovarian last reached stage IV, change the salinity .The conditional of environment always:
- pH = 8,0 - 8,5
- Salinity = 30 – 32ppt
- H_2S; NH_3-N; NO_2 - N < 0,01 mg/l
- Air compressor 24/24h.
+ Time for broodstock 10 - 30 days / 1 phase.

Check egg of mud crab

3.1.2. Spawn

Periodically check the development of the gonads: 3 days/1 time. When crab's ovary development in late stage IV, we conducted stimulating by changing salinity and water flows to stimulation for spawn.

Table 1. The result of broodstock and spawn

Times	Number	Number of spawn	Rate of spawn (%)
I (20/3- 20/4/2010)	9	5	55.56
II (4/4- 5/5/2010)	11	6	54.55
III (15/5- 15/6/2010)	9	5	55.56

3.1.3 Incubation and management

Using net for crab eggs from cracking hug, then passed through sanitation and incubation tank. Swimming incubation can be from 120 to 150 liters. Hang on to egg hatching eat once a day and 100% water change. Before the eggs hatch into larvae two days, handling eggs and embryos of his mother while stopped to eat crab. The incubation period from 13-17 days, maintained continuous aeration 24/24 hours and always keep the environment clean water.

Table 2 : Environment of tank for nursing

pH	H_2S	NH_3-N	NO_2-N	Salinity (ppt)	Temperature (^oC)
8,0 - 8,6	< 0,01	< 0,01	< 0,01	30 - 35	27 - 29

3.1.4. Havest Zoae

Crab eggs hatch into larvae Zoae occurred at 6.30 pm to 8 am, sometimes these processes occur more slowly but almost all the larvae in these appearances were killed in late stage Z1 and Z2. After the eggs hatch into larvae about 30 minutes, collecting larvae Zoae conducted. Method of collection: Before collecting larvae, aeration off all, to such 3 - 5 minutes, then the whole larva Zoae good quality optics and will rise towards the water's surface, are clustered. Number of poor-quality larval deposition at the bottom. Use pipe siphons remove all poor quality larvae, larvae-quality collection of the 100-liter plastic container, then transferred into the tank and quantitative level. Completion time for larvae 10-15 minutes.

3.1.5. The technical for nursing Zoae

Before they hatched Artemia (Artemia) to eat at the end of stage Z1 larval stage. Larvae eat daily for 2 - 3 times per day at 5-6 hours, 15-18 hour and 24 - 1 hour. Maintain the food density in the tank level as follows:

+ And care management:

In the early days of the first phase Zoae siphons to remove dead livestock environmental contamination (by a lot of dead larvae (approximately 40-50%). From 2 to Zoae Zoae stage 5, end stage cleaning siphons run a tank on the bottom. Do not change water levels during hatching.

Engineering Central Zoae stage 4, 5 and crab meal

- Some preparatory work:
+ Feeding Artemia biomass as food for the larval stage before Meagalope from 5-7 days.
+ Prepare the standard (Table 3), the process used to run like before Zoae larvae.
Table 3: Criteria used in the process of hatching larvae

Salinity	pH	NH- N (mg/l)	NO2-N(mg)	Fe+2(mg/l)	Nhiệt độ (oC)
25- 27	8,0- 8,5	<0,1	<0,1	<0,01	28- 30

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Table 4: Criteria used in the process of hatching larvae

Times	**Number of nursing (million larvae)**	**Number of Me (million larvae)**
I (3/5 – 10/6/2010)	7.8	0,75
II (20/5 – 25/6/2010)	10,2	1,24
III (15/6 – 22/7/2010)	8.2	1,52

Collected by the entire larval siphons Zoae 5 and Megalope bucket to move the tank and run Megalope Zoae 5.
Transfer of newly-collected larvae in the tank level.
Drop-swimming larvae to run.
-Density level of about 50 individual larvae / 1 liter.
-Food and care management larval stage vaMegalope Zoae 5.
+ Food and feeding method:
Nauplius of Artemia fed off stage and Megalope Zoae. Artemia larvae eat biomass for 5 days, fed three times daily: morning from 5-6 hours; afternoon from 17 to 18 hours and from 24 pm - 1 hour. Artemia feeding density maintained from 20 to 25 individuals per liter.
Approximately 2-3 days of the last larval stage Megalope, the larvae eat more processed foods. When Megalope period ends, continue to eat Artemia biomass and food processing until dough crab harvested from 3-5 days old.
+ Care Management: Poker room full tank to remove excess food and dead fish can not move by stages from 5 to Megalope Zoae Megalope to and from crab meal. Daily inspection of environmental factors in order to promptly handle the fluctuation of environmental factors adversely affecting larval life.

Tank outdoor for nursing megalope

Harvesting and transportation of flour

+ Powder crab:

-Withdrawal of water in the tank to about 20cm.

-Fish out the shells as a shelter for the crab powder.

-Remove the crabs dry powder collected at the same time through 2mm mesh size.

+ Shipping powder technique to pond level:

For a thin layer of fine sand in the bottom of transport equipment such as buckets, plastic and so can the thickness of the layer of sand about 1 to 1.5 cm.

Shipping-dry density: 2 - 3 con/cm^2 bottom area of transportation equipment.

Times for transported from 24-30 hours. The survival rate about 90-99%.

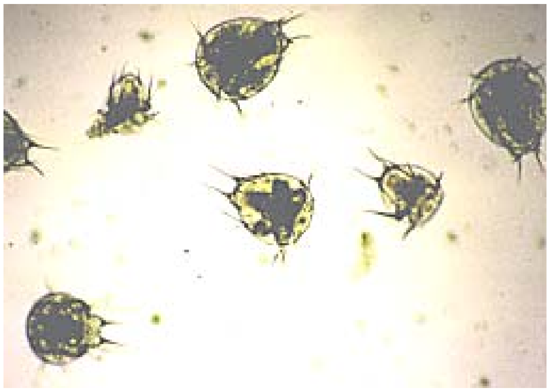
Table 5. Result nursing

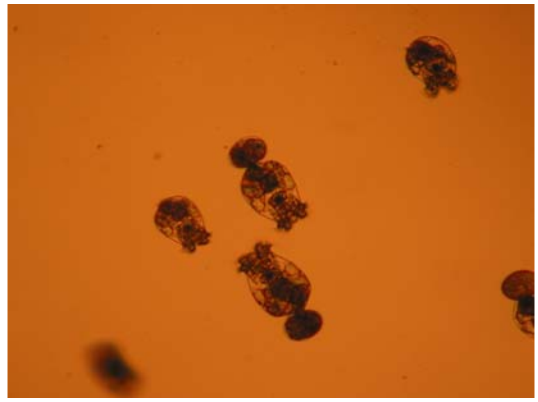
Times	Number of Zoae (million)	Number of seed ((million)	Survival of larvae from Zoae to seed (%)
I (3/5 – 10/6/2010)	7.5	0.25	3.33
II (20/5 – 25/6/2010)	10,2	0.64	6.27
III (15/6 – 22/7/2010)	8.2	0.72	8.78

3.2. Result of use rotifers and copepod in nursing Zoae to Megalope

3.2.1. Research results the influence of some food items to the conversion rate of the larvae stage Zoea to Megalopa

Results showed that the variation of environmental factors such as daily monitoring t0, pH, DO, S ‰, during experiments without major changes. Water temperature in the range suitable for Crab Zoea larval growth, ranging from 22 - 310C, the highest DO was 5 mg / l and lowest was 3.5 mg / l, ¬ levels of NO2 - N 0.001 to 0.090 for Average low pH ranges from 8.0 to 8.3 and suitable salinity range from 29 to 30.5 ‰.





Nauplii copepod use for larvae

Rotifer used food for larvae

Algae cultured in bag

Table 6: Influence of food to the survival rate through each stage of the crab larvae

Feed	The survival from Zoae - Megalope (%)				
	Z1-Z2	Z2-Z3	Z3-Z4	Z4-Z5	Z5-Me
I	68.32^{b}±1,36	78,38^{b}±2,54	74,67^{c}±5,22	73,11^{b}±5.28	62,11^{b}±2,10
II	72,22^{c} ±1,06	82,38^{b}±4,47	80,73^{b}±2,23	78,08^{b}±7,12	65,17^{c}±2,33
III	52,44^{a} ±1,12	54,23^{a}±2,24	67,87^{a}±2,00	65,35^{a}±4,01	51,22^{a}±2,47

(The data in the same column with different exponents are different levels of meaning with α= 0.05)

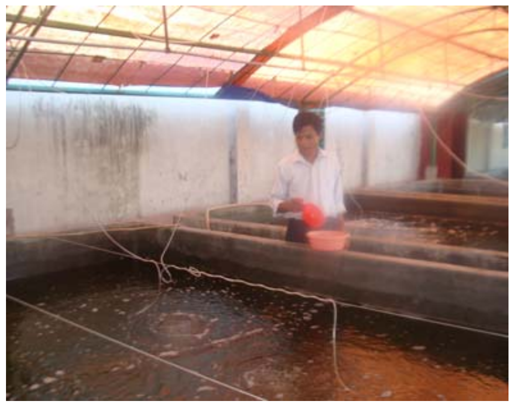
Note

I	Artificial feed,Rotifer,Artemia
II	Artificial feed,Nauplii copepod,Artemia
III	Rotifer,Artemia

In the same period of larval development, in experimental plots to eat different foods for the different survival rates. In phase 2 Z1 to Z ¬ I, II formula for higher survival rate compared with formula III, the group uses copepod Nauplii for superior results. From stage to Z Z2 ¬ 3 differences are more clear than mortal in the experimental plots. In formula III, the survival rate reached the lowest stage transfer (54.23%). Formula I, II stage survival rates move up from 64.32 to 78.38% and 72.22 to 82.38%.

From stage to Z3 Z4 survival rate in the reduction formula feed 1.56%, 1.23% and 2.52%. Me stage to survival rate in all experimental plots were however lower survival rate in formula I, and II is higher than the formula III

The survival rate in batch experiments I, II stage survival rate from Z1 to Megalop lot higher than in batch experiments I, III, survival rates from stage to stage Me Z1 is 17.72%, in formula II reached 23.2%.



Nursing larvae

3.2.2. Research results the influence of some food items to the survival rate of Zoea

Table 7: Influence of food to the survival rate of larvae Zoea

Exp	Survival of Zoae to Megalope (%)				
	Z1	Z2	Z3	Z4	Z5
I	68.32^{b}±5,32	53,54^{b}±2,17	39,97^{b}±2,29	29,22^{b}±1,65	18,11^{b}±4,37
II	72,22^{b} ±3,05	59,50^{b}±6,55	47,60^{c}±3,50	37,09^{c}±2,22	24,12^{c}±5,19
III	52,44^{a} ±4,17	28,43^{a}±4,28	19,29^{a}±1,84	12,54^{a}±3,12	6,42^{a}±1,75

(The data in the same column with different exponents are different levels of meaning with α= 0.05)

Batch experiments using Nauplii copepod + Artemia + food for general survival rate highest followed by batch experiments using Rotifers + Artemia + food synthesis and final batch experiments using Artemia + food synthesis. Z1 survival rate plots I, II, III, lot higher than 16-20%, in the presence of natural food provides essential nutrients for the larvae of which feed industry is very difficult to replace. Z3 stage, the survival rate into three groups, in which the second batch of experiments for the highest survival rate, the lowest plot III Artemia and feed use of the difference is expressed as Z4 and Z5 stages, III lot lower survival rate than lots and lots I, II.

3.3. Propose some solutions to improve production

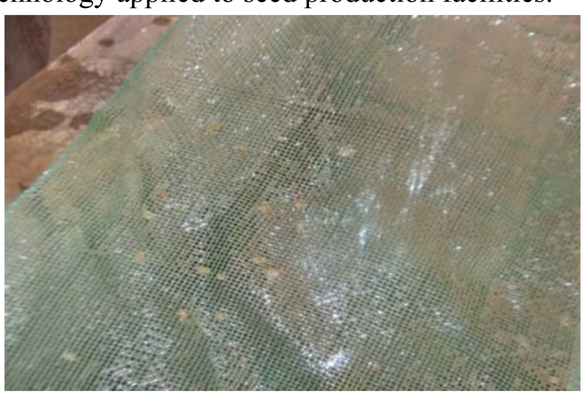
The pat-raising: Need to improve the rate of maturation in the process of raising flaps:
+ Managing water quality in the process of raising the wife of mother
+ Food for the mother's nutritional needs to ensure: shrimp food for the appropriate quarters to feed the wife's mother

- The Central larvae Zoae: Stage Zoae generally low survival rate is only reached 20-30%, one of the reasons it is a matter of nutrition. Artemia use of new powers should be to meet nutritional needs of larvae.

- The experimental results show the effectiveness of the use of rotifers and copepod nauplii for larval survival rate of Zoae.

- The crab seed production farms in Hai Phong area in general and aquatic breeding farm Bang La - Son of biomass in particular raising rotifers as food for larval crabs is very new. To increase production efficiency, improve the survival rate of larvae on farms need to focus on the use of rotifers as important food of the larvae Zoae necessary.

- For copepod also adopted a new, currently only applies in the Institute, to gradually bring adoption of biomass technology applied to seed production facilities.



Seed crab two days old

PART IV. Conclusion and recommendations

4.1. Conclusion

Brachionus spp and copepod nauplii are appropriate food for the larval stage Z1, Z2. Phase Z3, 4 is the combination of the Nauplius of Artemia food and general food. Z5 stage and early stage Megalopas is a combination of food and Artemia biomass synthesis. Megalopas Phase two is a combination of Artemia biomass, food processing and food of animal protein from meat.

4.2. Recommendation

Should have adopted the technology Rotifers, copepod (copepod nauplii collected) to improve survival rate of crab larvae stage Zoae special.

With regard to the intensity of Artemia for larval crab before eating it to ensure essential nutrients.

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