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ISBN : 4-925135-13-9

Proceeding of

The JSPS-DGHE International Seminar on Fisheries Science in Tropical Area

- towards the Integrated Sustainable Fisheries in Asia -

Crustacean Fisheries 2002

Biology, Technology and Management

Bogor, INDONESIA, August 20 - 21, 2002

Edited and Compiled by

Sulistiono, M.F. Rahardjo, Zairion, Murniarti Brodjo, Seiichi Watanabe, Masashi Yokota

JAPAN SOCIETY FOR THE PROMOTION OF SCIENCE

TOKYO UNIVERSITY OF FISHERIES

BOGOR AGRICULTURAL UNIVERSITY

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DIRECTORATE GENERAL OF HIGHER EDUCATION

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POTENTIAL IMPROVEMENT OF THE FIRST DISQULIFIED TIGER PRAWN(*Penaeus monodon* Fab.) BROOD STOCK BY SINGLE INJECTION DOPAMINE

Etty Riani[1], Mozes R. Toelihere[2], M. Ichsan Effendie[1], Tuty L. Yusuf [2], Endhay Kusnendar[3] and Srihadi Agungpriyono[2]

[1]Faculty of Fisheries and Marine Science, IPB, INDONESIA
[2]Faculty of Veterinary Science, IPB, INDONESIA
[3]Head of Aquacultur Laboratory, Jepara, Central Java, INDONESIA

Disqualified tiger prawn brook stocks is defined as brood stocks have been eye stalk ablation treated and have undergone breeding twice. In most cases, such kinds of brood stocks would not have any value in fisheries sector. The purpose of this study was to find out the proper dosage of dopamine which could produce good quality of the disqulified tiger prawn for breeding. Dopamine inhibits maturation, which offers ample time for maturation and improves the qulity of eggs.

This experiment used 18 pairs of twice breeding tiger prawn (The first disqualified brood stock), which was taken from Binuangeun (West Java). The samples were treated with different dosages of dopamine (10^{-5}, 10^{-6}, 10^{-7}, 10^{-8},10^{-9} mol and control which injected with aquabidest). The injection periods were every theree, five and seven days (four injections) and each treatment was repeated three times. Parameters identified were duration (days) of eggs maturation, fecundity, fertilization rates, and hatching rates.

The results of the research showed that the average of duration for egg maturation in the brood stock which were injected with dopamine dosage 10^{-5}, 10^{-6}, 10^{-7}, 10^{-8}, 10^{-9} moll and control were 2,0; 2,3; 6,0; 9,7; 11,3 and 5,0 days. The fecundity were 277.238, 354.178, 359.224, 403.405,45153630 and 175.908; The fertilization rates were 70,6 %, 64,5 %, 77,3 %, 76,8 %, 81,8 % and 71,2 %. Hatching rate were 15,2%; 17,7%; 49,9%; 73,3%; 72,3% and 21,4 %

KEYWORDS: Disqualified tiger prawn, dopamine, inhibits maturation, injection

Introduction

The tiger prawn (*Penaeus monodon* Fab.) is the number one agricultural export commodity, The demand from domestic and also from abroad are very high. This case stimulated the public to invest in this activity.

Although in the latest 20 years the research of the prawn culture technology has been developed but this activity still has many problems. For example, the brood stock (natural brood stock) from the open sea and treated, after twice breedings, they will be disqualified, and would have no more value.

The twice breeding brood stocks are disqualified because they have lower fecundity and lower egg quality. Hence a research is needed to improve the first (after the second spawning), disqualified brood stock. Researches on fish and mammals have proven that, dopamine could inhibit gonadothropine hormone production. In the red swamp cray fish *Procambarus clarkii*, chematerial dopamine inhibits maturation of testis (Sarojini, Nagabhusahanam and Fingerman, 1995). I may also be used to inhibit Gonadothropine Stimulating Hormone production in the ablated brood stock which prolongs the periods of eggs maturation.

The purpose of this experiment was to find the proper dosage of dopamine which could improve the quality for breeding of the first disqualified tiger prwan brood stock.

Materials and Methods

The research was conducted from March – May 1999 in BDAP hatchery – Labuan – Pandeglang, West Java. We used 18 pairs after two breeding periods of tiger prawn (the first disqualified), cellected from Binuangeun (West Java). The hormone used in this experiment was dopamine hydrochloride diluted in aquabidest. Other used materials were chemicals for water analysis and water treatment.

The brood stock were kept in the concret circle water tank (diameter 6 m and 1 m in hight); and plastic circle water tank (upper diameter = 100 cm; base diameter = 80 cm and 100 cm in hight). These containers were set with aerator, and with indoor light arrangeablein. During this experiment.the brood stock were fed with the chopped up fresh crab and fresh squid. The feeding time was at 6.00, 12.00, 18.00 and 23.00 hours (adlibitum). After twice breeding in the evening, in the next morning the prawn was injected at 6.00 o'clock (Riani, Hitam, Eidman, 1995) with different dosage (10^{-5}, 10^{-6}, 10^{-7}, 10^{-8}, 10^{-9} moll and control), with three replicates for each treatment. Identified parameters in this experiment were the duration (days) for egg maturation, fecundity, fertilizing rate and hatching rate.

The data have been analysed based on normality and homogenity test. The anova is used to see the treatment effect. The further test was Duncan test (Steel and Torrie, 1981).

Table 1. Respons of the dopamine on the average egg quality and duration of egg maturation in the first disqualified tiger prawn

Disqualified broodstock	Dopamine (mol)	Fecundity (no of eggs)	Fertilization rate (%)	Hatching rate (%)	Time for maturation (days)
The first disqualified prawn	10^{-5}	277238 [c]	195730 (70.6) [a]	42140 (15.2) [c]	2.0 [c]
	10^{-6}	354178 [b]	228445 (64.5) [a]	62689 (17.7) [c]	2.3 [c]
	10^{-7}	359224 [ab]	277680 (77.3) [a]	179252 (49.9) [b]	6.0 [b]
	10^{-8}	403405 [ab]	309815 (76.8) [a]	295696 (73.3) [a]	9.7 [a]
	10^{-9}	451363 [a]	369215 (81.8) [a]	326335 (72.3) [a]	11.3 [a]
	0	175908 [d]	125246 (71.2) [a]	37644 (21.4) [c]	5.0 [b]

The different superscript shown in the coloumn shows the difference at $P<0.05$

Results and Discussion

The whole experiments in the research indicated that the survival rates of the brood stock (all stage) were 100 %.

The average duration of the egg maturation of the brood stock injected with dopamine were 10^{-5}, 10^{-6}, 10^{-7}, 10^{-8}, 10^{-9} moll and for controls, were 2.0; 2.3; 6.0; 9.7; 11.3; and 5.0 days. Result of this research showed that injection of dopamine 10^{-8} and 10^{-9} mol inhibited gonad development. While injection of 10^{-5} and 10^{-6} mol dopamine only two days for maturation, with average

fecundity of 277.238 and 354.178; fertilization rate 70,6 and 64,5 % and hatching rate 15,2 and 17,7 %. The control animal needed five days for maturation, with the fecundity of 175.908, fertilization rate 71,2% and hatching rate 21,4 %.

The average duration of egg maturation in the brood stock that were injected with different dosages of dopamine showed that the dosage 10^{-8} and 10^{-9} mol had longer time for maturation, with fecundity, fertilization rate and hatching rate better than the other treatments (Tabel 1).

The first disqualified brood stock which were injected with high dosage of dopamine (10^{-5} and 10^{-6} mol) influenced egg maturation in short time (two days), but they had the lowest fecundity, smaller eggs and the lowest hatching rate. While the brood stock which were injected with low dosage (10^{-8} and 10^{-9} mol) needed longer time for spawning, hence, longer than normal ablation, was 3 to 5 days (Primavera, 1983). This experiment indicated that dopamine injection (optimum dosage: 10^{-8}, 10^{-9} mol) of the first disqulified brood stock could have a positive effect on fertilization rate, hatching rate and duration of egg maturation.

The first disqualified brood stock which were injected with dopamine 10^{-5} and 10^{-6} mol caused fast maturation. This condition was expected because of much difference from optimum dosage. In optimum dosage dopamine inhibited gonadothropine hormone (like GSH in the prawn). While the brood stock which were injected with 10^{-8} and 10^{-9} mol needed a longer time. This means the brood stock has more time to save nutrition and the quality of egg showing every type of eggs is the A type (Primavera and Posadas, 1981). The highest dosage of dopamine influences rebound phenomenon in the internal body, causing this gonad to matur very fast and affecting in bad quality eggs (B type) (Primavera and Pasados, 1981). In this experiment; the control eggs (first disqualified brood stock) had an averege of five days duration of maturation, with small diameters of eggs and bad quality eggs

All disqualified tiger prawn brood stock which were treat with dopamine had 100 % survival rates, had normal activities and normal colored body (carapace), but the control had the lowest survival rates, lowest activities (became weak), and feeding activities and the color body was changed as in the ablated tiger prawn brood stock.

Conclusions

1. The optimum dosage of administration dopamine can inhibit gonad of the first disqualified prawn brood stock
2. The optimum dopamine dosage for the first disqualified brood stock (which has two breeding period after ablation) to inhibit gonad development is 10^{-9} mol
3. Administration of the highest dosage of dopamine in the first disqualified brood stock, causes rebound phenomena.

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COMPOSITION OF THE COPEPODS IN SEMANGKA BAY, LAMPUNG

Irâ Miavarani and Enan M. Adiwilaga

Faculty of Fisheries and Marine Science, Bogor Agricultural University, Bogor, INDONESIA.

Study on the composition of the Copepods in Semangka Bay has not yet been carried out. Therefore the present of this paper is due to its relevant information on the composition of the Copepods as basic information for further observation and research . On this study 22 genera from 4 orders (Calanoids, Cyclopoids, Harpacticoids, and Poecilostomatoids) were collected representing the 14 stations through out Semangka Bay. Composition based on the mean average of the 22 genera of copepods which were sampled on the months of July, October and December 2001. *Calanoids* dominated the hauled by 84.75% followed by Poecilostomatoids 7.60%, *Cyclopoids* 5.01%, and *Harpacticoids* 2.73%. *Calanoids* dominated the three months sampling in abundance of genus *Acrocalanus*, *Paracalanus*, and *Parvocalanus* which were always present in almost all stations observed.

KEYWORDS: Composition, Calanoids, Harpacticoids, Cyclopoids, Poecilostomatoids, Semangka Bay

Introduction

Semangka Bay which located on the 5^0 45'- 5^0 75' S and 104^0 45'- 104^0 95' E in the south of Sumatra, district of Tanggamus, Provinces of Lampung (Fig. 1), is one of a potential area for fisheries and aquaculture, and also for transportation. It is also an area of river runoffs from Semangka river, Limau river, Belu river and Putih river. The research was held on three months July, October, and December 2001.

Main purpose of this research is to study the composition of Copepods in Semangka Bay as basic information for further observation in Semangka Bay.

Copepods are microcrustaceans holoplanktonic which dominates the groups of zooplankton by 70-90% all over seas and ocean. Calanoids mostly dominate among the group of Copepods by 70 % of all zooplankton, highly in abundant and variation of species.

Ecological condition of the water in Semangka Bay is proven to influence the composition of each spesies in certain way, thus generally temperature, salininity, and water current are the three major parameters that effected its distribution and composition.

Materials and Methods

Termometer, salinometer, plastic basket (5 l) attached to a scaled-rope, plankton net (33µm mesh size), bottle samples, lugol, glycerine, petri disc, microscope, aquades were used for this study.

The fourteen stations sampling site observed in Semangka Bay were then divided into three different category as :

1. Inner zone includes stations 1-5, 7, Port (13), dan Estuary (14), which influenced by river runoffs such as Semangka and Belu river, domestic activities, boating activities.
2. Middle zone includes stations 6, 8, 9, dan 10 influenced by river runoff from Putih river.
3. Outer zone includes stations 11 dan 12, very much influenced by the oceanic characteristic.

Sampling was done by surface haul with plankton net (34µm mesh size). Plankton samples were placed into bottle samples and preserved by lugol.

Fig 1. Map of Semangka Bay and sampling sites

Results and Discussion

The temperature and salinity measured in Semangka Bay on July, October, and December 2001 varied between 28.5^0-31.25^0 C and 8-34‰. Respectively acording to Riley (1967) zooplankton are well developed in temperature of 25^0 C or above and that waters with salinity ranging from 18-30‰ are rich in abundance of the Calanoids. This statement proven by the fact that on this research the two parameters measured in Semangka Bay, salinity and temperature does belong to the statement mentioned (Table 1), and also that Calanoids are dominant and very abundance (Table 2).

From the three months of observation, December has the highest in abundance total of 187725ind/m^3 followed by July 85464ind/m^3, and October 44658ind/m^3, and still Calanoids dominant in every catchment Table 2.

Overall there were 22 genera found in this research and Calanoids were most dominant in varieties of species (13 genera) followed by Poecilostomatoids (5 genera), Harpacticoids (3 genera), and Cyclopoids (1 genus) Table 3.

Analysis result in composition of abandance on July Calanoids were dominant (85%) followed by Poecilostomatoids (8%), Harpacticoids (5%) and Cyclopoids (2%). On October Calanoids were still dominant (74,33%) followed by Poecilostomatoids (11.93%), Cyclopoids (11.64%), and Harpacticoids (2,10%). On December the Calanoids still remain most dominant (95.80%), Poecilostomatoids (2.56%), Cyclopoids (1.50%), and Harpacticoids (0.14%) Table2 and Fig 2.

As a result based on the three months observations July, October, and December 2001 can be stated that the Calanoids are dominant and highly in abundance especially for genus *Acrocalanus*, *Paracalanus*, and *Parvocalanus*, and varieties of species. This statement is appropriate to Kim's (1985), which mentioned that Calanoids dominates among all zooplankton all over seas and oceans by 70%.

Table 1. Temperature and salinity measured in Semangka Bay

Stations	Observation					
	July 2001		October 2001		December 2001	
	Temperature (^{0}C)	Salinity ‰	Temperature (^{0}C)	Salinity ‰	Temperature (^{0}C)	Salinity ‰
1	29,5	29	30	33	29,5	29
2	29,9	33	30	33	29,5	33
3	29,5	30	30	34	29,5	34
4	29,5	33	30	31	29,5	34
5	28,5	32	30	34	29,5	34
6	29,5	34	30	33	29,5	34
7	28,5	33	30	34	29,5	34
8	29,5	34	29,5	33	29,5	33
9	29	30	30	34	29	33
10	29,5	33	30	33	29,5	34
11	29	32	30	33	29,5	34
12	29	33	30	33	29	34
13 (Port)	31,25	30	30	32	30	33
14 (Estuary)	29,5	8	30	18	29,5	15

Table 2. Total genus, abundance and composition (%) of Copepods in Semangka Bay

Ordo	Observation									Avr. Compo sition (%)
	1 (July 2001)			2 (Oct 2001)			3 (Dec 2001)			
	Total genus found	Abundance (ind/m3)	Compo sition (%)	Total genus found	Abundance (ind/m3)	Compo sition (%)	Total genus found	Abundance (ind/m3)	Compo sition (%)	
Calanoida	11	72666	85	12	33195	74,33	9	178960	95,80	85,04
Poecilostomatoida	5	7199	8	2	5332	11,93	2	4798	2,56	7,50
Cyclopoida	1	1733	2	1	5199	11,64	1	2800	1,50	5,05
Harpacticoida	3	3866	5	2	932	2,10	1	267	0,14	2,41
Total	20	85464	100	17	44658	100	13	187725	100	100

Table 3. The ordos and genus found in Semangka Bay

Ordo	Genus
Calanoid	*Acartia, Centropages, Paracalanus, Acrocalanus, Parvocalanus, Bestiola, Metacalanus, Calanopia, Pontella, Labidocera, Pontellopsis, Pseudiaptomus, Temora.*
Poecilostomatoid	*Corycaeus, Faranula, Oncaea, Kelleria, Pseudanthesius.*
Cyclopoid	*Oithona*
Harpacticoid	*Euterpina, Microsetella, Setella.*

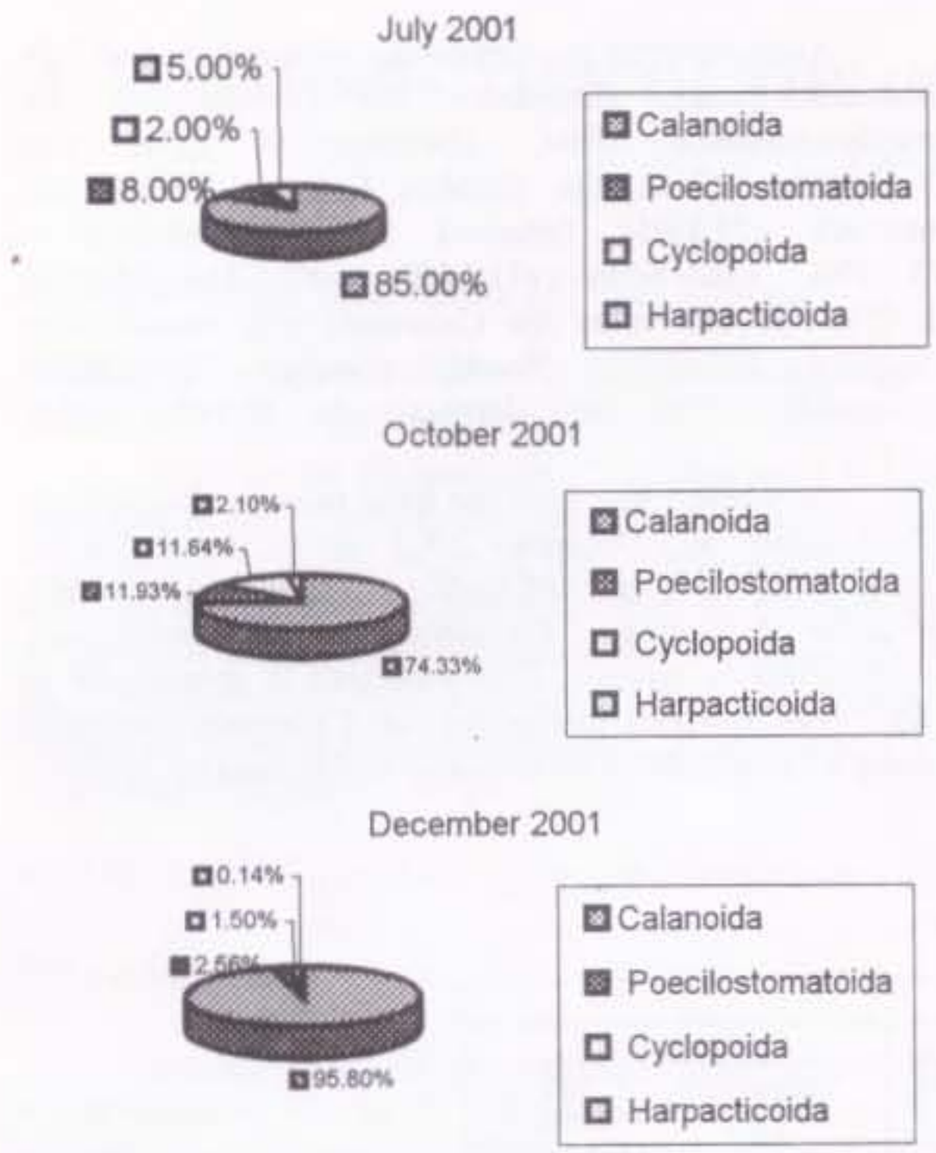

Fig 2. Composition of Copepods in Semangka Bay

Conclusion

The temperature and salinity measured in Semangka Bay on July, October, and December 2001 ranging between 28.5^0-31.25^0 C and 8-34‰.

On this research 22 genera from 4 orders (Calanoids, Cyclopoids, Harpacticoids, and Poecilostomatoids) were collected representing the14 stations through out Semangka Bay. Composition based on the mean average of abundance from the 22 genera of copepods which were sampled on the months of July, October and December 2001, Calanoids dominates the hauled by 85,04% followed by Poecilostomatoids 7.50%, Cyclopoids 5.05%, and Harpacticoids 2.41%. Calanoids dominates the three months sampling in abundance and the total amount of genus found.

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