

THE GROWTH OF MOTAN (*Thynnichthys thynnoides*) WITH DIFFERENT REARING AND STOCKING

by:

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Abstract

The research was aimed to determine the growth and survival rate of Motan fish (*Thynnichthys thynnoides*) rearing in cages with different stockings and locations. The treatments stocking used 40, 50, and 60 fishes/cage with a size 1 x 1 x 1 m. It was conducted on May to October 2010, while the location of rearing was in the Kampar river and ponds of Fisheries and Marine Science Faculty of Riau University. Results of this study showed that the best growth was rearing in the cage with stocking 50 fishes/cage on the Kampar river, the growth in the absolute weight of 8,61 grams, the growth of the absolute length of 2,34 cm, the daily weight growth rate of 0,5445 %, the daily length growth rate of 0,1750 % and the survival rate 100 %.

Keyword: motan, growth, Kampar river

1. INTRODUCTION

Motan fish (*Thynnichthys thynnoides*) is one of 31 species of economically important fish in the Kampar river, Riau. Usually, this fish is sold as fresh and smoked fish. The smoked motan fish is still produced by fishing effort in the Kampar river. Presently, this species has not been farmed yet. *T. thynnoides* can be accepted by consumers in the market in adult size only, while in the small fish can not be sold as smoked fish raw material or fresh fish, usually small fish size only used as feed for carnivorous fish species that are rearing in floating net cages. If these activities continue, this fish can be an extinction fish. Improving growing techniques for small size *T. thynnoides* from wild is a solution to this problem.

2. MATERIALS AND METHODS

The experiment study was conducted on May to October 2010 in the Kampar river, Lubuk Siam village Siak Hulu, Kampar District, Riau Province and fish ponds of the field laboratory of Fisheries and Marine Science, Riau University.

3. DESIGN OF THE EXPERIMENT

The study used a completely randomized factorial. The first factor was stocking, which consisted of 40 fishes/cage, 50 fishes/cage and 60 fishes/cage. The second factor was rearing, which consisted of two locations: the first location in the Kampar river and the second location in the fish ponds of the field laboratory of Fisheries and Marine Science, Riau University. The statistical model used was as follows:

$$Y_{ij} = \mu + A_i + B_j + (AB)_{ij} + \sum_{ijk}$$

Where :

Y_{ij} = Result response variable observation
 μ = Average



- A_i = Effect of level – i from A factors (stocking in the river and the pond)
 B_j = Effect of level –j from B factors (rearing in the river and the pond)
 $(AB)_{ij}$ = Treatments combination which consist from two factors
 \sum_{ijk} = deviation/margin error

4. EXPERIMENTAL PROCEDURES

The small fish of *T. thynnoides* were reared was caught from Kampar river, Lubuk Siam Village Siak Hulu, Kampar district. The small size fish was used as 9.0 to 9.8 grams in weight and 10.1 to 10.9 cm in length. All specimens was reared for 4 months at different location (the Kampar river and Fish ponds of field laboratory of Fisheries and Marine Science, Riau University) and stocking treatment (consists of 40 fishes/cage, 50 fishes/cage and 60 fishes/cage), the size of cage was 1 x 1 x 1 meter. Duplication of this research was 3 times from each treatment. During reared, the small fishes were fed pelleted, in the first month to the second month were fed shrimp pellete with content 40 % protein, 6% fat, 2% carbohydrate, 11 % water and 3% ash. Furthermore, the rearing of the third month until the fourth month of the test fishes were fed pelleted fish with content of 38% protein, 2% fat, 3% crude fiber, 13% ash and 12% water. The feeding dose was 5%/kg from body weight and given 3 times a day on morning, afternoon and evening. Measurement of small fish growth (weight body and length body) was begins from fishes began stocked into cages by means sampling as much as 20% of each treatment. Next measurement was conducted once of two weeks until 4 months. Parameters measured were absolute weighted growth, absolute length growth, the daily growth rate and survival rate.

5. RESULT AND DISCUSSION

a. The Absolute Weight Growth

Result measurements of the absolute weight growth are present in table 1.

Table 1. The absolute weight growth of fish in each treatment

Treatment (location)	Duplication	Fish Stocking in Cage		
		P1 (40 fishes)	P2 (50 fishes)	P3 (60 fishes)
Kampar river	1	7,85	8,61	6,69
	2	7,57	8,59	6,75
	3	7,79	8,63	7,12
	Subtotal	23,21	25,83	20,56
	Average	7,74	8,61	6,85
Ponds of Fisheries and Marine Science of Riau University	1	6,23	8,05	5,67
	2	5,85	7,28	5,30
	3	5,96	6,88	5,43
	Subtotal	18,04	22,21	16,4
	Average	6,01	7,40	5,47
	Total	41,25	48,04	36,96
	Average	6,88	8,01	6,16

From table 1 shows that the absolute weight growth in the Kampar river has the best result than ponds of Fisheries and Marine Science of Riau University in each treatments. Furthermore, based on the treatment of fish stocking in cage, the highest result average of absolute weight growth is treatment P2 with 8,61 grams in rivers and 8,01 grams in ponds, then P1 and the last is P3. The effect of low fish stock in cage can make feed and space be inefficient, but high fish stock in cage can make competition in getting food and space for fish live and it will be the growth of the fish also inhibited (Wardoyo and Muchsin, 1990). Fish stocking in cage influence the fertility of pond, pond area, water discharge, fish size and the type of fish (Djatmika, 1986). On research of kapiék fish found that the best result was fish rearing with 20 fish/cage (Sukendi *et. al*, 2007). The absolute weight growth of each treatment are displayed in figure 1.



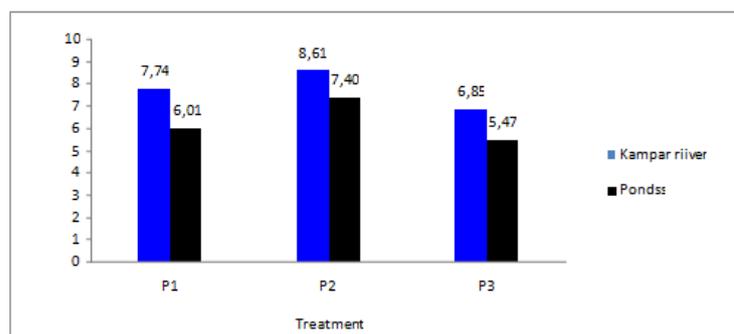


Figure 1. Histogram of absolute weight growth from each treatment.

b. Absolute Length Growth

Result measurement of absolute length growth from Kampar river and ponds of Fisheries and Marine Science of Riau University are present in table 2.

Table 2. The absolute length weight of fish in each treatment

Treatment (location)	Duplication	Fish Stocking in Cage		
		P1 (40 fishes)	P2 (50 fishes)	P3 (60 fishes)
Kampar river	1	2,24	2,37	2,20
	2	2,20	2,45	2,17
	3	2,34	2,47	2,46
	Subtotal	6,78	7,29	6,83
	Average	2,26	2,43	2,28
Ponds of Fisheries and Marine Science of Riau University	1	2,19	1,89	1,90
	2	2,01	2,31	1,84
	3	2,08	2,17	2,02
	Subtotal	6,28	6,37	5,76
	Average	2,09	2,12	1,92
Total		13,06	13,66	12,59
Average		2,18	2,28	2,10

From table 2 shows that the absolute length growth in the Kampar river has the best result than ponds of Fisheries and Marine Science of Riau University in each treatments. Furthermore, based on the treatment of fish stocking in cage, the highest result average of absolute length growth is P2 in river and pond, then P3 in river and P1 in ponds, the last is P1 in river and P3 in the ponds. The absolute length growth of each treatment are display in figure 2.

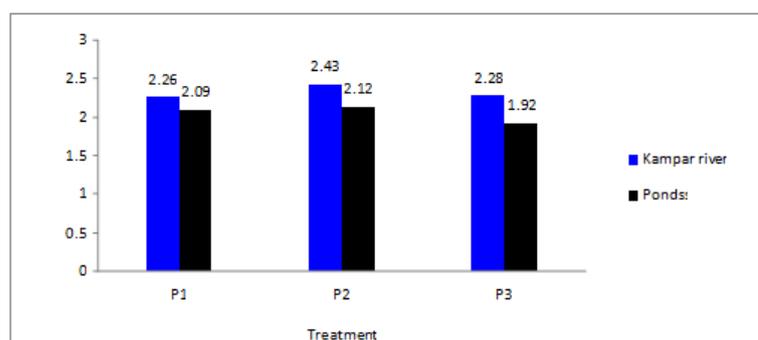


Figure 2. Histogram of absolute length growth from each treatment

c. Daily Weight Growth Rate

Result measurement of daily weight growth rate from Kampar river and ponds of Fisheries and Marine Science of Riau University are present in table 3.

Table 3. The daily weight growth of fish in each treatment

Treatment (location)	Duplication	Fish Stocking in Cage		
		P1 (40 fishes)	P2 (50 fishes)	P3 (60 fishes)
Kampar river	1	0,5083	0,5417	0,4500
	2	0,4917	0,5500	0,4500
	3	0,5083	0,5417	0,4750
	Subtotal	1,5083	1,6334	1,3750
	Average	0,5028	0,5445	0,4583
Ponds of Fisheries and Marine Science of Riau University	1	0,4250	0,5250	0,4000
	2	0,4083	0,4833	0,3750
	3	0,4083	0,4667	0,3917
	Subtotal	1,2416	1,4750	1,1667
	Average	0,4139	0,4917	0,3889
	Total	2,7499	3,1084	2,5417
	Average	0,4583	0,5181	0,4236

From table 3 shows that the daily weight growth in the Kampar river has the best result than ponds of Fisheries and Marine Science of Riau University in each treatments. Furthermore, based on the treatment of fish stocking in cage, the highest result average of daily weight growth is treatment P2 in the river and pond, then P1 in the river and ponds, the last is P3 in the river and the ponds. Treatment P2 is more suitable to culture of *T. thynnoides*, because from total weight growth and total length growth resulted P2 as the best result. Growth rate of daily weight was influenced by diet, environmental temperature, age of fish and nutrient substances contained in the water (Syurflayman, 1994). Growth occurs when the amount of food consumed was greater than required for the maintenance of the body (Huet, 1971). Describe of growth of daily weight in histogram can be see in figure 3.

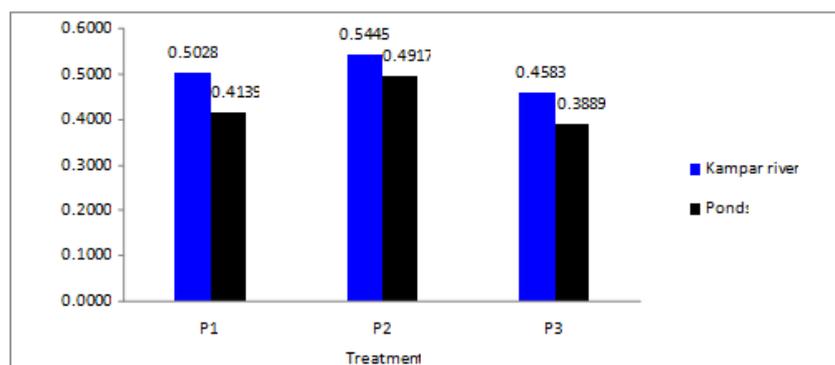


Figure 3. Histogram of daily weight growth from each treatment

d. Daily Length Growth Rate

Result measurement of daily length growth rate from Kampar river and ponds of Fisheries and Marine Science of Riau University are present in table 4.

Table 4. The daily length growth of fish in each treatment

Treatment (location)	Duplication	Fish stocking in cage		
		P1 (40 fishes)	P2 (50 fishes)	P3 (60 fishes)
Kampar river	1	0,1583	0,1667	0,1583
	2	0,1583	0,1833	0,1583
	3	0,1667	0,1750	0,1750
	Subtotal	0,4833	0,5250	0,4916
	Average	0,1611	0,1750	0,1639
Ponds of Fisheries and Marine Science of Riau University	1	0,1583	0,1750	0,1417
	2	0,1500	0,1667	0,1417
	3	0,1500	0,1583	0,1500
	Subtotal	0,4583	0,5000	0,4334
	Average	0,1528	0,1667	0,1445
	Total	0,9416	1,0250	0,9250
	Average	0,1569	0,1708	0,1542

From table 3 show that the daily length growth in the Kampar river has the best result than ponds of Fisheries and Marine Science of Riau University in each treatments.

Furthermore, based on the treatment of fish stocking in cage, the highest result average of daily weight growth is treatment P2 in the river and pond, then treatment P3 in river and P1 in ponds, the last treatment P1 in river and P3 in ponds. Generally, treatment P2 is the best treatment, condition and fish stocking in cage is more suitable for culture of *T. thynnoides*. The daily length growth of each treatment are displayed in figure 4.

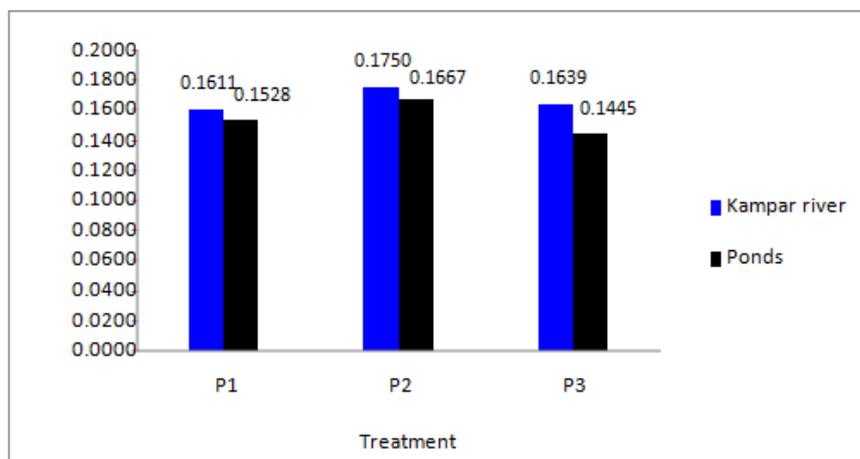


Figure 4. Histogram of daily length growth from each treatment

e. Survival Rate

During experiment fish, the result of measurement survival showed that no one fish died, or survival fish rate 100 %. This result indicated that *T. thynnoides* could adapt with environment. Survival of water organism was influenced with two factors, first biotic factors consist of competitors, population density, age and adaptation ability organism to environment, then a second factor was a biotic factors where consist of temperature, dissolved oxygen, pH and ammonia.

f. Water Quality

Results of measurement of water quality on Kampar river and pond of fisheries and Marine Science Faculty of Riau University are present in table 6

Table 6. Water quality

Water Quality	Location	
	Kampar River	Ponds
Temperature	29 – 30 °C	29 – 30 °C
Turbidity	1,3 – 3,2 m	0,75 – 1,2 m
pH	5 – 6	5 – 6
DO	2,98 – 3,32 ppm	2,12 – 2,66 ppm

Water value quality from table 6 indicated that the water quality still in the normal range for the fish can live. Optimal water quality for fish could live on aquaculture was water that has a pH on 5.0-8,6, water temperature between 25-30 °C, then range temperature between day and night not more than 5 °C (Mulyanto, 1990). Optimal water temperature for tropical fish between 25-32 °C (Cholik *et.al*, 1986), then the optimal water quality for fish was temperature on 25 °C and pH 5-6 (Jangkaru, 1974).

6. CONCLUSION

The best growth *T. thynnoides* in this experiment were rearing intensive with stocking 50 fishes/cage with size 1 x 1 x 1 meter were placed in the Kampar river produce in the absolute weight growth of 8.61 gram, the growth of the absolute length of 2.43 cm, the daily weight growth rate of 0.5445%, the daily length growth rate of 0.1750% and survival rate of 100%.

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