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The Effect of Natural Feeding Combination on Growth and Survival of Synodontis Fish Larvae *(Synonontis Nigriventris)*

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Abstract

The research on the effect of combining natural feed on growth and survival of synodontis larvae (Synodontis Nigriventris) was conducted on January - April 2018 at Fishing University Fish Breeding and Breeding Laboratory. The purpose of this study was to determine the effect of combining natural feed on growth and survival of synodontic larvae and to determine the best combination of natural feed for growth and survival of synodontic larvae. The method used is an experimental method using a complete randomized design of one factor with three treatments and 3 repetitions. The treatments used were P1 (Artemia sp. 10 days + Water tick 10 days + Tubifex sp 20 days), P2 (Artemia sp 10 days + Water fleas 20 days + Tubifex sp. 10 days), P3 (Administration Artemia sp 20 days + 10 days water tick + Tubifex sp. 10 days), P4 (10 days water flea + Tubifex sp 30 days), P5 (20 days watering + Tubifex sp 20 days), P6 (Giving Water fleas 30 days + Tubifex sp. 10 days). The results showed that P1 (Artemia sp. 10 days + 10 days water tick + Tubifex sp 20 days) gave the best result with absolute weight growth of 1.53 gram, absolute growth of 4.54 cm, daily growth rate of 3, 57 (% day) and the survival rate of 81.11%.

Keywords: Synodontis, combinations, natural feed, growth and survival.

INTRODUCTION

The prospect of ornamental fish cultivation and business is increasingly widespread, because the exports of ornamental fish from year to year increase (Lingga & Susanto, 2013). Many types of ornamental fish (both freshwater and marine) are potential for

cultivation, but still a little exposed by the cultivators. One type of freshwater ornamental fish that has both local and export markets that are well cultivated is the upside-down catfish (*Synodontis nigriventris*).

Factors affecting the success of ornamental fish farming, in addition to the environmental conditions cultivated to suit the conditions of their natural habitat. Also the influence of feed is no less important. The feed given should be in accordance with the diet of its natural habitat. In its development the larvae require appropriate natural feed, so it can adapt to the type of feed given.

Natural feed has a smaller size than the mouth opening of the larvae and has good nutritional contents; it is very good when given to the larva stadia. So onthat basis the authors are interested to examine the effect of giving a combination of natural feed to the growth and the survival synodontis larva (larva *Synodontis nigriventris*).

This study aims to determine the effect of natural feeding on the growth and survival of larvae and to determine the best combination of natural feed for the growth and survival of synodontis larvae.

RESEARCH METHODS

The study was conducted from March to June 2018 .The larva of synodontis catfish (*Synodontis nigriventris*) which is used as a 14 day sample, obtained from the injection of the prime fish, 30 x 30 x 30 cm, fish-keeping container as many as 18 units in the Faculty of Fisheries and Marine, University of Riau . Other materials used in the form of Artemia cysts will be hatched as the feed for the test larvae, water fleas, Tubifex sp , worms, ovaprim, physiological solution NaCl 95%, transparent solution, tissues and napkins. Equipment used in this research is fiber bathtub (the size is 3 x 0.8 x 0.5 m), basin, analytical scales, syringes,thermometers, pH indicators, DO meters, aeration and appliances.

The method used in this study is the experimental method while the design used is *Complete Randomized Design (CRD).* It refers to one factor and six treatments with three repetitions to minimize the error of each treatment.

The research applied in this study refers to the research that has been done by Wahyudi (2015) on fish larvae (*Anabas testudineus*) with feeding in adlibitum and feeding frequency 3 times daily:

P_1 : Giving *Artemia* sp. 10 days + Water fleas10 days + *Tubifex* sp. 20 days.

P_2 : Giving *Artemia* sp. 10 days + Water fleas 20 days + *Tubifex* sp. 10 days.

P_3 : Giving *Artemia* sp. 20 days + Water fleas 10 days + *Tubifex* sp. 10 days.

P_4 : Providing Water Fleas for 10 days + Tubifex sp. 30 days.

P_5 : Providing Water Fleas for 20 days + Tubifex sp. 20 days.

P_6 : 30 days Water fleas + Tubifex sp. 10 days.

Sources of fish larvae synodontis obtained from injections which were conducted at the laboratory of Fish Breeding at the Faculty of Fisheries and Marine. The fish were injected only once, conducted at 04.00 PM. The injection on Synodontis can be seen in Figure 1. After the first 18 hours of the injection, the fish was stripped to remove the eggs as shown in Figure 2. Stripping discontinued if eggs couldn't come out or if the egg came out mixed with blood and repeated every hour.

Figure 1. Injecting hormone in synodontis (*Synodontis nigriventris*)

Figure 2. Stripping on synodontis (*Synodontis nigriventris*)

The parameters measured from this study were absolute weight growth, absolute length growth, daily growth rate, and water quality i.e. temperature, dissolved oxygen (DO), and pH.

RESULTS AND DISCUSSION

Absolute weight growth, absolute length growth, growth rate and survival daily weights obtained from this study are presented in Table 1.

Table 1. Growth of absolute weight, absolute length growth, daily growth rate of synodontis catfish (*Synodontis nigriventris*) obtained from the results of the study.

Treatment	absolute length growth(mm)	absolute weight growth (gram)	daily weight growth rate (% / day)	Kelulushidupan(%)
P1	4.54 ± 0.36 ^{d}	1.53 ± 0.27 ^{c}	3.57 ± 0.07 ^{c}	81.10 ± 1.91 ^{d}
P2	4.21 ± 0.21 ^{cd}	1.30 ± 0.14 ^{bc}	3.51 ± 0.44^{bc}	71.13 ± 5.09 ^{c}
P3	3.81 ± 0.15 ^{c}	1.07 ± 0.16 ^{b}	3.43 ± 0.06 ^{b}	64.43 ± 1.96 ^{b}
P4	3.67 ± 0.25 ^{bc}	1.00 ± 0.17 ^{b}	3.40 ± 0.07 ^{b}	60.00 ± 3.30 ^{ab}
P5	3.24 ± 0.10 ^{ab}	0.53 ± 0.12 ^{a}	3.15 ± 0.08 ^{a}	57.80 ± 1.91 ^{a}
P6	3.01 ± 0.35 ^{a}	0.53 ± 0.03 ^{a}	3.15 ± 0.02 ^{a}	55.57 ± 1.96 ^{a}

Description: average value followed by the same letter states no significant difference (p> 0.05)

P1 : Giving *Artemia* sp. 10 days + Water fleas 10 days + *Tubifex* sp. 20 days.

P2 : Giving *Artemia* sp. 10 days + Water fleas 20 days + *Tubifex* sp. 10 days.

P3 : Giving *Artemia* sp. 20 days + Water fleas 10 days + *Tubifex* sp. 10 days.

P4 : Providing Water Fleas for 10 days + *Tubifex* sp. 30 days.

P $_5$: Providing Water Fleas for 20 days + *Tubifex* sp. 20 days.

P $_6$: 30 days Water fleas + Tubifex sp. 10 days.

Absolute Weight Growth

Absolute Weight Growth of individual Synodontis (*Synodontis nigriventris*) is the average weight of individual synodontis at the end of the study minus the average individual synodontis at the end of the study. Weighing data of larvae is done every 10 days. On average weight growth the absolute weight of the individual fish of each treatment can be seen in Figure 3.

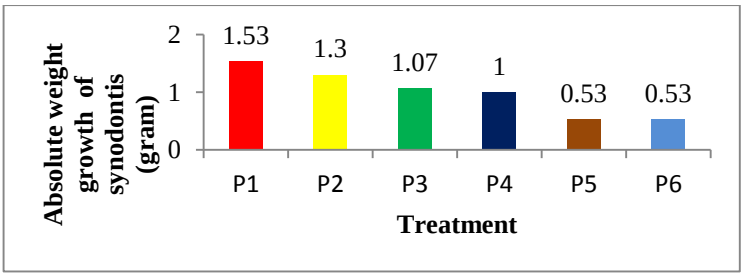

Figure 3. Histogram of average absolute weight for synodontis (*Synodontis nigriventris*).

From Figure 3, it is seen that P1 treatment gives the highest influence to the absolute weight growth of synodontis (Synodontis nigriventris). This indicates that treatment of P1 (Administration of *Artemia* sp 10 days + Water tick 10 days + *Tubifex* sp 20 days) is the best treatment towards the growth of the absolute weight of 1.5 grams. Isnansetyo and Kurniastuty (1995) revealed that protein plays an important role in maintaining new tissue function so that protein affects larval growth.

Based on analysis of variance test (ANOVA) in Table 1, it showed P1 treatment was not significantly different to the absolute weight growth of synodontis larvae. According to the Newman-Keuls advanced test to the average increase of absolute individual weights of the larvae, it shows that P1 is significantly different from P5 and P6, but P1 is not significantly different from P2, whereas P2 is not significantly different from P3 and P4.

Absolute Length Growth

From the findingof the measurement of absolute length of synodontis (*Synodontis nigriventris*) during the study experienced increased growth. The measurement results can be seen in Figure 3.

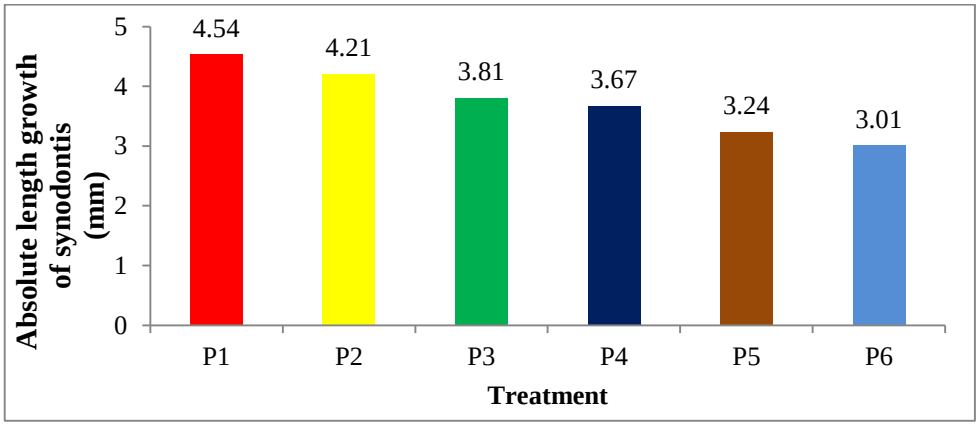

Figure 4. Absolute length growth of synodontis (*Synodontis nigriventris*).

In Figure 4. It can be seen that the absolute height growth of the highest average synodontist fish is found in the P1 treatment of 4.54 mm, followed by P2 (4.21 mm), P3 (3.81 mm), P4 (3, 67 mm), P5 (3.24 mm) and the lowest average growth was at P6 of 3.01 mm. Judging from the homogeneity result shows homogeneous data, where P value> 0,05. According to Halver (1977), Protein contained in the feed is a major factor affecting the growth of fish.

Based on analysis of variance test (ANOVA) in Table 1, it showed P1 treatment is not significantly different to the absolute length growth of synodontis larvae. Further test

results show that P2, P3, and P4 aren't significally different fromP1,otherwise P5 and P6 are significantly different from P1.

Daily Growth Rate of Weight

The observed daily growth rate of synodontis fish (*Synodontis nigriventris*) from each treatment can be seen in Figure 5.

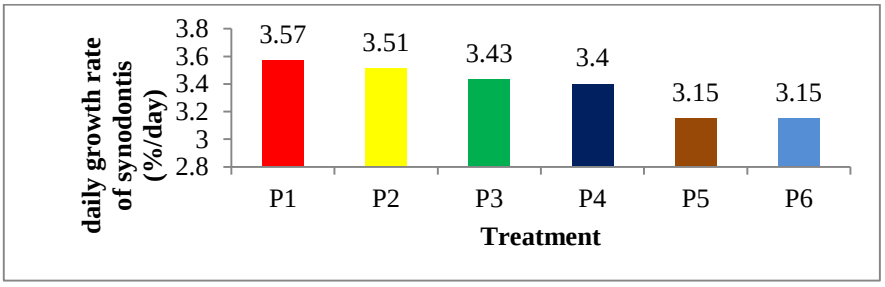

Figure 5. Observation histogramof daily growth rate for synodontis (*Synodontis nigriventris*)

From Figure 5. It can be seen that the average daily growth rate of synodontis catfish larvae maintained for (40 days) has a difference. The daily growth rate ofthese synodontist larvae from the highest to the lowest was P3 of 3.57%, P2 of3.51%, P3 of 3.43, P4 of 3.4%, and the lowest was P5 of 3.15% and P6 of 3.15% .The occurrence of fish growth is caused by tissue changes due to cell division resulting in meat and bone which is the largest part of the body (Weatherlay, 1986 *in* Hartami, 2006).

From the results of the Anava test in table 1 it showed P1 treatment was not significantly different to the daily growth of synodontis larvae.From the results of the further test analysis (Keuls's Range Test) it was found that P2, P3, and P4 aren't significantly different from P1, meanwhile P5 and P6 treatments are significantly different.

Survival Rate

Survival rate is the ratio between the amount of live fish at the end with the start of maintenance at one period in one population. The average survival rate of the synodontis larva can be seen in Figure 6.

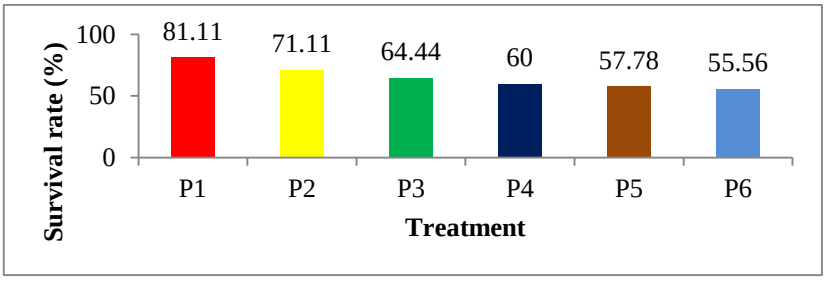

Figure 6. Histogram of Survival rate for synodontis (*Synodontis nigriventris*)

Based on Fig.6, it can be seen that the highest survival rate lies in the treatment of P1 which is 81.11% and the smallest is in the P6 treatment which is 55.56%. Survival especially in larvae is determined by feed. Larvae will experience death in a short time if they do not get food. Optimal feeding, both quality, and quantity can improve survival (Effendi, 1979). Sharma et al. (2012) stated that the ability of fish to receive feed depends on the type of feed and feed size. This affects the rate of growth and survival. According to Djajasewaka (1985), the feed with a better nutrient content can guarantee the survival of the fish as well. Sukendi (2004) said that the success of larvae maintenance still has obstacles, especially the high mortality rate. It is necessary to provide good food and timely.

The Analysis of Variance Test (Anava) in Table 1 shows that there's a significant effect to the survival of synodontis larvae. Further test results (Newman Keus) show that P6, P5, and P4 aren't significantly different from P3, P2 treatment is significantly different from P1, and P6, P5, and P4 are significantly different from P1.

Water quality

The results of water quality measurement during the study are presented in Table 2.

Table 2. Water Quality Measurement Results

NO	Parameter	Result
1.	Temperature	26.7-26.9 º C
2.	pH	6
3	DO	6.3-7.3 ppm

Based on the data in Table 2, it can be seen that the quality of water for the maintenance of fish larvae is still in good condition.The temperature in this study was still in good condition; this is in accordance with the statement of Sitanggang (1987) which states that freshwater fish can live ranging from 28▫C to 32oC. Temperature has an important influence for fish survival. Effendi (2003) explains that temperature has a great influence of the exchange of substances or metabolism of living creatures in the water.

CONCLUSION

From the results of this study,itcan be concluded that the combination of natural feeding has an effect on the growth and survival of synodontis (*Synodontis nigriventris*). The best treatment of growth and survival is P1 treatment. The average weight is 1.53 grams, the average length of 4.54 mm, the average daily growth rate of 3.57 (% day) and the survival rate of 81.11%.

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