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Effect of Using Silkworm (*Tubifex Sp.)* Living on The Survival Rate And Growth of The Catfish Larvae (*Clarias* Sp.)

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Abstract: *In general, feeding of silk worms (Tubifex sp.) for catfish larvae aged 5 days to 10 days is done by chopped it first into small part. It is intended that the catfish larvae can utilize silk worms with more leverage, because the mouth opening catfish larvae are still small.*

Treatment of silk worm chopped is not impossible also cause other problems, some problems that can be caused, among others: (1) The loss of nutrients contained in the body mass worm due to dissolve into the water; (2) Water quality degradation is caused by pollution from silk worm organic material that begins to decompose. Therefore it is necessary a study of how big the effect of silk worm feed given intact compared to that provided with the first chopped.

The study was conducted at the Aquaculture Laboratory of the Reproduction Division, Fisheries and Marine Science Faculty of Brawijaya University. The study took place in October 2017. The test organisms used in this study is the catfish larvae obtained from local farmers in Malang. The size of the fish larvae used is 1cm (3-5 days). A total of 50 heads per container. The larvae are kept for 10 days in containers of 26 liters of water volume

The percentage of survival highest value achieved in the treatment of chopped repeat 2 and 3 respectively by 86%, while the lowest value was in the treatment of chopped repeat 1 and 2, also on the intact treatment repeat 1; 3 and 4 by 82%. Percentage of Daily Length Growth Rate highest value achieved in the treatment of chopped repeat 3 by 11.89%, while the lowest value was in the intact treatment repeat 4 of 10.5%. Specific Growth Rate Percentage catfish highest value achieved by treatment of chopped repeat 4 9.68%, while the lowest value contained in the intact treatment repeat 2 at 6.68%. From result of data analysis and t test show that treatment of silk worm with chopped and without chopped (intact) did not give significant difference to survival, daily growth rate, and growth rate of specific catfish larvae. This indicates that both treatments are considered equal or have no effect on other treatments. It means that the feeding of the silk worm, whether chopped or given intact, can be done equally well. With other considerations based on practicality and maintaining water quality, the intact silk worm (without chopping) is recommended.

Key Words: *catfish larvae, intact silk worms, growth and survival.*

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I. Introduction

Catfish is one of freshwater fish are much in demand by the people of Indonesia. Catfish are many cultivated from the usual local catfish, "Dumbo" catfish, and to this day that began cultivated by the farmers in the field of fisheries is "Sangkuriang" catfish. This can not be separated from the features of catfish that can be maintained with high dense stocking. In addition, catfish cultivation technology is easy to do and marketing is not difficult. Catfish is a type of fish that the selling price is quite cheap. So this fish can be reached by all circles of society (Krisnando and Sujarwanta, 2014).

Catfish are nocturnal animals, the animals are active at night or in the dark. Catfish including meat eaters or also called carnivores (Basahudin, 2009). So the catfish prefers live feed or that has a smaller body size. Some feeds suitable for catfish larvae are zooplankton, water flea, moina, rotifera, *Tubifex* sp., Mosquito larvae and pellet granules in the form of fish meal porridge, shrimp flour, and egg yolks (Soetomo, 2000).

Silkworm (Tubifex sp.) Is the most preferred natural feed by freshwater fish. Silk worms (*Tubifex* sp.) Are excellent for freshwater fish growth because of their high protein content (Subandiyah et al., 2003). The nutritional content of the Tubifex sp. ie 57% protein, 13.30% fat, 2.04% carbohydrate (Madinawati et al., 2011). With such compositions, the silk worm takes one of the most important roles of success in catfish culture. Besides being easy to find in any catfish farming area, silk worms can also last longer in the waters than with artificial feeds that are easy to decompose. So not too pollute the quality of the waters where cultivation.

In general, feeding of silk worms (Tubifex sp.) for catfish larvae aged 5 days to 10 days is done by chopped it first into small part. It is intended that the catfish larvae can utilize silk worms with more leverage, because the mouth opening catfish larvae are still small.

Treatment of silk worm chopped is not impossible also cause other problems, some problems that can be caused, among others: (1) The loss of nutrients contained in the body mass worm due to dissolve into the water; (2) Water quality degradation is caused by pollution from silk worm organic material that begins to decompose. Therefore it is necessary a study of how big the effect of silk worm feed given intact compared to that provided with the first chopped.

II. Materials And Methods

Design of this study using experimental methods and two treatments. The purpose of this research is to know the difference of survival rate and growth of catfish larvae (*Clarias* sp.) which is better between intact silkworm feeding (*Tubifex* sp.) with feeding of silk worm (*Tubifex* sp.) first chopped.

The study was conducted at the Aquaculture Laboratory of the Reproduction Division, Fisheries and Marine Science Faculty of Brawijaya University. The study took place in October 2017. The test organisms used in this study is the catfish larvae obtained from local farmers in Malang. The size of the fish larvae used is 1cm (3-5 days). A total of 50 heads per container. The larvae are kept for 10 days in containers of 26 liters of water volume, equipped with an aerator as an oxygen supply. Every day water exchange as much as 25% of the volume. Water used in this study using tap water that has been deposited for 24 hours. The parameters collected were survival and growth. Fish are die every day, taken and recorded amount. At the end of the period the daily cumulative amount of deaths will be calculated to determine survival. Life is calculated according to the following formula (Effendie, 1997):

$$S=\frac{N_t}{N_0}\times 100\%$$

Information :
S = Survival
N0 = Number of fish stocked at the start of maintenance
Nt = Number of fish that live at the end of maintenance

Growth parameters were measured at the beginning and end of maintenance period, using a specific growth rate and daily growth rate of daily length with the following formula Specific Growth Rate (Elliot and Hurley, 1995):

$$SGR=\frac{(\ln W_t-\ln W_0)}{t}\times 100\%$$

Information :
SGR = Specific growth rate (% / day)
Wt = Fish weight at time t (g)
W0 = Fish weight at time 0 (g)
t = Day of observation
Fish Daily Long Growth Rate (Satyani et al., 2010)

$$\text{Fish Daily Long Growth Rate }=\frac{(\ln L_t-\ln L_0)}{t}\times 100\%$$

Information :
Lt = Average total length on day t
L0 = Average total length on day 0
t = Day of observation

The results were analyzed using t-test (t-test) with a confidence interval of 95% and 99% to determine the differences in the effect of the both treatments.

III. Results And Discussion

Survival Rate

The percentage of survival of catfish larvae in each treatment and replication maintained for 10 days showed the highest value achieved in the treatment of chopped repeat 2 and 3 respectively by 86%, while the lowest value was in the treatment of chopped repeat 1 and 2, also on the intact treatment repeat 1; 3 and 4 by 82% as shown in graph 1, as follows:

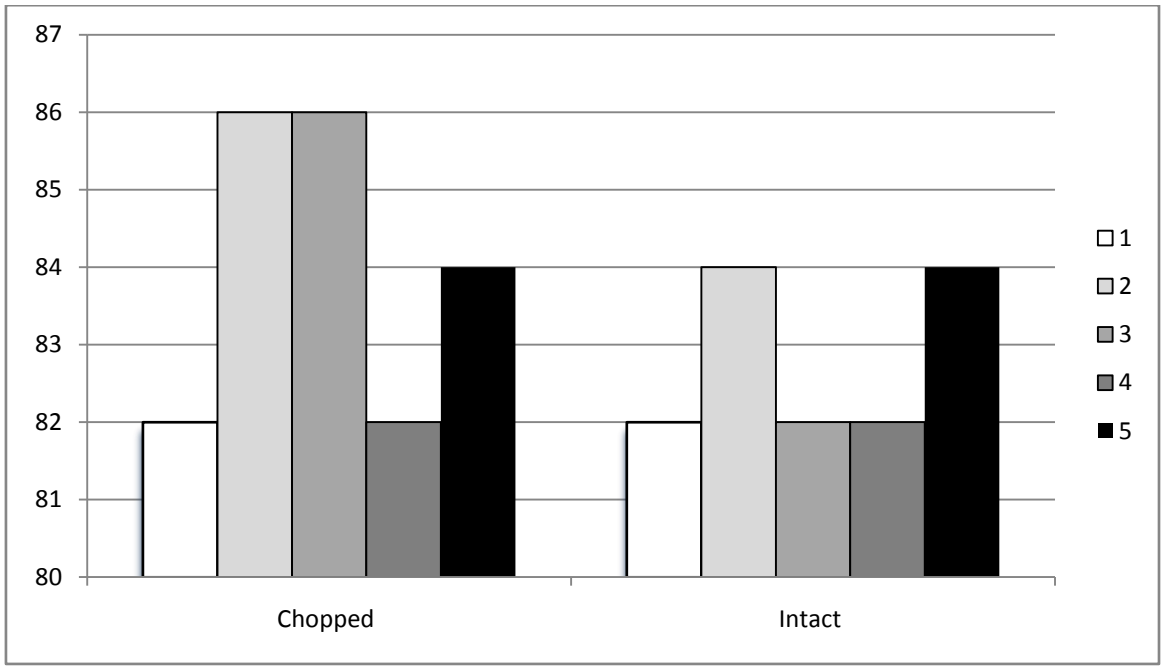
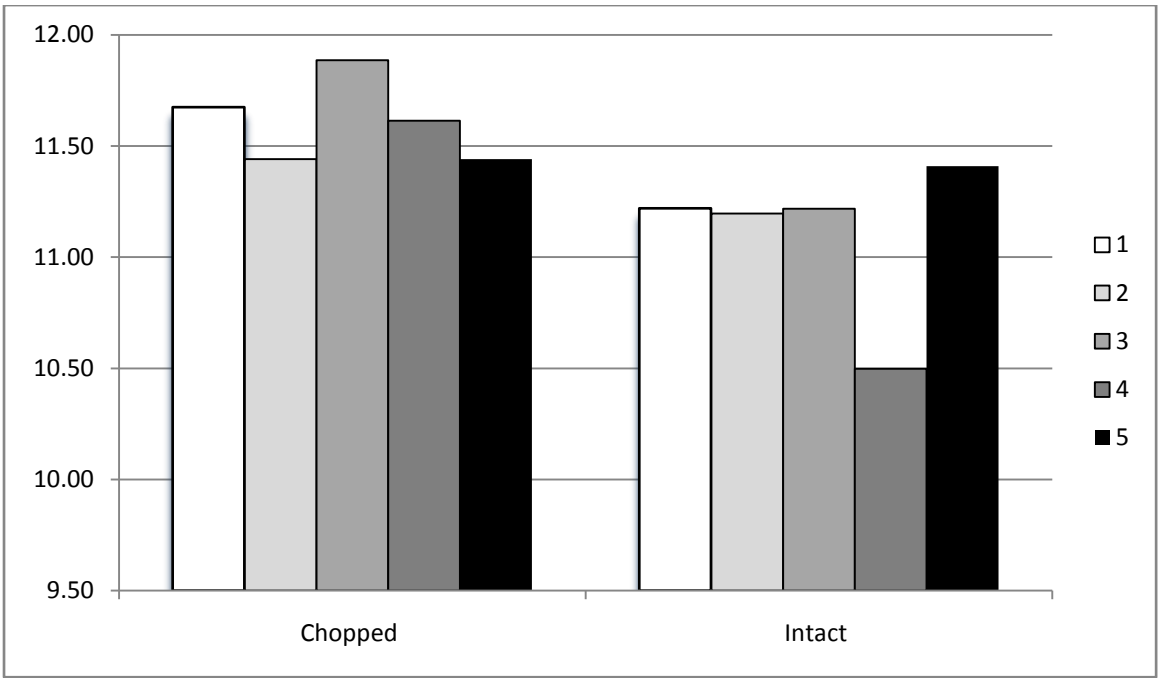


Figure 1. Percentage survival Catfish larvae (%) (1; 2; 3; 4; 5 was a repeat)

The percentage of survival of catfish larvae during the study ranged from 80-86%. This is good enough, indicating that both treatments do not make the survival percentage of catfish seed being low. The survival rate has a value that is not much different from that obtained by Syahputra et.al. (2016) where the range is 85-90%. Also better than that obtained by Rosmawati and Muarif (2010) where the level of survival (SR) obtained by 66%. Mulyani (2014) stated that the survival of fish is highly dependent on the adaptability of fish to food and the environment, fish health status, stocking density, and water quality enough to support fish life.

Daily Long Growth Rate

Percentage of Daily Length Growth Rate of catfish larvae in each treatment and replication that was maintained for 10 days showed the highest value achieved in the treatment of chopped repeat 3 by 11.89%, while the lowest value was in the intact treatment repeat 4 of 10.5% presented in graph 2, as follows:

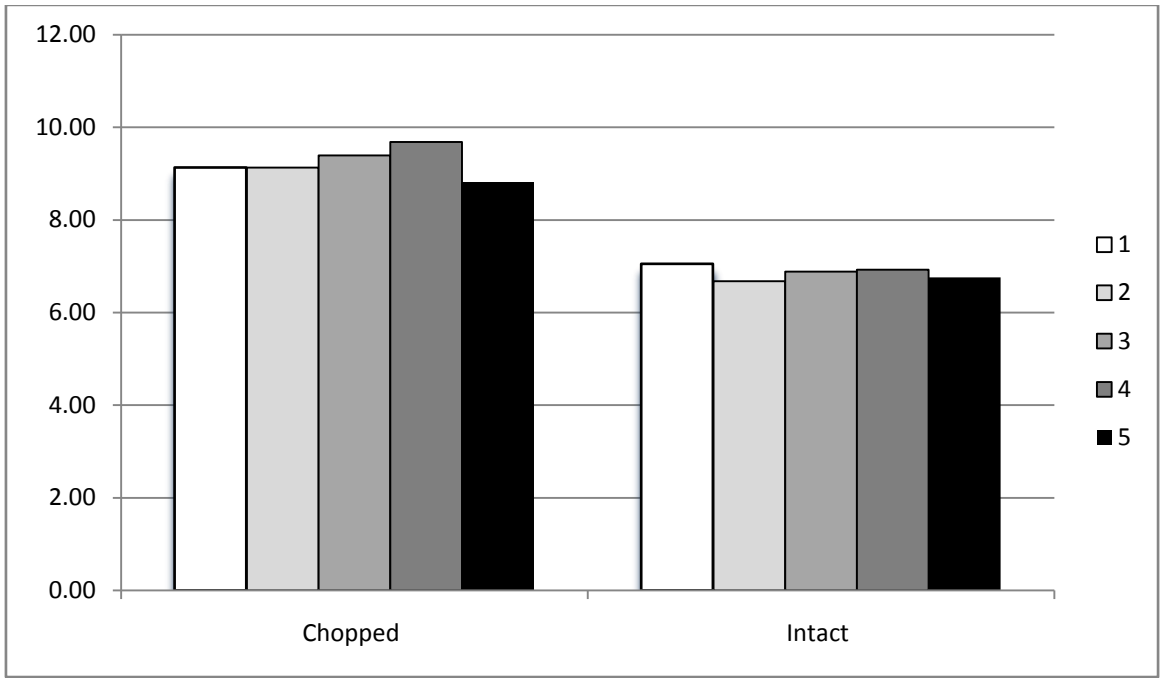


Graph 2. Percentage of Daily Long Growth Rate of Fish of Catfish (%)

The percentage of growth rate of daily length of catfish seed during the study ranged from 10.5 to 11.89%. It is already quite good, indicating that the treatment does not make a percentage of the daily length growth rate of catfish reared seed be varied very much. Mulyadi (2001) states that growth occurs because of the excess energy derived from the feed after being reduced by the energy of metabolism and energy contained in the feces

Specific Growth Rate

Specific Growth Rate Percentage catfish at each treatment and repetition maintained for 10 days showed the highest value achieved by treatment of chopped repeat 4 9.68%, while the lowest value contained in the intact treatment repeat 2 at 6.68% as presented in graph 3, as follows:



Graph 3. Percentage of Specific Growth Rate of Catfish Seeds (%)

The percentage of specific growth rate of catfish seed during the study ranged from 6.68 to 9.68%. It is already quite good, indicating that the treatment does not make a percentage of the specific growth rate of catfish reared seed be varied very much. According to Widyawati, (2009) the specific growth rate explains that fish are able to utilize nutrient feed to be stored in the body and convert it into energy.

From result of data analysis and t test show that treatment of silk worm with chopped and without chopped (intact) did not give significant difference to survival, daily growth rate, and growth rate of specific catfish larvae. Where t count of survival equal to 1.64 is still under t table 5% (2,776) and t table 1% (4,604), whereas t count of daily growth rate of 0,5 is still below t table 5% (2,776) and t table 1% (4.604) and t count the specific growth rate of 2.15 is still below t table 5% (2.776) and t table 1% (4,604). This indicates that both treatments are considered equal or have no effect on other treatments. It means that the feeding of the silk worm, whether chopped or given intact, can be done equally well. With other considerations based on practicality and maintaining water quality, the intact silk worm (without chopping) is recommended. In accordance with the statement of Khairuman et. al. (2008) silk worms are usually given to fish directly into the pond or can also be spread evenly

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