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# The Effects of Probiotics Administration on Silkworms (*Tubifex sp*) Natural Feed on Growth of Kancra Fish (*Tor soro*)

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**Abstract.** Kancra fish (*Tor soro*) is a freshwater fish that has become scarce. This is seen from the decrease of its population in its natural habitat. To anticipate the decline of the kancra fish population. The method used in this research is completely randomized design (CRD) experimental methodology. Based on the results of the research that has been conducted, the administration of different probiotic dosage in natural feed shows the best result in treatment C (probiotic 5%). This proves that the administration of different probiotic doses results in variations where treatment C (probiotic 5%) which has an average grow of 0,150 grams is different from treatment A (probiotic 1%) which has an average growth of 0,087 grams and treatment B (probiotic 3%) which has an average growth of 0.117 grams.

## 1. Introduction

Kancra fish (*Tor soro*) is a kind of freshwater fish that has become scarce. This is seen from the decrease of its population in its natural habitat. To anticipate the decline of kancra fish population, many efforts have been made, such as developing artificial habitat, domestic and biology aspects, gonads maturation and spawning using hormones, the use of pellets with different level of proteins, the rearing of larvae at different stocking densities, and manipulating spawning environmental factors. This research stage adds to the completeness of data and information of hatchery technology to be disseminated to farmers because the community is very responsive towards kancra fish rearing. (Redjeki, 2004). One of the alternatives is to use silkworms as a natural feed. This consideration is taken based on the high protein content in silkworms. Silkworms are natural food for the fish seed that is easy 3% crude y to digest with nutritive value of 11,21% water, 64,47% crude protein, 17,63 % crude fat, 7.48 % ash, and 10.06% betaine, as well as active *tubifex sp* movement. The frequency of silkworms feeding to kancra fish seed is still unknown (Alfikri *et al.*, 2018:49).

Another factor that enhances the growth of fish is by natural feeding. However, natural feeding alone gives fewer benefits, hence why the administration of probiotics to improve fish growth is now popular among fish farmers. Kancra fish is one of the examples. Probiotics are microorganisms that have beneficial advantages and can survive in the digestive tracts. Probiotics are useful in preventing pathogenic intestinal microorganisms and improving the efficiency of natural food excretion in fish. The bacteria in probiotics produce several digestive enzymes such as amylase, protease, lipase, and cellulase. These enzymes will assist the hydrolysis process of the nutrients in the stored natural food, such as carbohydrates, proteins, and fats which turn into simple molecules from the start so that the fish digestive tract will easily digest and absorb the food. (Sainah *et al.*, 2016)



The administration of probiotics on food has benefits in maintaining the aquaculture water quality and preventing the growth of pathogenic microorganisms to build a sustainable fish rearing system (Khasani, 2007). Probiotics contain microbes that break down metabolic waste and boost immune response which improve the health and affect the growth of fish. Presumably, the pattern of prebiotics administration on fish should be tested on kancra fish which have been known to be a species that requires a relatively long time to grow. This research is expected to determine the effects of probiotic administration on silkworms (*tubifex sp*) towards a better growth of kancra fish (*Tor soro*)

### 1.1. Goals

The goals of this research are to determine the growth rate of kancra fish (*Tor soro*) by administering probiotic on silkworms (*Tubifex sp*) natural feed and to determine the best probiotics dosage administered to silkworms (*Tubifex sp*) natural feed.

### 1.2. Benefefits

The benefits and targets of this research are administering probiotics towards the growth and survival of kancra fish (*Tor soro*). To serve as a guideline in the efforts of developing the concept of kancra fish rearing by and to serve as information and knowledge to students, related agencies, and the communities of fish farmers to improve the rearing of kancra fish (*Tor soro*).

### 1.3. Materials

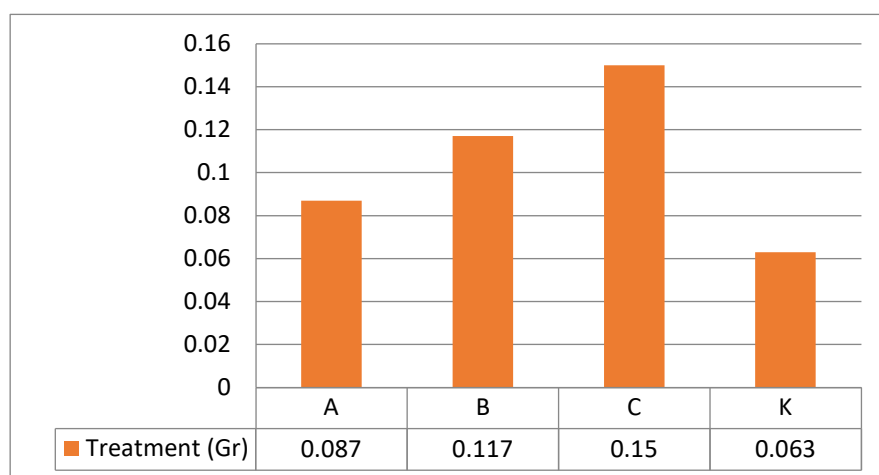
The materials used in this research are Kancra fish (*Tor soro*), 1 – 2 cm in length and 0.05 grams in weight that are obtained from a local fish farmer in sub- district Moga, district Pemalang and the commonly used rearing equipment.

## 2. Method

In conducting the research, completely randomized design (CRD) experimental method is applied. Hadi (2002) explains that experimental method is a method that applies the presence or absence of a cause and effect relationship between treatments and concludes the relationship. The cause and effect relationship in this research is the best method of probiotics administration on natural feed for the growth rate of kancra fish (*Tor soro*).

## 3. Results

### 3.1. Absolute weight Growth



**Figure. 1.** Individual Weight Growth

Bacteria inside the fish's digestive tract and survive. According to the results of the conducted research, it is known that the administration of different probiotics dosage in natural feed shows the best result in treatment C. This proves that the administration of different probiotics dosage gives an actual difference towards the absolute growth of each treatment, where treatment C is significantly different from treatment A and treatment B. It is suspected that the bacteria that enter the digestive tract increase along with the administration of the probiotics, thus improving the growth of kancra fish (*Tor soro*). The increased digestibility is affected by the higher nutrients absorbed by the body, thus the growth improvement. The bacteria inside the fish's digestive tract excrete digestive enzymes such as protease and amylase (Fardiaz, 1992). The amount of the excreted enzymes increases according to the dosage of probiotics given, so the digested food increases as well. Treatment C has the highest average of the absolute growth of kancra fish (*Tor soro*), whereas treatment A has the lowest average of the absolute growth. In treatment C, the population of probiotics inside the digestive tract increase according to the growth of the kancra fish (*Tor soro*). It can be seen from Graphic 1 that during the research, there is an increase in the absolute weight growth of kancra fish (*Tor soro*) in each treatment until the fourth week affected by the administration of probiotics on natural feed, the microbes inside the kancra fish (*Tor soro*)'s digestive tract functions to digest the food.

### 3.2. Survival Rate

**Table 1.** Survival rate (%) of kancra fish (*Tor soro*)

Repetition	A	B	C	K
1	60	70	70	70
2	60	50	70	50
3	70	70	60	60
<b>Average</b>	63,33	63,33	66.67	60,00

The result of the analysis shows that the differences in probiotics dosage administration on natural feed do not give a significant difference in the survival rate of kancra fish (*Tor soro*) in each treatment. This means treatment A does not have a significant difference with treatment B and treatment C. The reason is that probiotics can improve the food quality or increase the nutrients so it can be easily digested inside the kancra fish (*Tor soro*)'s digestive tract as well as improve the fish's immune. Atira (2009) states that positive bacteria can increase the growth rate and reduce the molarity level of aquaculture organisms. Atira in (Agustina, 2012) reports that probiotics benefit animals by increasing the balance of microorganisms in the gut. The average survival rate of kancra fish (*Tor soro*) in treatment A is 63.33% just like it is in treatment B. This indicates that the bacteria in treatment A and B are dead. It is assumed that the population of bacteria inside the digestive tract was small, thus the pathogenic bacteria could still compete. Meanwhile, the mortality of fish in treatment C is assumed to happen due to the competition between the same type of bacteria population during the consumption of nutrients, thus inhibiting the work of the bacteria. Gandara (2004) suspects that rapid bacteria population leads to the competition among bacteria of the same type during the consumption of nutrients or substrates, which results in the inhibition of bacteria inside the digestive tract and the decrease of secretion enzymes.

### 3.3. Water Quality Parameter

The water quality in the rearing media during the research experiences fluctuation in normal to good category to support fish rearing. The quality of the water is a crucial element aside from the food as well as the fish species in supporting the growth and survival of the reared commodity. It can be seen from table 2 that aquatic organisms have a normal average temperature to support its growth. During the research, the temperature is around 27 – 30°C. By looking at the temperature result during the research, it is still considered good because the normal temperature for fish rearing ranges between 25 – 30°C (Khairuman, 2002). An increase in temperature will lead to the respiration of aquatic animals and the faster rate of the metabolism of aquatic organisms, which in result will cause high dissolved

oxygen consumption (Monalisa, 2010).

Based on the degree of acidity or pH in the waters is the high concentration of hydrogen ions in these waters. In natural water, the pH ranges between 4 to 9 due to the acidic chemical compounds or CO<sub>2</sub>. If water has a pH lower than 4 or more than 11, there will be mass death of aquatic biota in said water. During the research, the pH ranges from 7.5 to 8, which is still considered good for rearing activity because the ideal category from its natural water is 7 to 8.5 (Kordi, 2010).

Dissolved oxygen (DO) is one of the most important water quality parameters in a rearing activity. There will always be changes in the concentration of dissolved oxygen. Dissolved oxygen in water or other rearing media comes from oxygen diffusion and photosynthesis process of chlorophyll biota found in waters. The dissolved oxygen (DO) in the media during the research ranges from 5.8 to 6.9 ppm. It is considered good because according to Monalisa(2010), the minimum dissolved oxygen for rearing activity ranges from 3 to 5 ppm.

There are two ammoniac in the water which is (NH<sub>3</sub> and NH<sub>4</sub>). There is ionization in NH<sub>4</sub> ammoniac, whereas free ammonia (NH<sub>3</sub>) cannot be ionized. Free ammonia has a toxic characteristic towards aquatic organisms. If the content of free ammonia in the water or rearing media is too high, it can lead to the death of the biota because the ammonia disrupts the oxygentransporting process by blood and results in airway obstruction (suffocation). The lowest content of ammoniac in the rearing media during the research is found in treatment C with 0.086, treatment B with 0.162, and treatment A with 0.668, and control with 0.708. By looking at the results, the administration of probiotics on food is beneficial to decrease the ammonia content on the remaining food. This happens because probiotics are food that cannot be digested by the host but provides positive effects by stimulating the growth of beneficial bacteria inside host's digestive tract (Ringo et al.2010).

**Table 2.** Water Quality Parameter

Parameter	Result	Unit
Temperature	27 – 30	C
pH	7,5 – 8	
DO	5,8 - 6,9	Ppm
Ammoniac total	0.141 - 0.668	mg/l
Nitrate	0,00 - 0,05	Ppm
Nitrite	0,00 - 0,10	mg/l
Phosphate	0,10 - 0,50	mg/l

#### 4. Conclusion

Based on the conducted research, it can be concluded that the administration of different probiotics dosage affects the absolute individual weight growth and length growth rate. The administration on food C with 5% dose is the best treatment towards absolute individual weight with a value of 0.0053 grams, followed by B with 3% dose with a value of 0.0041 grams, and the last A with 1% dose with the value of 0.0031 grams. Treatment C is the best treatment with the survival rate of 66.6%. The parameter of water quality during the research is categorized well to be used in fish rearing.

#### 5. Suggestions

According to the results of the research, the suggestions are for the fish farmers of kancra fish (*Tor soro*) to conduct further research to determine the best dosage to be used in natural food. In conducting research, the researcher should change the water in the rearing media as often as possible to prevent NO<sub>3</sub> sedimentation and to maintain the water quality so that the kancra fish (*Tor soro*) seed can grow healthily.

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