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EFFECT OF DIFFERENT TYPES OF CONTAINERS TO GROWTH RATE AND SURVIVAL RATE OF MANGGABAI (*Glossogobius giuris*)

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Abstract. The aims of research to review determine growth and survival of fish Living Manggabei (*Glossogobius giuris*) are maintained at different types of containers. The method used is a method of experimental research with complete random design (RAL). The treatment consists from differences of containers and each treatment consists of three replicates. The Treatment consists of two types of container treatment is an aquarium and a concrete pool. The research variables consisted of the growth and survival of test animals. Test animals used were Manggabei fish measuring ± 10 cm to 60 head. Maintenance is carried out for five weeks to determine the growth of test animals. Data were analysed using descriptive analysis of the data length and weight growth during maintenance test animals. The results showed that the weight gain and the highest length obtained at treatment by using an aquarium container, whereas the lowest in concrete tank containers. Length and weight maintenance long aquarium containers 0.47 cm and weight of between 0.37 gram. The length and weight of the concrete maintenance of tank containers, which is 0.27 cm length and weight of 12.16 gr.

Keywords: Aquarium, concrete pool, Manggabei, Growth Rate, Survival Rate

Introduction

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Introduction

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Based on data from the Department of Marine Capture Fisheries, stated that the number of fish caught Manggabai in Gorontalo 3 years preceding the year in 2011 reached 84.70 tons /

year, in 2013 reached 19 tons / year, and in 2015, at only 13, 6 tons / year. The number and size of fish Manggabay are getting lower due to changes in water quality in the Limboto Lake. In addition, the area of the lake silting and shrinking habitat dependent Limboto Lake cause so feared Manggabay fish populations will become extinct. This happens because the quality of the waters of the lake as a natural habitat Limboto Lake damaged.

Habitat is one factor that is quite important for the sustainability of aquaculture commodities. One attempt to do to overcome the natural habitat destruction is to perform controlled cultivation or make natural commodity into a commodity cultivation. This can also be done to avoid the extinction of endemic organisms that exist in a natural habitat such as Limboto Lake.

Fish Manggabay as endemic commodities contained in the waters of the Limboto Lake will become extinct if no prevention as early as possible. One of the activities that can be done is fish farming Manggabay using controlled container maintenance. Maintenance container used to represent the characteristics ⁴ of the natural habitat that can support the needs of living organisms cultivation. Fish Manggabay is still obtained naturally in the lake Limboto, so that the necessary research that can be used to support the fish farming Manggabay. This leads to the need for research on the type of container that is suitable for pisciculture Manggabay controlled manner.

Materials and Methods

The tools used in the research are container maintenance, analytical balance, water quality checker, blowers, aeration hose, faucet aeration, aeration stone. Materials used during the research that fish seed Manggabay, silk worm, pellet F-189, and freshwater. The container used in the study is the aquarium container and concrete ponds each with three containers.

The study was an experiment with completely randomized design (CRD) consisting of two treatments and three replications of each treatment. The treatment in question is the maintenance by using a different container, the aquarium and concrete tanks. Maintenance container used has a size of 70 x 40 x 40 cm consists of three aquariums and three concrete tanks.

Seeds were used in this study is Manggabai fish seeds derived from a number of arrests in the lake Limboto tail length of 600 ± 10 cm and a weight of ± 40 grams per fish. Stocking density of fish as much as 1 fish / L. Feeding is given as much as 5% of the weight of the biomass by feeding frequency 2 times a day ie morning and afternoon.

Maintenance of fish seed Manggabai conducted for 5 weeks. Measurement of the length and weighing of fish seed Manggabai done by sampling technique is to take a fish sample 20% of the total number of seeds in each container and is done once a week. Water quality measurements carried out every week and the observed parameters such as temperature, pH, and DO.

Research variables

Absolute growth

The growth rate of fish seed Manggabai measured in this study is the absolute length growth and absolute weight of fish seed Manggabai.

a. Absolute Length Growth

Calculation of absolute length growth of fish seed Manggabai according Effendie (1997) in Tarigan (2014) are as follows:

$$L = L_t - L_o$$

Information:

¹
 L_t = length of fish at time t (cm)

L_o = length of fish baseline (cm)

b. Weight Absolute Growth

Calculation of absolute weight gain of fish seed Mangabai according Effendie (1997) in Tarigan (2014) are as follows:

$$W = W_t - W_o$$

Information:

W = weight gain of fish seed (gr)

W_t = weight of fish seed time to the end- t (g)

W_o = Initial weight of fish seed (gr)

Survival Rate

³
Survival, or the survival rate (SR) is the percentage of organisms that live at the end of a certain time. Calculation formula according Goddaard survival rate (1996) in Tarin (2014) are as follows:

$$SR = \frac{N_t}{N_o} \times 100\%$$

²
Information:

SR = Survival Rate (%)

N_t = Number of fish at all t (tail)

N_o = number of fish baseline (tail)

Data analysis

Data obtained include absolute growth, daily growth, specific growth rate and survival of fish seed Manggabai analyzed using descriptive analysis and shown in the graph. The analyzed data is data length and weight of absolute growth and survival of fish seed Manggabai maintained for five weeks.

Result and Discussion

Growth is increase the length, weight, and volume within a specified time. Growth can be used as an indicator to see the physiological condition of individuals or populations. Absolute growth consists of two, such as growth in length and weight growth.

Absolute Length Growth

Absolute length growth on the seed Manggabai fish reared in aquariums and ponds concrete for five weeks shows that the highest growth in length obtained in maintenance, using an aquarium container. While the fish seed Manggabai that use container maintenance of concrete pools generate long lower growth. Value growth in the absolute length of the aquarium fish seed Manggabai and concrete pool can be seen in Figure 1.

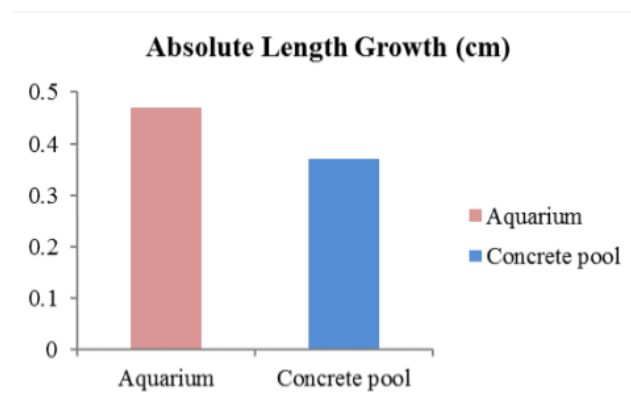


Figure 1. Growth Absolute Length Fish Seed Manggabai

Weight Absolute Growth

The results of the measurement of absolute weight gain showed that seed Manggabai fish reared at the aquarium container is higher than the seeds are kept in a concrete pool. These results suggest that heavy growth is influenced by different types of container maintenance. Value absolute gain in the second container can be seen in Figure 2.

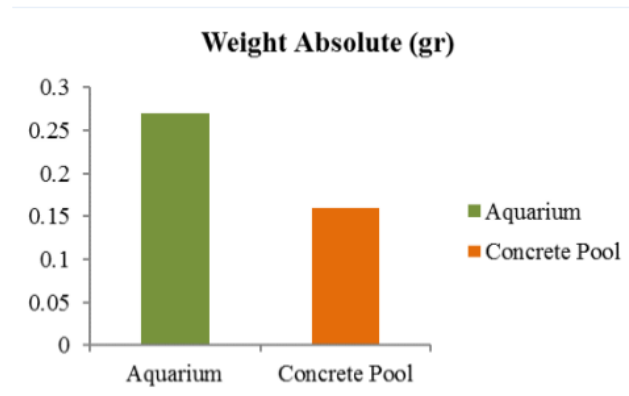


Figure 2. Added weight Absolute Fish Seed Manggabai

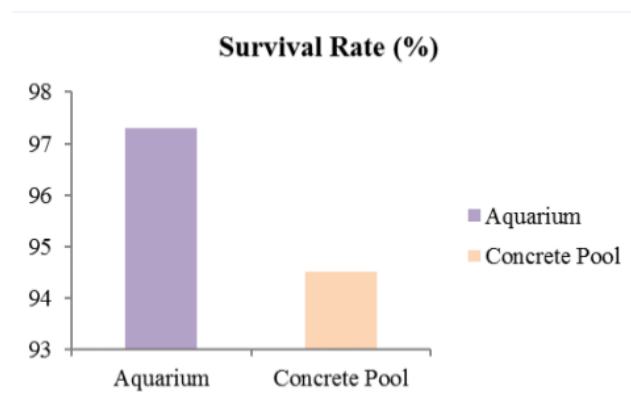
The container used in the maintenance of the organism is the replacement for the environment or the natural habitat of an organism. Maintenance container type used affects the growth and survival of an organism. Different types of containers will also affect the quality of the environment in a living organism.

Container maintenance will also affect the space, thereby reducing the fish to obtain the feed. Feed shortage will slow the growth rate of the fish and also a space for outside factors that affect the rate of growth, with ample movement space fish can move optimally. This opinion is in accordance with the opinion of Grace (2010), said that the artificial container will restrict fishing to obtain food because it depends on the feed given, so it will affect the growth rate of the fish.

Feed is one of the factors ¹ that play a role in the growth of fish Manggabai. The more varied and high nutrient content of feed would be good for the growth of fish. According Noegroho (2000) in Syamsunarno (2008), protein ⁴ plays an important role in the preparation of tissues and organs of animals, including fish. In the feed given to fish, protein should be available in sufficient quantities. Low level of protein feed which will lead to growth to be slow.

Survival Rate

Fish survival is a percentage of the number of fish that live on the number of fish that are kept in a container. Survival demonstrated by mortality (death). After doing research, data showed an average ⁵ survival rate of fish seed Manggabai presented in Figure 3.



⁵ **Figure 3. Survival Rate of Fish Seed Manggabai**

In this figure, it appears that the percentage of seed survival rate of fish Manggabai are maintained on the container which provides distinct survival value. Survival may be influenced by the content of available habitat and feed on habitat or container maintenance. One effort to overcome the low survival rate that is by maintaining the seeds in appropriate containers and also pay attention to proper feeding both in size, quantity and nutritional value of the food that will be given during the maintenance process (Wijayanti, 2010).

Based on the pictures can be concluded that the highest survival rate obtained in maintenance, using an aquarium that is equal to 97.3%, while the concrete tank container survival by 94.5%. Kind of container will influential on the growth and survival. This is because the container can affect the availability of feed naturally. In a controlled container maintenance or artificial feeding can not be obtained naturally, but must come from feed given during the maintenance process takes place.

Mudjiman (2000) in Suhenda et al (2003) which states that feed that have good nutrition plays an important role in maintaining the viability and accelerate the growth of the fish. In addition, the feeding does not spoil the quality of water and do not leave food remains such as the provision of pellets, the pellets granting media faster dirty water conservancy. This is in accordance with the opinion of Ward (1985) in Hutasoit (2014) which states that the survival rate of fish seed of life is largely determined by the quality of the water. During maintenance death occurred a few fish on all treatments, it is more common in the first week to the second week of maintenance, allegedly because the fish have not been able to adapt to the new container maintenance.

Water quality

Water quality is a very important factor in fish farming because it is required as a medium of life. Results of water quality measurements during maintenance Manggabay fish seed

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can be seen in Table 1.

Table 1. Water Quality Maintenance on Containers

Treatment	Parameter		
	Temperature (°C)	pH	DO
Aquarium	26,83 – 26,93	7,17 – 7,22	6,00 – 6,45
Concrete Container	26,85 – 27,19	7,18 – 7,41	5,55 – 6,04

Several environmental factors in the water that affect the lives of fish, among others, temperature, acidity (pH), dissolved oxygen (DO) and others. The water temperature during the study ranged from 26-27 °C. It shows that the media in accordance with the opinion Djokosetiyanto maintenance, et al (2005), which states that the water temperature is good for culture Manggabay range between 26-30 °C. The relationship between the temperature of the fish growth by Huet (1971) in Syamsunarno (2008) that is the growth of small or nonexistent below a certain temperature (20 °C). Further growth increases with increasing temperature until it reaches the maximum point (30 °C), and decreased again or even become negative (lethal) at temperatures above the maximum point (33 °C). In general, the magnitude of the pH of water to be used as a medium for the maintenance of fish seed Manggabay must correspond to their natural habitat in the wild, which is between 6.5 to 8.5 (BSN, 2009). Non-compliance with the terms of living water pH Manggabay fish seed will result in the development and growth is not optimal. Based on the results of measurements of pH of water during the study ranged from 7 to 7.5, a pH range of water during the study strongly supports the growth of fish fry fish Manggabay.

Besides these two factors the temperature and pH of the water above, oxygen is an important element in the life of the organism. Oxygen in the water is called dissolved oxygen (DO). From the measurement results of dissolved oxygen values in media studies ranged from 5.5 to 6.5 mg / l. Rise and fall of the soluble oxygen value associated with the value of the water temperature. The range of dissolved oxygen in the above, the present study is still worthy of media in supporting the growth of fish seed Manggabay. According Djokosetiyanto (2005) that the dissolved oxygen content both for maintenance (maintenance) fish Manggabay above 3 ppm.

Conclusion

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Based on the results of research on the growth and survival of fish fry Manggabei (*G. giuris*) are maintained on a different container, it can be concluded that:

1. Growth and Survival of fish seed Manggabei maintained at different container types show different results.
2. Growth of the length and the highest weight obtained on aquarium maintenance, using a container that is equal to 00:47 and 12:37 gr cm. While the length and weight of the lowest growth in container maintenance obtained using concrete tanks are 0:37 and 0:16 gr cm.
3. Survival of the highest obtained at the aquarium container that is equal to 97.3%, while the lowest was obtained on a concrete tank container that is equal to 94.5%

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