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VARIETY TYPES OF NATURAL FOOD FISH USAGE IN THE GROWTH OF SUPER RED AROWANA FISH (*SCLEROPAGES FORMOSUS*)

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ABSTRACT

This study aims to determine the effect of giving several types of natural feed and evaluate the best type of feed for thebody length of super red arowana fish (Scleropages formosus). This study used the Complete Randomized Design (RAL) method with 3 treatments and 3 repeats with 3 types of natural feed, namely crickets (A), Hong Kong caterpillars (B), and white shrimp (C). The maintenance of super red arowana fish is carried out for 70 days with a frequency of feeding three times a day and given satiation (ad satiation). The results showed that the feeding of crickets for super red arowana fish gave the highest length of 0.84±0.08 cm, the highest specific growth rate of 6.00±0.59%, and the survival rate (SR) at the end of the study was 100%. The results of measuring water quality parameters, namely temperatures of 28.7° C -30.4 °C, pH 7.97-8.14, and dissolved oxygen 4.6-5.4 mg.l^{-1}, are in the optimal range for the maintenance of super red arowana fish.

KEYWORDS *super red arowana fish (scleropages formosus); natural feed; growth; survival*

INTRODUCTION

Uper red arowana fish (*Scleropages formosus*) is a type of freshwater ornamental fish that is excellent and is endemic to Kalimantan Island. The natural habitat of super red arowana is in the Kapuas Hulu river and Lake Sentarum. Very attractive color, bright scales, large mouth jaws, and beautiful swimming style, make arowana fish called the king of the aquarium. Tavip, 1995 in Yue et al.,

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(2019), said that although the price is expensive, not a few who like this fish are even believed to bring luck to their keepers.

The growth of arowana fish is important in its maintenance, because the selling price of arowana fish is also influenced by the size of the arowana fish. The larger the size of the arowana fish, the more expensive the price (Noviyanti et al., 2019). Djonu et al., (2020), said that feed is a source of nutrition for fish growth and survival. Furthermore, Batu (1982) said in Madinawati et al., (2011), thatutrition is one of the important factors in the growth of fish used by the body for energy and metabolism. Super red arowana fish is a carnivorous fish (Yahya et al., 2016) and carnivores require high protein which is 40-55% (Wilson, 2002; NRC, 2011; Oliva-Teles et al., 2015). According to Yue et al., (2019), that arwana fish requires nutrients that are 46% protein.

Pwill be given adjusted to arowana fish, where this fish prefers live feed rather than artificial feed (Medipally et al., 2016). It is said by Ramadlon (2011) in Pamungkas & Prayogo (2019), that live feed is the main feed for arowana fish as carnivorous fish. According to Apin (2004), the size of the feed must match the mouth opening of arowana fish. Arowanas with a size of 20 cm can be fed crickets and caterpillars (Harianto & Wibawa, 2009). According to Apin (2004), arowanas with a size of 10-20 cm can be fed, silkworms and frozen bloodworms, then after a size greater than 20 cm can be given feed for white freshwater shrimp, Hong Kong caterpillars, crickets, centipedes, cockroaches, and small toads. Based on this description, the author needs to conduct research on the use of several types of natural feed that aims to see the influence on the growth of super red arowana fish (*Scleropages formosus*)". This research is expected to be useful as a consideration for choosing the type of natural feed given as a source of nutrition by arowana fish farmers or hobbyists. Moreover, this study aims to determine the effect of giving several types of natural feed and evaluate the best type of feed for thebody length of super red arowana fish (*Scleropages formosus*).

RESEARCH METHOD

The research was carried out from April 9 to June 18, 2022 at the Cultivation Laboratory, Fisheries Business Expert Polytechnic, South Jakarta. The research method used was a Complete Randomized Design (RAL) with 3 treatments and 3 repeats, namely feeding A (crickets), feeding B (Hong Kong caterpillars), and giving pacan C (shrimp). The test animals used were super red arowana fish (*Scleropages formosus*) measuring between 20.1-21.6 cm as many as 9 heads with a density of stocking 1 head into an aquarium measuring 100 cm x 50 cm x 40 cm, thickness 80 mm, and water level is 25 cm. Measurement of water quality parameters, namely temperature, pH, and dissolved oxygen (d *isssolved* oxygen/ DO) carried out at the time of preparation or will beflowed into the aquarium is also carried out periodically during the maintenance period. Water changes are carried out every two days as much as 20% and once every 2 weeks as much as 50%. The feed given is first cleanedn and dipped with saline at a dosage of 50 g.l^{-1}. Then the feed is given with frequency of giving three times a day and given as full *as possible (ad satiation)*. Measurements of the length of the body of the fish are carried out

every 2 weeks during the 70-day rearing. The basis for this measurement is in accordance with the opinion of Said (2005) who states that the parameter for the growth of ornamental fish is a measure of length and measuringn is carried out once every two weeks. Measuring the body length of arowana fish is done by lowering the aquarium water up to 12 cm and when the arowana fish swims right on the edge of the aquariam, immediately taken pictures, where on the outside front of the aquarium, a measuring instrument has been installed. The normality test uses the Shapiro-wilk test and yuji homogeneity uses the Homogeneity of Variance Test. Variance analysis with One-way ANOVA test at 95% confidence interval. If the ANOVA test results have a noticeable difference (sig. < 0.05), then continue with the Duncan test. Then, the data was processed using *Statistical Package and Service Solutions* (SPSS) software version 21, to find out whether there was an influence on each treatment.

RESULT AND DISCUSSION

Based on the results of length measurements, it can be seen that superred arowana fish experience long growth. According to Harianto & Wibawa (2009) which states that arowana fish at a size of 20 cm can experience the fastest growth and do not experience changes in anatomy. Thelong growth of super red arowana fish during the experiment can be seen in Figure 1.

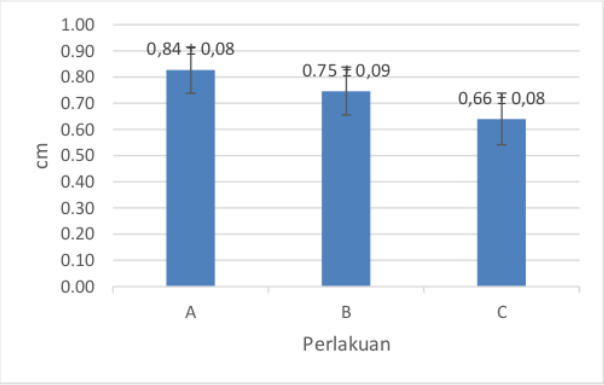

Figure 1. Length Grpwth Arowana Fish Super Red

The highest length pert measurement results are in treatment A, which is 0.84±0.08 cm. Ptreatment A (0.84±0.0 8 cm), treatment B (0.75±0.09 cm), and treatment C (0.66±0.08 cm). Cricket feeding shows the highest long pert umbu han, while shrimp feeding showsthe lowest pert umbuh an. Specific *Growth Rate* is used to calculate the increase in length of arowana fish each day. The graph of the pertumbuhan rate can be seen in Figure 2.

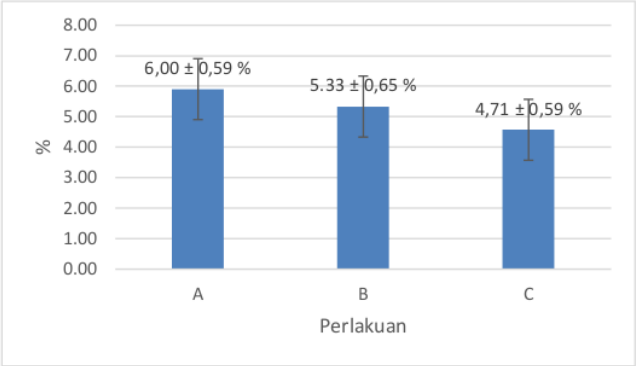

Figure 2. Specific Growth Rate

Based on the results of the calculation of the specific growth rate of the length of arowana fish shows that different feedings have a real effect on the growth rate (sig. <0.05). Growth rate results in treatment A (6.00±0.59%), treatment B (5.33± 0.65%), and treatment C (4.71±0.59%). The highest specific growth rate is cricket feeding, namely treatment A, which is 6.00±0.59%. Crickets have a protein content of 56.02-74.5% (Shilman et al., 2022), while according to Wang et al. (2004) in Prastowo et al., (2018), the value of protein in crickets is 58.3%. So, it can be said that jangkrik with its high protein can support the growth of arowana fish better than Hong Kong caterpillars and shrimp. Hong Kong caterpillars have a protein content of 48% (Haryanto, 2013 in Prastowo et al., 2018). Shrimp has a protein content of 39.59% (Ponnuchamy et al., 1981).

Fat is one source of energy in arowana fish. Arowana requires 5% fat nutrition (Yue et al., 2019). Carnivorous fish require feed with a fat content ranging from 4-18% (Hidayat, 2013 in Warsono et al., 2017). Carnivorous fish have higher lipase activity than herbivorous and omnivorous fish (Furné et al., 2005). Higher lipase activity due to food available in its natural habitat. In their natural habitat, arowanas eat foods with high fat, such as live insects and smaller fish (Natalia et al., 2004). Crickets have fat content that suits the nutritional needs of arowana fish as carnivorous fish. Cricket feed contains 10.3% fat (Wang et al., 2004 in Prastowo et al., 2018). The fat content of crickets is in accordance with the fat needs of arowana fish from Hong Kong caterpillars and shrimp. Hong Kong caterpillars have a fat content of 40% (Haryanto, 2013 in Prastowo et al., 2018). Shrimp has fat of 47.40% (Ponnuchamy et al., 1981).

The eating habits of arowana fish have an effect on the appetite of fish. This is because arowana fish like feed that is on the surface of the water becausearowana is a *surface feeder* fish (Yue et al., 2004). Furthermore, it is said by (Apin, 2004), the shape of the mouth that looks up. Fish interest in feed is important in feeding (Khasani, 2013). Hong Kong crickets and caterpillars are live feed that floats or floats, while shrimp immediately sink or like to be at the bottom of the maintenance container. Types of natural feed crickets, Hong Kong caterpillars and white shrimp can be seen in Figure 3.

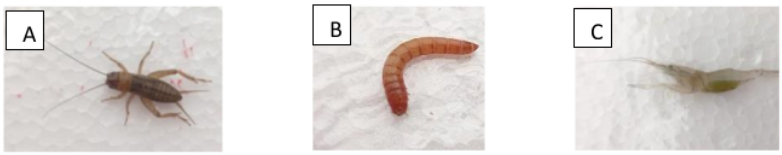

Figure 3. Feed (A) crickets, (B) Hong Kong caterpillars, and (C) white shrimp

The survival rate (SR) obtained at the end of maintenance in treatments A, B, and C is 100%. In addition to feed, survival is influenced by the quality of water used as a maintenance medium. Water quality affects the survival and growth of fish (Effendi et al., 2006 in Jumaidi et al., 2017). The factor that influences growth is the tolerance ability of the fish body, where if the habitat is not suitable it willinterfere with growth (Saparinto and Rini, 2011 in Siegers et al., 2019). The survival graph is presented in Figure 4.

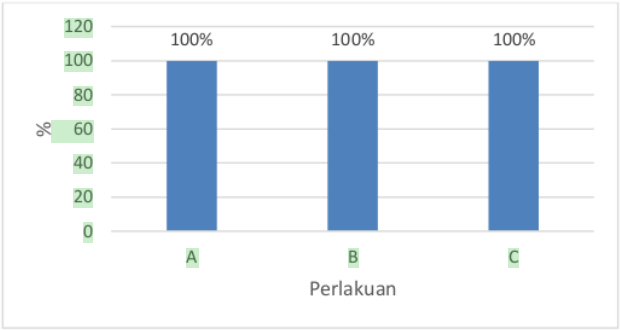

Figure 4. Shack Treatment

The results ofwater quality measurements during the study, namely temperature, pH and DO, can be seen in Table 1.

Table 1. Water Quality Parameter Measurement Results

Parameters	Treatment		
	A	B	C
Temperature	28.7°C -30.4°C	28.7°C -30.3°C	28.7°C -30.4°C
Ph	7,97-8,14	7,97-8,14	7,97-8,13
DO	4.6-5.4 mg.l^{-1}	4.6-5.4 mg.l^{-1}	4.6-5.4 mg.l^{-1}

The temperature obtained is 28.7°C-30.4°C is the ideal temperature. This is in accordance with the opinion of Apin (2004), that the ideal temperature for arowana fish maintenance is 27°C-30°C. At ideal temperatures, the growth of arowana fish is not inhibited. Conversely, fish will lose their appetite and be susceptible to disease at low water temperatures (Suriansyah, 2014 in Yanuar, 2016). Temperatures that exceed the optimum temperature cause the metabolic rate

to increase so that the energy originally for growth is diverted to the metabolic rate (Stickney, 1979 in Sihombing &; Usman, 2018).

The pH measurement results during the study ranged from 7.97-8.14. The pH value is still at the appropriate pH for arowana fish, which is 6.5-8.5 (Wardoyo, 1975 in Apriyandi et al., 2021). Inappropriate pH will affect the growth and survival of arowana fish. But at a low pH that can still be tolerated, fish will use their energy to survive (Hasanah *et al*., 2019). While at high pH, ammonia formed is not ionized and is toxic (toxic) to fish (Diansari et al. , 2013) .

The results of dissolved oxygen (DO) measurements duringthe study ranged from 4.6-5.4 mg.l^{-1}. The DO value is in the optimal range. According to Apin (2004), that dissolved oxygen for the maintenance of arowana fish is at least 3 mg.l^{-1}. The dissolved oxygen content affects the appetite and growth and continuity of fish. If dissolved content that is insufficient for fish needs will result in a decrease in fish activity, one of which is growth (Madinawati et al., 2011). Appetite is triggered by high dissolved oxygen (Islami et al., 2017).

CONCLUSION

Based on the research results, the conclusions are; (1) the use of different types of natural feed has a significant effect on the increase in length and specific growth rate. Crickets in treatment A gave the highest pert umb uhan length (0.84±0.08 cm) and also gave the highest specific growth rate (6.00±0.59%), (2) t*he survival rate* (SR) of super red arowana fish (S*cleropages formosus*) obtained at the end of the study was 100% in treatment A, B and C, and (3) the results of water quality measurements during the study were in the optimal range for the maintenance of super red arowana fish, namely temperatures of 28.7 ° C -30.4 ° C, pH 7.97-8.14, and dissolved oxygen 4.6-5.4 mg.l^{-1}.

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