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Length Frequency, Cohort and Growth of Beloso Fish (*Glossogobius* sp) In the Waters of Lake Tempe South Sulawesi

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Abstract: BelosoFish (*Glossogobius* sp) as one of the native fish in Lake Tempe that has not been cultivated. The existence of these fish in the waters of the lake tempe ecologically and economically very important. But this time the fish Beloso experienced a decline in production and the size of the problem. Beloso fish size that are commonly found today only ranges from 100 mm to 140 mm, which formerly could reach 375 mm. The genetic diversity of fish even this has been very low. If this is left unchecked, then the fish Beloso this will decrease the size and production are so serious that can lead to extinction. To preserve this fish on Lake Tempe and as initial information for this Beloso fish cultivate, the study was conducted.

This study aims to determine the frequency distribution of the length and the cohort as well growth of fish Beloso. Total length frequency of the sample Beloso fish collected from five locations in Tempe lake waters using fishing gear bubu step, a passive trap and timpo. Determination of the age group of Beloso fish analyzed by Bhattacharya method and Infiniti length (L_∞) measurement using Fisat II program (version 1.2.2). While the analysis of the theoretical age Beloso fish when the fish length is equal to zero (t_o), used empirical equation Pauly (1983). Growth curve models created by applying the growth parameters into the formula Von Bertalanffy growth equation.

Total length size distribution Beloso fish caught during the study was 82 mm up to 231 mm. In general, the cohort that obtained at each sampling locations are three cohort. Similarly, the combined population of the cohort and the cohort males gained three age groups, whereas the cohort females only earned two age groups. Infiniti length ($L\infty$) fish Beloso is 325 mm, t_o is -0.1595 and growth coefficient was 0.53

Keywords: Beloso Fish, Length Frequency, Cohort, Lake Tempe

Introduction

Beloso Fish is one fish species with high economic value and loved by the people, has a special flavor and distinctive with a thick flesh and a bit of bones. Can be used in fresh or dried form.Beloso Fish (Glossogobius sp) as one of the native fish in Tempe Lake that has not been cultivated. The size of Beloso fish that are commonly found currently only ranges from 100 mm to 140 mm; which formerly could reach 375 mm (Tamsil, 2000). The genetic diversity of fish even this has been very low (Hadijah, 2011 and Hadijah et.al, 2014). If this is left unchecked, then the fish Beloso This will decrease the size and production are so serious that may lead to the extinction.

Various community activities around Lake Tempe potentially damage Beloso fish habitat and other fish species that can cause a reduction in the size of fish and decrease / loss of population and the diversity of fish in these waters (Nasution, et.al, 1995 and Tamsil, 2000). Cultivation and introduction of fish (Cyprinuscarpio and Tilapia) to the waters of Tempe Lake , is another activity that threatens the existence Beloso fish in this lake. This activity could cause significant pressure on endemic species and native species through predation and competition (Wijeyaratne and Perera 2001). Leyse et.al. (2003) suggested that non-native fish species will cause a decline in the population of endemic species.

The intensity of utilization of Beloso fish resources higher could threaten its sustainability. To preserve this Beloso fish that can be used continuously with the harness and manage them rationally. Length frequency distribution information and age groups as well as the growth of Beloso fish in the waters of Tempe Lake is expected to be used as the basis for its management.

Research Methods

Location of research and sampling Beloso fish conducted in the waters of Lake Tempe, South Sulawesi, which is precisely:

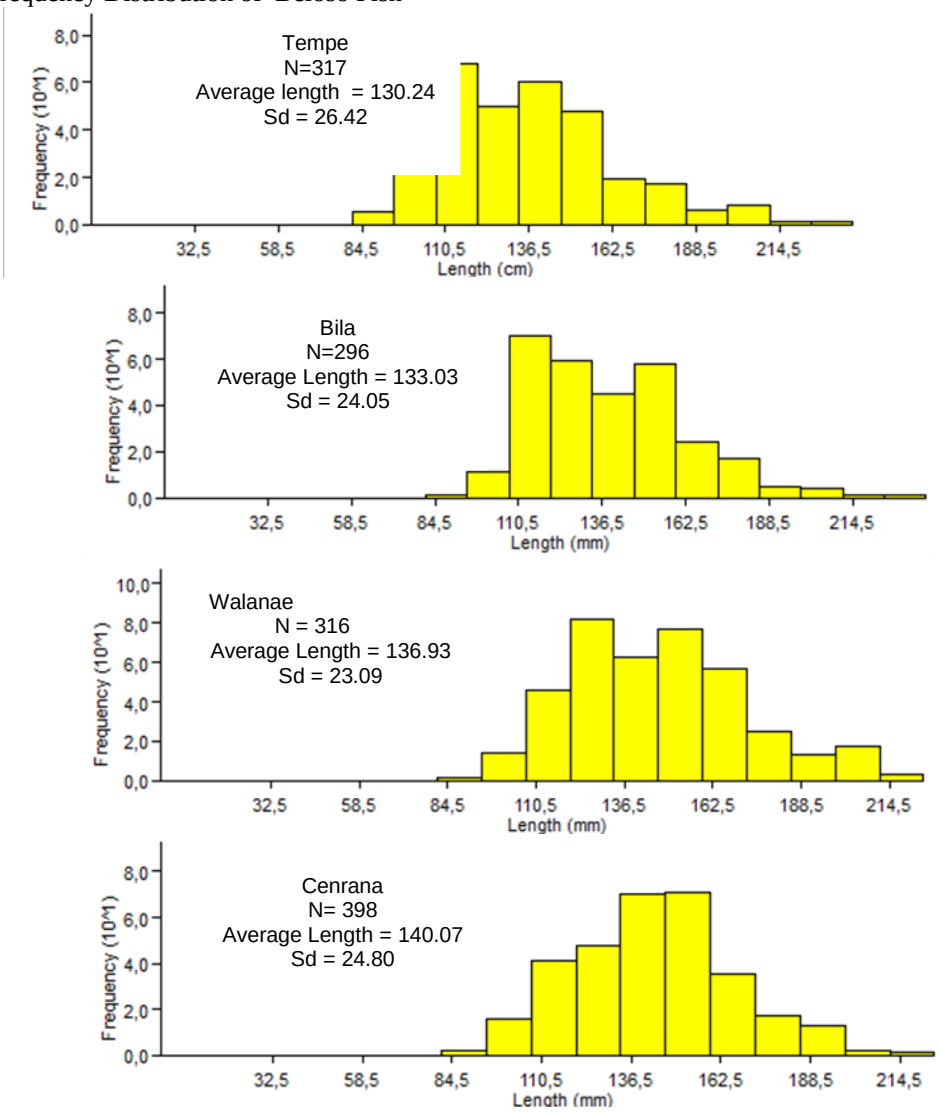
1. In the central area of Lake Tempe is a fishing area, 119°57 706' EL and 4° 6.674' SL.
2. In the area of water from the Bila river 119°57'19.47'EL and 4°3'56.22' SL.
3. In the area of water from the River Walanae, 120 ° 1.220 'EL and 4 ° 8097' SL.
4. In the discharge of water into the River Cenranaee, 120° 1.678 'EL and 4° 8.118' SL.
5. In Batu-batu areas of Soppeng, 119°55.168' EL and 4°7502' SL

The collection of samples is done by using gear bubu step, a passive trap and timpo (a type of fishing gear from bamboo, one end remains closed and the other end open). Beloso fish caught calculated amount is then measured using a length measuring board fishing (fish measuring board) with a precision of 1 mm. Length measurement is done is to measure the total length of the fish Beloso, the measure of the leading end in the head (the tip of the mouth) to the tail end of the last section.

To determine the length frequency distribution of Beloso fish done by grouping the frequency length of the data entire length measurement obtained during the study. Determination of the cohort of Beloso fish analyzed by Bhattacharya method and Infiniti length (L_∞) measurement using Fisat II program (version 1.2.2). While the analysis of the theoretical age Beloso fish when the fish length is equal to zero (t_o), used empirical equation Pauly (1983). Growth model estimated by Von Bertalanffy equation; using Fisat II program (version 1.2.2):

Results and Discussion

Length Frequency Distribution of Beloso Fish



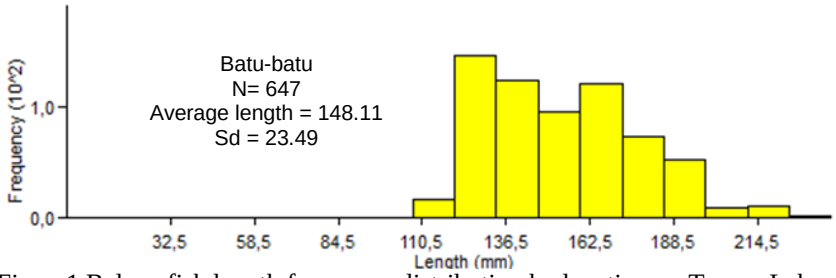


Figure1.Beloso fish length frequency distribution by location on Tempe Lake

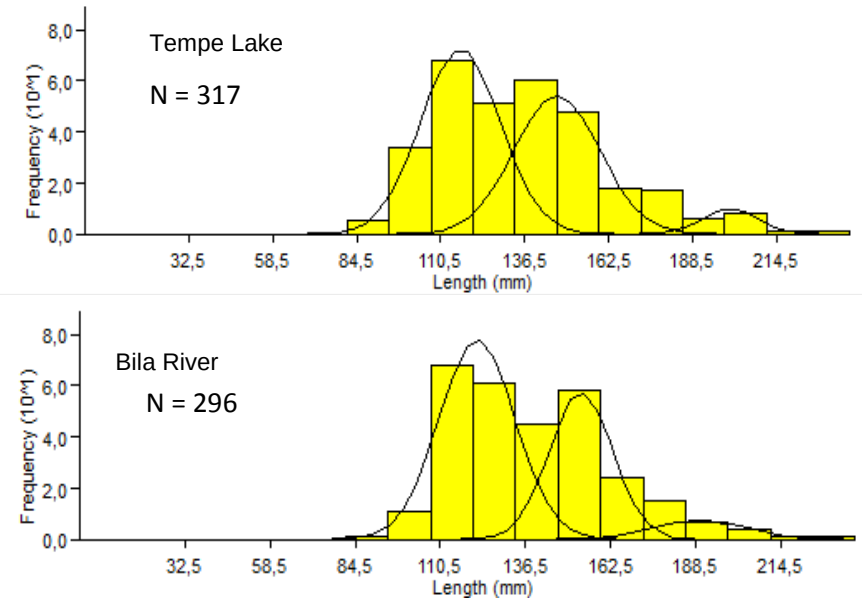
Length frequency of Beloso fish caught during the study was 82 mm - 231 mm. Distribution of this total length is a measure of the Beloso fish commonly caught by fishermen in the waters of Lake Tempe. Beloso fish length frequency distributions based on sampling sites can be seen in Figure 1.

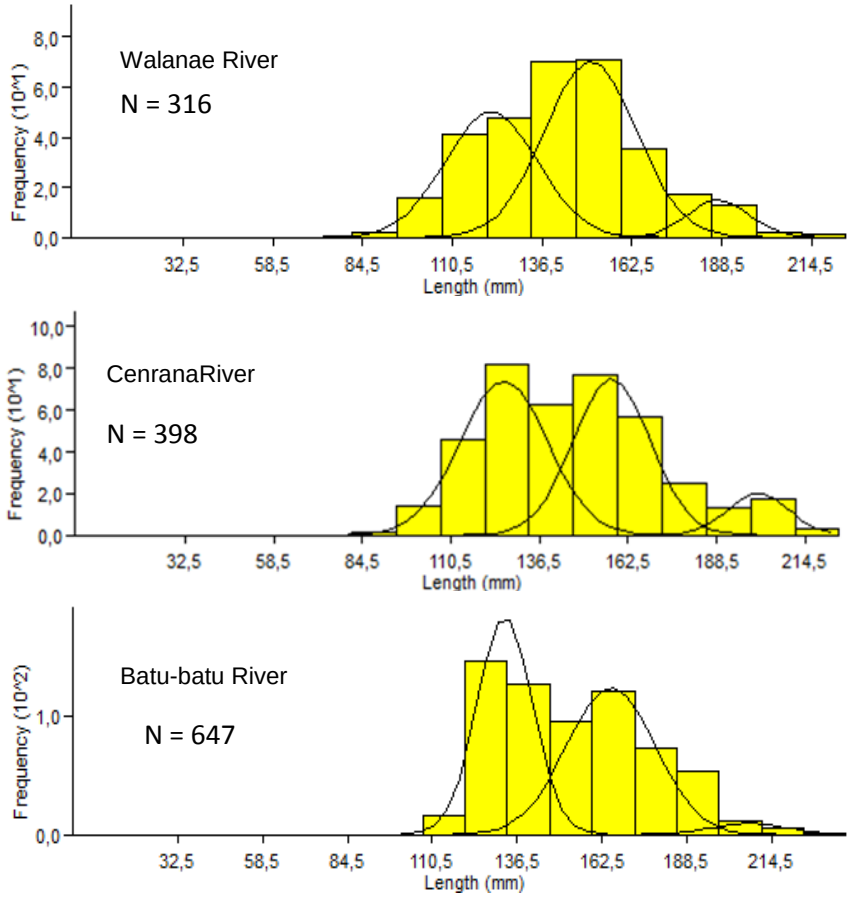
From Figure 1 can be explained that the Beloso fish populations structure in each location indicates that the fish are small by middle value total length (88 mm) can still be found in all sampling locations except the Batu-batu location are no longer found the fish are small. When compared with Tamsil (2000) who obtained a total length ranging from 43 mm to 375 mm; it can be said that this time fishermen are aware not to catch a fish that is too small. The largest size obtained in this study was 231 mm, very different from those obtained (Tamsil, 2000) who get the fish measuring 375 mm.

Cohort of Beloso Fish

A cohort is a group of fish born in the same year within a population or stock. Beloso fish smallest obtained in this study is 82 mm. The smallest size is found in February, March and April. The existence of small-sized fish in a group showing the addition of a new individual. While the size of the longest obtained is 231 mm. The longest fish was obtained in July. Given the size of the longest fish sector in the waters indicate that these fish are able to survive in conditions of the water environment. Obtaining the size distribution of fish are sufficiently varied to show their relationship with the new additions to the waters and the death rate due to catching.

Determination of the age group / size of fish Beloso in this study were analyzed by using the method of Bhattacharya. Beloso fish age group in each capture site can be is shown in Figure 2.





Fiture2. Cohort of Beloso Fish by location on Tempe Lake

Figure 2.note that the average length of a group the size of the first group (I), is between 116.63 mm to 132.69 mm; and the average size of fish that most captured at each location in general is on the group size of the first (I) except on Walanae and Batu-batu River location, the most numerous group was caught should be in the size of the second (II) is at the average length of 150.58 and 165.29 mm. Group size of fish that most captured in this study is greater when compared with the catches Beloso by Tamsil (2000), who obtained group of fish size between 100 mm to 119 mm. But in the largest size group of fish in this study is much smaller in size 207.60 mm compared to Tamsil (2000) obtained the largest group of fish size is 360 mm to 380 mm. The longest fish caught in this study was 231 mm was obtained catch 1 fish. Mamangkey (2010) obtained the Butini fish (*Glossogobiusmatanensis*) that most captured the average length was 28.08 cm and the least caught was 40.50 cm. This indicates that the length of the fish Beloso in the waters of Lake Tempe is now very short.

In general, (cohort) Beloso fish have very low or very small. The age group of the catch per month at most two cohorts; and mostly only one course per month almost at each location. The analysis shows that there are three (3) cohorts Beloso fish at each sampling location in the waters of Lake Tempe. While the normal population have a range of cohort between 5-7 (Mallawa, 1986). This indicates that the fish population in the waters of Lake Tempe Beloso is already very depressed.

The growth of Beloso Fish

Infinity length (L∞), Growth coefficient (K)and size $t_o$at each sampling location can be seen in Table 1. Table 1 shows the growth coefficient (K) is the highest in the Batu-batu location is 0.72 a year, and the lowest in the Bila River is 0.52 a year. The high value of the growth coefficient at the Batu-batu location explains that the growth of the Beloso fish at that location is faster than other locations. The length of infiniti (L∞) obtained in this study was relatively lower compared to the length of Infiniti (L∞) of Butini fish (G. matanensis) measuring 46.62 cm and the total length of butini fish obtained reached 46.2 cm (Mamangkey 2010). The length of Infiniti (L∞) from the results of Tamsil's research (2000) is 515.81 mm and the total length of the catch obtained is 375 mm.

Table 1. Parameters of growth (fish Beloso) each study site location

Location	Infiniti Length (L∞)	Growth coefficient (K)	t_o
Tempe Lake	303	0.68	-0.1255
Bila River	285	0.52	-0.1757
Walanae River	302	0.70	-0.1219
Cenrana River	290	0.60	-0.1447
Batu-batu River	292	0.72	-0.1195

The length of infiniti (L∞) obtained in this study was relatively lower compared to the length of Infiniti (L∞) of Butini fish (G. matanensis) measuring 46.62 cm and the total length of butini fish obtained reached 46.2 cm (Mamangkey 2010). The length of Infiniti (L∞) from the results of Tamsil's research (2000) is 515.81 mm and the total length of the catch obtained is 375 mm. This shows that the size of beloso fish in the waters of Lake Tempe is very small.

Conclusion

1. Distribution of size (total length) Beloso fish is very low, ie 82 mm to 231 mm.
2. In general, there are three Beloso fish cohorts, this shows that the population of beloso fish in the waters of Lake Tempe has been very depressed.
3. The size of fish Beloso is very small with Infiniti length (L∞) obtained Beloso fish 285-302 mm and growth coefficient is 0.52 - 0.72.

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