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Abundance Index Slender Walking Catfish With Correlation of Water Quality In Natural Habitat

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Abstract

Slender walking catfish (*Clarias leiacanthus*) has decreased in its natural habitat. Many factors affect the decline of the population, including the conversion of land where natural habitat becomes plantation, the presence of excess arrest, and the quality of water that has been contaminated. The condition of the waters determines fish life, considering that various species of fish can only live on certain conditions. A study related to the correlation of water quality with fish abundance index is needed as a knowledge of determining biological and ecological needs of fish as a biological resource in a water.. The results of this study showed the abundance index of wild-type catfish at January (0.15 Ind./m^2), February (0.22 Ind./m^2), and March (0.20 Ind./m^2). The correlation analysis of water quality showed pH has a correlation (+) with a value of r (0.827).

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C.leiacanthus, abundance index, water quality correlation, natural habitat

Introduction

Catfish (Siluriformes) mostly live in freshwater and marine waters. The Siluriformes family is a fish that has a tentacle in its mouth. The group consists of 106 species and is grouped into 35 genera and 12 families, namely Bagridae, Siluridae, Schilbidae, Pangasiidae, Akysidae, Parakysidae, Sisoridae, Clariidae, Chacidae, Ariidae, Plotosidae and Loricariidae (Kottelat, et al., 1993).

One of the types is the slender walking catfish (*C. leiacanthus*). The difference with other catfish only lies in its color and complexion, because the slender walking catfish has a brown color and has a yellow leopard pattern. Fish Limbat also has a delicious flavor and high economical value. Nutritional content also has benefits for health including: prevent atherosclerosis, increase muscle mass, prevent autoimmune diseases, brighten and moisturize the skin, nourish the eyes, and banish the disease of diabetes (Rianto, 2018).

C. leiacanthus is a endemic fish found in the island of Sumatra and Kalimantan. Lately it has begun to be difficult to find in its natural habitat. One factor of the cause is land conversion, where its natural habitat is converted into plantation land. In the Riau Province due to the opening of peatland into plantations allegedly have an impact on reduced habitat

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and natural feed sources for fish, increasing turbidity and water temperature (Haryono, 2007).

Research needs to be done regarding the abundance index of *C. Leiacanthus* population with the correlation of environmental conditions in its natural habitat. Based on field observations, the natural habitat of *C. Leiacanthus* is found in the white sand village and Bandar Tinggi village. The Data and information of the study is a preliminary step to anticipate the impact of decline in *C. Leiacanthus* population and also as an effort to preserve sustainability in its natural habitat.

Materials and Methods

Fish sampling was conducted in January-March 2020. This research is an exploratory study, where researchers are looking for a wild type catfish habitat found in its natural habitat. Furthermore, the arrest uses the Banjur (passive fishing rod) and the bait in the form of earthworm. Banjur used as many as 20 pieces. Fish samples were taken at 2 locations: Station 1 at Pasir Putih Village, Silangkitang District, South Labuhan Batu Regency and Station 2 at Bandar Tinggi Village, Bilah Hulu District, Labuhanbatu Regency. Further observation location can be seen in Figure 1.

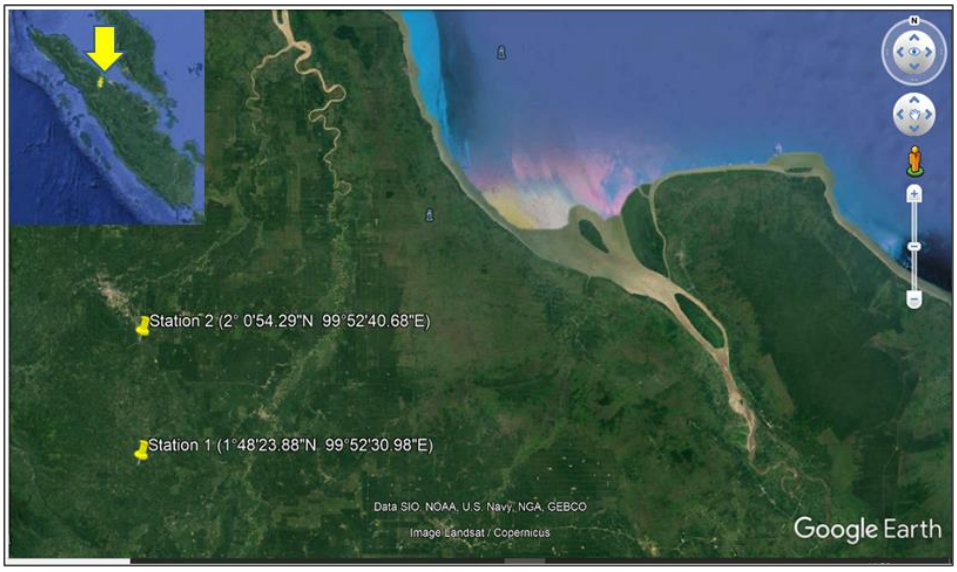

Figure 1. Map of Research Observasation

Population estimation using the catch per Unit method effort refers to (Ricker, 1975); (Pauly,1983). Data analysis for calculating the Abundance Index using formulas (Tjakrawidjaja & Haryono, 2001).

$$\mathrm{Ki} = \frac{\mathrm{Ni}}{\mathrm{Na}}$$

Where: Ki = Abundance Index; Ni = number of individual catches; Na = number of fishing rod.

Some of the water quality parameters in the test are TDS, TSS, DO, BOD, COD, (exsitu), pH and temperature (insitu). Water samples were analyzed in The Testing Laboratory The Institute for Industrial Research and Standardization of Medan. Subsequent data processing was analyzed using Microsoft Excel 2010 and SPSS version 22 programs.

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Results and Discussion

Abundance Index

The abundance Index of *C. leiacanthus* in each month shows the difference of January (0.15 individual/m^2), February (0.22 individual/m^2), and March (0.20 individual/m^2). The Data can be viewed in Figure 1.

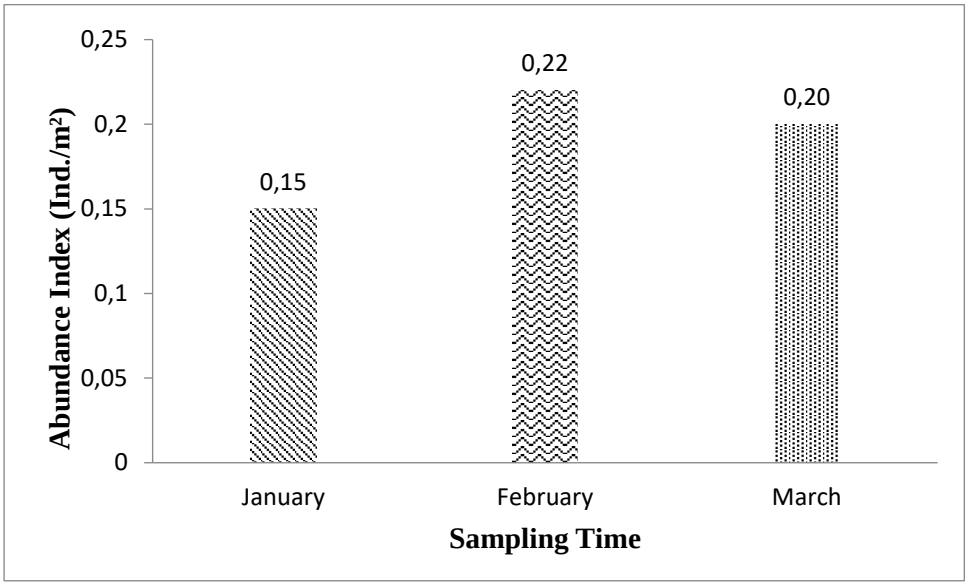

Figure 2 . Abudance Index of *C. leiacanthus*

The population density of *C. leiacanthus* based on the results of the study differs in each month, index of Abundance *C. leiacanthus* is still quite high at every research site, where in March is the peak of 0.22 individuals/m^2. This research is much higher the index of Abundance *C. leiacanthus* if comparative with fish kaloso with density 0.017 individuals/m^2 in the Pomo Swamp, Merauke regency, Papua (Tjakrawidjaja & Haryono, 2001). The abundance and spread of a population in a aquatic ecosystem, determined by several factors among them the level of resource availability, factors or the physical and chemical properties of water that can be tolerated by species in the population (Odum, 1953). It is possible that the habitat of these fishes in the form of rivers and swamps is still in good condition as well as catching mostly using a banjur (Marhana & Kamri, 2017). The difference in the very high rainfall will also change the structure of the fish community because the difference in water surface changes so that it correlates to changing conditions and availability of habitat for fish (Jenkins & Jupiter, 2011)

Correlation of Water Conditions with Abundance Index

Results of the analysis of SPSS application Program version 22 used to determine the correlation of water quality condition in the form of: TDS, TSS, DO, BOD, COD, pH, and temperature with a abundance index *C. leiacanthus* at the research observation. More data can be seen in table 1.

Table 1. Correlation Water Quality with Abundance Index of *C. leiacanthus*

No.	Water Quality	r
1	TDS	0.132
2	TSS	0.135

3	DO	0.103
4	BOD	0.112
5	COD	0.105
6	pH	0.827
7	Temperature	0.161

Analysis results indicate the direct correlation (+), meaning the higher the value of the water quality then the value of Abundance Index *C. leiacanthus* the higher. The pH value that indicates the highest correlation, it is given the pH as a limiting factor for fish life. The occurrence of change of water quality parameters in nature can also be caused by the forest over the function of plantation land (Sari, et al., 2017). The use of fertilizer and anorganic pesticides continuously can adversely affect the environment especially on the quality of groundwater to the occurrence of pollution, especially Nitrogen (N) NPK fertilizer that is used continuously without any control or control will affect the quality of groundwater periodically, this influence that will trigger an increase in the concentration of nitrate, phosphate, and potassium in the soil (Fikri, et al., 2014). This will certainly affect the value of pH in a water. The pH value after the first fertilization ranges from 5.50-6.60 and the pH value after the second fertilization range 6.5-7.2 (Jana, et al., 2014). Surely it will donate waste or chemical residue to the river and can impact its water quality (Alfionita, et al., 2019). Optimal pH for catfish life ranges from 6.7- 8.6 (Warseno, 2018).

Conclusions

The abundance index of *C. leiacanthus* is based on March's capture of the highest score, followed by February and January. The abundance index is categorized as high, habitat condition still supportive for its life in nature. It is correlated with a polysistive water quality factor that is pH, catfish that live in the wild need optimal pH for body development and reproduction.

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