Abundance and Length-weight Relationship of Anchovy Pekto (*Stolephorus waitei*) in Tanjung Beringin Water, Serdang Bedagai, Sumatera Utara

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Keywords: Abundance, Distribution Pattern, Length-Weight Relationship.

Abstract: Research about the abundance and length-weight relationship of anchovy pekto (*Stolephorus waitei*) has been carried out in Tanjung Beringin Water, Serdang Bedagai Regency, Sumatera Utara. This study aims to analyze the abundance, distribution pattern, and length-weight relationship of anchovy pekto. This research use purposive sampling methods. Sampling of anchovy pecto use a mini purse seine. Abundance and distribution of anchovies were analyzed using the equation according to [1] and the length-weight relationship using the Fish Stock Assessment Tool version 2. This study obtained 1238 ind/60 m^2. The highest abundance of anchovy at station 1 is 490 ind/60m^2, followed by station 2 is 386 ind/60m^2, and the lowest at station 3 is 362 ind/60m^2. The distribution pattern of anchovy pecto is group distribution. The length-weight relationship of anchovy pekto showed that increase in anchovy body weight faster than its length, which illustrates a positive allometric growth pattern, with a value of b > 3.

1 INTRODUCTION

Utilization of marine fishery resources is an important issue, as a food and trade commodity, including anchovy pecto (*S. waitei*). Anchovy pecto is often found in Indonesia waters, including the water of Tanjung Beringin, Serdang Bedagai Regency, Sumatera Utara. Anchovy pecto is very widely used by the community, both for sale and consumption to meet protein needs. The high selling price and market demand for this commodity has caused many fishermen around the Tanjung Beringin water of Serdang Bedagai Regency to catch this commodity, without any restrictions. This condition can affect population abundance and growth of this commodities in nature. Until now, there is no data on the abundance and growth of anchovy in the Malacca Strait Waters of Serdang Bedagai Regency, Sumatera Utara. This study aims to analyze the abundance and length-weight relationship of anchovy pekto.

2 ANCHOVY SAMPLING

Anchovy sampling was carried out in the waters of Tanjung Beringin, Serdang Bedagai Regency, every 12 days for 7 months of observation. This research use purposive sampling methods. Sampling of anchovy pecto use a mini purse seine. Samples of captured anchovies were collected, then measured the total length from the anterior end to the posterior end of the body using millimeter blocks to the nearest 0.1 mm. Fresh weights of anchovies were also measured per individual by weighing each individual using a digital scale with an accuracy of 0.1 g, then an analysis of abundance, distribution, and growth pattern.

Abundance of anchovy pecto were analyzed using the equation according to Silaen and Mulya (2018):

$$K\ (ind/m^2) = n_i/A$$

with:

K = abundance (ind/m^2)
n_i = number of individuals spesies i
A = plot area (m^2)

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Distribution patterns were analyzed based on the Morisita Distribution Index (Bengen, 1998) with the equation:

$$ID = n\left[\frac{\left(\sum_{i=1}^{n} x_i^{\,2}\right) - N_i}{N_i\left(N_i - 1\right)}\right]$$

ID = Morisita distribution index
N = number of plots (ranging from 1 to n)
N_i = total number of individuals in the total plot
Σx_i^2 = number of individual squares in the total plot

Length-weight relationship using the Fish Stock Assessment Tool version 2 according to Sparre and Venema, (1998), with regretion equation:

$W = a\,L^b$ or $Ln\,W = Ln\,a + b\,Ln\,L$,
W = wet weight (g)
L = total length (cm)
a and b = constans

2.1 Abundance

The abundance analysis of anchovy pecto can be seen in Figure 1. This study obtained 1238 ind/60 m^2. The highest abundance of anchovy at station 1 is 490 ind/60m^2, followed by station 3 is 386 ind/60m^2, and the lowest at station 2 is 62 ind/60m^2. High abundance at station 1 is due to the fact that this station is 15 km from the beach leading to the sea, and is an anchovy catchment area. The water temperature at this station is 28°C, and strongly supports the life of this biota.

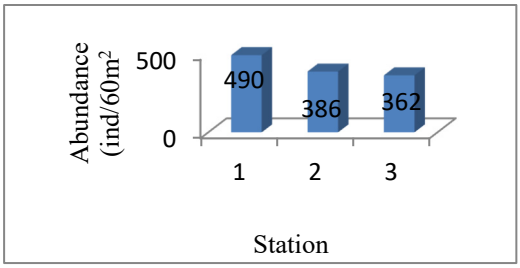

Figure 1: Abundance of anchovy pecto in each station.

Yuanda et al. (2017) stated that anchovy generally lives in groups, the number reaches hundreds individuals, and has a length of about 6-9 cm. Fitriani and Pursetyo, (2012) stated that the anchovy pecto belongs to a group of small pelagic fish that can live in a temperature range of 26ºC-29ºC.

2.2 Distribution

The distribution of anchovy pecto at each station, which was analyzed using the morisita distribution index can be seen in Figure 2.

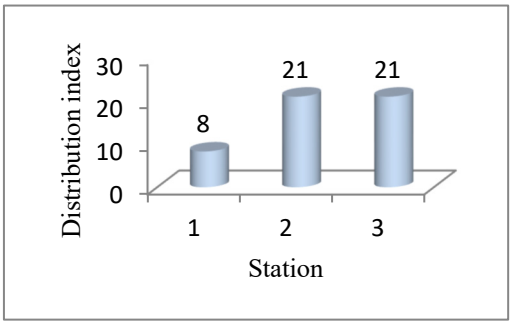

Figure 2: Distribution of anchovy pecto at each station.

The results of the distribution analysis of anchovies get a distribution index value greater than 3 or Id > 3, which illustrates the distribution of anchovies at each station, classified into the pattern of group distribution. This can be seen from the anchovy found at each station generally has a size that is not much different and found always in groups. Mulya and Harahap, (2019) stated that, distribution criteria can be grouped into three groups based on the value of the morista distribution index. The distribution of a population is categorized randomly, if it has a distribution index value (Id) = 1.00. The distribution of a population is categorized as normal if it has a distribution index value (Id) = 0, and the distribution of a population is categorized as a group if it has a distribution index value (Id) ≠ 1 or Id ≠ 0.

2.3 Growth Pattern

The results of the length-weight analysis of anchovies obtained, it appears that the growth of anchovy pecto at each station is a positive allometric, with a value of b > 3 (Figure 3).

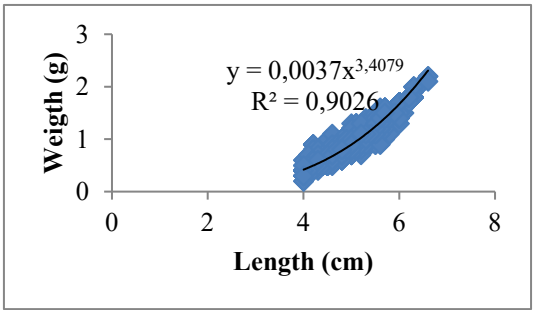

Figure 3: Growth pattern of anchovy pecto.

The result of analysis show that equation: Log W = 0,0037 + 3,4079 log L, or in exponential form: $W = 0{,}0037L^{3{,}4079}$ with coefficient of determination (R^2) = 0,8828. Mulya (2019) states that the growth is said to be isometric, if the value of b = 3, whereas if the value of b is greater or smaller than 3 then growth is said to be allometric, assuming if the value of b < 3 body length increases faster than weight gain, whereas if the value of b > 3 increases weight faster than increasing body length.

Some factors that cause positive allometric growth are physiological and environmental conditions, such as temperature, pH, salinity, geographical location and sampling technique (Mulfizar et al. 2012). The results also found that anchovies at each station had a fat size.

3 CONCLUSIONS

1) The highest abundance of anchovy at station 1 is 490 ind/60m^2, followed by station 3 is 386 ind/60m^2, and the lowest at station 2 is 362 ind/60m^2.
2) The distribution pattern of anchovy pecto is group distribution.
3) The length-weight relationship of anchovy pekto showed that increase in anchovy body weight faster than its length, which illustrates a positive allometric growth pattern, with a value of b > 3.

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