

Comparison of Length, Weight and Morphology of Mullet Fish (Mungilidae) in the Aquatic Ecosystem of Ujung Kulon National Park-Pandeglang, Banten and the Aquatic Ecosystem of Panjang Island, Batam City

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ABSTRACT

Habitat affects growth and can even affect fish morphology. Environmental factors also affect the weight, length, and morphology of fish, especially mullets. The aim of the study was to compare the weight, length and morphology of mullets in the Ujung Kulon-Pandeglang aquatic ecosystem, Banten and Panjang Island, Batam city.

Key words: Habitat, Tinyidae and Morphology

INTRODUCTION

The diversity of fish species plays an important role in the ecosystem. Fish is one of the food sources that contain unsaturated fatty acids that are needed for growth, one of which is mullet fish. Mullet or Mugillidae is a tropical and subtropical marine fish species. Mullet fish can be found in mangrove waters. Mullet fish can migrate to the shoreline for spawning. Mullet fish have high adaptability.

Mullet fish is a bentopelagic fish species that has a catadromous nature, can be found in river estuaries in the juvenile phase, when adults mullet fish migrate to the shore for landing (Okfan et al., 2015). Mullet fish have high

adaptability. The good adaptability of mullet fish causes easy cultivation and wide distribution (Nelson, 2016).

To determine the morphological characteristics of mullet fish for sex determination. Performance morphology, truss morphometrics, standard morphometrics and meristics are popular techniques to distinguish sex in fish (Febriani et al., 2019). With a body shape that almost resembles milkfish. Mullet fish have several characteristics, namely the body is rather slim and flat, the length of the adult body reaches 30 cm, silver in color like milkfish, the dorsal fin consists of one hard finger and eight weak fingers, while the anal fin consists of one hard finger and nine weak fingers that are dirty

white, the tail is homocercal, the mouth has thick lips on the top, and lives in muddy waters. The relatively high catch of mullet fish due to the increasing market demand for fish, directly or indirectly encourages the level of exploitation, thus reducing its population in nature. Studies on the biological and ecological aspects of mullet fish can be used to develop a management concept for mullet fish resources in order to maintain their sustainability (Okfan et al., 2015)

Length-weight relationship is one aspect of growth in fish. Information on length-weight relationships and fish condition factors is important to know in efforts to manage fisheries resources in this area. This is considering the intensity of fishing activities carried out by the community and the threat of disturbance to water conditions both caused by natural factors and human activities such as overfishing and environmentally unfriendly (Muttaqin, Z. 2016).

METHODS

The method in writing this article uses the literature review method from various journals that discuss the comparison of Length Weight Relationships and Mullet Condition Factors.

RESULTS AND DISCUSSION

Ecosystem Influence on Mullet Length-Weight

Ecosystem factors can affect the length-weight of mullet. In Batam waters, mullet fish ranged in length from

17.20-26.10 cm (mean 21.9 cm) and in weight from between 58.00-187.00 g (average 111.32 g). This is because mullet fish in Batam waters have allometric growth patterns, which are influenced by environmental factors such as competition for food, food availability, season, temperature, salinity, season, and sex.



Figure 1. Mullet fish in the waters of Long Island, Batam City: (a). *Liza vaigiensis* (mullet tamok); (b). *Liza tade* (mangrove mullet); (c). *Crenimugil crenilabis* (white mullet).

The length-weight range of mullet in the waters of Ujung Kulon-Pandeglang, Banten was 98.5% for males and 98.7% for females. The overall results obtained show that most of the fish caught are still juvenile. This is influenced by the waters of TNUK which are directly related to the Indian Ocean are rich in nutrients as food for juvenile mullet or mullet feeding ground.

Ecosystem influences on mullet morphology

The growth parameters of mullet (*Planiliza planiceps*) are influenced by biological factors (gonadal growth and sex), the environment (food sufficiency and water conditions), and preservation techniques as well as differences in the length of observation of captured specimens (Jumailani, 2022). From the existing journal data, no morphology has changed due to the influence of the ecosystem. Mullet fish show relative growth, which means that it is possible to change over time. If there are changes to the environment and food availability, it is expected that this value will also change (Effendie MI, 1997). Added that changes in fish weight can result from changes in feed and energy allocation for growth and reproduction, resulting in different fish weights even though the length is the same (Meretsky et al., 2000).

Condition Factor

The condition factors in Batam waters measured in this study are Fulton condition factor (K) and relative condition factor (Wr). K and Wr values of *L. Vaigiensis* species had positive allometric growth and exponent 'b' > 3 (3.079). Based on the coefficient of determination (R²), all species showed a close relationship between weight and length gain. Studies on the bio-ecology of these fishes include studies on length-weight relationships and condition factors (Bidawi, 2017).

Condition factor values indicate good condition and balance between prey and predators. In mullet fish (*L. Subviridis*) in Ujung Kulon waters have a negative allometric growth pattern for both males and females. This is driven by the possibility of food in Ujung Kulon waters so much that it increases the value of the condition factor (Wahyudewantoro, 2013).

Comparison of environmental factors in aquatic ecosystems of Ujung Kulon National Park-Pandeglang, Banten and Panjang Island, Batam City

Comparison of ecosystem factors in each aquatic ecosystem there are some differences. Ecosystem factors in TNUK and Batam waters will have different effects on mullet, such as growth patterns, length-weight, species type, and the coefficient of determination (R²) (Ramses, 2020).

Criteria	Batam Waters	Ujung Kulon Waters
<i>Spesies</i>	<i>L. vaigiensis</i>	<i>L. subviridis</i>
<i>Koefisien Determinan (R²)</i>	0,980 (98,0%)	0,966% (96%,66)
$W = aL^b$	$W = 0,0104 L^{3,079}$	$W = 0,0141 L^{2,662}$
<i>Growth Pattern</i>	Positive Allometric	Negative Allometric

CONCLUSIONS

Mullet (*L. vaigiensis*) in Batam waters had positive allometric growth

with exponent $b > 3$ (3.079). Based on the coefficient of determination (R^2), all species showed a close relationship between weight and length gain. The value of the condition factor indicates that the environment is in good condition and there is a balance between prey and predators. Mullet (*L. subviridis*) in the mangrove waters of Ujung Kulon National Park has a negative allometric growth pattern for both males and females, this also occurred in several studies for the same or different mullet species before. Detritus as the main food of mullet is likely very much in the mangrove waters of TNUK, thus increasing the value of its condition factor.

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