

Morfometry Diversity of Uceng Fish (*Nemacheilus fasciatus*) With Truss Method in Downstream of Yeh Sungai River

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Abstract

This study aims to determine the morphometric diversity of uceng fish that live in the downstream of the yeh sungai river and the environmental influence on the morphometry of the uceng fish that lives in the lower reaches of the yeh sungai river. This research was carried out in the Lower Sections of the Yeh Sungai River, Kediri District, Tabanan Regency, Bali Province. This research began on January 3 to April 17, 2019. The research method used was descriptive observation method by holding a series of sampling objects under study or data objects directly at the research location, in this study the intended data objects were uceng fish and types other fish caught as well as water quality. Uceng fish was measured by the truss method and the characters observed were 13 characters, namely A1, A2, A3, B1, B2, B3, B4, B5, C1, C2, C3, C4, and C5. The results of the study showed that the morphometry characters of Uceng fish (*Nemacheilus fasciatus*) that live in the lower reaches of the Yeh Sungai river were 13 characters observed at the Stasion I, Station II, and Station III, from the characters observed 5 characters had similarities (38.46%) that is on the characters A1, B1, B2, B4, and B5, while 8 characters have differences (61.54%), namely the characters A2, A3, B3, C1, C2, C3, C4, and C5. The high difference shows that uceng fish in the downstream of the Yeh Sungai river are resistant to environmental changes, other fish caught include broom fish, beboso fish, wader fish, catfish, gouramy fish, klepek batu, and cork fish and range water quality parameters during the study were temperature 25 OC, pH 5-7, DO 6 ppm, NO₃ - 0.5 mg / l, and KH 6-10 dH.

Keywords: Morphometry, Uceng Fish, Yeh Sungai River

1. Introduction

Indonesia is known as the country with the highest biodiversity wealth in the world after Brazil, it is estimated that there are four thousand species of fish in Indonesian waters and eight hundred of them are fresh and brackish fish [1]. One of the regions in Indonesia is Bali which has diverse aquatic biota, Bali's aquatic environment consists of sea, lake and river. One of the rivers is the yeh sungai river, the downstream area of the Yeh Sungai river is an area that is located in a densely populated area, community domestic activities are still frequently carried out and fishing activities are still carried out, fish that are often obtained by the community are surface fish species such as Nyalian fish, Netran, Plati and others, besides basic fish species such as cork fish, Beboso, and Uceng fish are often found.

Uceng fish (*Nemacheilus fasciatus*) is one of the freshwater fish found in rivers including the Yeh Sungai River in Bali. Uceng fish is a fish classified as demersal fish which during its life looking for food in the bottom waters [2]. Uceng fish is widely used by the community as consumption fish that have economic value because uceng fish contains unsaturated fatty acids including omega-3 and omega-6 which are useful in the process of brain intelligence and help in growth [3]. Demersal fish, one of which is uceng, which lives in the riverbed is very vulnerable to environmental changes and river pollution, both by organic and inorganic pollution.

Morphometry is one way to determine the diversity of a species by testing morphological characters in general, testing is done by measuring, where this measure is one of the things that can be used as a taxonomic characteristic when identifying fish and measurement results expressed in millimeters or centimeters called absolute size, while the morphometric truss technique can identify the possibility of morphological differences in organisms that have close kinship relationships, both inter species and intra species, including differences between males and females [4]. Morphometric truss technique is more recommended compared to normal morphometry because in the usual morphometry method the distance of the number of truss is very limited so it is less able to give a picture of body shape [5].

Based on the description above, a research was conducted on the morphometric diversity of Uceng fish (*Nemacheilus fasciatus*) with the truss method on the downstream of the Yeh Sungi River.

2. Material and Methods

This research was carried out in the downstream part of the Yeh Sungi River, Kediri District, Tabanan Regency. The study was conducted for 3 months, from January to April 2019. The tools used are Nets, Scoop, Digital Caliper, Millimeter Paper, Pens and Books, Corks / Styrofoam, Needle preparations, Cool Boxes, Cellphones, Tissues, Cameras, Buckets, and Thermometers. The materials used in this research are pH paper, oxygen test kits, nitrate paper, and KH paper [6]. The method used in this study is a descriptive observation method by conducting a series of sampling objects under study or data objects directly at the study site, in this study the intended data objects are uceng fish and other types of fish caught and water quality.

Samples of uceng fish are done by netting and using scoop, then each type of fish is recorded and the types of uceng fish are taken for further analysis in the laboratory using the Truss Morphometry method, the sample is put into a plastic flip and marked with the sample number in each station. From the sample obtained, observing the fish character by measuring in accordance with the characters in the Truss Morphometry method, the measured chart includes:

A1: The distance between the leading end point of the snout to the base point of the hard dorsal fin.

A2: Distance between the base of the lower jaw to the leading edge of the snout.

A3: The distance between the front point of the hard dorsal fin to the base of the lower jaw.

B1: The distance between the dorsal fin front point is hard to the dorsal fin front end is weak.

B2: The distance between the front base point of the anal fin to the base point of the lower jaw.

B3: The distance between the dorsal fin front point is weak to the front base point of the anal fin.

B4: Distance between the front point of the hard dorsal fin to the front point of the anal fin.

B5: The distance between the front point of the weak dorsal fin to the base of the lower jaw.

C1: The distance between the front end point of the dorsal fin is weak to the dorsal tail folding.

C2: The distance between the ventral tail folding to the base of the front of the anal fin.

C3: The distance between the dorsal tail folding and the ventral tail folding.

C4: Distance between the foremost point of the weak dorsal fin to the ventral tail folding.

C5: Distance between the front base point of the anal fin to the dorsal tail folding.

Morphometry Truss data analysis using Microsoft Excel 2010 to find the length range and the average length in millimeters (mm) for each character, then analyzed using SPSS version 22.0 to see variations of each species and location, and followed by Duncan's test to find out the level of difference, water quality data is river water quality data at the time of uceng fish sampling and also presented in tabular form so as to facilitate comparison at each station.

3. Results and Discussion

The number of fish caught during the study was 114 fish, consisting of 30 fish in Station I, 43 fish were caught in Station II, and 41 fish were caught in Station III.

4.1 Univariate Analysis

Data obtained from observations of morphometric characters tested by one-way ANOVA showed that differences in catch locations showed significant differences in some of the morphometric characters studied ($P < 0.05$).

Table.1
Univariate Analysis of Uceng Fish in the Lower Yeh Sungi River

No.	Characters	Location of Arrest (n = 30)								
		Station I			Station II			Station III		
1	A1	19.319 ^a	±	0.673	19.785 ^a	±	0.555	18.384 ^a	±	0.467
2	A2	10.726 ^b	±	0.477	10.890 ^b	±	0.304	9.146 ^a	±	0.262
3	A3	14.759 ^b	±	0.497	14.612 ^b	±	0.345	13.413 ^a	±	0.360
4	B1	13.489 ^a	±	0.507	13.500 ^a	±	0.468	12.707 ^a	±	0.429
5	B2	22.968 ^a	±	0.721	23.082 ^a	±	0.636	22.997 ^a	±	0.502
6	B3	11.170 ^b	±	0.427	11.049 ^b	±	0.391	9.419 ^a	±	0.313
7	B4	25.440 ^a	±	0.845	25.549 ^a	±	0.640	23.698 ^a	±	0.593
8	B5	17.866 ^a	±	0.605	17.816 ^a	±	0.517	16.445 ^a	±	0.508
9	C1	24.104 ^a	±	0.681	27.013 ^b	±	0.887	25.083 ^{ab}	±	0.771
10	C2	23.603 ^a	±	0.659	26.821 ^b	±	0.858	24.115 ^a	±	0.829
11	C3	7.908 ^b	±	0.241	7.972 ^b	±	0.330	6.307 ^a	±	0.210
12	C4	26.260 ^a	±	0.704	29.174 ^b	±	1.155	26.026 ^a	±	0.843
13	C5	26.593 ^a	±	0.673	29.057 ^b	±	0.981	25.244 ^a	±	0.815

(Sumber : primary data analysis results SPSS ver. 22 and Uji Duncan)

4.1.1 Station I

In table 1 the morphometric measurements show that fish caught in waters of Station I have three characters with the highest values, A3, B3, and B5 from two other stations, this shows that the uceng fish at this station have a higher height, this is probably due to the station environment interaction factor which has rocky and sandy substrate which is a good habitat for uceng fish survival, rocky condition to become a shelter for uceng fish from predators, with slow water flow resulting in the distribution of food that is slow, this causes uceng fish at Station I get a higher amount of food and a longer feeding period. Basic sandy conditions indicate the process of settling water due to the presence of waste flowing in the river. Duncan's test shows that there is no significant difference in this area with the other two regions, this is due to the river water flow from station III to station II to station I, so that the water condition of station I is influenced by the two other stations so that the water conditions tend to be the same.

4.1.2 Station II

At station II, the morphometric measurements carried out showed that the fish caught in waters of station II had 10 characters with the highest values, namely A1, A2, B1, B2, B4, C1, C2, C3, C4, and C5 compared to the other two stations This shows that the uceng fish in this station tend to have elongated body shape, this is likely due to the environmental condition of the station which has rocky substrates which is a good habitat for uceng fish survival, rocky conditions to become a shelter for uceng fish from predators and foraging areas for food. attached to the rock, with a swift flow of water resulting in rapid distribution of food, this causes the uceng fish at Station II to get the optimum amount of food from searching on the rocks. The condition of this heavy water flow

increases the physiological activity and the metabolic process of uceng fish increases, so that the growth of fish tends to elongate. Factors that influence food on growth include physiological activities, metabolic processes and digestibility that are different in each individual fish [7, 8, 9]. Duncan Test results show three characters namely C2, C4 and C5 in this area which are significantly different from the other two regions, while the other characters do not differ, the three characters at station II have differences when compared to the two other stations namely stations I and III, this shows that the three characters are longer than the characters at the other two stations, this is caused by the activity of the uceng fish that live in this station against the swift river water flow which allows the uceng fish to continue swimming by moving the tail fin.

4.1.3 Station III

At station III the results of morphometric measurements showed that fish caught in waters of Station III did not have the highest value character, this shows that the size of the uceng fish at this station was relatively small when compared to the two other stations, this was due to several factors including environmental conditions. Environmental conditions consisting of muddy waters and slow flow of water cause the waters tend to stagnate, which in this condition is an unfavorable place for the growth of uceng fish, but the condition at Station III is optimum as a fish spawning area and a fish nursery area. Duncan's test shows A2, A3, B3 and C3 in this area which are significantly different from the other two regions, while the other characters are not different, the fourth at station III has a difference when compared to the two other stations, this is due to water conditions that tend to get the influence of the water source that will flow to station III. When compared with the number of characters that are significantly different at Station II, which is three characters, while the number of characters that are significantly different at Station III is more that there are four characters, this is also caused because Station III tends to get an influence from the source of river water flow.

On the results of univariate analysis showed that the uceng fish at stations I, II, III had quite high morphometric characters differences that were 8 out of the 13 characters measured, 61.54% were different and 38.46% had similarities.

4.2 Other Catch Fish and Water Quality Parameters

The river ecosystem is so complex, in this study besides the target is the sample fish, other fish caught in the sampling are supporting data. Other fish describe the diversity of living creatures in the Yeh Sungi river ecosystem, fish caught besides uceng fish include, broom fish, beboso fish, wader fish, catfish, gouramy fish, stone klepek fish, and cork fish. parameters include temperature range of 25 °C, acidity range of 5 to 7, dissolved oxygen content of 6 ppm, nitrate 0.5 mg / l, and hardness ranging from 6 to 10 dH.

4. Conclusions

Based on the research results it is known that the morphometry characters of Uceng fish (*Nemacheilus fasciatus*) that live in the lower reaches of the Yeh Sungi river are 13 characters observed at station I, Station II, and Station III, from the characters observed 5 characters have similarities (38.46%) namely the characters A1, B1, B2, B4, and B5, while 8 characters have differences (61.54%), namely the characters A2, A3, B3, C1, C2, C3, C4, and C5. The high difference shows that uceng fish in the downstream of the Yeh Sungi river are resistant to environmental changes. In addition to uceng fish there are other fish caught during the study describing the diversity of living creatures in the Yeh Sungi river ecosystem, fish caught besides

uceng fish include fish, broom fish, beboso fish, wader fish, catfish, gouramy fish, stone klepek fish and cork fish. The environment has an influence on the morphometry of Uceng fish (*Nemacheilus fasciatus*) including water conditions, bottom waters, and river cover, and the range of water quality parameters during the study did not have a significant effect on morphometry diversity of uceng fish parameters including temperature in the range of 25 °C, acidity levels around 5-7, dissolved oxygen content 6 ppm, nitrate 0.5 mg/l, and hardness ranges from 6-10 dH.

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