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# Analysis of Morphological Characteristics and Growth Patterns of Uceng Fish *Nemacheilus fasciatus* (Valenciennes, 1842) on the Setail River, Banyuwangi, East Java

Kharisma Orchida[1*], Diana Arfiati[2], Wahyu Endra Kusuma[2], Syeftyan Muhammad Ali Hamami[3]

[1] Magister Degree Program in Faculty of Fisheries and Marine Science, Brawijaya University, Malang, Indonesia.
[2] Department of Aquatic Resource Management, Faculty of Fisheries and Marine Science, Brawijaya University, Malang, Indonesia.
[3] Bachelor of Biology, Department of Biology, Brawijaya University, Malang, Indonesia.

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Corresponding Author:
Kharisma Orchida
kharismaorchida@student.ub.ac.id

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**Abstract:** Indonesia's. Setail River is one of the longest rivers in Banyuwangi Regency. Setail River has high potential for fishery biodiversity. One of the fish that is often found in Setail River is Barred loach or known locally as Uceng Fish (*Nemacheilus fasciatus*). The purpose of this study was to determine the morphological characteristics and determine the relationship between length, weight and condition of Uceng fish in Setail River. Observation of color patterns and special characteristics of sample fish morphologically *Nemacheilus fasciatus* with characteristics including Having a brown body color, a small elongated body (fusiform). On the body there is a longitudinal black spot pattern, a dorsal pattern resembling a saddle, a homocercal tail fin type, an emarginate tail morphology (slightly concave). The type of mouth is subterminal inferior and has 3 pairs of barbels. Meristic observations of uceng fish have pectoral fins, pelvic fins, dorsal fins, tail fins and anal fins. In this study, an analysis of the relationship between length and weight showed that the growth pattern of the uceng fish was negative allometric and the condition factor obtained the range of condition factor values for male uceng fish during the study at each station for male uceng fish 0.68-1.35 and female uceng fish 0.68-1.40.

**Keywords:** Condition factor; Growth pattern; Morphology; *Nemacheilus fasciatus*; Setail river

## Introduction

Indonesia is known as a country with high biodiversity, including fish. Fish are divided into marine fish and freshwater fish (Mokodongan et al., 2024). Indonesia is the largest freshwater fish mega-biodiversity country in the world after Brazil (3,504 species) and China (1603 species) with 1,218 species of fish living in Indonesia (Froese & Pauly 2013; Mubarik et al., 2022). To date, 1,218 species belonging to 84 families have been reported from Indonesian freshwater, including 1,172 native species from 79 families, of which 630 species are endemic to this country. Among the 1,218 species, 28 species are exotic species (Hubert et al., 2016). However, information on the richness of fish species in Indonesia is still relatively low. The low knowledge of the richness of fish species is an obstacle to its utilization (Bhagawati et al., 2013). Budiman et al. (2002) explained that characterization of native Indonesian fish needs to be done immediately considering that knowledge about the types of native fish is still relatively low. This is holding back the acceleration of the utilization of fish biodiversity in Indonesia. Therefore, exploration of fish biodiversity must be a priority to be done immediately considering

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the heavy pressure on habitats and changes in ecosystems.

Setail River is one of the longest rivers in Banyuwangi Regency. Setail River is the result of the eruption of material from the eruption of Mount Raung. This river flows south then east of Banyuwangi Regency and empties into the Bali Strait or the Indian Ocean. Among other rivers, Setail River is 73.35 km long. Setail River is used directly by the community. Setail River is used for various human activities such as fisheries, agriculture, plantations, household activities such as cooking, bathing, washing and so on. Setail River has high potential for fishery biodiversity. One of the fish that is often found in Setail River is Barred loach or locally known as Uceng Fish (*Nemacheilus fasciatus*).

Uceng fish belongs to the Balitoridae family and the genus Nemacheilus. Its body size is small, its maximum length only reaches 10 - 12 cm. This fish is thin, round, small, and has lines on its body, and several barbels at the end of its mouth. Uceng fish (*Nemacheilus fasciatus*) is a native fish of Indonesia, with populations spread across Java and Sumatra. The distribution of Uceng fish in the world is not too wide. The distribution of uceng fish in the world is not too wide (Prakoso et al., 2016). *Nemacheilus fasciatus* is a type of fish that inhabits waters whose habitat characteristics are dominated by rocks, sand and gravel substrates, moderate to strong currents, and relatively high dissolved oxygen content (Haryono, 2017). The behavior of uceng fish is that it often hides among rocks and swims actively and agilely (Tjahjo et al., 2000). The broodstock of this uceng fish most likely migrates between rivers, causing its wide distribution in each river (Kusuma et al., 2021)

The fact shows that knowledge about the wealth of fish resources in Banyuwangi's freshwater waters is still relatively limited and research is not carried out continuously, therefore it is necessary to conduct continuous research to determine the types of freshwater fish in Banyuwangi waters, especially uceng fish. Uceng fish in the Setail River, Banyuwangi, East Java have characteristics that have never been studied. The purpose of this study was to determine the morphological characteristics and to determine the growth length and condition factors of Uceng fish in the Setail River.

## Method

*Study Area*

This study was conducted from November 2023 to February 2024. Uceng fish specimens were taken from the Setail River, Banyuwangi, East Java (Figure 2). In this study, samples were taken at four (4) sampling points (Table 1). The sampling location was determined based on the distribution of the uceng fish population in the river. The process of sampling uceng fish used a bubu (fish trap) installed on the riverbed. In general, the conditions for taking uceng fish are at the bottom of the river which has a sandy rock substrate and strong currents (Haryono, 2017).

*Procedures*

The sampling procedure is as follows: (i) Research activities begin with a location survey and preparation of research tools and materials. (ii) Traps are installed at each sampling point; (iii) Observation and measurement of physical parameters of water quality (iv) The specimens obtained are put into jars, labeled, then taken to the laboratory for identification purposes and measurement of length and weight (v) Specimen documentation is carried out using a camera.

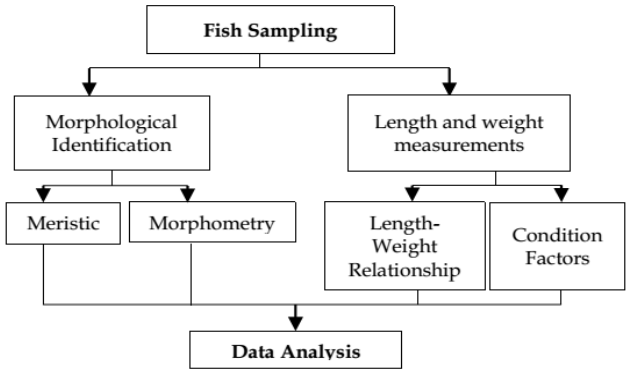


**Figure 1.** Research flow

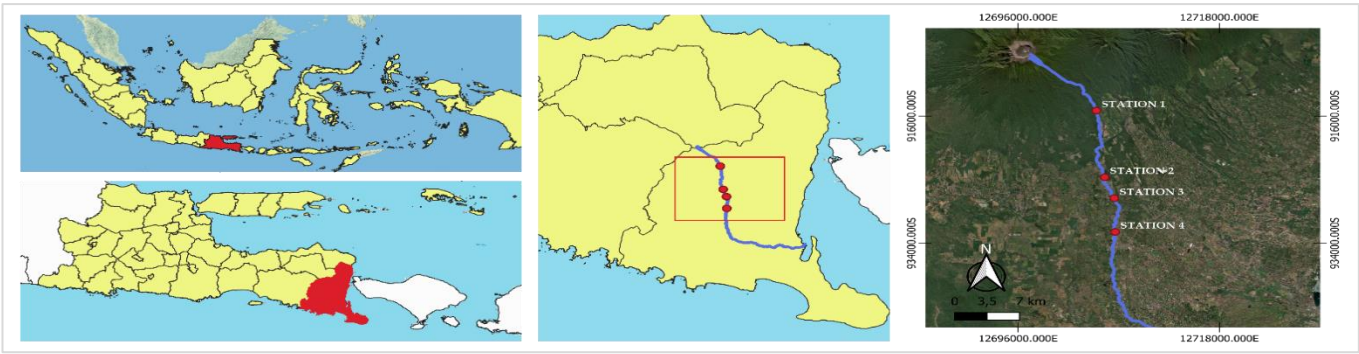


**Figure 2.** Research maps

**Table 1.** Position and Characteristics of the Research Site on the Setail River

| Station | Coordinate | Positioning and Characteristics |
|---|---|---|
| 1 | 8°11'38.1"S | Upstream area, near the waterfall |
| | 114°07'36.5"E | Location at 712 meters above sea level |
| | | Gravel and sandy substrate |
| 2 | 8°16'24.1"S | Areas around rice fields |
| | 114°08'09.6"E | Location at 355 meters above sea level |
| | | Gravel and sandy substrate |
| 3 | 8°18'45.9"S | Neighboring residential areas |
| | 114°08'56.4"E | Location at 243 meters above sea level |
| | | Gravel, sandy and boulder substrates |
| 4 | 8°20'48.3"S | City areas and around cafe areas |
| | 114°08'42.8"E | Location at 195 meters above sea level |
| | | Gravel and sandy substrate |

*Data Analysis*

Morphometric and meristic data, length-weight growth, condition factors and water quality were analyzed using Microsoft Excel version 2021. The results of morphological observations were analyzed descriptively.

*Morphometry and Meristics*

Determination of morphometric and meristic characters at this stage refers to Kottelat (1984) which is based on fish morphology. Morphometric is the measurement of certain parts of the fish body structure (measurement method). Unlike morphometric characters that emphasize the measurement of certain parts of the fish body, meristic characters are related to the calculation of the number of parts of the fish body (counting method). The measured meristitic characters can be seen in Figure 3.

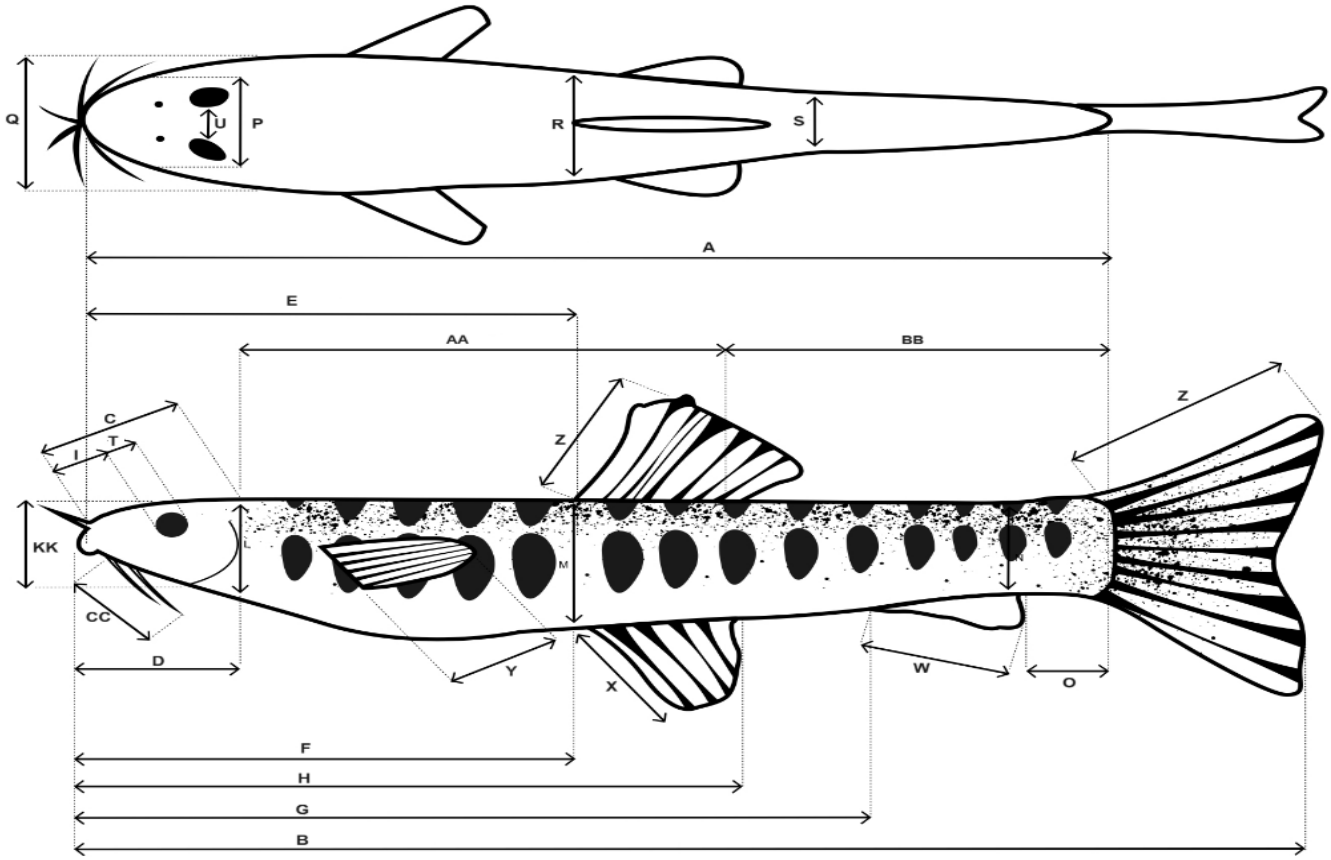


**Figure 3.** Fish morphometry. Description: Standar length (A); Total length (B); Head length (C); Lateral head length (D); Predorsal length (E); prepelvic (F); preanal (G), Pre-anus length (H); Snout length (I); Head height (K); posterior extremity of the occiput (L); Body height (M); caudal peduncle (O); Head width(P); Maximum head width (Q) Body width (R) anal fins length (S); Eye diameter(T); Interorbital width (U); Height of dorsal fin(V); Anal (W), pelvic (X) and pectoral fin length (Y); Lengths of caudal (Z); Length of lateral line(AA); length of the lacking part of lateral line (BB); Barbel lengths (CC)

*Length-Weight Relationship*

The length weight relationship analysis of Uceng fish was carried out using the formula (Effendie, 2002; Hasani et al., 2023) as follows:

$$W = aL^b \quad (1)$$

Description:
W = Body weight (g)
L = Total length (mm)

a and b are constants the value of b obtained is used to estimate the growth pattern whether it is isometric (b = 3), meaning that the increase in length is equal to the increase in weight or allometric (b≠3), meaning that the increase in weight and length is not balanced, b> 3 positive allometric, b < 3 negative allometric

If the value of b > 3, it is said to be positive allometric growth, which means that weight gain is more dominant or faster than length gain. If the value of b < 3, it is said to be negative allometric growth, which means that the increase in length is more dominant or faster than the increase in weight.

The closeness of the relationship between fish length and weight is indicated by the correlation coefficient (r) obtained, if it is close to 1, the relationship between the two is strong and there is a high correlation, otherwise if it is close to 0, the relationship between the two is very weak or almost none.

*Condition Factors*

The condition factor is calculated using relative weight (Effendi, 2002; Laheng et al., 2022) with the following formula:

$$Kn = \frac{W}{aL^b} \quad (2)$$

Description:
Kn = Condition Factors
W = Body weight (g)
L = Total length (cm)

## Results and Discussion

*The Morphology Characters of Uceng Fish*

Visually, species identification can be done through morphological observations so as to distinguish between one species and another. The accuracy of identification using morphological characters is highly dependent on the observer's accuracy and taxonomic insight. Morphological observations in this research consisted of observations of color patterns and special characteristics, meristic observations, and morphometric observations. Morphological identification of the samples was carried out using the identification key according to Kottelat, (1984) and Hadiaty et al. (2014) as a comparison. The morphology of the fish samples obtained can be seen in Figure 4.

Observations of color patterns and special characteristics of the sample fish were first carried out on the sample fish obtained. All fish samples collected were identified morphologically as *Nemacheilus fasciatus* with characteristics including a small, elongated fish body (fusiform). Alipin et al. (2021) Fusiform is a slender fish body shape, elliptical cross-section. Has a brown body color and scales tend to be clear yellowish. On the right and left sides of the body there is a longitudinal spot (band) pattern following the lateral line from anterior to posterior, the color pattern on the body consists of dark spots and a black pattern on the dorsal part resembling a saddle. The results of the character count based on Kottelat (1984), that the dark spots (bands) on this fish number 14-18 and have a saddle-like pattern on the dorsal part numbering 11-12, the results of observations found 13- 14 dark black spots at all stations. In general, based on its identification characteristics, this fish is included in N. fasciatus (Valenciennes, 1842; Kottelat, (1984).

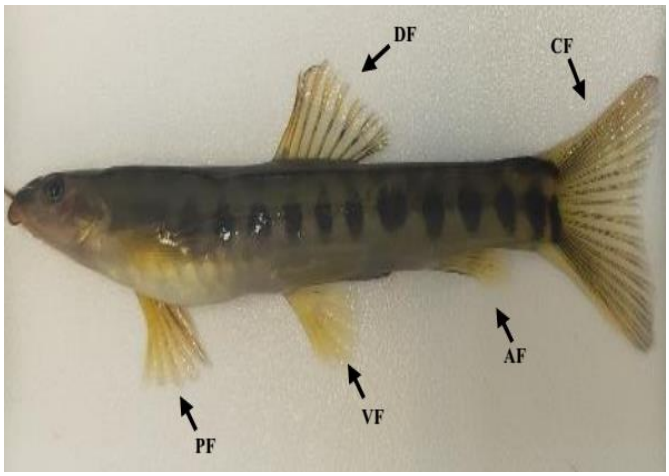


**Figure 4.** Uceng fish spin in Setail River. DF: Dorsal fin, CF: Caudal fin, AF: Anal fin, VF: Ventral/Pelvic fin, PF: Pectoral fin

This uceng fish also has a homocercal tail fin type, emarginate tail morphology (slightly concave). The type of scales owned by the uceng fish is cycloid (Figure 5C). explains that cycloid type scales are generally described as disc-shaped, smooth, and thin scales, marginal grooves or thorn-like protrusions may occur but are not as clear as in ctenoid scales (Bräger & Moritz, 2016). The scales have a very small eccentric focal area (about one tenth of the scale length).

The position of the uceng fish's mouth, which is located near the tip of the fish's head or under the tip of its nose or snout, In Figure 5A, the type of mouth in the uceng fish is subterminal inferior, namely the upper jaw is longer than the lower jaw, this shows that the uceng fish tends to look for food at the bottom of the waters or the bottom of the substrate. The mouth of the uceng fish is semicircular, the lips are somewhat fleshy, wrinkled and have 3 pairs of barbels (6) (Figure 5B) which function as sensory organs and chemical receptors. Has teeth that tend to be smooth and slightly serrated.


**Figure 5.** A. Mount; B. Barbel; C. Scale Uceng fish (*Nemacheilus fasciatus*

*The Morphometric and Meristic Characters of Uceng Fish Morphometric*

Table 2 shows the morphometric characteristics of Uceng fish in the Setail River Waters, Banyuwangi, East Java. The morphometric characteristics of Uceng fish in the Setail River, along with the classification are presented in Table 2. Based on the results of morphometric observations of Uceng fish, it can be explained that this fish has a fusiform body shape, which shows that Uceng fish are generally small, agile and live at the bottom of waters that have strong currents because their long body shape makes them agile in swimming and fighting the current. The body shape of this fish is related to its habitat and lifestyle. The location of the mouth is subterminal inferior (Figure 5A), with a truncated caudal fin shape and a Homocercal tail type. The position of the pelvic fin (V) to the pectoral fin (P) is abdominal (the ventral fins are located behind the lower part of the pectoral fins). The dorsal fin (D) is one. This fish also has paired pectoral and pelvic fins, dorsal fins, caudal fins, and anal fins (Figure 4).

**Table 2.** Measurement Results of Morphometric Characters of Uceng Fish (*Nemacheilus fasciatus*)

| Morphometric Characters | Min | Max | Average | % of TL |
|---|---|---|---|---|
| Standard Length (A) | 2.1 | 6.1 | 4.91 | 80% |
| Total length (B) | 2.7 | 7.5 | 6.11 | 100% |
| Head length (C) | 0.5 | 1.2 | 1.06 | 17% |
| Lateral head length (D) | 0.4 | 0.9 | 0.87 | 14% |
| Predorsal length (E) | 1.1 | 3.1 | 2.49 | 41% |
| Prepelvic (F) | 1.1 | 3.1 | 2.49 | 41% |
| Preanal (G) | 1.7 | 4.9 | 3.87 | 63% |
| Pre-anus length (H) | 1.5 | 4.5 | 3.48 | 57% |
| Snout Length (I) | 0.2 | 0.6 | 0.49 | 8% |
| Head height (K) | 0.2 | 0.5 | 0.46 | 8% |
| Posterior extremity of the occiput (L) | 0.3 | 0.9 | 0.69 | 11% |
| Body height (M) | 0.3 | 1.1 | 0.79 | 13% |
| Height of the caudal peduncle (N) | 0.2 | 0.7 | 0.54 | 9% |
| Caudal peduncle (O) | 0.4 | 1.1 | 0.83 | 14% |
| Head width (P) | 0.2 | 0.6 | 0.47 | 8% |
| Maximum head width (Q) | 0.3 | 0.8 | 0.67 | 11% |
| Body width (R) | 0.3 | 0.8 | 0.70 | 12% |
| Anal fins length (S) | 0.2 | 0.5 | 0.43 | 7% |
| Eye diameterm(T) | 0.1 | 0.3 | 0.24 | 4% |
| Interorbital width (U) | 0.1 | 0.5 | 0.34 | 5% |
| Height of dorsal fin (V) | 0.4 | 1.1 | 0.88 | 14% |
| Anal fin length (W) | 0.4 | 1.1 | 0.93 | 15% |
| Pelvic fin length (X) | 0.4 | 1.1 | 0.84 | 14% |
| Pectoral fin length (Y) | 0.4 | 1.1 | 0.95 | 16% |
| Caudal fin Lengths (Z) | 0.5 | 1.5 | 1.19 | 20% |
| Length of lateral line (AA) | 0.8 | 2.4 | 1.86 | 30% |
| Length of the lacking part of lateral line (BB) | 0.8 | 2.4 | 1.91 | 31% |
| Barbel lengths (CC) | 0.6 | 0.6 | 0.60 | 10% |

Based on the results of morphometric measurements, the uceng fish at each station had a total length ranging from 2.7 to 7.5 cm. Differences in the values of the results of morphometric character measurements in fish can be influenced by several factors such as environmental conditions or the

availability of food sources which are a form of fish adaptation to environmental conditions and also affect the growth rate and development of fish (Larasati & Budijastuti, 2022). Differences in size in fish can also be caused by differences in age of the fish, there are fish that are adults and still young. The results of morphometric measurements of uceng fish in the Setail River can be seen in Table 2.

*Meristic*

Based on the observation of the meristic characters of Uceng fish (Table 3), it is known that the fish obtained the fin fingers each amounted to the first dorsal fin 9-10, anal fin 6, caudal 18-19 fins with 2 types of hardened soft fins and 16-17 soft fins., ventral fin 6-7, pectoral fin 9-11. The results of the meristic character of Uceng fish are in line with Kottelat (1984), which explains that observations made physically on Uceng fish have five types of fins, namely the dorsal fin, pectoral fin, ventral fin, anal fin and caudal fin, which includes the number of dorsal fin fingers between 8-9, the number of anal fin fingers between 5-8, the number of pectoral fin fingers between 11-13, the number of pelvic fin fingers 8 and the number of caudal fin fingers 17. Differences in the value of meristic character measurement results in fish can be influenced by factors such as different environments.

**Table 3.** Results of Calculating the Meristic Characteristics of Uceng Fish (*Nemacheilus fasciatus*)

| Morphometric Characters | Min | Max | Average |
|---|---|---|---|
| Dorsal fin rays | 9 | 10 | 9 |
| Anal fin rays | 6 | 6 | 6 |
| Caudal fin rays | ii. 16 | ii. 17 | 18 |
| Ventral fin rays | 6 | 7 | 7 |
| Pectoral fin rays | 9 | 11 | 10 |

*Catch Results*

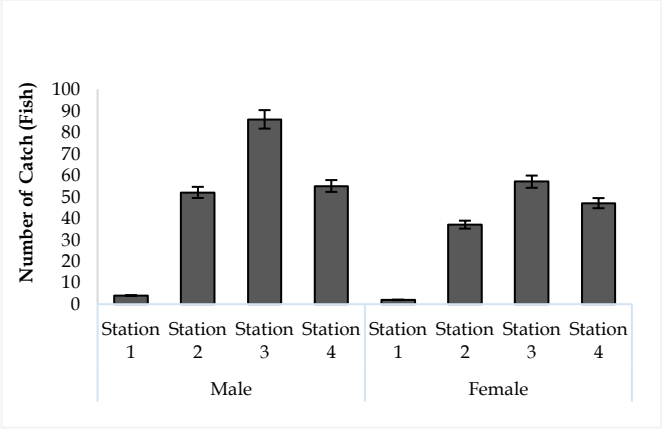


**Figure 6.** Fish Caught Results Uceng (*Nemacheilus fasciatus*)

The results of the Uceng fish catch during sampling can be seen in Figure 6. Based on the results of the graph above, the total number of male and female fish caught during the study at each station was 340, consisting of 197 males and 143 females. The most fish caught were at Station 3, while at Station 1 the fewest fish were found, this could be due to environmental conditions that were less suitable for the life of the uceng fish.

*The Growth Pattern of Uceng Fish*
*Length-Weight Relationship*

Regression Model of the relationship of length (L) and weight (W) based on the sex of the fish, in male Uceng fish is $W = 0.010^{L2,75}$, r = 0.97 with a coefficient of determination of 0.9477. The result of the analysis of the relationship of length and weight obtained by the value of the coefficient b value of b = 2.75, (Picture 4). In the female Uceng fish is $W = 0.0084\ L^{2,89,}$ r = 0.98, with a coefficient of determination of 0.966, which means that 97% of the increase in weight is due to the increase in length, while 3% is due to other unknown factors. The result of the analysis of the relationship of length and weight obtained by the value of the coefficient B value of b = 2.75 (Figure 4).

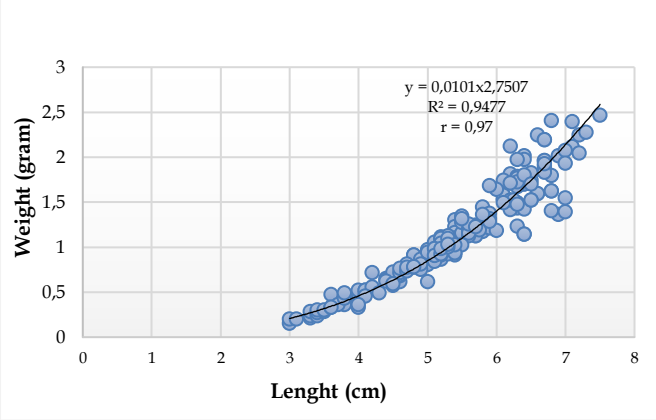


**Figure 7.** The relationship between length and weight of the male Uceng fish

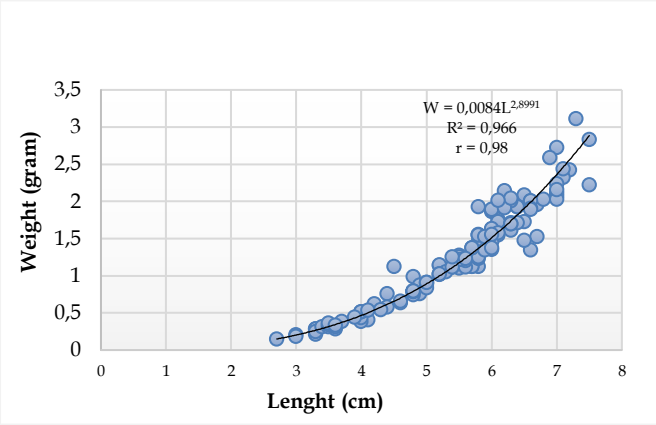


**Figure 8.** The relationship between the length and weight of female Uceng fish

Based on the acquisition of the value of the coefficient B on the results of the analysis of the relationship of length and weight of Uceng fish, shows Uceng fish males and females have a negative allometric growth pattern that is meaningful the increase in length is faster than the increase in body weight of fish. According to Gani et al. (2020) differences in B values can be caused by differences in the number and variety of fish observed.

Analysis of the relationship between the length and weight of Uceng fish at each station (Table 4) obtained a coefficient B value ranging from 2.50-2.84 in male fish and 0.53-2.94 in female uceng fish. The results of the analysis showed that the growth pattern of fish at each station was negative allometric. The b values obtained between male and female uceng fish at stations 1 to 4 were different. According to Effendi (2002) and Permatachani et al. (2017), the influence of fish body length and weight is very large on the b value obtained so that indirectly the factors that affect fish size will affect the pattern of variation in the b value. According to Ibrahim et al. (2017), food availability, gonad maturity level, and variations in body size of fish samples can also cause differences in b values. It can also be influenced by the behavior of fish that perform active movements and ruaya (Hasibuan et al., 2018). Muttaqin et al. (2016) which states that the size of the B value can be influenced by the behavior of fish, for example, fish that swim actively show a lower B value than fish that swim passively.

The growth rate will increase with the increasing amount of food eaten. Growth is closely related to feed, because the nutrients and energy needed for growth come from feed (Pratiwi et al., 2011). It is further stated that growth will occur if there is excess energy after the available energy has been used for standard metabolism, digestion and activity.

**Table 4.** The Growth Pattern of Uceng Fish (*Nemacheilus fasciatus*) Each Station

| Station | Male | | | | Female | | | |
|---|---|---|---|---|---|---|---|---|
| | N | B value | R | Growth Type | N | B value | R | Growth Type |
| 1 | 4 | 2.64 | 0.92 | Allometric Negative (-) | 2 | 0.53 | 1.00 | Allometric Negative (-) |
| 2 | 52 | 2.50 | 0.90 | Allometric Negative (-) | 39 | 2.89 | 0.97 | Allometric Negative (-) |
| 3 | 86 | 2.84 | 0.97 | Allometric Negative (-) | 57 | 2.94 | 0.98 | Allometric Negative (-) |
| 4 | 55 | 2.80 | 0.90 | Allometric Negative (-) | 45 | 2.83 | 0.92 | Allometric Negative (-) |

*Condition Factors*

Condition factors indicate the good state of the fish in terms of physical capacity for survival and Condition factors describe fish loss expressed based on length and weight data. Factor conditions indicate the good state of the fish in terms of physical capacity for survival and reproduction. Factors based on the condition of fish according to station can be seen in Table 5.

**Table 5.** The Growth Pattern of Uceng Fish (*Nemacheilus fasciatus*) Each Station

| Station | Male | | | Female | | |
|---|---|---|---|---|---|---|
| | Range | Average | SD | Range | Average | SD |
| 1 | 0.89-1.06 | 1.00 | 0.08 | 1.00 | 1.00 | 0.00 |
| 2 | 0.68-1.28 | 1.01 | 0.14 | 0.79-1.31 | 1.01 | 0.11 |
| 3 | 0.68-1.35 | 1.01 | 0.11 | 0.76-1.24 | 1.01 | 0.11 |
| 4 | 0.68-1.28 | 1.01 | 0.13 | 0.68-1.40 | 1.01 | 0.12 |

Based on Table 5, the range of male Uceng fish condition factors during the research at each station was 0.68-1.35 and female Uceng fish was 0.68-1.40. The relative condition factor of the average male fish is always smaller than the female fish indicates that the condition of the female fish is better than the male fish. Syahrir (2013) stated that the condition factor of male fish is greater than that of female fish because the energy obtained by female fish is invested more in gonad development. Effendie (2002) and Kresnasari (2020), states that fish whose bodies are slightly flattened have a condition factor value ranging from 3-4 and for fish whose bodies are less flattened have a condition factor value ranging from 1-3. Kusmini et al. (2018), states that the variation in the value of the condition factor depends on the population density, the degree of maturity of the gonads, food, sex and age of the fish.

*Water Quality*

Based on the results of water quality measurements at each station, the temperature values ranged from 23-28.9°C. The normal range of water temperature in tropical areas where fish adapt is 25–35°C (Islam et al., 2019). While at a temperature of 18°C-25°C, fish are still able to survive but experience a decrease in appetite. While below this temperature, fish will experience death in tropical areas, due to cold (Kordi et al., 2010; Warman, 2015). At station 1, a little uceng fish were found because

the temperature was not suitable for fish life, because the temperature was too low. The current ranged from 0.71-0.78 m/s. River classification based on current speed is divided into five categories, namely very fast flow (>100 cm/s), fast flow (50-100 cm/s), moderate flow (25-50 cm/s), slow flow (flowing (10-25 cm/s) and very slow flow (<10 cm/s) (Erika et al., 2018). The current speed in the Setail River from sampling points 1 to 4 shows a current speed that tends to be fast. Uceng fish tend to live in waters that have strong currents.

**Table 6.** Water Quality Measurement

| Parameters | Station 1 | Station 2 | Station 3 | Station 4 |
|---|---|---|---|---|
| Temperature (°C) | 23.3 | 25.8 | 27.5 | 27.8 |
| Flow (m/s) | 0.72 | 0.78 | 0.78 | 0.71 |
| Brightness (%/cm) | 100% | 100% | 100% | 100% |
| pH | 7 | 7 | 7 | 7 |
| DO (mg/L) | 7.39 | 6.76 | 6.34 | 6.16 |
| Nitrate (mg/L) | 0.018 | 0.023 | 0.019 | 0.022 |
| Phosphate (mg/ L) | 0.080 | 0.083 | 0.057 | 0.057 |
| Ammonia (mg/L) | 0.052 | 0.078 | 0.094 | 0.082 |
| TOM (mg/L) | 20,224 | 26.544 | 22,752 | 17,696 |

The clarity of the water at sampling points 1 to 4 shows 100% clarity. The Setail River at this sampling point tends to be clear and clean. The results of pH measurements at all sampling points obtained a value of 7. Generally, a pH between 7 and 8.5 is ideal for biological productivity (Adhikary et al., 2019). Fish can become stressed in air with a pH ranging from 4.0 to 6.5 and 9.0 to 11.0 and death is almost certain at a pH less than 4.0 or greater than 11.0 (Ekubo & Abowei, 2011). The pH of the aquatic system is an important indicator of air quality and pollution levels in the watershed. The pH values of the air samples described indicate that the Setail River waters generally support aquatic life.

DO (Dissolved Oxygen) ranges from 5.78-7.39 mg/L. If the DO level in the water body drops below 4-5.0 mg/L, aquatic life will experience stress. Even the most resilient fish will die if the DO drops below 3 mg/L (Ali et al., 2022). DO samples at all sampling points including DO which are still considered optimal for the life of uceng fish. The nitrate value ranges from sampling points 1 to 4 ranging from 0.17-0.023 mg/L. and the phosphate value ranges from 0.057-0.088 mg/L. The nitrate and phosphate values in the Setail River waters are based on the water quality standard PP no. 22 of 2022 is still in accordance with class II and III quality standards.

Ammonia ranges from 0.052-0.94 mg/l. Ammonia levels of 1 mg/l per day in waters will cause death in certain fish due to the presence of ammonia in the waters, thereby reducing dissolved oxygen levels in the air (Ngibad, 2019). Ammonia can be harmful to aquatic life starting from a concentration of 1 mg/l which causes some small fish to die (Hamonangan & Yuniarto, (2022). The TOM (Total Organic Matter) value ranges from 11.376-20.224 mg/l. The threshold value of total organic matter that can be accepted by waters is between 26-60 mg/L (Sunaryuga et al., 2024). TOM showed that the average Setail river waters are in the range quite suitable for aquatic life.

## Conclusion

Observation of color patterns and special characteristics of sample fish morphologically *Nemacheilus fasciatus* with characteristics including having a brown body color, a small elongated body (fusiform). On the body there is a longitudinal black spot pattern, a dorsal pattern resembling a saddle, a homocercal tail fin type, an emarginate tail morphology (slightly concave). The type of mouth is subterminal inferior and has 3 pairs of barbels. Meristic observations of uceng fish have pectoral fins, pelvic fins, dorsal fins, tail fins and anal fins. In this study, an analysis of the relationship between length and weight showed that the growth pattern of the uceng fish was negative allometric and the condition factor obtained the range of condition factor values for male uceng fish during the study at each station for male uceng fish 0.68-1.35 and female uceng fish 0.68-1.40.

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