Fish Species Diversity in The Krasak River Srumbung Subdistrict Magelang Regency Central Java

Maryam Tirta Nuur*[1], Ainun Rodhiyah Nurhayati[1], Astuti[1], Navida Vinca Hanif[1], Tony Budi Satriyo[1], Mukti Aprian[1]

[1]Department of Fisheries, Faculty of Agriculture, Universitas Gadjah Mada, Jl. Flora, Bulaksumur, Sleman, Special Region of Yogyakarta 55281, Indonesia
*Author: maryamtirtanuur2004@mail.ugm.ac.id

Recieved: January 8, 2026; Accepted: February 26, 2026

Abstract

This research aims to explore the diversity of fish species in the Krasak River, Central Java, where information on fish composition is still limited, in contrast to the Progo River and Elo River, which have been studied by several researchers. This river, originating from the slopes of Mount Merapi, has water characteristics with volcanic material and variations in current and substrate. The research was conducted from October to November 2025 at three observation locations using purposive sampling. All the fish caught were identified to the species level, counted for their individual numbers, and analysed using the Diversity Index (H'), Evenness Index (E), Dominance Index (D), and Relative Abundance (RA). Environmental parameters, including temperature, pH, current, depth, brightness, and substrate, were also measured as supporting data. The results show that the fish community in the Krasak River comprises 221 individuals across 12 species and 6 families. The Diversity Index shows low values (0.647-0.882), and the Evenness Index is also low (0.260-0.355), indicating an uneven distribution of individuals among species. The species *Mystacoleucus obtusirostris* became the dominant species, accounting for 53.39% of the total individuals captured. This study provides an initial overview of fish diversity in the Krasak River and is expected to be useful for fisheries resource management and further research.

Keywords: Abundance, Community, Diversity, Krasak River

Introduction

Rivers in Magelang Regency are located within the Progo and Bogowonto River Basins (DAS) (BAPPEDALIT-BANGDA, 2021). The Krasak River is one of the rivers that flows along the border between Sleman Regency and Magelang Regency. The upper reaches of the Krasak River are situated on the slopes of Mount Merapi, specifically in Ngablak Village, Magelang Regency, and Ngargomulyo Village, Sleman Regency. The lower reaches of the river are located in Blingo Village, Magelang Regency, and Banyurejo Village, Sleman Regency (Rohman *et al*., 2024).

The Krasak River watershed covers an area of 30.152 km², and the river is approximately 24 km long (Rohman *et al*., 2024). As part of the Progo River watershed, this river should serve as a habitat for various local fish species. A study on fish diversity in the Progo River conducted by Jailani & Mujtahidah (2021) showed that the fish caught were dominated by the Cyprinidae family, such as *Osteochilus vittatus* (nilem), *Mystacoleucus obtusirotris* (kepek), *Barbonymus balleroides* (balar), *Barbodes binotatus* (wader cakul), *Rasbora argyrotaenia* (wader pari), and others. Furthermore, another study by Mulyasari *et al*. (2023) reported that 23 fish species from

11 families were caught in the Progo River. Furthermore, a study on the Elo River in Magelang reported the presence of 6 families, 9 genera, and 9 fish species in both the upper and lower reaches of the river, with the Cyprinidae family being the most dominant (Darma & Putra, 2020).

The Krasak River has a unique characteristic: a high sediment content from volcanic material, which affects both water flow and water clarity (Suhendar *et al*., 2022). These conditions naturally lead to changes in the composition of the fish inhabiting the river (Taufik *et al*., 2021). In addition, there is active sand mining around the Krasak River. This is evidenced by numerous sand depots, the use of excavators to dig and dredge material, and trucks transporting it, all of which clog the main access roads around the river. These activities directly alter habitat conditions, affecting the composition and abundance of fish in the Krasak River (Fauzan *et al*., 2025).

Therefore, research on fish species diversity in the Krasak River is necessary to evaluate and analyze the current structure of the fish community. The results of this evaluation are expected to provide baseline data on the condition of the fish community in the Krasak River. The findings of this study are expected to support future conservation and river management efforts.

MATERIALS AND METHODS

Study Site

Fish species diversity was sampled along the Krasak River using purposive sampling. This method was chosen because of the varying environmental conditions and the differing vegetation and habitat surrounding the river at each sampling site. There were three sampling stations. The first station was located in Kranggan Lor Hamlet, Srumbung Subdistrict, Magelang Regency. The second location was in Kranggan Kidul Hamlet, Srumbung Subdistrict, Magelang Regency.

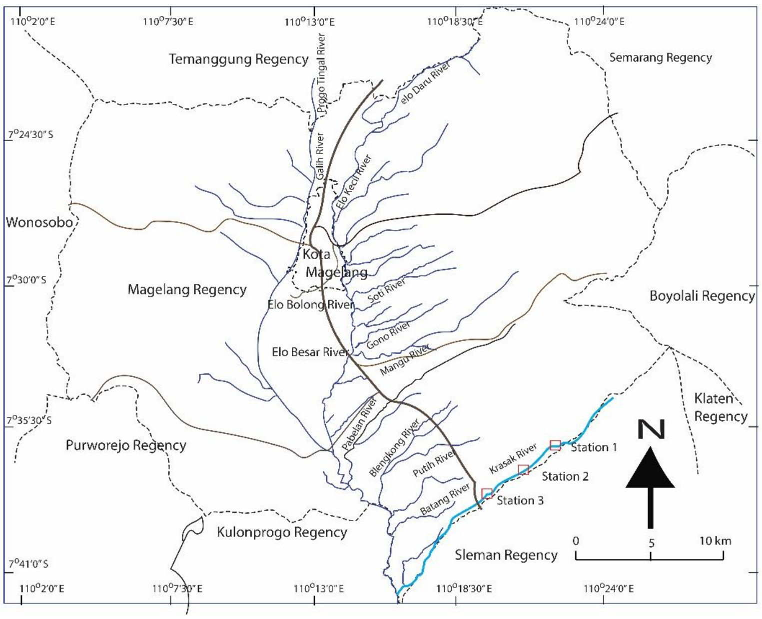

Figure 1. Map of sampling station locations on the Krasak River

Table 2. Research Map Location

Station	Description
1. Kranggan Lor Hamlet, Sudimoro Village, Srumbung Subdistrict.	The station is located at coordinates 7°37'27.5"S 110°20'53.0" E elevation of 452 meters above sea level. This station is characte by slightly brown water with a moderate to calm current. Chi farms and agricultural land surround the station. The riverbed co of rock and sandy silt. The vegetation around the station is very d
2. Kranggan Kidul Hamlet, Sudimoro Village, Srumbung Subdistrict.	The Kranggan Kidul Station is located at coordinates 7°37'4 110°20'22.7" E at an elevation of 409 meters above sea level. A Kranggan Kidul Station, there is a waterfall that produces a strong current. The riverbed substrate is hard, dominated by r gravel, but the water is not very deep. The water is the clearest a station compared to the other stations. There are farm fields ar the station, so the water is used for irrigation. Additionally, the st features dense and diverse vegetation.
3. Sempon Hamlet, Sudimoro Village, Srumbung Subdistrict.	The Sempon Station is located at coordinates 7°38'2 110°19'44.1"E at an elevation of 365 meters above sea level a situated near the Krasak River Dam. This station is characteriz turbid water with a calm current. The riverbed consists of rock soft mud. In the vicinity of this station, there is intensive dredging activity, and it is the closest station to the highway. vegetation growing along the riverbanks is very dense. It is very to encounter people fishing here.

The final sampling location was in Sempon Hamlet, Srumbung Subdistrict, Magelang Regency. These sampling locations were also determined based on information from local fishermen. The location map for each station is shown in Figure 1, while the characteristics of each observation station are presented in Table 1.

Fish Sampling

Fish sampling was conducted from October through November 2025, once a week in the morning from 7 AM to 11 AM. Sampling at each station lasted 1 hour along a 100-meter stretch. Fish caught using cast nets were collected, cleaned, and placed in plastic bags labeled with their origin. The number of individuals caught at each station was counted. The fish were then transferred to a cooler box to keep the samples fresh. The collected fish were measured for total length The collected fish were measured for total length using a measuring tape and weighed using a digital scale. Each specimen was documented for archival purposes and to verify identification. After measurement and documentation were complete, all samples were transferred to a freezer to maintain their freshness prior to further analysis.

The identification and measurement data were then compiled into a table listing the number of individuals per species, as well as the fish's length and weight. Next, the samples were identified using the identification guides by Haryono *et al.* (2024), Kottelat *et al.* (1993), and Sukmono & Margaretha (2017), and cross-referenced with the latest literature on the identified species. The identification results were grouped by family, genus, species, and local name in tabular form. Photographs of the caught fish are included.

Environmental Condition Measurements

As supporting data, environmental parameters were measured at each sampling point simultaneously with fish collection. The parameters measured included river width (m), water temperature (°C), depth (cm), water clarity (cm), and current velocity ($m\ det\ -1$), each of which was measured three times. In addition, the data were supplemented with observations of water color, riverbed substrate, and vegetation around the sampling sites. The data obtained from ecological index calculations and environmental parameter measurements were then analyzed and presented in tables and graphs. The results of this analysis were subsequently discussed to determine the structure of the fish community, the level of diversity, species dominance, and their relationship to the environmental conditions of the Krasak River.

Ecological Index

Fish data collected from three observation stations were then analyzed to determine the structure of the fish community in the Krasak River. The analysis was conducted using an ecological index approach, consisting of:

a. Shannon-Wiener Diversity Index (H') (Odum, 1994).

$$H' = -\Sigma pi\ In\ pi$$

Notes:
H'= Shannon-Wiener diversity index
Pi = Ratio of the number of individuals of species (i) to the total number of individuals (ni/N)
Ni = Number of individuals of species i
N = Total number of individuals of all species

b. Dominance Index (D) (Odum, 1998).

$$D = \Sigma(\frac{ni}{N^2})$$

Notes:
D = Dominance Index
Ni = Number of individuals of species i
N = Total number of individuals of all species

c. Evenness Index (E) (Odum,1993).

$$E = \frac{H'}{H\ maks}$$

Notes:
E = Evenness Index
H'= Diversity Index
S = Number of species in the community

d. Relative Abundance Index (RAI) (Krebs,1989)

$$RAI = \frac{ni}{N}x100$$

Notes:
RAI = Relative Abundance Index (ind/m^2)
Ni = Number of individuals of species i
N = Total number of individuals of all species

Result

Fish Species Diversity

Fish catches recorded at three sampling stations along the Krasak River from early October 2025 through November 2025 revealed a fairly wide range of species diversity. A total of 221 fish were caught, representing 4 orders, 6 families, and 12 species. The variation in fish species at each sampling station reflects similarities due to the even distribution of certain species across all stations. Data on the identified fish species are presented in Table 2.

Table 3. Fish Species in the Krasak River by Order, Family, and Species

No	Ordo	Family	Types of ichthyofauna		N (Indiv.)
			Species	Local Name	
1	Anabantiformes	Channidae	Channa striata	Gabus	1
2	Cypriniformes	Cyprinidae	Barbodes binotatus	Wader Cakul	33
3			Tor sp. / Neolissochilus sp.	Mangur	2
4			Mystacoleucus obtusirostris	Kepek	118
5			Osteochilus vittatus	Nilem	21
6		Danionidae	Rasbora argyrotaenia	Wader Pari (A)	2
7			Rasbora lateristriata	Wader Pari (B)	36
8		Nemacheilidae	Nemacheilus chrysolaimos	Uceng	2
9	Cyprinodontiformes	Poeciliidae	Poecilia reticulata	Guppy	3
10			Poecilia wingei	Endler Guppy	1
11	Siluriformes	Sisoridae	Glyptothorax major	Lele Sungai	1
12			Glyptothorax platypogon	Kehkel	1

The fish species caught during the study belonged to four orders, with Cypriniformes being the most dominant. This order was represented by a composition of 7 species distributed across 3 families: Cyprinidae, Danionidae, and Nemacheilidae. The family with the highest species diversity was Cyprinidae, with 4 species, followed by Danionidae with 2 species. Meanwhile, the family Nemachelidae is represented by only one species.

Distribution of Caught Fish

The composition of individual presence at each sampling station varies in terms of both number and percentage, as shown in Table 3.

Based on the table, Cypriniformes is the order with the most species, namely 7. On the other hand, the family with the highest species diversity is Cyprinidae, which consists of 4 species. The data in the table show the distribution of fish caught at each station.

Table 3. Distribution and percentage composition of individual attendance

No	Scientific Name	Local Name	Kranggan Lor	Kranggan Kidul	Sempon	Number	RA (%)
1	Barbodes binotatus	Wader Cakul	10	10	3	33	14.93
2	Channa striata	Gabus	1	0	0	1	0.45
3	Glyptothorax major	Lele Sungai	0	1	0	1	0.45
4	Glyptothorax platypogon	Kehkel	1	0	0	1	0.45
5	Mystacoleucus obtusirostris	Kepek	36	52	30	118	53.39
6	Nemacheilus chrysolaimos	Uceng	2	0	0	2	0.90
7	Tor sp. / Neolissochilus sp.	Mangur	0	2	0	2	0.90
8	Osteochilus vittatus	Nilem	3	9	9	21	9.50
9	Poecilia reticulata	Guppy	0	1	2	3	1.36
10	Poecilia wingei	Endler Guppy	0	1	0	1	0.45
11	Rasbora argyrotaenia	Wader Pari (A)	0	1	1	2	0.90
12	Rasbora lateristriata	Wader Pari (B)	19	9	8	36	16.29
	Total		72	86	53	221	53

This distribution demonstrates that *Mystacoleucus obtusirostris* has a strikingly high abundance percentage of 53.39%. This number accounts for more than half of the total individuals caught. At Sempon Station, 30 individuals were found; at Kranggan Kidul Station, 52; and at Kranggan Lor Station, 36. Thus, the total number of kepek fish is 118. This indicates that the kepek fish is the most abundant species found across all sampling locations.

To provide a clearer visualization of differences in species numbers across stations, the data are presented as a bar graph in Figure 2. Furthermore, details on variations in fish species composition across all study sites are summarized in Figure 3.

The community structure at each sampling station can be analyzed using ecological index parameters. The results of the ecological index calculations are presented in Table 4.

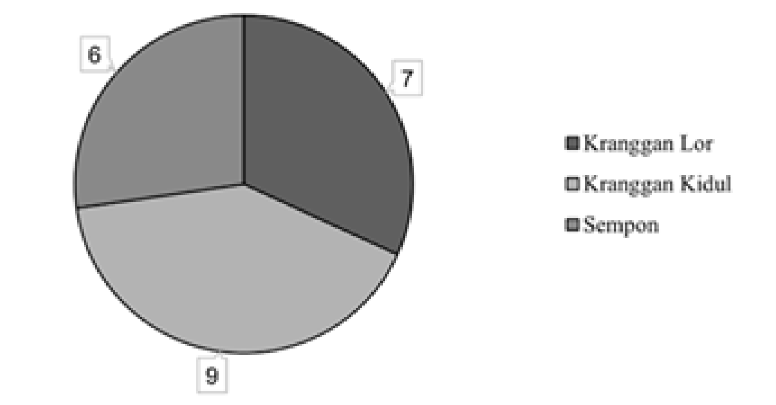

Figure 2. Number of fish species at each station

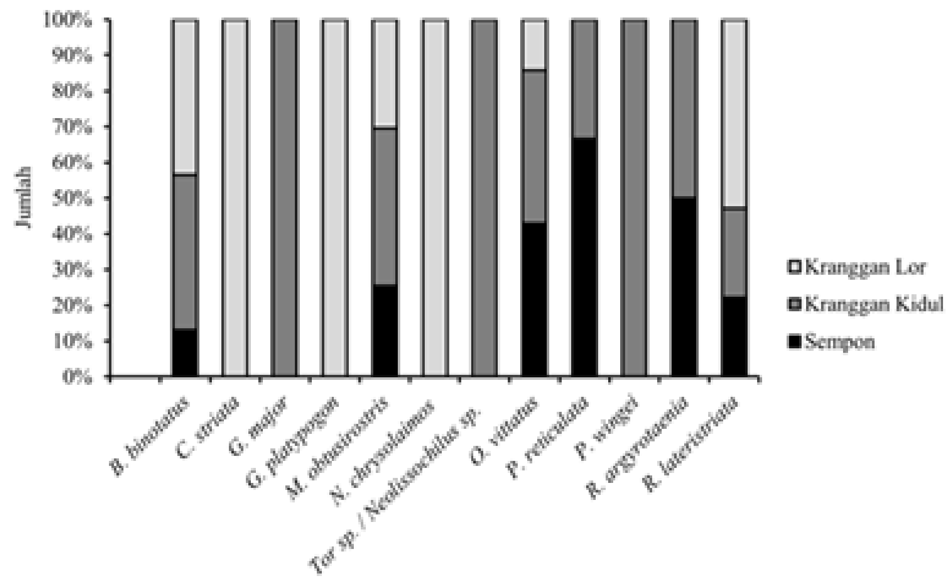

Figure 3. Percentage of each fish species at each station

Table 4. Diversity (H'), Evenness (E), and

Description	1 (Kranggan Lor)	2 (Kranggan Kidul)	3 (Sempon)
Number of Fishes (n)	72	86	53
Diversity Index (H')	0.796	0.882	0.647
Evennes Index (E)	0.321	0.355	0.2603
Dominance Index (D)	0.073	0.061	0.0217

Based on the calculations performed at all sampling stations, the highest H' value was 0.882 at the Kranggan Kidul Station, while the lowest value was recorded at the Sempon Station at 0.647, followed by the Kranggan Lor Station at 0.796. The number of fish species found was only 6 at Sempon Station, 9 at Kranggan Kidul Station, and 7 at Kranggan Lor Station. Furthermore, the fish species composition also confirmed a very strong dominance by M. obtusirostris, with 118 individuals—accounting for 53.39% of all fish caught. Meanwhile, most other species were found in only small numbers; in fact, some species were found in as few as 1–2 individuals, such as *C. striata*, *G. major*, and *G. platypogon*.

The evenness index (E) is a value that represents the abundance and evenness of species within an aquatic ecosystem. If the uniformity index approaches 0, it indicates a tendency toward the dominance of a particular species in that ecosystem; conversely, if the index approaches 1, the ecosystem is in a relatively stable condition with an even distribution of species (Setyobudiandi *et al*., 2009). Table 4. shows that the evenness index (E) values at the Sempon, Kranggan Kidul, and Karangan Lor stations range from 0.2603 to 0.355. A low E value indicates that the distribution of individuals across species is uneven, with most individuals concentrated in one or two dominant species. The dominance index (D) values at the research stations ranged from 0.0217 to 0.073, with the highest value recorded at the Kranggan Lor Station. Although the dominance index values are numerically still very low, the presence of a single species with very high relative abundance indicates a tendency toward biological dominance within the fish community. As supporting data clarifying the structure of the fish community, details on the body size of each fish species found are provided in Table 5.

Table 5 shows the distribution of length and weight of fish caught at all stations, with the average fish length ranging from 2 to 25.5 cm and the average weight ranging from 2 to 114 g. Based on these data, the majority of the fish caught were small. Approximately 88.69% of the total population consisted of individuals less than 10 cm in length, dominated by the species *M. obtusirostris* and *R. lateristriata*. Meanwhile, individuals measuring 10–15 cm accounted for only 1.36% of the total catch, and those larger than 15 cm accounted

Table 5. The species and body size of each type of fish caught at all stations

No	Scientific name	N (Indv.)	Total Length (cm)	Weight		
				Average (cm)	Weight (g)	Average (g)
1	*Barbodes binotatus*	33	6-6.7	6.90	2-15	4.21
2	*Channa striata*	1	25.5	25.50	114	114
3	*Glyptothorax major*	1	13.8	13.8	15	15
4	*Glyptothorax platypogon*	1	6	6	3	3
5	*Mystacoleucus obtusirostris*	118	5-12	7.66	2-17	5.37
6	*Nemacheilus chrysolaimos*	2	7.2-7.3	7.25	2-3	2.5
7	Tor sp. / Neolissochilus sp.	2	11.1-14.7	12.9	10-20	15
8	*Osteochilus vittatus*	21	27.3-13	18.54	18-381	79.19
9	*Poecilia reticulata*	3	3.2-4.1	3.67	0	0
10	*Poecilia wingei*	1	2.2	2.2	0	0
11	*Rasbora argyrotaenia*	2	6.2-7.3	6.75	0-4	2
12	*Rasbora lateristriata*	36	3.1-9.5	7.19	0-7	3.43

for 9.95%, driven by the presence of *O. vittatus*. Analysis of fish weight showed a pattern similar to that of length distribution. Species in the weight category below 10 g also contributed to the population with the same percentage, namely 88.69%. The dominant species were *M. obtusirostris* and *R. lateristriata*. In contrast, the group of fish weighing over 50 g accounted for only 9.95%. The species in this weight category are O. vittatus and C. striata. Meanwhile, the percentage of fish weighing between 10 and 50 g is only 1.36%. The presence of many small fish indicates that the study site serves as a habitat for juvenile fish.

Aquatic Environmental Conditions

The physical environmental conditions of the water at all sampling stations showed differences in characteristics between stations; for example, the Kranggan Lor Station is located near residential areas, chicken farms, and areas where sand is dredged using heavy machinery. The Kranggan Kidul Station is situated near a waterfall and chili pepper farms, while the Sempon Station is located near a sand dredging area where heavy machinery is used. Other factors affecting water quality include river width, river depth, water color, bottom substrate type, and riparian vegetation. It is important to examine these variations in order to understand the distribution patterns and community structure of the fish caught. Detailed results of environmental parameter measurements are presented in Table 6.

The water temperature range is 25–26°C. The depth values at all stations range from 40.7 to 85 cm. Furthermore, current speeds at the three sampling stations range from 0.19 to 0.90 m/s. The strongest current is at the Kranggan Kidul Station because it is located beneath a waterfall. Conversely, the Sempon Station has the slowest current. This is consistent with Tambunan (2013), who classified current speeds into four categories: slow currents ranging from 0 to 0.25 m/s,

Table 6. Environmental Quality at Each Sampling Station

Parameter	1 (Kranggan Lor)	2 (Kranggan Kidul)	3 (Sempon)
Temperature (°C)	26,73	25,07	25,97
pH	7,79	7,86	8,21
Current Speed (m/s)	0,44	0,9	0,19
Water Clarity (cm)	22,5	37,17	13,0
Depth (cm)	85	40,7	50
River Width (m)	18,9	26,86	7,48
Water Color	Light brown	Slightly brown	Murky brown
Substrate	Silt, sand, and rocks	Gravel and rocks	Rocks and silt
Surrounding Vegetation	Banana, coconut, bamboo, keladi, putri malu, beringin, grasses, sengon, waru	Banana, coconut, beringin, grasses, ketul, waru, sengon	Banana, bamboo, grasse ketapang, beringin, lamtoro, sengon

moderate currents ranging from 0.25 to 0.50 m/s, fast currents ranging from 0.5 to 1 m/s, and very fast currents exceeding 1 m/s. In addition, the Sempon Station has the narrowest river width, while the Kranggan Kidul Station has the widest.

Water conditions are also reflected in the water's color. The water color observed across all stations tends to be brown, with the clearest water at the Kranggan Kidul Station and the murkiest at the Sempon Station. The bottom substrate at the Kranggan Lor Station consists of mud, sand, gravel, and large rocks. At the Kranggan Kidul Station, the substrate is predominantly coarse. In contrast, at the Sempon Station, the substrate consists of mud, with many rocks covered by fine sediment. This type of substrate also causes the gaps between the rocks to fill with mud. The riparian vegetation growing at all stations is quite diverse and dense.

Discussion

The structure of fish communities in rivers is closely linked to the physical conditions of their habitat. Fish do not simply occupy random areas; rather, they select habitats that are most suitable for their survival, foraging, and reproduction. When viewed through the lens of the most fundamental factor—temperature—conditions in the Krasak River are highly conducive to biological productivity. Based on temperature measurements ranging from 25–26°C, this range falls within the optimal temperature for fish feeding, which is between 22–29°C (Manunggal *et al*., 2018). Below this temperature, fish can still survive but experience a decrease in appetite. Temperature variations affect physical, chemical, and biological factors in the water body, such as the metabolic activity of organisms and the growth of aquatic biota.

Ideal temperature alone is not sufficient; the structure of fish communities in rivers is also influenced by the riverbed substrate. Rivers with muddy bottoms tend to have lower fish abundance due to instability in fish habitat structure (Nuryanto *et al*., 2015).

Soft mud mixed with rocks causes the gaps between the rocks to be filled with fine sediment. This condition can reduce the availability of microhabitats—such as the spaces between rocks and open rocky bottoms—that fish typically use for foraging and as shelter from predators. On the other hand, very calm water currents result in food particles being poorly distributed. In fact, river fish generally rely on water currents to obtain natural food sources such as detritus, periphyton, and other small organisms. Under calm current conditions, fish tend to move to sections of the river with more dynamic flow. This is because fish are dynamic animals that constantly migrate, both to forage and to spawn. Furthermore, in sufficiently deep rivers, fish must expend more energy to move around in search of food, so not all species are capable of doing so.

Based on the observations, the Kranggan Lor station has the greatest depth, which provides a larger volume of water for fish to move vertically. This explains why relatively large fish, such as *C. striata* and *O. vittatus*, were found at that station. Furthermore, the discovery of *M. obtusirostris* in large numbers indicates that this fish has a broad habitat tolerance and good swimming ability in waters ranging from calm to fast-flowing currents. This habitat preference is particularly evident at stations with stronger currents. According to Cahyono *et al*. (2018), several species in the Cyprinidae family have torpedo-shaped (streamlined) bodies, which allow them to withstand high current speeds by minimizing drag at high flow velocities. This finding aligns with the data presented in Table 4.2, which shows that the most frequently caught fish belong to the family Cyprinidae. Furthermore, fish from the Cyprinidae family can swim against the current—a trait known as rheophilic (Lujan & Conway, 2014).

Different conditions were observed at stations with moderate currents, such as Kranggan Lor Station. Moderate currents still allow fish to forage, though not as effectively as in fast-flowing currents. According to Suryaningsih *et al*. (2018), rivers with moderate currents and a mixed substrate of rocks and sandy silt tend to support moderate populations of generalist fish communities. However, they rarely support high abundance compared to rivers with rocky substrates and strong currents.

On the other hand, the increased proportion of *R. lateristriata* at the Kranggan Lor Station aligns with the findings of Prasetyo & Retnoaji (2020), which showed that *R. lateristriata* tends to be more sedentary and active in waters with weak to moderate currents compared to fast-flowing currents. This is because less intense currents allow the fish to conserve energy while swimming and foraging. Research by Sentosa & Djumanto (2010) further supports the finding that *R. lateristriata* prefers shallow riverbank areas with sandy and gravelly substrates to facilitate foraging and enhance reproductive success. Based on this, the presence of *R. lateristriata* indicates that the habitat characteristics at the Kranggan Lor Station are suitable for this species.

In addition to current and substrate type, dense riparian vegetation plays a key role in increasing *R. lateristriata* abundance. Riparian vegetation serves as a gathering place for detritus and microorganisms, which are the primary food sources for small fish such as *R. lateristriata*. According to Suryaningsih *et al*. (2018), small fish from the Cyprinidae family tend to be more abundant in river segments with good riparian vegetation and high habitat heterogeneity.

Although all stations had dense riparian vegetation, an interesting phenomenon was observed: species were caught only in very limited numbers. Species caught in very small numbers in the Krasak River included Channa striata, *Glyptothorax major*, *Glyptothorax platypogon*, *Nemacheilus chrysolaimos*, *Tor sp. / Neolissochilus sp.*, and *Poecilia wingei*. The presence of these species is likely due to habitats that were underrepresented at the sampling stations.

Each species has different morphological, behavioral, and habitat preferences. For example, *C. striata* naturally inhabits waters with muddy, rocky, or sandy bottoms, as well as those rich in plant roots and tree roots. These types of substrates serve as hiding places for juvenile fish, whether to hunt for prey or to seek shelter from predators (Sirodiana & Irawan, 2020). The discovery of *C. striata* at the Kranggan Lor Station—in relatively deep waters with rocky and sandy-mud substrates, as well as dense riparian vegetation—provides both shelter and a food source for *C. striata*. As an opportunistic predator, this species preys on a wide range of aquatic organisms, including small fish, crustaceans, aquatic insects, and benthic organisms (Rosita & Monalisa, 2026). However, because the current at this station is moderate and sand dredging continues near the river, the habitat is not yet stable enough to support a resident population. This statement is supported by Rosita and Monalisa (2026), who note that the natural habitat of *C. striata* includes slow-flowing rivers, lakes, swamps, canals, and seasonal pools. Thus, the presence of a single *C. striata* individual at the Kranggan Lor Station more accurately reflects a temporary presence due to movement along the river, rather than a stable local population.

C. striata is a fish species equipped with an additional respiratory organ that allows it to breathe directly from the air, enabling it to survive in various habitats, such as swamps, rivers, lakes, and even flooded rice fields (Zega, 2025). Morphologically, *C. striata* has a long, slender body. This characterizes its rapid swimming movements and predatory behavior, as it lies in wait among vegetation for prey until it comes within striking distance (Kottelat *et al*., 1993). However, in terms of habitat preference, this species tends to choose waters with slow currents and dense vegetation to facilitate its hunting. Therefore, the presence of this fish indicates that at the Kranggan Lor Station, *C. striata* uses the area as a hiding place, given that this station is the deepest one. Additionally, the limited number of these fish is likely due to their solitary and territorial nature. On the other hand, fishing gear has limited ability to reach *C. striata*'s habitat among the vegetation. This is further supported by similar research on the decline in swimming endurance of snakehead fish in fast-flowing waters. High current speeds cause the fish to swim faster, leading to exhaustion due to increased energy expenditure (Nofrizal *et al*., 2011).

Small benthic species such as *N. chrysolaimos* also exhibit limited populations. *N. chrysolaimos* prefers habitats with moderately strong water currents and a substrate of small rocks. In addition to substrate factors, organic inputs from nearby aquaculture activities around the study site may also influence this fish's habitat preferences, given that *N. chrysolaimos* prefers fresh water with good environmental quality (Yudha & Hamdani, 2024). Furthermore, Kottelat *et al*. (1993) noted that Nemacheilus inhabits shallow riverbanks and riverbeds with sandy-gravel substrates and that this species can swim against the current. *N. chrysolaimos* uses the sandy gravel riverbed for self-defense when threatened (Keskar *et al*., 2014). When viewed in terms of habitat suitability, this species is indeed poorly suited to the physical characteristics of the Kranggan Lor Station, which is dominated by soft substrates, and thus cannot provide the habitat required by the fish to cling to rocks or forage on the riverbed. This is supported by Yudha *et al*. (2018), who noted that this fish is a demersal species with adhesive pectoral fins that enable it to attach to rocks on the riverbed and avoid being swept away by the current. Additionally, this fish has a subterminal mouth, which correlates with its feeding habits in the river. Consequently, very few individuals have been found. This habitat limitation is also a constraint for species that depend on fast-flowing water with hard substrate.

The presence of *G. platypogon* at the Kranggan Lor Station is likely due to the fish migrating to sections of the river with calmer currents for specific activities, such as foraging or temporarily avoiding very strong currents. However, because the substrate at the Kranggan Lor Station is dominated by soft, sandy mud, this habitat cannot sustain a Glyptothorax population over the long term. Very small numbers of *G. major* and *N. soroides* were also found at Kranggan Kidul Station. Fish of the genus Glyptothorax are also known as obligate rheophilic fish, meaning they prefer very strong water currents and rocky substrates (Ng & Kottelat, 2016). This is due to their bodies being equipped with a ventral adhesive apparatus, also known as the Thoracic Adhesive Apparatus (Kottelat *et al*., 1993). This apparatus consists of fine skin folds that help the fish attach firmly to rocks in extremely fast-flowing currents and in areas with better water quality (Maizul, 2020). These fish are active on the riverbed and typically hide beneath rocks. In addition, this rocky substrate serves as a feeding habitat. The presence of a waterfall in Kranggan Kidul—with its very strong current and a substrate of rocky gravel—indicates a suitable habitat for *G. major*. However, the limited number of individuals captured was due to the fish's tendency to hide among the rocks and the extremely strong current at this station.

An interesting finding in this study is the variation in species numbers across all stations. This variation will directly affect the water body's ecological index value. The quality of an aquatic ecosystem can be interpreted through the ecological index values obtained. The diversity value depends on the variation in individuals within each captured species; thus, the more species and the greater the variation in the number of individuals per species, the greater the diversity in that ecosystem (Sriwidodo, 2013). According to Magurran (2004), diversity indices are classified into three levels: if the diversity index (H’) is greater than 3, the diversity is considered high; if H’ is less than 1, the diversity is low. The analysis results show that the diversity index value for the Krasak River ranges from low to moderate.

In this study, a unique distribution pattern was observed, with the highest diversity index values—both in individual abundance and species richness—concentrated at the Kranggan Kidul Station. This phenomenon contrasts with the findings of Arunkumar & Manimekalan (2018), who studied freshwater fish fauna and concluded that fish species diversity and abundance decrease with increasing elevation. In contrast, in this study, Sempon Station—which has the lowest elevation—recorded the fewest individuals and species. The low species diversity at Sempon Station is likely due to substrate instability from intensive sand dredging and proximity to a highway. On the other hand, the high species richness at Kranggan Kidul Station can be explained by the river's wider dimensions. The river's width is positively correlated with the number of microhabitats and the total area. Thus, it can be inferred that longer and wider rivers are inhabited by more species than smaller ones (Nuryanto *et al*., 2015). A larger area naturally contains a greater number of microhabitats, and thus is more likely to be inhabited by a wider variety of fish species (Kottelat *et al*., 1993). Additionally, Kranggan Kidul features a variety of microhabitats, ranging from areas near waterfalls (riffles) to deeper sections (pools), enabling it to support a greater number of species.

Research by Sriwidodo *et al*. (2013) revealed that fish diversity in areas with strong currents is higher than in areas with slow currents; current velocity significantly influences the habitat and environmental conditions of river ecosystems—including both biotic and abiotic factors—resulting in greater fish diversity. This demonstrates that the Kranggan Kidul station, which has the strongest current velocity, exhibits the highest diversity value. Cahyono *et al*. (2018) also found that stations with higher current velocities account for 91% of the variation in fish diversity. Furthermore, the high species diversity in the upstream zone confirms the findings of a study by Titik & Agus (2019), which showed that fish species richness in the upper reaches of the Luk Ulo River in Kebumen Regency is higher than in the lower reaches—a difference attributed to extensive human activities, overfishing, and land-use practices. These factors ultimately alter the river's characteristics, leading to a decline in the population and diversity of river biota. Thus, this confirms the presence of environmental pressure at the Sempon Station, triggered by intensive sand dredging activities.

Intensive sand dredging activities can lead to excessive sedimentation and water turbidity. Meanwhile, conditions at the Kranggan Kidul and Kranggan Lor stations—which are slightly farther from mining activities—show slightly higher biodiversity values. This is also consistent with the statement by Kadim & Pasisingi (2024) that low H' values and low evenness in rivers are associated with habitat disturbance caused by anthropogenic activities. This disturbance leads to the dominance of a single species that can adapt to the habitat conditions in the Krasak River. The dominance of a single species across all stations causes the fish community to become unbalanced. This condition is consistent with anthropogenic activities along the Krasak River, namely intensive sand mining. Sand mining around the river is physically correlated with the riverbed substrate and water clarity parameters at the study site (Bhattacharya *et al*., 2019). Furthermore, variations in water clarity affect photosynthesis and aquatic productivity (Mardani *et al*., 2013).

Thus, it can be concluded that *M. obtusirostris* has successfully survived in these waters. The dominance of *M. obtusirostris* at the study site indicates that this species possesses a high adaptive capacity to stressed river environmental conditions. The high relative abundance of this fish, accounting for more than 50% of the total individuals caught, suggests that this species can survive and thrive in waters with declining habitat quality. Furthermore, *M. obtusirostris* is a river fish species characterized by a relatively fast growth rate and a fairly high natural mortality rate, though this is offset by a recruitment pattern that occurs almost year-round (Djumanto *et al*., 2014). These characteristics allow the population to recover more quickly, even under environmental stress or habitat disturbance, enabling it to remain dominant in the fish community of disturbed rivers. Saprudin *et al*. (2022) and Suryaningsih *et al*. (2018) noted that fish from the family Cyprinidae tend to dominate in river segments subjected to anthropogenic pressures, such as changes in river morphology and sedimentation resulting from sand mining. This pattern is similar to that of this study, in which the species *M. obtusirostris* was found at all sampling stations due to its high adaptability.

Sand dredging activities can increase sedimentation and water turbidity. Both of these factors are less favorable for fish that require rocky substrates or clear water, but they are still tolerable for *M. obtusirostris*. The resilience of *M. obtusirostris* is also driven by its very broad feeding pattern. The kepek's ability to survive is also linked to its ecological flexibility in utilizing habitats and food sources. The kepek reaches its asymptotic length quickly, resulting in high growth rates. This high growth rate is due to the kepek fish's broad dietary range (euryphagous), enabling it to prey on both animal and plant matter in its surroundings (Djumanto *et al*., 2014). The main diet of the kepek fish consists of worms, crustaceans, insects, aquatic plants, phytoplankton, and detritus (Froese & Pauly, 2014). Consistent with these findings, Bainiyah *et al*. (2020) note that the Cyprinidae family is indeed known as the primary inhabitants of several rivers and swamps.

Consequently, the dominance of the kepek fish at the study site represents an ecological response to environmental pressures in the river. The combination of high environmental tolerance, good growth rates and recruitment, and flexibility in habitat use and foraging makes *M. obtusirostris* a species capable of surviving and dominating in disturbed river ecosystems, particularly those affected by human activities such as dredging or sand mining. The low uniformity index reflects an unstable community that is sensitive to environmental changes. A similar pattern was reported by Wahyuningsih *et al*. (2022) in the Logawa River, Central Java, where sand mining activities altered the physical conditions of the water, in turn leading to low aquatic organism diversity. Odum (1993) explains that in disturbed ecosystems, dominance values tend to increase because only a few species are able to adapt and thrive. This aligns with the findings of Pramono *et al*. (2018) on the Klawing River in Central Java, who reported that the increased dominance of fish from the Cyprinidae family was associated with human activity pressures around the river. A similar pattern was observed at this study site, where fish distribution was uneven and showed signs of community simplification in response to ongoing environmental disturbances.

Thus, the uneven distribution of fish among stations, the dominance of highly tolerant species, and the limited distribution of sensitive species indicate that the fish community structure at the study site is under ecological stress. This distribution pattern reinforces the results of the diversity, evenness, and dominance index analyses and indicates that human activities around the river—particularly dredging and sand mining—play a significant role in shaping the spatial distribution of the fish community.

Conclussion

A Total of 12 fish species belonging to 6 families were found. A total of 12 fish species belonging to 6 families were found. The Cyprinidae family was the most dominant group, with the species *Mystacoleucus obtusirostris* (kepek fish) having the widest distribution across all sampling sites. The distribution of fish species showed an uneven pattern, though this was not particularly significant. The Diversity Index (H') ranged from 0.647 to 0.882, falling into the low category. Differences in H' values are closely related to habitat variations among stations. The Evenness Index (E) ranged from 0.260 to 0.355, indicating low values. This is evidenced by the uneven distribution of individuals across species, with the majority concentrated in a single species. Furthermore, the Dominance Index (D) is reflected in the Relative Abundance (RA) values, in which the number of Mystacoleucus obtusirostris individuals that accounted for >50% of the total catch is shown. This demonstrates the species' high adaptive capacity compared to other species. The aquatic environmental conditions in the Krasak River—particularly current velocity, bottom substrate type, and turbidity levels—are the primary limiting factors for fish distribution. Differences in environmental characteristics at each station also influenced the composition of the species found. In addition, sand dredging activities around the stations are suspected to have contributed to changes in substrate conditi-ons and water turbidity levels, which in turn affected fish distribution.

References

Bainiyah, R., K. Salim, & E. Utami. 2020. Struktur komunitas ikan di perairan Sungai Mendo Kabupaten Bangka. Akuatik: Jurnal Sumberdaya Perairan, 14(1): 67-73.

BAPPEDALITBANGDA Kabupaten Mage-lang. 2021. Kajian Sosial Budaya Di Kecamatan Borobudur Kabupaten Magelang. Magelang : BAPPEDALIT-BANGDA Kabupaten Magelang.

Bhattacharya, R. K., N. Das Chatterjee, & K. Das. 2019. Geomorphic response to riverine land cover dynamics in a quarried alluvial River Kangsabati, South Bengal, India. Environmental Earth Sciences, 78(22): 633.

Cahyono, R. N., A. Budiharjo, & S. Sugiyarto. 2018. Keanekaragaman dan kekerabatan ikan Famili Cyprinidae pada ekosis-tem Bendungan Colo Sukoharjo Jawa Tengah. EnviroScienteae, 14(2): 137-146.

Djumanto, D., M. I. P. Devi, I. F.Yusuf, & E. Setyobudi. 2014. Kajian dinamika populasi ikan kepek, *Mystacoleucus obtusirostris* (Valenciennes, in Cuvier & Valenciennes 1842) di Sungai Opak Yogyakarta. Jurnal Iktiologi Indonesia, 14(2): 145-156.

Froese R, D. Pauly. Editors. 2014. FishBase. World Wide Web electronic publication. www.fishbase.org, ver-sion (08/2013).

Haryono, Y. Hikmayani, Wahyudewantoro, R. Gustiano, Aisyah, I. Hidayatullah, & Y. Y. P. Jaya. 2024. Panduan

Identifikasi Jenis Ikan Perairan darat. Jakarta: Kementerian Kelautan dan Perikanan.

Kadim, M. K., & N. Pasisingi. 2024. Kondisi habitat fisik dan keanekaragaman makroinvertebrata sebagai indikator pencemaran di sungai Bone Gorontalo. Jurnal Kesehatan Lingkungan Indonesia, 23(3): 301-310.

Keskar, A., Padhye, A., & Dahanukar, N. 2014. Fighting against all odds: the struggle for existence among hill stream loaches of northern Western Ghats. Min-Newsletter of FFSG, 2: 25-29.

Kottelat, M., T. Whitten, S. N. Kartikasari, & S. Wirjoatmodjo. 1993. Freshwater Fishes of Western Indonesia and Sulawesi. Singapore: Periplus Editions.

Krebs, C.J. 1989. Ecological Methodology. Harper and Row Inc Publiser, New York.

Lujan, N. K., & K. W. Conway. 2014. Life in the fast lane: a review of rheophily in freshwater fishes. Extremophile fishes: Ecology, evolution, and physiology of teleosts in extreme environments, 107-136.

Maizul, R. 2020. Mengenal ikan kekel (*Glyptothorax platypogon* Valenciennes, 1840), ikan asli dari Pulau Jawa. Warta Iktiologi. 4(2): 21-26

Magurran, A. E. 2004. Measuring Biological Diversity. Oxford: Blackwell Publishing.

Manunggal, A., R. Hidayat, S. Mahmudah, D. Sudinno, & A. Kasmawijaya. 2018. Kualitas air dan pertumbuhan pembesaran ikan patin dengan teknologi biopori di lahan gambut. Jurnal Penyuluhan Perikanan dan Kelautan, 12(1): 11-19.

Mardani, M., A. Mangalik, Y. Jagau, & J. Hadie. 2013. Inventarisasi Jenis Ikan yang Tertangkap di Beberapa Perairan Danau di Wilayah Kecamatan Kamipang Kabupaten Katingan Kalimantan Tengah. Enviro Scienteae, 9(2), 85-99.

Mulyasari, T. M., J. Mukono, and Y. Sincihu. 2023. The presence of microplastics in the Indonesian environment and its effects on health. Journal of Public Health in Africa. 14(2): 8.

Ng, H. H., & M. Kottelat. 2016. The glyptothorax of Sundaland: a revisionary study (Teleostei: Sisoridae). Zootaxa, 4188(1): 1-92.

Nofrizal, N., M. Ahmad, & I. Syofyan. 2011. Daya tahan dan kecepatan renang ikan selais (Kryptopterus sp.)[Swimming endurance and speed of catfish (Kryptopterus sp.)]. Jurnal Iktiologi Indonesia, 11(2): 99-106.

Nuryanto, A., D. Bhagawati, M. N. Abulias, & I. Indarmawan. 2015. Fauna ikan di Sungai Cikawung Kabupaten Cilacap Jawa Tengah. Jurnal Iktiologi Indonesia, 15(1): 25-37.

Odum, E.P. 1993. Dasar-dasar Ekologi. Diterjemahkan dari Fundamental of Ecology oleh T. Samingan. Gadjah Mada University Press. Yogyakarta

Odum, E.P. 1994. Dasar-dasar Ekologi. Edisi-3. Terjemahan Tjahjono Samingan. Gadjah Mada Univ. Press. Yogyakarta.

Odum, E. P. 1998. Dasar-dasar Ekologi. Diterjemahkan dari Fundamental of Ecology oleh T. Samingan. UGM Press. Yogyakarta.

Prasetyo, A., & B. Retnoaji. 2020. Migration biomodelling of wader pari fish (*Rasbora lateristriata* Bleeker, 1854) toward varied current direction and substrate type. In AIP Conference Proceedings (Vol. 2260, No. 1, p. 030005). AIP Publishing LLC.

Pramono, T. B., D. Arfiati, M. S. Widodo, & U. Yanuhar. 2018. Iktiofauna di hilir Sungai Klawing Kabupaten Purbalingga, Jawa Tengah. Samakia: Jurnal Ilmu Perikanan, 9(2): 65-69.

Rohman, F., Ikhsan, J., & Hairani, A. 2024. Prediksi Dampak Endapan Sedimen

Hasil Erupsi 2023 terhadap Karakteristik Banjir Lahar di Kali KrasakMenggunakanSIMILAR. Konst ruksia, 15(2), 39-48.

Rosita, S. P., S. S. Monalisa, & S. Pi. 2026. Parasit Protozoa pada Ikan Gabus (*Chana striata*). Uwais Inspirasi Indonesia. 101 p.

Sentosa, A. A., & D. Djumanto. 2010. habitat pemijahan ikan wader pari (*Rasbora lateristriata*) Di Sungai Ngrancah, Kabupaten Kulon Progo [Spawning habitat of *Rasbora lateristriata* in Ngrancah River, Kulon Progo Regency]. Jurnal Iktiologi Indonesia, 10(1): 55-63.

Setyobudiandi I, Sulistino, Ferdinan Y, Kusuma C, Hariadi S, Damar A, Sembiring A dan Bahtiar. 2009. Sampling dan Analisis Data Perikanan dan Kelautan Terapan Metode Pengam-bilan Contoh di Wilayah Pesisir dan Laut. Fakultas Perikanan dan Ilmu Kelautan. IPB

Sirodiana, S., & D. Irawan. 2020. Pemeliharaan benih ikan gabus (*Channa striata*) di kolam dengan substrat dasar pasir. Buletin Teknik Litkayasa Akuakultur, 18(1): 25-28.

Sriwidodo, D. W. E., A. Budiharjo, & S. Sugiyarto. 2013. Keanekaragaman jenis ikan di kawasan inlet dan outlet Waduk Gajah Mungkur Wonogiri. Bioteknologi Biotechnological Studies, 10(2): 43-50.

Suhendar, A., R. Dwi, & I. Maulana. 2022. Dampak aktivitas penambangan pasir pada kualitas air S.Krasak, Magelang. Jurnal Lingkungan & Sum-berdaya Alam Indonesia, 10(3): 142–152.

Sukmono, T. & M. Margaretha. 2017. Ikan Air Tawar di Ekosistem Hutan Sumatera dan Frankfurt Zoological Society. Yayasan Konservasi Ekosistem Hutan Sumatera & Frankfurt Zoological Society.

Suryaningsih, E., A. K. Zakaria, & I. S. Rohyani. 2018. Distribusi longitudinal ikan di Sungai Klawing, Jawa Tengah. JII, 18(2): 129–140.

Tambunan, J. M. 2013. Strategi Pengelolaan Lingkungan Pantai Tanjung Pesona Kabupaten Bangka untuk Pengembangan Wisata. UNDIP. Program Pasca Sarjana.

Taufik, M., D. Rahmadani, & A. Syamsuddin. 2021. Pengaruh aktivitas manusia pada kualitas air dan keanekaragaman biota sungai. J. Ilmu Lingkungan Lestari, 18(2): 97–107.

Titik. T. W and Agus Z. 2018. Keanekaragaman Ikan di Sungai Luk Ulo Kabupaten Kebumen. Biosfera Vol 35, No 1 Januari 2018 : 23 - 28 DOI: 10.20884/1.mib.2018.35.1.592

Wahyuningsih, E., N. L. Rahayu & M. Zaenuri. 2022. Pengaruh penambangan batu terhadap komunitas makrozoobentos di S. Logawa. Jurnal Multidisiplin Madani, 2(2), 1047-1066.

Yudha, D. S., & Hamdani, F. N. 2024. Keanekaragaman morfologis *Nemacheilus fasciatus* di Perairan S.Bogor, Temanggung dan Blitar. J.Biologi Papua, 16(2): 114-121.

Yudha, I. G. N. A. P., I. W. Arya, dan S. A. M. P. Suryani, 2018. Studi identifikasi keragaman jenis, feeding habit dan food habit ikan demersal pada bagian Hilir Sungai Yeh Sungi, Tabanan, Bali. Gema Agro, 23(2): 114-123.

Zega, A., B. V. Telaumbanua, D. Laoli & R. D. Zebua, 2023. Physical water quality parameters in Boyo River Onowaembo Village, Gunungsitoli Subdistrict. J.Perikanan Tropis, 10(2):43-52.

Zega, H.V. 2025. Meristik ikan gabus. Ju Zega, H.V. 2025. Meristik ikan gabus. Jurnal Ilmu Pertanian&Perikanan, 2(3): 58-65