

**DIVERSITY OF FISH TYPES IN CIRAHAB SOURCE WATER
AND WATER QUALITY FOR FISH ECOSYSTEMS IN CIRAHAB,
CURUGGOONG VILLAGE PADARINCANG DISTRICT,
SERANG-BANTEN**

Hermawan

Faculty of Science and Technology, UIN Sultan Maulana Hasanuddin Banten

E-mail: hermawanbrow24@gmail.com

Abstract

The research was conducted at water sources in Cirahab, Curuggoong village, Padarincang District, Serang-Banten Regency, research was conducted in January 2024, this research was conducted to determine the diversity of fish in the water source water ecosystem in Cirahab. The results obtained in the research There are 11 types of fish obtained during the research, including tilapia, goldfish, wader, betook, eel, nilem, chana, tawes, sili-sili, kampala (paitan) and catfish. The fish that dominate the waters of Cirahab are the wader fish which are often found there. Fishing is found in 3 places, namely places number 1, 2 and number 3. The category obtained in the fish diversity index is the "low" category because the value is -1.7255. The water parameters in Cirahab waters are ideal because they have a pH of 7, clarity of 90, water temperature of 23°C and an average depth of only 1 meter.

Keywords: Diversity of Fish Type, Water Quality, Cirahab

1. INTRODUCTION

Fish are a form of diversity which forms an ecosystem in rivers, seas, lakes and other places which plays a role in maintaining the stability of this natural ecosystem (Henle et al., 2008). Fish can also be used as a staple ingredient for side dishes when eating, cultivated and can also be bought and sold in the market, fish has many benefits for human needs.

There is a huge diversity of fish found in Indonesia, estimated at thousands of types of fish, 4000-6000 types of fish found in all Indonesian waters. It has been recorded that 2,917 types of freshwater fish have been identified in Southeast Asia, Sudia et al (2021). There are a large number of fish that have been identified in Indonesia (Hubert et al., 2016), especially those that have been documented in the Zoological Museum of Bogor City, there are around 1,300 types of fish that have been identified.

Rivers are aquatic ecosystems that have the function of producing lots of fish. Apart from that, rivers also have a very long shape and flow continuously from upstream to downstream until they meet the ocean. The diversity of fish species in Indonesia is also very abundant, especially those found in river waters or flowing springs.

The habitat of freshwater fish is usually in rivers or abundant water sources, of course there are many types of fish in them such as tilapia, goldfish, river catfish, chana fish, eels, river crabs, betook fish, sepat fish and other types of fish (Kottelat & Whitten, 1996). other fish found in the river or water source. Cirahab Village, Curuggoong Village, Padarincang District, Serang-Banten Regency is one of the villages that has abundant water sources that flow to neighboring villages, such as Batukuwung Village. This stream certainly has many types of fish in it. With this in mind, researchers want to know what

types of fish are found in the Cirahab river and water sources in Curuggoong village, Padarincang sub-district.

2. LITERATURE REVIEW

2.1. Fish Diversity In Indonesia

Indonesia is renowned for its vast fish diversity, with estimates suggesting that between 4,000 to 6,000 fish species inhabit its waters (Amarasinghe & De Silva, 2015). This includes a wide range of environments, from marine to freshwater ecosystems. According to, Sawayama et al (2015), Southeast Asia, which includes Indonesia, has identified approximately 2,917 types of freshwater fish. The Zoological Museum of Bogor City has documented around 1,300 fish species, highlighting Indonesia's significant contribution to global fish diversity.

2.2. Ecological Role of Fish In Rivers

Rivers are dynamic aquatic ecosystems characterized by their continuous flow from upstream sources to downstream estuaries. They support a wide array of fish species that are adapted to different conditions within the riverine environment. Fish in rivers contribute to ecological balance by participating in nutrient cycling, serving as prey for larger animals, and maintaining the health of aquatic plants and habitats (Holmlund & Hammer, 1999). The diverse fish species in rivers are a reflection of the varied ecological niches present in these habitats.

2.3. Freshwater Fish Habitat and Species

Freshwater fish habitats typically include rivers, lakes, and other water sources. These habitats support numerous fish species, each adapted to specific environmental conditions. Common freshwater fish in Indonesia include tilapia, goldfish, river catfish, chana fish, eels, river crabs, betok fish, and sepat fish. These species play various roles in their ecosystems, from controlling insect populations to contributing to the food web.

3. RESEARCH METHODS

This research was conducted between January to February 2024. Located at Air Sumber Cirahab, Curuggoong Village, Padarincang District, Serang Regency. The samples were then identified at the Biology Laboratory of UIN Sultan Maulana Hasanuddin Banten. The method used in this research is the survey method. The place for collecting samples is of course at the Cirahab water source using the Purposive Sampling method because the flow of the Cirahab spring is also quite wide and long, it is necessary to use this method for maximum results.

Sampling was carried out by using fish scoops, nets and fishing rods as sampling aids. The sampling was carried out randomly. Nets are used in rather shallow water, while fishing rods are used in rather deep water, and the gutter is used as a tool for holding fish so that the fish you get remain safe.

The measurements of the ecological factors are:

1. Measure the water temperature using a thermometer
2. Measure the speed of the water flow by washing away a plastic bottle that has been filled with a little water and throwing the bottle on the surface of the water flow and then counting using a stopwatch.
3. Measure the pH of the water using a pH meter.
4. Measure water clarity using a metal plate or a plate that has been painted black.

Fish Identification

The types of fish from the research results were identified at the Biology Laboratory of UIN Sultan Maulana Hasanuddin Banten using various aids and guidebooks regarding fish types such as the Rainboth guidebook and Kottelat et al. 1993 and other guidebooks to confirm what types of fish can be found in the Cirahab water source (Kottelat & Whitten, 1996).

Data Analysis

Analysis of data regarding the diversity of fish species in the Cirahab water source uses the Shannon-Winner diversity index with the formula as follows:

$$H' = - \sum \frac{n_i}{N} \log \frac{n_i}{N}$$

With

H' = Shannon-Winner Diversity Index

n_i = Number of Individuals of one type of Fish

N = Total number of all individuals

The magnitude of the Shannon-Winner diversity index is as follows:

H' value > 3 = High species diversity

H' value $1 < H' < 3$ = Medium diversity

H' value < 1 = Low diversity

4. RESULTS AND DISCUSSION

From the results of the research, it was found that several types of fish from the order *Percomorphi* and the genus *Oreochormis* (tilapia fish) are found in abundance in the waters of Cirahab, apart from those from the order Ostariophysi and the species *Cyprinus carpio* Linn (goldfish), the order *Perciformis* and the species *chana striata* (chana fish), the order of *Ostariopshi* and the species *Clarias* sp (catfish), the order *Cypriniformes* and the species *Rasbora* (wader fish) and other fish that are widely distributed in the water source of the cirahab.

The most abundant fish or the type of fish that dominates is the wader fish (paray fish) *Barbodes binonatus* from the order *Cypriniformes* which is most abundant in the Cirahab source water flow. This fish is also widely used as food fish by local people who take it, either with nets, nets, or by fishing. The size also varies greatly from small to the size of five fingers put together, because the size can become a large fish.

Apart from wader fish, the fish that are widely cultivated and widely distributed in the Cirahab waterways are tilapia (*Oreochormis niloticus*) from the order Perciformes which are abundant in the Cirahab source waterways, tilapia fish are also widely cultivated around the Cirahab water sources because the aim is to sell them in the market.

The last fish that is most common is the goldfish (*C. Auratus*) from the order *Cypriniformes*. This fish is also widely distributed in Cirahab water sources and many

people cultivate these fish for the consumption needs of the people there. The number of fish other than wader fish, tilapia and goldfish is much smaller because the population is not growing rapidly apart from wader fish, tilapia and goldfish.

The types of fish that exist in the Cirahab water source area, Curuggoong village, Padarincang sub-district, Serang-Banten district can be seen in the table below:

Table 1. Types Of Fish Found in Cirahab Source Water

No	The Name of the Fish	The Latin Name	Order	Family
1	Parrot Fish	<i>Oreochormis Niloticus</i>	<i>Perciformes</i>	<i>Ciclidae</i>
2	Goldfish	<i>C. Auratus</i>	<i>Cypriniformes</i>	<i>Cyprinidae</i>
3	Catfish	<i>Clarias batracus</i>	<i>Siluriformes</i>	<i>Clariidae</i>
4	Wader fish	<i>Barbodes Binotatus</i>	<i>Cypriniformes</i>	<i>Cyprinidae</i>
5	Eels	<i>Monopetrus albus</i>	<i>Synbranchiformes</i>	<i>Synbranchidae</i>
6	Betook fish	<i>Anabas testudineus</i>	<i>Anabantiformes</i>	<i>Anabantidae</i>
7	Chana fish	<i>Chana micropeltes</i>	<i>Anabantiformes</i>	<i>Channidae</i>
8	Tawes fish	<i>Barbonymus gonionotus</i>	<i>Cypriniformes</i>	<i>Cyprinidae</i>
9	Nilem fish	<i>Osteochilus vittatus</i>	<i>Cypriniformes</i>	<i>Cyprinidae</i>
10	Sili-sili fish	<i>Mastacembelus erytrotanea</i>	<i>Synbranchiformes</i>	<i>Mastacembelidae</i>
11	Hampala fish	<i>Hampala macrolepidota</i>	<i>Cypriniformes</i>	<i>Cyprinidae</i>

Table 2. Number Of Fish Caught in The Cirahab Water Source

No	Fish name	Latin Name	Research Place			Number of Fish
			1	2	3	
1	Tilapia	<i>Oreochormis Niloticus</i>	50	20	30	100
2	Goldfish	<i>C. Auratus</i>	20	30	45	95
3	Catfish	<i>Clarias batracus</i>	10	5	5	20
4	Wader fish	<i>Barbodes binotatus</i>	100	30	20	150
5	Eels	<i>Monopetrus albus</i>	2	3	3	8
6	Betook fish	<i>Anabas testudineus</i>	10	3	5	18
7	Chana fish	<i>Chana micropeltes</i>	5	2	5	12
8	Tawes fish	<i>Barbonymus gonionotus</i>	2	1	2	5
9	Nilem fish	<i>Osteochilus vittatu</i>	3	2	1	6
10	Silifish	<i>Mastacembelus erytrotanea</i>	2	1	1	4
11	Hampala fish	<i>Hampala Macrolepidota</i>	5	2	1	8
		Score	209	99	118	426

Table 2 shows the results that the most abundant fish are dominated by wader fish with a maximum number of 100 at place number 1, and the fish that are mostly obtained at place number 1 are tilapia with a total of 50 fish and the third is goldfish with a total of 20 fish. Meanwhile, only a few fish, ranging from 2 – 10 fish, were found in the Cirahab water source. The total number from each place 1, 2 and 3 is that at place number 1 the highest number of fish obtained was 209, while at place number 2 it was 99 and at place number 3 there were 118 fish and the total number of fish obtained there was 426 fish.

Wader type fish are often found in the waters of the Cirahab water source, because these fish breed quickly and in large numbers. This type of wader fish has no predators

on itself in Cirahab waters, so this fish dominates and is the largest in number. This fish is also often used as a side dish for local people. Because the number of these fish is very large in the waters of the Cirahab water source.

Apart from the dominant fish, there are also fish whose presence is few or rarely seen, namely the sili-sili fish (*Mastacembelus erytrotaea*) from the order *Synbranchiformes*. This fish has the characteristics of being thin and long, like an eel and has mucus so that it feels slippery and slippery when held. There are spines on the top fins of the fish. There are only 1 or 2 sili-sili fish in Cirahab waters, because the presence of these fish is very rare in Cirahab waters.

Table 3. Index Value Of Diversity Of Fish Species In Cirahab

No	Fish Name	Latin Name	Number of Fish	H'
1	Tilapia	<i>Oreochormis Niloticus</i>	100	-0.3402
2	Goldfish	<i>C. Auratus</i>	95	-0.33463
3	Catfish	<i>Clarias Batracus</i>	20	-0.1436
4	Wader fish	<i>Barbodes Binotatus</i>	150	-0.36754
5	Eel	<i>Monopetrus Albus</i>	8	-0.07465
6	Betook fish	<i>Anabas Testudineus</i>	18	-0.13369
7	Chana fish	<i>Chana Micropeltes</i>	12	-0.10055
8	Tawes fish	<i>Barbonymus Gonionotus</i>	5	-0.05217
9	Nilem fish	<i>Osteochilus Vittatus</i>	6	-0.06004
10	Sili-sili fish	<i>Mastacembelus Erytrotaea</i>	4	-0.04383
11	Hampala fish	<i>Hampala macrolepidota</i>	8	-0.07465
		Total	426	-1.72555

In Table 3, results are obtained regarding the fish species diversity index in the Cirahab water source, Curuggoong Village, Padarincang District, Serang-Banten Regency. The results of the table above show the type of fish diversity in the Cirahab "Low" water source, which is -1.7255. The size of the diversity index is greatly influenced by the number of individual fish species which are found in different places between places 1, 2 and 3.

This is also because the fishing is done using fishing rods and fishing rods so that the results are not satisfactory, apart from that, many residents there catch fish in various ways, either with electric sertum or even with fish medicine or poison so that the fish species are unable to reproduce there again, thus causing the diversity of fish found in water sources is relatively small or low. Apart from that, there are also lots of residents' activities, including bathing, washing or vacationing there, especially on holidays, of course there is a lot of poison that is wasted in the water, such as bath soap, shampoo, laundry soap or other rubbish which can cause the death of fish and it is very difficult for these fish to breed because of the environment. It has been polluted by the large number of human activities there.

Table 4. Water Parameter Measurement Results

No	Water parameters	Fish Sampling Place		
		1	2	3
	Water Temperature (°C)	24	23	23
	Depth of Water Flow	1	1.5	2
	Levels of Clarity	80	90	90
	Water pH	7	6.7	7
	Current speed (m/s)	0.20	0.30	0.25

There are several factors that support why the number of wader fish, tilapia and goldfish dominate the waters in the Cirahab water source because the water temperature is in accordance with the temperature of the three types of fish, namely 23 °C so that these waters are ideal. This temperature is ideal for the metabolic and growth processes of the fish. dominates the waters of the cirahab source. Apart from that, the pH of the water is at 7, which indicates a normal water pH with a clarity level of 90. So these water parameters show that the level of wader (paray) fish is much more dominant than other types of fish.

5. CONCLUSION

The results of research conducted at the Cirahab water source showed that 11 types of fish species were found, including tilapia, goldfish, wader, cana, catfish, beto, tawes, kampala, sili-sili, eel and nilem fish. The most dominant fish is in the order *Cypriniformes* with the Latin name *Barbodes binotatus* with the highest number. The category contained in the fish diversity index there is "Low" with a value of -1.7255.

REFERENCES

- Amarasinghe, U. S., & De Silva, S. S. (2015). Fishes and fisheries of Asian inland lacustrine waters. In *Freshwater Fisheries Ecology*. <https://doi.org/10.1002/9781118394380.ch31>
- Henle, K., Alard, D., Clitherow, J., Cobb, P., Firbank, L., Kull, T., McCracken, D., Moritz, R. F. A., Niemelä, J., & Rebane, M. (2008). Identifying and managing the conflicts between agriculture and biodiversity conservation in Europe—A review. *Agriculture, Ecosystems & Environment*, 124(1–2), 60–71.
- Holmlund, C. M., & Hammer, M. (1999). Ecosystem services generated by fish populations. *Ecological Economics*, 29(2). [https://doi.org/10.1016/S0921-8009\(99\)00015-4](https://doi.org/10.1016/S0921-8009(99)00015-4)
- Hubert, N., Kadarusman, Wibowo, A., Busson, F., Caruso, D., Sulandari, S., Nafiqoh, N., Pouyaud, L., Rüber, L., Avarre, J.-C., Herder, F., Hanner, R., Keith, P., & Hadiaty, R. K. (2016). DNA Barcoding Indonesian freshwater fishes: challenges and prospects. *DNA Barcodes*, 3(1). <https://doi.org/10.1515/dna-2015-0018>
- Kottelat, M., & Whitten, T. (1996). *Freshwater fishes of Western Indonesia and Sulawesi: additions and corrections*. Periplus editions Hong Kong.
- Sawayama, S., Nurdin, N., Akbar AS, M., Sakamoto, S. X., & Komatsu, T. (2015).

Introduction of geospatial perspective to the ecology of fish-habitat relationships in Indonesian coral reefs: A remote sensing approach. *Ocean Science Journal*, 50, 343–352.

Sudia, L. B., Indriyani, L., Yunus, L., Mursidi, B., Yasin, A., & Nurdin, M. (2021). Water quality in thirty freshwater springs and twenty four brackish springs in the karst area to realize sustainable water resources management. *Sustainability*, 13(5), 2679.

Copyrights

Copyright for this article is retained by the author(s), with first publication rights granted to the journal.

This is an open-access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/4.0/>).