



## Diversity of Fresh Water Fishes from the Khadkpurna Reservoir of Maharashtra, India

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### Abstract

Fish is a significant source of nourishment for mankind. The primary goal of the study is to understand the area's fisheries potential and edible wild fishes. The information gleaned from the current study is valuable in a number of other ways, too, such as helping researchers and fishermen alike understand the tolerance and diversity of fish found in the Khadapurna Reservoir and selecting the precise mix of fish species for culture in order to maximise yield. Six different sites were chosen for fish collection, all of which are regularly used for fish farming by farmer societies. Present study finds 22 species of fishes belonging to 06 orders, 11 families and 19 genera from the study area. *Cypriniformes* like the *Labeo rohita*, *Catla catla*, *Cirrhinus mrigala*, *Cyprinus carpio*, *Labeo boggut*, *Garra mullya*, and *Puntius sophore* Most prevalent species included *Cirrhinus reba*, *Rasbora daniconius* (*Hamilton Crossocheiluslatius Hamilton*), and *Salmostoma* sp. This paper discusses the diversity of the aforementioned species in detail.

**Keywords:** Fish Diversity; Fresh Water; Khadkpurna; Maharashtra; India

### Introduction

Biodiversity and the environment that it supports are gifts from nature that are essential to the continuation of life as we know it. The diversity and variability of plants, animals, and microorganisms within an ecosystem is known as biodiversity. Ichthyodiversity is the diversity of fish species; depending on the setting and scale, it may also refer to alleles or genotypes within a population of fish, species within a fish community, and species across aquaregimes [1]. India is blessed with a sizable area of undeveloped inland water. The resources of fresh water are extremely valuable to the life on our planet. In the past few years, there have been a lot more dams, reservoirs, tanks, etc. The aquatic ecosystem is crucial, and

it is home to many economically significant creatures, particularly fish, which are a significant source of food.

The majority of vertebrates on earth are fish, which makes up nearly half of all vertebrates. They exist in almost every type of aquatic environment. They have a huge range in terms of size, shape, biology, and the habitats they live in. [2] estimated that there are 21,723 extant fish species worldwide, divided among 4,044 genera, 445 families, and 50 Orders, as opposed to 21,450 extant tetrapods, out of the 39,900 species of vertebrates in the world. 8,411 of these are freshwater species, and 11,650 are marine species. [22] described 1418 fish species from 342 genera in British India.

Maharashtra has a variety of fish species and a wealth of freshwater reservoirs, including rivers, irrigation canals, dams, and lakes. Maharashtra is a significant state for producing fish and for its natural water resources, and it offers great potential for developing its fisheries. A large number of researchers have extensively studied the fish diversity, including [3-18].

Because of constant anthropogenic stress, fish diversity is declining quickly every day. In addition to adding to the wealth of our planet, diversity has a significant impact on fisheries. Therefore, there is a pressing need for thorough research into and documentation of fish diversity in order to create an information system on freshwater fish diversity that includes both bioinformatics and geo-referenced databases of fish and fish habitat. Despite the fact that the Khadapurna Reservoir has undergone extensive surveys, none of them have provided a separate list of the fish species found in the current study area. The current study makes an effort to catalogue the variety of freshwater fishes found in the Khadapurna Reservoir of Maharashtra.

**Materials and Methods**

**Study area**

Khadakpurna is one of the three major dams of the Buldana district (Latitude: 20° 4' 10.79" N, Longitude: 76° 10' 4.73" E, Altitude: 445 meters above sea level) with storage capacity of 160.66 m cm water, has registered 276 mm rainfall in its catchment area. Khadakpurna Reservoir which rises from Gautala forest and upon which the dam lies, is now receiving good amount of water.

**Collection of fish samples**

Fish samples were collected for the current study from Khadkurna Reservoir and neighbourhood fish markets.

**Identification of fish sample**

Fish from dams were collected using a variety of fishing techniques, according to section 3.3 of the report. Following sampling, fish samples were preserved in 10% formalin for close examination and identification using the standard literature of [19-21]. Some of the samples were sent to Western Regional Office of Zoological Survey of India for further identification.

**Results, Discussion and Conclusion**

The Khadkurna Reservoir is home to 22 species of freshwater fish that are represented by six orders, eleven families, and 19 genera in the current study. The table below shows the freshwater fishes identified during the current study.

Sr. No.	Order	Family	Fish Species
1	<i>Cypriniformes</i>	<i>Cyprinidae</i>	<i>Labeo rohita</i> (Hamilton-Buchanan 1822)
2	<i>Cypriniformes</i>	<i>Cyprinidae</i>	<i>Catla catla</i> (Jhingran 1966)
3	<i>Cypriniformes</i>	<i>Cyprinidae</i>	<i>Cirrhinus mrigala</i> (Hamilton Bachanan, 1822)
4	<i>Cypriniformes</i>	<i>Cyprinidae</i>	<i>Cyprinus carpio</i> (Linnaeus 1758)
5	<i>Cypriniformes</i>	<i>Cyprinidae</i>	<i>Labeo boggut</i> (Sykes 1838)
6	<i>Cypriniformes</i>	<i>Cyprinidae</i>	<i>Garra mullya</i> (Sykes 1841)
7	<i>Cypriniformes</i>	<i>Cyprinidae</i>	<i>Puntius sophore</i> (Hamilton Bachanan, 1822)
8	<i>Cypriniformes</i>	<i>Cyprinidae</i>	<i>Cirrhinus reba</i> (Hamilton Bachanan 1822)
9	<i>Siluriformes</i>	<i>Siluridae</i>	<i>Ompok bimaculatus</i> (Lacepede 1803)
10	<i>Siluriformes</i>	<i>Bagridae</i>	<i>Mystus bleekeri</i> (Day)
11	<i>Siluriformes</i>	<i>Bagridae</i>	<i>Mystus cavasius</i> (Hamilton Bachanan 1822)
12	<i>Siluriformes</i>	<i>Siluridae</i>	<i>Wallago attu</i>
13	<i>Perciformes</i>	<i>Cichlidae</i>	<i>Tilapia mosombica</i> (W.K.H pterus 1852 )
14	<i>Perciforme</i>	<i>Gobiidae</i>	<i>Glossogobius giuris</i> (Hamilton-Bachanan 1822)
15	<i>Synbranchiformes</i>	<i>Mastocembelidae</i>	<i>Mastocemelus arnatus</i> (Scopoli 1777)
16	<i>Osteoglossiformes</i>	<i>Notopteridae</i>	<i>Notopterus notopterus</i> (pallas 1769)
17	<i>Cypriniformes</i>	<i>Cyprinidae</i>	<i>Rasbora daniconius</i> (Hamilton)
18	<i>Cypriniformes</i>	<i>Cyprinidae</i>	<i>Crossocheilus latius</i> (Hamilton)
19	<i>Anguilliformes</i>	<i>Anguillidae</i>	<i>Anguilla bengalensis</i> (Gray)
20	<i>Perciformes</i>	<i>Channidae</i>	<i>Channa striata</i> (Bloch)
21	<i>Cypriniformes</i>	<i>Cyprinidae</i>	<i>Salmostoma</i> sp.
22	<i>Perciformes</i>	<i>Ambassidae</i>	<i>Chanda nama</i> (Hamilton)

**Table 1:** List of fresh water fishes from the Khadkurna Reservoir.

Sr. no	Species (Binomial name)	Vernacular/Local name	Economic Status	Site of Collection	Conservation Status (IUCN 3.1)
1	<i>Labeo rohita</i> (Hamilton-Buchanan 1822)	Rohu	High	Ekburji damp	Least concern
2	<i>Catla catla</i> (Jhingran 1966)	Catla	High	Tornala damp	Least concern
3	<i>Cirrhinus mrigala</i> (Hamilton-Bachanan 1822)	Mrigal	High	Supkhela damp	Vulnerable
4	<i>Cyprinus carpio</i> (Linnaeus 1758)	Gowri	High	Tornala damp	Vulnerable
5	<i>Labeo boggut</i> (sykes 1838)	Bata	Less	Sukali damp	Vulnerable
6	<i>Garra mulya</i> (Sykes 1841)			Ekburji damp	Least concern
7	<i>Puntius sophore</i> (Hamilton- Bachanan 1822)	Gudda-pakke	High	Borala damp	Therattend
8	<i>Cirrhinus reba</i> (Hamilton-Bachanan 1822)	Arja	Less	Khandala damp	Least concern
9	<i>Ompok bimaculatus</i> (Lacepede 1803)	Godalae	High	Borala damp	Near Threatened
10	<i>Mystus bleekeri</i> (Day)			Sukali damp	Therattend
11	<i>Mystus cavasius</i> (Hamilton-Bachanan 1822)	Girlu	Less	Ekburji damp	Least concern
12	<i>Wallago attu</i>	Lachi	High	Khandala damp	Near Threatened
13	<i>Tilapia mosambica</i> (W.K.H pterus 1852)	Tilpia	Less	Supkhela damp	Near Threatened
14	<i>Glossogobius giuris</i> (Hamilton-Bachanan 1822)	Jilebi	High	Tornala damp	Least concern
15	<i>Mastocemelus arnatus</i> (Scopoli 1777)	Haavu-meenu	Less	Tornala damp	Least concern
16	<i>Notopterus notopterus</i> (pallas 1769)	Chappali	Less	Tornala damp	Least concern
17	<i>Rasbora daniconius</i> (Hamilton)	Blackline Rasbora,	Less	Tornala damp	Least concern
18	<i>Crossocheilus latius</i> (Hamilton)	Gangetic Latia	Less	Supkhela damp	Least concern
19	<i>Anguilla bengalensis</i> (Gray)	Vaam	High	Ekburji damp	Least concern
20	<i>Channa striata</i> (Bloch)	viral	High	Ekburji damp	Least concern
21	<i>Salmostoma</i> sp.	Myanmar	Less	Ekburji damp	Least concern
22	<i>Chanda nama</i> (Hamilton)	Glass Perchlet	High	Supkhela damp	Least concern

**Table 2:** List of fresh water fishes from the Khadkurna Reservoir with their Economic and conservation status.

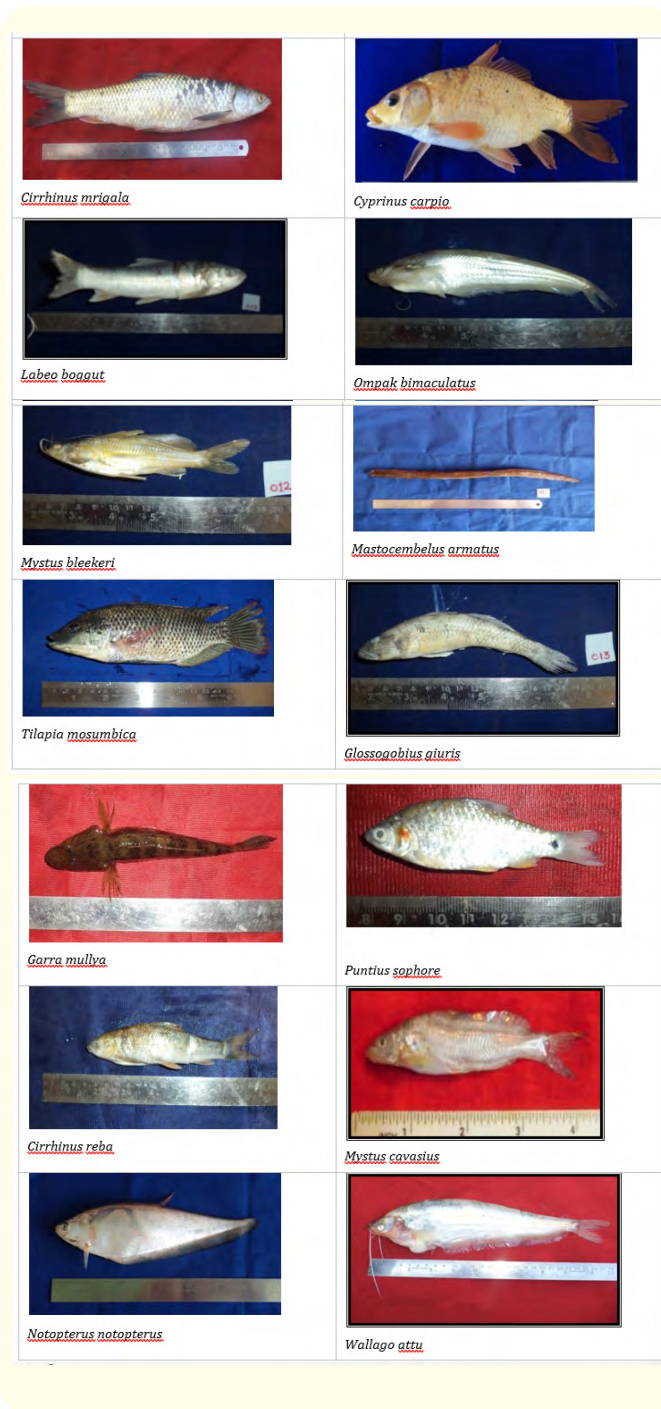
According to the study's findings, *Cypriniformes*, which include the fish species *Labeo rohita*, *Catla catla*, *Cirrhinus mrigala*, *Cyprinus carpio*, *Labeo boggut*, *Garra mulya*, and *Puntius sophore*, are the dominant group in the assemblage composition and account for 50% of all fish diversity. The three species that were most prevalent were *Crossocheilus latius*, *Rasbora daniconius*, and

*Cirrhinus reba*, *Salmostoma* sp., *Ompok bimaculatus* and *Wallago attu* are members of the Siluridae family, which makes up 9.09% of all fish species. *Mystus bleekeri* and *Mystus cavasius* were found in the Bagridae, which contributed 9.09% to the overall fish diversity. *Tilapia mosambica* was found in the *Cichlidae*, which contributed 4.54% to the total fish diversity. *Glossogobius giuris* species include

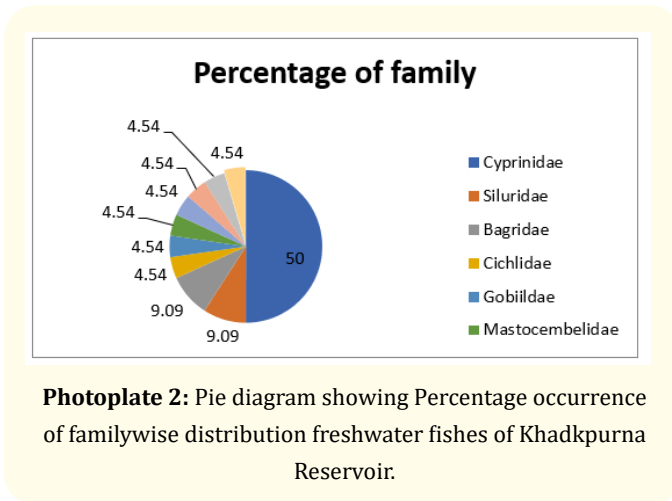
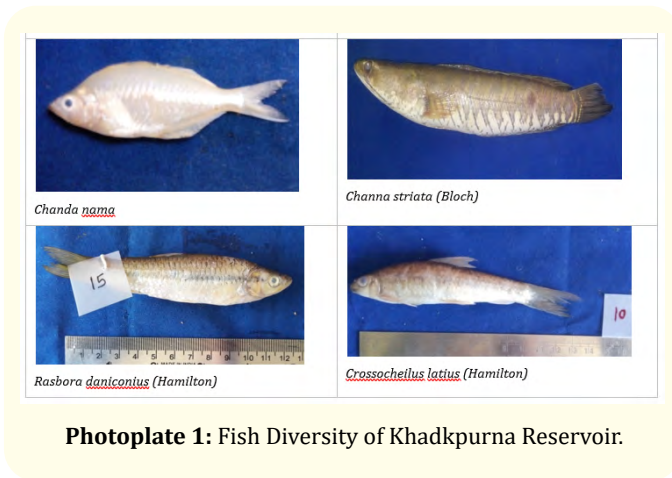
gobilidae, which contribute 4.54% to all fish diversity. The family *Mastocembelidae*, in which *Mastocemelus arnatus* was the dominant species, was reported to contribute 4.54% of the total fish diversity. Six species of *Notopteridae* were identified, contributing 4.54% of the total fish diversity, including the *Notopterus notopterus* fish. *Anguilla bengalensis* is a member of the *Anguillidae* family, which makes up 4.54% of all fish species. *Channa striata*, a member of the *Channidae* family, contributes 4.54% to the diversity of all fish. 4.54% of all fish with *Chanda nama* belong to the *Ambassidae* family.

In terms of freshwater fish species, India is one of the nations with “Mega diversity”. India ranks third in Asia and eighth in the world for diversity of freshwater fish. There are many species that can be cultivated. The value systems of the society should also take the local fish into consideration (sport, biological control, aesthetic, etc). Declaring fish sanctuaries or aquatic diversity management areas for the bodies of water that are home to endangered fish is necessary. To stop the depletion of freshwater fish resources, illegal fishing practises should be outlawed in this region, and fish farmers should have access to scientific training and facilities in addition to being made aware of fishing practises. Fishing on spawns, larval fish, and immature fish should be avoided, and large-scale loan subsidies could help with high yield fish production. It was further concluded that research could be done to create methods for cultivating fish, safeguarding them, and conserving their biodiversity.

If proper conservation measures are not taken, the loss of aquatic fish diversity is likely to worsen due to the human population’s rapid growth, increased reliance on aquatic fishery resources, such as water, and the ongoing introduction of exotic species into natural water bodies.







5. DeviPrasad AG., et al. "Studied Fish diversity and its conservation in major wetlands of Mysore". *Journal of Environmental Biology* 30.5 (2009): 713-718.
6. Goswami AP and Landmankodi PC. "Diversity of fishes from freshwater reservoir Nyari II of Rajkot district, Gujarat". *Electronic Journal of Environmental Sciences* 3 (2010): 23-26.
7. Sarwade JP and Khillare Y K. "Studied fish diversity of Ujani Wetland, Maharashtra, India". *Journal of Fish Diversity of Ujani Wetland* 1 (2010): 173-179.
8. Jadhav BV., et al. "Studied Freshwater fish fauna of Koyna River, northern Western Ghats, India". *Journal of Threatened Taxa* 3.1 (2011): 1449-1450.
9. Thirumala S., et al. "Fish diversity in relation to physico-chemical characteristics of Bhadra reservoir of Karnataka, India". *Advances in Applied Science Research* 2.5 (2011): 34-47.
10. Muruga S and Prabaharal C. "Fish diversity in relation to physico-chemical characteristics of Kamala Basin of Darbhanga District, Bihar, India". *International Journal of Pharmaceutical and Biological Archives* 3.1 (2012): 211-217.
11. Gohil M and Mankodi P C. "Diversity of Fish Fauna from Downstream Zone of River Mahisagar, Gujarat State, India Research". *Journal of Animal, Veterinary and Fishery Sciences* 1.3 (2013): 14-15.
12. Islam MR., et al. "Studied Fish Diversity and Fishing Gears used in the Kulsri River of Assam, India". *Annals of Biological Research* 4.1 (2013): 289-293.
13. Bose AK., et al. "Fishes of the Middle Stretch of River Tawa, Madhya Pradesh, India. An International Peer Review E-3". *Journal of Sciences* 3.1 (2013): 706-716.
14. Khanna DR and Fouzia I. "Impact of water quality attributes and comparative study of ichthyofaunal diversity of asan lake and river asan". *Journal of Applied and Natural Science* 5.1 (2013): 200-206.
15. Mohite SA and Samant J S. "Impact of Environmental Change on Fish and Fisheries in Warna River Basin, Western Ghats, India". *International Research Journal of Environment Sciences* 2.6 (2013): 61-70.
16. Chouhan M., et al. "Fish biodiversity of Narmada River in Some Selected Stations of Madhya Pradesh, India". *International Journal of Advanced Research* 1.3 (2013): 20-25.

## Bibliography

1. Battul PN., et al. "Fish Diversity from Ekrukha Lake Near Solapur Maharashtra". *Journal of Aquatic Biology* 22.2 (2007): 68-72.
2. Nelson JS. "Fishes of the world". 4 edition. John Wiley and sons, Inc, (2006): 601.
3. Bandopadhyay PK. "Fish Diversity in Freshwater Perennial Water Bodies in East Midnapore District of West Bengal, India". *International Journal of Environmental Research* 2.3 (1999): 255-260.
4. Ahmad SM., et al. "Fish diversity of Sogane and Santhekadur tanks, Shimoga, Karnataka India". *Current Biotica* 5.1 (2008): 46-55.

17. Sirajudheen TK and Khan J. "Freshwater pond ecosystems and ichthyofaunal diversity of Lakshadweep Islands, India". *Journal of Aquatic Biology and Fisheries* 2 (2014): 691-696.
18. Londhe SD and Sathe T V. "Fish faunal diversity and occurrence from lakes of Kolhapur district". *Biolife* 3.2 (2015): 2320-4257.
19. Day F. "The fishes of India, being A natural history of the fishes known to inhabit the seas and fresh waters of India, Burma and Ceylon". Vol. I and II. Ceylon text and atlas in 4 pts., London, (1878).
20. Jayaram KC. "The Freshwater Fishes of the Indian Region". Second Edition. Narendra Publishing House, Delhi, (2010): 616.
21. Talwar PK and Jhingran AG. "Inland fishes of India and adjacent countries". Oxford and IBH Publishing Co. Pvt. Ltd. New Delhi, (2001): 18.
22. Day F. "The fauna of British India including Ceylon and Burma". *London Fishes* 2 (1889): 509.