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# Studies on fish diversity of Wainganga River around Desaiganj region Dist. Gadchiroli (Maharashtra)

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**Abstract**
The aim of the present study was to investigate the diversity of fish fauna of Wainganga river at Wadsa, district, Gadchiroli. The present study was conducted during November, 2022 to March, 2023. The study revealed the presence of 28 species of the fishes that are represented by 22 genera. All the observed species belong to 10 orders and 15 families. Among all the observed orders, Cypriniformes was the most dominant and represented by 10 species. However the order Siluriformes was dominated by 08 species. Orders Ophiocephaliformes and Osteoglossiformes were represented with 02 species each and Synbranchiformes, Anabatiformes, Beloniformes, Anguilliformes, Cichliformes and Perciformes orders were represented by one species each. The 15 families of fishes noted during the study were Cyprinidae, Chichlidae, Mastacembellidae, Anabantidae, Channidae, Bagridae, Claridae, Heteropneustidae, Siluridae, Pangasiidae, Sisoridae, Belonidae, Notopteridae, Anguillidae and Nandidae. The order Cypriniformes was represented by the eight genera that were *Catla*, *Labeo*, *Cirrihinus*, *Cyprinus*, *Ctenopharyngodon*, *Rasbora*, *Hypophthalmichthys* and *Abramis*. The order Siluriformes was represented by six genera that were *Mystus*, *Clarias*, *Heteropneustes*, *Wallago*, *Pangasius* and *Bagarius*. However orders Synbranchiformes, Anabatiformes, Beloniformes, Anguilliformes, Cichliformes, Ophiocephaliformes Osteoglossiformes and Perciformes were represented by single genera *Mastocembalus*, *Anabas*, *Xenentodon*, *Anguilla*, *Oreochromus*, *Ophiocephalus Notopterus* and *Nandus* respectively.

**Keywords:** Ichthyofauna, ichthyofaunal diversity, cypriniformes, wainganga river, siluriformes

## Introduction
India supports and nurtures the rich and unique biodiversity and thus is included among the 12 most rich biodiversity countries (Jain *et al*., 2014) [4]. The varied weather, climatic conditions and physico-geographic topographies are the most important factors responsible for rich biodiversity. The term biodiversity has been referred to as "life" or "wilderness" in many instances (Winter and Hughes, 1997) [21]. Biodiversity of any region is mainly responsible for affecting the capacity of the living system to respond to the variations in environmental conditions. This capacity of living system is vital for providing many resources from that ecosystem including nutrient cycle and water (Rahbek and Colwell, 2011) [16]. India is among the countries which have rich biodiversity and with reference to freshwater diversity occupies the ninth position (Shinde *et al*., 2009 and Jain *et al*., 2014) [4, 19]. Among the many states of India, Maharashtra state has rich ichthyofaunal diversity due to many natural and artificial water resources like rivers, lakes, reservoirs, dams and irrigation canals which nurtures the diverse fish fauna. Thus Maharashtra is among the states which is important for aquaculture and production of fish from the natural water resources. Mittermeier and Mitemeir (1997) [12] have recorded the 8,411 freshwater and 11,650 fishes from the world. Jayaram (1999) [6] and Kar (2003) [7] have reported the 2500 fish species from India, among these fish species 1,570 are marine and 930 are freshwater species. In aquatic ecosystems fishes are the top level consumers in the food chain. These fishes can act as indicators of environmental quality, pollution and stress on aquatic ecosystems due to anthropogenic factors (Okwuosa *et al*., 2019) [13]. The exponential growth of population in India is causing pressure on the natural wetlands, thus posing lots of wetlands of the world under threat (Finlayson and Moser, 1991) [3]. Wetlands are of immense importance for mankind due to aquaculture which is an important source of food. Thus it becomes necessary to develop wetlands scientifically for the fisheries purpose (Pawara *et al*., 2014) [15]. Among the vertebrates, fishes represent the most diverse group and are important for scientific study and as a source of food (Marshall, 2000) [11]. Therefore it becomes necessary to study the fish fauna of different water bodies, which will help in planning of fisheries, aquaculture and production of fishes. Destruction of natural habitats, water pollution and introduction of exotic species has resulted in depletion of ichthyofaunal diversity (Revenga, 2005) [18]. This resulted in a drastic fall in the production of fishes. Although many of the researchers have studied the fish diversity in various states of India (Lal *et al*., 2013; Sayyad and Dhamani, 2018; Dalavi and Pawar, 2022) [1, 10] but yet in most of the parts of Maharashtra ichthyofaunal diversity is not reported. Thus present study was undertaken to assess the fish diversity of Wainganga river near Desaiganj, district Gadchiroli.

## Material and methods
For the present investigation Wainganga river, near Desaiganj was selected. Wainganga river, near Desaiganj is located at longitude 20° 36´ 55´´ N and latitude 79°. 58´ 08´´ E at 255 MSL. The present study was conducted for four months from November 2022 to March 2023 from Wainganga river, Desaiganj region district Gadchiroli, Maharashtra. The Google map image is shown in figure 1.

For the present investigation, local fishermen helped in the capture of the fishes from the bed of Wainganga river. During the entire study, local fishermen had collected the fishes with the help of gears like drag nets, cast nets and gill nets. Collected fishes were brought to the laboratory and preserved in 10% formalin solution and kept in specimen jars for further identification. However, an incision to the abdomen of large fishes was given for the preservation purpose. Identification of species was done with the help of standard keys and books of Jayram (1981; 1999), Day (1994) [2] and Talwar and Jhingran (1991) [20].


**Fig 1:** Google map image of Wainganga river at Desaiganj dist. Gadchiroli.

## Results

During present investigation, the ichthyofaunal diversity of Wainganga river at Wadsa, district, Gadchiroli was studied. The study was carried out between November, 2022 to March, 2023 for four months. The study revealed the presence of 28 species of the fishes that are represented by 22 genera. All the observed species belong to 10 orders and 15 families. Among all the observed orders, Cypriniformes was the most dominant and represented by 10 species. However the order Siluriformes was dominated by 08 species.

Entire ichthyofauna revealed during the study is presented in Table. 1. The orders Ophiocephaliformes and Osteoglossiformes were represented by 02 species each, whereas Synbranchiformes, Anabatiformes, Beloniformes, Anguilliformes, Cichliformes and Perciformes orders were represented by one species each. The 15 families of fishes noted during the study were Cyprinidae, Chichlidae, Mastacembellidae, Anabantidae, Channidae, Bagridae, Claridae, Heteropneustidae, Siluridae, Pangasiidae, Sisoridae, Belonidae, Notopteridae, Anguillidae and Nandidae. The percent composition of observed fish families from Wainganga river at Desaiganj is shown graphically by the pie chart in fig. 2. The order Cypriniformes was represented by the eight genera that were *Catla*, *Labeo*, *Cirrihinus*, *Cyprinus*, *Ctenopharyngodon*, *Rasbora*, *Hypophthalmichthys* and *Abramis*. The order Siluriformes was represented by six genera that were *Mystus*, *Clarias*, *Heteropneustes*, *Wallago*, *Pangasius* and *Bagarius*. However orders Synbranchiformes, Anabatiformes, Beloniformes, Anguilliformes, Cichliformes, Ophiocephaliformes Osteoglossiformes and Perciformes were represented by single genera *Mastocembalus*, *Anabas*, *Xenentodon*, *Anguilla*, *Oreochromus*, *Ophiocephalus Notopterus* and *Nandus* respectively.

## Discussion

Studying the diversity of fishes is important to understand the health of the aquatic ecosystem and the effect of anthropological factors on that fresh water body. Community composition of fishes is directly or indirectly altered by the change in physico-chemical and biological characteristics of the riverine system. The ever increasing population of India is posing threat to both lentic and lotic aquatic ecosystems. The exponential growth of population in India, rapid industrialisation, urbanization has significantly contributed to the over exploitation, pollution and adding industrial effluents to the water bodies and had remarkably caused the disturbance in the delicate balance of aquatic ecosystem. Population of many species of the fish is declining day by day due to the changing aquatic habitat and environmental conditions. Thus to conserve the species diversity and prevent the declining population of the fish species certain conservative measures must be followed that are, preventing the introduction of exotic species, ban on the capture of brood fishes during breeding season, avoiding capture of fry and fingerling, preventing the direct disposal of waste from industries to the water bodies in order to prevent the water pollution and bringing awareness among the local fisherman to conserve the biodiversity and maintain the balance of the aquatic ecosystem.

The anthropological activities, disposal of industrial waste water, disposal of sewage and changing physic-chemical characteristics of water had led to the decline of the fish population of various species of fishes during the last decade in Wainganga river around Desaiganj. Demand of fish as a food is increasing day by day and thus causing all

water bodies and aquatic ecosystems under constant pressure. Thus present study will be useful in conservation of the fish fauna in the Wainganga river around Desaiganj.

Khobragade and Lipokrenba (2016) [8] had reported the fish diversity at the confluence of Pravara and Godavari rivers at Toka and documented the 21 fish species that belonged to 6 orders. He observed the order Cypriniformes as the most dominant order followed by the Perciformes. He noted that Cypriniformes and Perciformes were represented by 10 and 5 species respectively. However, Beloniformes and Synbranchiformes were represented by 2 species each. Least dominant orders were Siluriformes and Osteoglossiformes represented by a single species each.

Dalavi and Pawar (2022) [1] had studied the diversity of ichthyofauna and fishery potential of Mandohol reservoir, Ahmednagar and noted the 10 fish species from 9 genera, 7 families, together with 5 orders. The most predominant family in the assemblage composition was the Cyprinidae family. IUCN conservation status of species showed that 70% of fish species were of Least Concern, 20% were Near Threatens and only 10% of species were Vulnerable.

The existence of a variety of fish species indicates that the water bodies have the potential for fishing (Pawar *et al*., 2011) [14]. The present study showed that: (i) The existence of a total of 28 fish species suggested a healthy fish community and rich ichthyofaunal diversity in Wainganga river near Desaiganj. (ii) The river was dominated by fishes of the family Cyprinidae and order Cypriniformes, followed by the siluridae (iii) The majority of the fish species that were seen were significant commercially. Since the fishes are a cheaper source of protein and essential resources of food, it is necessary to conserve the fishes and improve the population of fish fauna by following the different conservation methods to maintain the balance of the aquatic ecosystem.

All carnivorous species are hazardous to the fisheries since they continue to hunt the fingerlings of other fishes (Rajbanshi, 1996; Kunjir and Kawade, 2021) [9, 17]. The most hazardous carnivorous fish species are *Clarias*, *Heteropneustes* and *Ophiocephalus*. Fingerlings suffer significant losses because of the presence of predatory fish.

## Conclusion

The data of present study on ichthyofaunal diversity of Wainganga river near Desaiganj will help in understanding fishery potential and fish resources of this area. It will be also useful in planning the sustainable exploitation and conservation of fishes in future. Capture of fishes from the Wainganga river near Desaiganj has broad concern towards providing 'food security'.

Various strategies should be adopted for the conservation of the species and preventing the depletion of fish population. The fisheries co-operative societies must be formed to uplift the economic status of the fisherman and training should be given to fishermen regarding the scientific techniques of capturing the fishes and to inform them about conservation of aquatic habitat.

Population of many species of fishes which were abundant in past years, showed a decline in recent catches, due to illegal methods of fishing, pollution, destruction and degradation of their natural habitat.

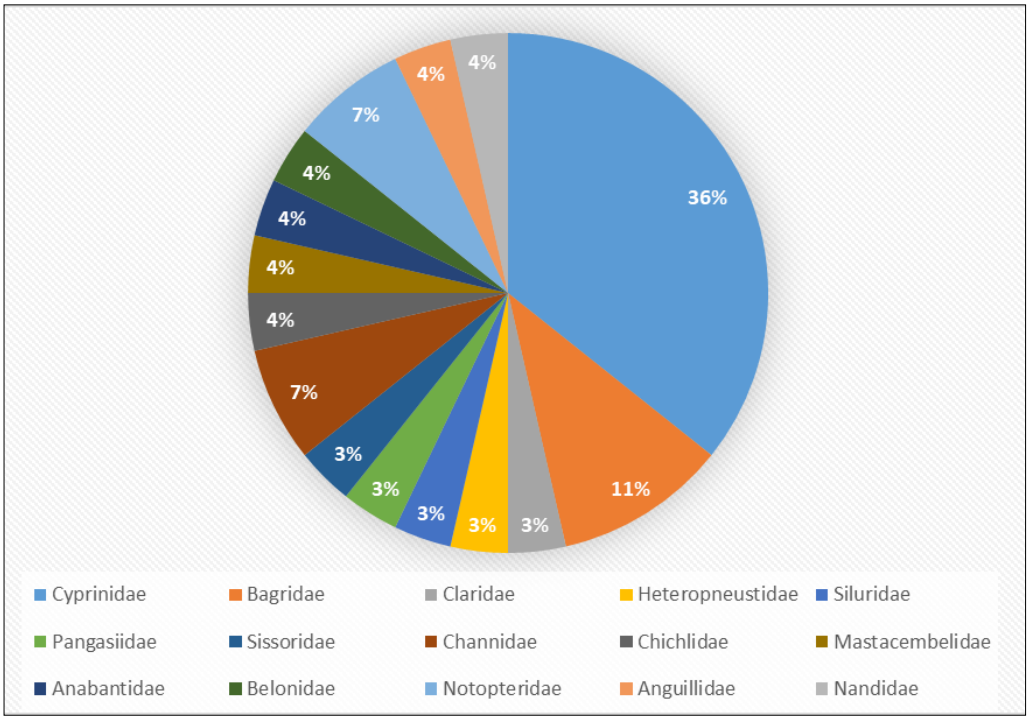


**Fig 2:** Percentage composition of observed fish families from Wainganga Reservoir

**Table 1:** Showing Fish diversity of Wainganga river at Desaiganj.

| Sr. No. | Name of Fish | Order | Family |
|---|---|---|---|
| 1. | *Catla catla* | Cypriniformes | Cyprinidae |
| 2. | *Labeo rohita* | | |
| 3. | *Labeo bata* | | |
| 4. | *Labeo calbasu* | | |

| | | | |
|---|---|---|---|
| 5. | *Cirrihinus mrigala* | | |
| 6. | *Cyprinus carpio* | | |
| 7. | *Ctenopharyngodon idella* | | |
| 8. | *Rasbora danoiconius* | | |
| 9. | *Hypophthalmichthys molitrix* | | |
| 10. | *Abramis brama* | | |
| 11. | *Mystus seenghala* | Siluriformes | Bagridae |
| 12. | *Mystus cavasius* | | |
| 13. | *Mystus aor* | | |
| 14. | *Clarias batrachus* | | Claridae |
| 15. | *Heteropneustes fossilis* | | Heteropneustidae |
| 16. | *Wallago attu* | | Siluridae |
| 17. | *Pangasius pangasius* | | Pangasiidae |
| 18. | *Bagarius yarrelli* | | Sissoridae |
| 19. | *Ophiocephalus punctatus* | Ophiocehaliformes | Channidae |
| 20. | *Ophiocephalus striatus* | | |
| 21. | *Oreochromus mossambicus* | Cichliformes | Chichlidae |
| 22. | *Mastacembalus armatus* | Synbranchiformes | Mastacembelidae |
| 23. | *Anabas testudineus* | Anabantiformes | Anabantidae |
| 24. | *Xenentodon cancila* | Beloniformes | Belonidae |
| 25. | *Notopterus notopterus* | Osteoglossiformes | Notopteridae |
| 26. | *Notopterus chitala* | | |
| 27. | *Anguilla bengalensis* | Anguilliformes | Anguillidae |
| 28. | *Nandus nandus* | Perciformes | Nandidae |

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