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

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Abstract:

The present investigation aims to study the ichthyofaunal diversity of Wainganga river at Wadsa, district, Gadchiroli. The study was carried out during November, 2022 to March, 2023. The study revealed the presence of 28 fish species belonging to 10 orders, 15 families and 22 genera. The members of order Cypriniformes were dominated by 10 species. However the Siluriformes were 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.

Key words: Ichthyofauna, Ichthyofaunal diversity, Cypriniformes, Wainganga river, Siluriformes

Introduction:

India has a rich nature of heritage and nurtures a unique biodiversity, placing it among the 12 most biodiversity rich countries (Jain et al., 2014). The varied weather, climatic conditions and physico-geographic topographies are the most important factors responsible for rich biodiversity. In many instances, biodiversity has been referred to as "life" or "wilderness" (Winter and Hughes, 1997). Capacity of living systems for responding to the changing environmental conditions is affected by the biodiversity of that region and is an essential factor for providing goods and services from ecosystems, nutrient cycles and water (Rahbek and Colwell, 2011). 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). Maharashtra is rich in freshwater diversity (rivers, irrigation canals, dams, lakes and reservoirs) and thus it is one of the important states for aquaculture and production of fish from the natural water resources. Mittermeier and Mitemeir (1997) have recorded the 8,411 freshwater and 11,650 fishes from the world. Jayaram (1999) and Kar (2003) have reported the 2500 species of fishes from India out of which 1,570 are marine and 930 are freshwater species. In aquatic ecosystems fishes are the top level consumers in the food chain and act as indicators of balanced environment, quality of environment and anthropogenic stress in aquatic ecosystems (Okwuosa et al., 2019). 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). 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). Fishes form the most diverse group of vertebrates, that is a precious source both as food and as material for scientific study (Marshall, 2000). Thus there is a need to survey fish fauna associated with different freshwater habitats, which will help in planning methods for their production. Destruction of natural habitats, water pollution and introduction of exotic species has resulted in depletion of ichthyofaunal diversity (Revenga, 2005). 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) but yet in most of the parts of Maharashtra ichthyofaunal diversity is not reported. Thus present investigation 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 work was carried out 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. The fish study was carried out with the help of local fishermen. Fishes were collected with the help of local fishermen during their fishing period using different types of nets namely gill nets, cast nets and drag nets. Fishes were brought to the laboratory and preserved in 10% formalin solution in separate specimen jars according to the size of species. Small fishes were directly placed in the 10% formalin solution. However, an incision to the abdomen of large fishes was given for the preservation purpose. Species identification and confirmation were carried out with the help of standard keys and books of Jayram (1981; 1999), Day (1994) and Talwar and Jhingran (1991).

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 fish species belonging to 10 orders, 15 families and 22 genera. Entire ichthyofauna revealed during the study is presented in Table. 1. The members of order Cypriniformes were dominated by 10 species followed by Siluriformes, which were dominated by 08 species. 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:

This ichthyofaunal study is a very important aspect to understand the diverse fish fauna in the water body. Changes in the fish community directly or indirectly affect the physical chemical and biological characteristics of the riverine system. Different types of habitat of fish fauna diversity should be monitored all over the world. Industrial effluent, over exploitation, pollution and anthropogenic activities had contributed towards the disturbance in the balance of the aquatic system. In order to maintain fish diversity certain conservative measures are recommended : (i) fingerling/fry should not be harvested (ii) prevent the introduction of new species (iii) no harvesting in breeding seasons (iv) prevent anthropogenic activities like pollution, contamination etc. (v) educate the people about the importance of biodiversity in maintaining ecological balance. The fishes of Wainganga river are subjected to pollution leading to the killing of spawn and decrease in fish population. Owing to increasing demand of fish as food the aquatic ecosystems are under constant pressure. In future, this work will provide strategies for monitoring, controlling, conserving and developing the diverse fish fauna of the freshwater ecosystem in the Wainganga river.

Khobragade and Lipokrenba (2016) had studied the fish fauna at the confluence of Pravara and Godavari rivers at Toka and revealed the occurrence of 21 fish species belonging to 6 orders. The order Cypriniformes was dominant with 10 fish species followed by order

Perciformes with 5 species, order Beloniformes and Synbranchiformes with 2 species each; and Siluriformes and Osteoglossiformes with 1 species each, were the least dominant.

Dalavi and Pawar (2022) had studied ichthyofaunal diversity 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). The results of the present investigation showed that: (i) The existence of a total of 28 fish species suggested a good variety of fish 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 the essential resources of food and ornament, it is necessary to conserve and improve the fish fauna by adopting conservation strategies. Study of fish diversity is important for the conservation of the fish fauna in their natural habitat.

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

Conclusion:

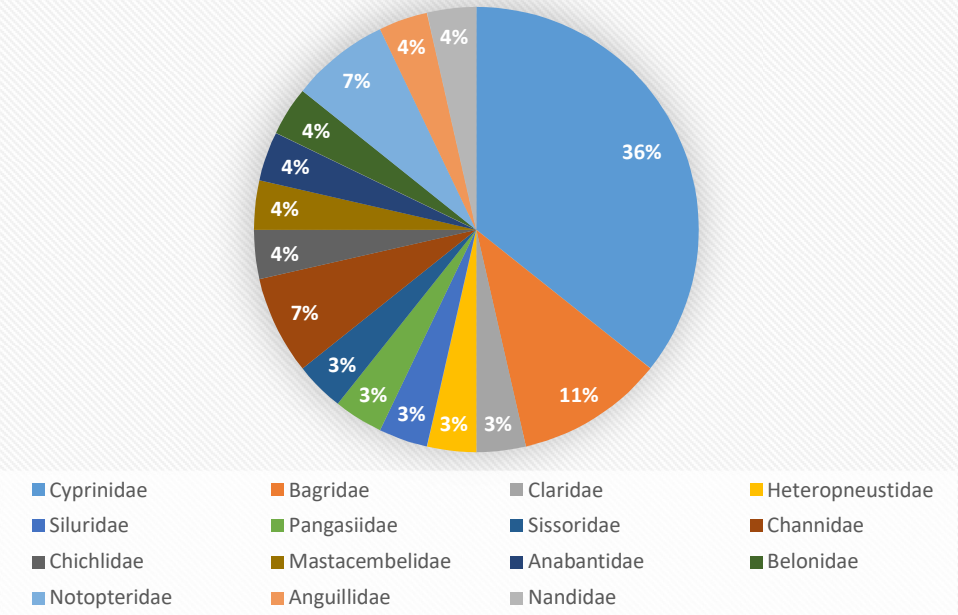
The scientific information on ichthyofaunal diversity and distribution status will surely help in serving the future purposes of sustainable exploitation and concurrent conservation of fish resources, besides estimation of fishery potential of the Wainganga river near Desaiganj and broad concern towards providing ‘food security’. The use of illegal methods to catch fishes should be banned in this area to prevent the depletion of different varieties of fishes. The fishermen should make aware about fishing and scientific training methods which may help in high yield of fish production in the Wainganga river.

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.

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

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



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