

## Ichthyofaunal diversity, abundance and economic status from Chandrabhaga River flowing through Pandharpur, Maharashtra, India

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### Abstract

Chandrabhaga River (Bhima River) is a life line for Solapur district. Chandrabhaga River referred in Pandharpur, due to its curvature flow i.e. it resembles the Moon shape. Most of the people from villages are dependent for their agricultural and fishing practices. The present study was conducted for the duration of one year (July 2023 to July 2024). Weekly visits were conducted at the Chandrabhaga River on different sites located in Pandharpur. During the study period the investigations included identification of, 24 fish species belonging to 09 order with 14 family. The high ranking of Cichliformes order show 86.34% while others orders are as compare to relegate. (Cypriniformes 5.62%, Synbranchiformes 3.32%, Gobiiformes 1.69%, Anabantiformes 1.52%, and Siluriformes 0.66%, Osteoglossiformes 0.39, Beloniformes 0.37%, Perciformes 0.07%) According to Fish market value, Anabantiformes (*Channa marulius*), Synbranchiformes (*Mastacembelus armatus*) and Cypriniform which represent native species i.e. major indian carps are economically significant as compared to Cichliformes (*Oreochromis mosambicus*) which is exotic species. As per Fish market status, due to highest abundance of *Oreochromis mosambicus* was one hundred to one hundred fifty per kg, while most of the major indian carps are one hundred fifty to two hundred per kg. According to comparative economical fish market data Major Indian Carps per sample size was richer than *Oreochromis mosambicus*. The results are discussed in the light of fish diversity and their economic value from Pandharpur and with help of available literature the current status of Ichthyofauna discuss.

**Keywords:** Chandrabhaga river, fish diversity, economic status

### Introduction

Central India represents a wide variety of freshwater fishes due to its biogeographical condition as well as its diverse water resources such as streams, rivers, reservoirs, sub-terrain aquatic ecosystems, traditional lakes and domestic ponds. (Wani *et al.*, 2015) [7] Chandrabhaga River (Bhima River) is life line for Solapur district. This River referred in Pandharpur, due to its curvature flow i.e. it resembles the crescent shape. Overall flow of Bhima River, southeast for a long journey of 861 kilometres (535 mi), with many smaller rivers as tributaries. In recent years Bhima basin has been subjected to excessive pressure of anthropogenic activities such as religious festivals attracting millions of pilgrims through of the year. (Kumbha *et al.*, 2018)

In aquatic ecosystem, Fish group have widely been used as ecological indicators to assess and evaluate the health of rivers. Due to the anthropogenic activities, habitat degradation, exotic species introduction, water diversions, pollution and global climate change many indigenous fish species become declined. (Vijaylaxmi *et al.*, 2010) [11] The Economically important animal in aquatic ecosystem is fish and important source of food for human. During Ancient time up to recent era Fishes used in food industry and medicinal purpose. Maharashtra is famous for fish production and its natural water resources hence; it has wide scope for developing scientific fisheries in this state. (Pawara *et al.*, 2014) [9]

The main objective of the present study is to analyse ichthyofauna at Chandrabhaga River, Pandharpur sites. And also analyse the annual economic value of fishes from local Fish market



**Fig 1: Study Site:** Chandrabhaga River (Bhima River), Pandharpur

### Material and Methodology

The present investigation has been carried out by using following material and specific methods,

#### Study Site -Pandharpur:

The Bhima River i.e. Chandrabhaga River runs along the Pandharpur in Solapur district, Maharashtra. It is situated in Site 1: 17°45'44.7"N 75°11'38.5"E and Site 2: 17°40'03.9"N 75°21'15.3"E

#### Sample Collection and analysis

The present study was conducted from July 2023 to July 2024. Weekly visits were conducted at Patwardhan Kuroli Site 1 as well as Pandharpur Site2 for collection of data from the local fishermen. The fishes were identified with the help of available standard literature (Day's volume, Talwar & Jhingran 1991 [8] and also communicating with ZSI.)

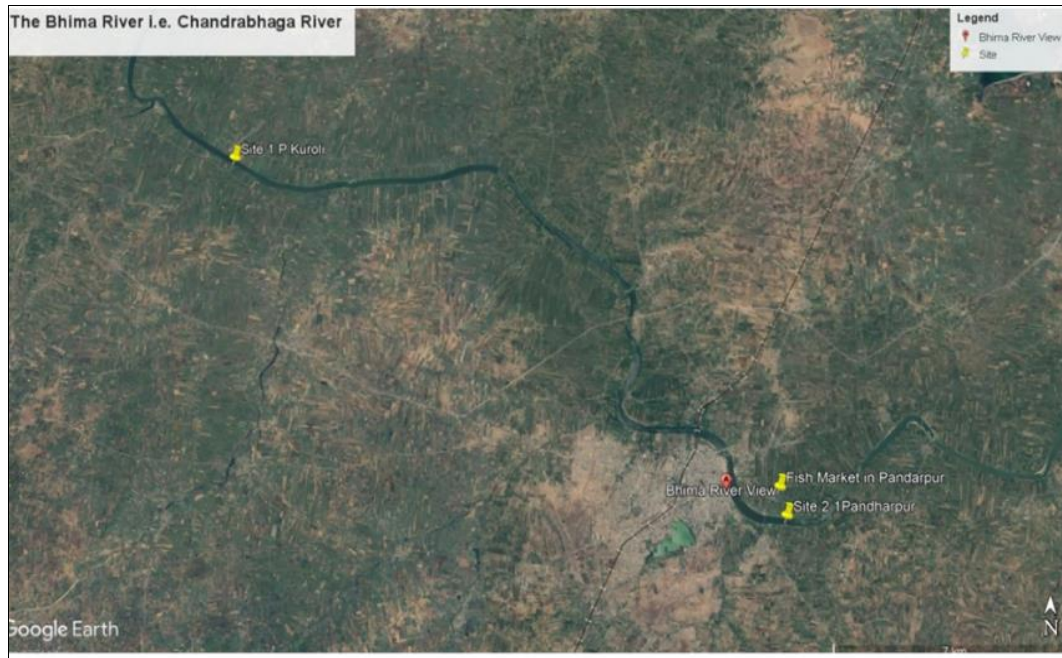
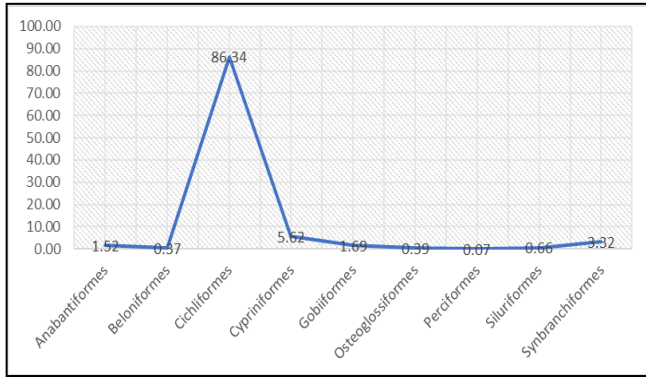


Fig 2: Chandrabhaga River (Bhima River), Pandharpur showing collection sites

**Result and Discussion**

**Table 1:**

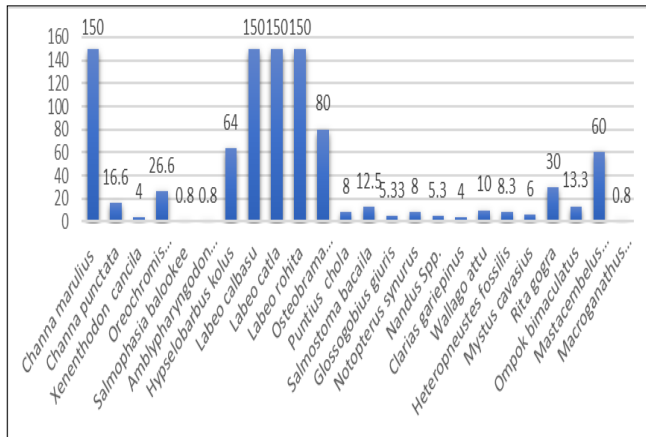
Sr.no	Order	Scientific Name	Abundance	Per Kg Amount as per Fish market data in Rupees (₹)	Per single Fish Economic Status in Rupees (₹)	Annual Economic Value in Rupees (₹)
1	Anabantiformes	Channa marulius	93	300-400	150	13950
2		Channa punctata	70	100-120	16.6	1166.6
3	Beloniformes	Xenentodon cancila	40	80-120	4	160
4	Cichliformes	Oreochromis mossambicus	9235	80-120	26.6	246266.6
5	Cypriniformes	Salmophasia balookee	52	80-120	0.8	41.6
6		Amblypharyngodon mola	275	80-120	0.8	220
7		Hypselobarbus kolus	25	80-120	64	1600
8		Labeo calbasu	1	150-180	150	150
9		Labeo catla	89	150-180	150	13350
10		Labeo rohita	41	150-200	150	6150
11		Osteobrama peninsularis	70	80-120	80	5600
12		Puntius chola	43	80-120	8	344
13		Salmostoma bacaila	5	100-120	12.5	62.5
14	Gobiiformes	Glossogobius giuris	181	80-120	5.33	965.3
15	Osteoglossiformes	Notopterus synurus	42	80-120	8	336
16	Perciformes	Nandus Spp.	8	80-100	5.3	42.6
17	Siluriformes	Clarias gariepinus	4	60-80	4	16
18		Wallago attu	15	150-200	10	150
19		Heteropneustes fossilis	30	100-150	8.3	250
20		Mystus cavasius	5	150-250	6	30
21		Rita gogra	2	150-200	30	60
22		Ompok bimaculatus	15	200-250	13.3	200
23	Synbranchiformes	Mastacembelus armatus	337	300-400	60	20220
24		Macrognathus pancalus	18	100-150	0.8	15



**Graph 1:** Order wise Freshwater Ichthyofauna percentage in Chandrabhaga River, Pandharpur



**Fig 3:** Fish Market, Pandharpur



**Graph 2:** Economical Value of per single Freshwater Fishes in Chandrabhaga River, Pandharpur



**Fish Diversity**

From Graph 1, The Freshwater Fish diversity of Chandrabhaga River represents total 9 orders. In which the highest abundance order is Cichliformes containing *Oreochromis mosambicus* species with 86.34% followed by Cypriniformes 5.62%, Synbranchiformes 3.32%, Gobiiformes 1.69%, Anabantiformes 1.52%, and Siluriformes 0.66%, Osteoglossiformes 0.39%, Perciformes 0.07%. Such type of highest abundance of Cichliformes reported in previous record. As per Dede, 2016 [1] analysed in their project work Cichliformes order showed over the odds record in freshwater fish diversity in Bhima River at from Gursale Village, Dist. Solapur. Also, Kadam *et al.*, (2020) [12] demonstrated that exotic fishes like Tilapia (Cichliformes order) These fish was carnivores, they feed on other fish so other fishes become threatened, and also, they become abundant.

**Economic Status**

From Graph 2, The Economical status of each of every single species of Chandrabhaga River is represented as Cypriniformes and Anabantiformes reflects highest status which was approximately fetching Rupees one fifty per individual species which is followed by Synbranchiformes sixty Rupees per individual species whereas Cichliformes: *Oreochromis mosambicus* obtain near about twenty-six / seven rupees per individual species. Economic status of fish is directly related to financial status of Fisherman

Order	Scientific Name	Abundance in Percentage %	Per single Fish Economic Status in Rupees	Overall Annual Economic Value in Rupees
Anabantiformes	Channa marulius	1.52	150	13950
Cypriniformes	Labeo calbus, Labeo catla, Labeo rohita	5.62	150	19650
Synbranchiformes	Mastacembelus armatus	3.21	60	20220
Cichliformes	Oreochromis mosambicus	86.34	26.6	246266.6

From our research work, one can educate the fishermen from local area about how to increase financial status by capturing Indian major carps using Government policies such as obtained seeds/eggs from government hatcheries and release in the native area. According to Kumar *et al.*, (2018), this was essential need to studies on fisheries status and socio-economic conditions of fishery community in

Dholi region reported 34.44% people of village was only concern towards fishing practice either capture or culture.

During water stagnation seasons and care has to be taken regarding river zonation and distribution of native species. It also enriched overall ecological status of Bhima River and directly or indirectly control the exotic fish *Oreochromis mosambicus* (Tilapia). As per Wani *et al.*, (2014), The

introduction of exotic fish *Oreochromis* (*Tilapia*) grows widely, but it may be one of the several causes for dwindling of freshwater fish biodiversity. As per previous work on Fish diversity, Cichliformes: *Oreochromis mossambicus* (*Tilapia*) was found to be 79% maximum range as compared to native species like Cypriniformes: *Labeo catla*, *Labeo rohita* 4% Synbranchiformes: *Mastacembelus armatus* 4% from Bhima River at Machnur, Solapur (Sutrave *et al.*, 2024) [2]

Kadam *et al.*, (2020) have proposed that, *Tilapia* was available throughout the year in their project work. The population of that species affects the diversity of fish fauna. Hence, they further concluded that the ecological threat to fish species needs to conserve in the given aquatic ecosystem.

Emphasis has to be taken to study river zonation-distribution pattern of fishes to increases Ichthyofaunal population. Efforts also to be under taken to implement the present outcome at ground level especially from fish market and ultimately use for sustainable development of Bhima River basin aquaculture.

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