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A study of fresh water fish fauna and water quality from Painganga River of Mehkar Tehsil in Buldhana District M.S. India

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Abstract
The research study of fish fauna of Painganga river in Mehkar tehsil was carried out during Jan 2025 to Dec 2025. Painganga river originates in the Ajantha ranges of Maharashtra, spans 495-676 km and depends on monsoon rainfall. Painganga river flowing heavily during the rainy and winter seasons and its water is useful for human consumption, agriculture and fisheries in Taluka Mahekar, District Buldhana. It is situated approximately 54 km from Buldhana district location. In the present study it was observed that the ichthyofauna belong to 07 order 10 families, 18 genus and 19 species, were Cyprinidae family is dominant with 08 (42.10%) species followed by Channidae and Mastacembelidae with 02 (10.52%) species, Balitoridae, Bagridae, Clariidae, Belonidae, Notopteridae, Cichlidae, and Poecilidae contribute 01 (5.26%) species each. Finally, it may be concluded that the water parameters are within permissible limit and support fish diversity of Paintakli dam were Cyprinidae family which is dominant and still in a position to set a good example of conservation and sustainable management of fish and fishery.

Keywords: Ichthyofauna, diversity, cyprinidae, penganga river, mehkar

Introduction

Biodiversity is essential for stabilization of ecosystem protection of overall environmental quality for understanding intrinsic worth of all species on the earth. Fishes are the only major group of vertebrate which very much effect on human civilization from ancient time to date. It is one of the good and cheapest sources of proteins food for economic as well as high class people so it is essential to study the distribution and the availability of fish from freshwater reservoirs and tanks. Painganga river is one of the major rivers from Vidarbha region which successfully contribute the biological diversity of this region. From the 18th century to date various workers have studied about Taxonomy, ichthyofaunal diversity i.e, from Himalayan Rivers, from Godavari and Krishna river, studied fishes of Kavery river. However, scanty information is available of fishes regarding Penganga River of Mehkar tehsil. Hence an attempt has been made here to present piscine inventory from Penganga River.

Study Area

The Painganga river (also known as Pengang River) is the chief river flowing in Mehkar tehsil of Buldhana district, Hingoli district, Nanded district, Yavatmal district, Chandrapur district and Washim district in the Maharashtra state in India. The river flows through the town of Mehkar, which is part of Buldhana District (latitude ~20.17 ^{0}N, longitude ~76.62 ^{0}E). The total length of the river is 495 Km (308 mi) and average rain fall is 751.32 mm and climate is cold in winter and hot in summer season. The Pentakli dam (an earthfill dam) is located on the Penganga river near Mehkar, used for local agriculture and water supply, drinking water, domestic use and fishing to nearby villages.

Fig 1: Satellite view of Painganga river bridge of Mehkar Tehsil of Buldhana District

Objectives

- To Report the freshwater fish diversity from Buldhana district (Vidarbha region).
- To analysis the present status, categories of freshwater fish and fishery from Paintakli dam Buldhana district.
- To generate gainful rural employment with special reference to fishing communities.

Material and Methods

To study the ichthyofauna of Painganga river from Jan 2025 to Dec 2025, fish samples were collected from dam which represents the ichthyofaunal composition from Painganga river. Fish samples were collected every week during the study period from the fish landing centres with the help of skilled local fishermen by various fishing crafts, gears with variable mesh size. Sampling points were distributed throughout the site to cover its whole area and location was changed for the collection of fish fauna according to the season. Identification of fishes was done up to species level at fish landing centre to get its natural colour, pattern of scales, fins, mouth pattern, identification marks like black spot, blotch on operculum, paired and unpaired fins and body parts with the help of standard literature etc. According to the season, locations were changed for successive fishing operation. Fish species which were not identified on the field (landing centre) were preserved in 10 % formalin. These fish samples were brought to Department of Zoology, Jijamata College, Buldhana for further identification. Specimen with doubtful identifying characters was sent to Zoological Survey of India (ZSI) Pune, regional branch (ZSI) Kolkata for identification. To study the water quality, which define as physical, chemical parameters Water samples were collected monthly at 2 feet depth from the surface area of the water body from the two sampling points in between 7 to 11 am during the study period. The first sampling point (S1) near the first site of flowing river and second sampling site (S2) at the river exit point and the distance between two sampling points were approximately 500 meter to 1 Km.

Study of physical parameters: Physical parameters were analysed by the standard methods described by APHA (1992) [2], pH (Hydrogen ion concentration) pH of water was recorded by field pH Meter Hanna –Model champ during study period on sampling sites. Temperature Air temperature of Painganga river was recorded from Jan 2025 to Dec.2025. The temperature was recorded with a centigrade mercury thermometer (graduated from 0^0C to 110 ^{0}C) in the field. Study of Chemical parameters-Water samples from Painganga river during the study period Jan 2025 to Dec 2025 were collected monthly and brought to the Research Centre, Department of Zoology, Jijamata College, Buldhana, for analysis of various chemical parameters. Chemical parameters like dissolved oxygen, free CO2, determined by standard methods as described by Dissolved oxygen. Dissolved oxygen was estimated in the laboratory by using Winkler's iodometric method as described by Free CO_2, was estimated in the laboratory by using titration method.

Systematic position of fish species at Penganga river from Mehkar teshil (M.S) India

Sr. No.	Order	Family	Genus	Species
01	Cypriniformes	Balitoridae		
			Nemacheilus	
				beavani
			Genus :- 01	Species:- 01
		Cyprinidae	*Labeo*	*rohita*
			Salmostoma	
				phulo
			Garra	
				lamta
			Rasbora	
				daniconius
			Catla	
				catla
			Cyprinus	
				carpio communis
			Cirrhinus	*mrigala*
			Hypothalmichthys	*molitrix*
	Result	Family :- 02	Genus :- 08	Species:-09
02	Siluriformes			
		Bagridae		
			Mystus	
				bleekeri
			Genus :- 01	Species :- 01
		Clariidae		
			Clarias	
				batrachus
			Genus :- 01	Species:- 01
	Result	Family :- 02	Genus :- 02	Species :- 02
03	Synbranchiformes	Mastacembelidae	*Mastacembelus*	*armatus*
			Macrognathus	*pancalus*
			Genus :- 02	Species:- 02
	Result	Family :- 01	Genus :- 02	Species :- 02
04	Osteoglossiformes			

		Notopteridae		
			Chitala	
				chitala
			Genus :- 01	Species:- 01
	Result	Family :- 01	Genus :- 01	Species :- 01
05	Perciformes			
		Channidae		
			Channa	
				orientalis
				punctatus
			Genus :- 01	Species :- 02
		Cichlidae		
			Oreochromis	
				mossambica
	Result	Family :- 02	Genus :- 02	Species :- 03
06	Cyprinodontiformes	Poecilidae	*Poecilia*	*reticulate*
			Genus :- 01	Species:- 01
	Result	Family :- 01	Genus :- 01	Species :- 01
07	Beloniformes	Belonidae		
			Xenentodon	
				Cancila
			Genus :- 01	Species:- 01
	Result	Family :- 01	Genus :- 01	Species :- 01
	Order:-07	Family :- 10	Genus :- 18	Species :- 19

Fish status at Painganga flowing river from Mehkar tehsil of Buldhana district (M.S) India

Sr N.	Name of Fish	FF	HEI	HNF	CF	HSF	OF	LF	EXPTF	MCF	TR	EN	VU	R	LR NT	C	UNC	EX
1.	*Labeo rohita*	√	√	√												√		
2.	*Salmostoma phulo*	√														√		
3.	*Garra lamta*	√				√			√							√		
4.	*Rasbora daniconius*	√				√			√	√						√		
5.	*Catla catla*	√	√	√												√		
6.	*Cyprinus carpio communis*	√	√	√					√							√		√
7.	*Cirrhinus mrigala*	√	√	√												√		
8.	*Hypothalmichthys molitrix*	√	√	√												√		√
9.	*Nemacheilus bevani*	√	√	√		√			√								√	
10.	*Mastacembelus armatus*	√	√	√		√					√					√		
11.	*Macrognathus pancalus*	√	√										√			√		
12.	*Mystus bleekeri*	√				√										√		
13.	*Chitala chitala*	√	√	√							√		√			√		
14.	*Channa orientalis*	√							√	√						√		
15.	*Channa punctatus*	√							√	√					√	√		
16.	*Xenentodon cancila*	√								√						√		
17.	*Oreochromis mossambica*	√	√	√					√	√						√		√
18.	*Clarias batrachus*	√				√			√				√			√		
19.	*Poecilia reticulata*	√								√								√

Sr. No.	Name		Sr. No.	Name	
1.	Food Fish	FF	10.	Exotic Fish	EF
2.	Highly Native Fish	HNF	11.	Coarse Food fish	CFF
3.	Mosquito Control Fish MCF	MCF	12.	Forage Fish	FF
4.	Highly economic IMP	HEI	13.	Experimental Fish	EXPTF
5.	Hill Stream Fish	HSF	14.	Threatened fishes	TR
6.	Larvivorous Fishes LF	LF	15.	Vulnerable fishes	VR
7.	Ornamental Fish OF	OF	16.	Endangered fishes	EN
8.	Lower risk near threatened	LR-nt	17.	Rare	R
9.	Common	C	18.	Common	U or C

Physico-chemical parameters of Paintakle dam, Jan 2025 to Dec.2025

Parameters	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec
Temp	31.00	36.2	39.2	42.3	45.3	34.5	32.5	30.40	32.5	33.4	30.5	31.20
pH	7.2	7.35	7.6	7.15	8.1	7.3	7.9	7.6	7.06	8.1	8.4	8.6
Dissolved Oxygen	4.5	7.4	5.2	5.5	3.4	5.4	4.5	5.2	5.6	9.2	10.5	10.6
CO_2	6.7	6.3	5.6	7.3	7.8	6.9	3.4	5.6	4.6	3.9	4.6	3.6

All values are expressed in mg/ L except air temperature.

Result and Conclusion

During the study period it was observed that the ichthyofauna belong to 07 order 10 families, 18 genus and 19 species, where Cyprinidae family is dominant with 08 (47.63%) species followed by Channidae and Mastacembelidae with 02 (10.52%) species, Balitoridae, Bagridae, Clariidae, Belonidae, Notopteridae, Cichlidae, and Poecilidae contribute 01(5.26%) species each. The maximum CO2 was observed in the month of May 7.8 and minimum was recorded in December 3.6 The free CO2 concentration was minimum in winter, this might be due to high photosynthesis activity and maximum in summer which may be due to less photosynthetic activity because of low phytoplankton population. During the study period it was observed that all the water parameters are within the permissible limit and shows supportive correlation to the ichthyofaunal diversity were Cyprinidae family is dominant and still in a position to set a good example of conservation and sustainable management of fish and fishery.

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