

## **Ichthyofaunal Diversity of Bheemgarh Dam Chhapara, Seoni M.P. (India)**

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### **Abstract**

Several types of fresh water fishes found in the Bheemgarh dam, therefore the present study was aimed to investigate ichthyo faunal diversity of the Bheemgarh dam Chhapara, Seoni. In the present study, a total of 19 species of fishes were recorded from 9 families and 6 orders during Jan., 2018 to Dec., 2018 from the Bheemgarh dam, Chhapara, Seoni region of Madhya Pradesh. Among them, family Cyprinidae was the most dominant with 09 (47.37%), followed by the families Bagridae 2 (10.53%), Channidae 1(5.26%), Siluridae 1 (5.26%), Nandidae 1 (5.26%), Clariidae 1 (5.26%), and Heteropneustidae 1(5.26%), respectively. Cyprinidae was the most dominant species on sampling site of Bheemgarh. Fishes maintain aquatic ecosystem, therefore, there is a need to follow conservation strategies to conserved ichthyo faunal diversity.

**F**ish enjoys very important consideration and role in human civilization from ancient periods immemorial. Fish food materials are gastronomic, culinary and having nutritional value and fish food products are beneficial. Most species of fish rank in the category of “gourmet par excellence”. Several others are sought as luxurious food in expensive restaurants. The one general goal of all is “the fish as food materials for the human being.”

The word fish is concerned to a heterogeneous gathering of aquatic chordates animals comprised of hagfish and lampreys, sharks, rays and chimaeras, and the finned bony fishes. The latter is by far the main diverse group and is well shown in fresh water system, while the others are prevalently marine

gatherings. Freshwater fishes have a tendency to be more-or-less confined drainage system, provide relatively a conservative system for examining patterns of distribution that may reflect the imprint of past continental and climate changes. The main role of fish in river food chain and food webs has been hotly debated.

Economically fishes are very important which are used as food in India. For successful fish forming in dams and reservoirs, it is essential to make a detailed hydrological study of the water body. Suitable species that are stocked in dams are the major carps. These are capable of adjusting successfully to ecological condition of the reservoir. The exotic carps also thrives in manmade lakes or dam and are suitable species for culture.

Distribution of ichthyo faunal population in the ecosystem, their composition and seasonal variation are essential prerequisite for any successful resources management. Species diversity is a property of the population level while the functional diversity concept is more strongly related to ecosystem stability and stresses, physical and chemical factors for determining population dynamic in the lentic ecosystem<sup>23</sup>. Fishes have a range of physiological tolerances that are dependent upon which species they belong to. They have different lethal temperature, dissolved oxygen requirements and spawning needs that are based on their activity levels and behaviors. Because fishes are highly mobile, they are able to deal with unsuitable abiotic factors in one zone by simply moving to another. Fishes exhibit enormous diversity in their morphology, in the habitats they occupy and in their biology. Unlike the other commonly recognized vertebrates, fishes are heterogeneous assemblage<sup>14</sup>. They can be used for ecological assessment<sup>14</sup>. Besides this, these are considered as an important protein rich food source in India. Therefore, it is need of the hour to study fish diversity in order to conserve water bodies and increase our national economy by culturing them on scientific basis.

Many workers have studied taxonomy, biodiversity and distribution of fishes found in freshwater bodies of various parts of India. David<sup>6</sup> recorded fish fauna of Godavari and Krishna River. Very less information is available about fish fauna present in lotic and lentic habitats of the tribal district Seoni. A large number of dams and reservoir are constructing during the recent year to provide water for irrigation and power production. These bodies

of water offer immense scope for fish culture for successful fish farming in dam and reservoir. Bheemgarh dam is very productive more work has been carried out of fish fauna. The distribution of fish species is quite variable because of geographical and geological condition.

Hence, in the present study, an attempt was made to accumulate information pertaining to various aspect of fish diversity of standing water bodies from this part of peninsular India. The present investigation has been carried out on Bheemgarh dam Chhapara is located in the Chhapara, Seoni district of the central Indian state of Madhya Pradesh. Bheemgarh dam also known as Sanjay Sarovar Bandh is built Across the Wainganga river in Chhapara tehsil of Seoni district of Indian state of Madhya Pradesh. The Bhimgarh Sanjay Sarovar Dam is located 43 km away from the Seoni. It is known as the biggest Mud / Earthen dam of Asia. It is situated 22°20'41"N 79°36'16"E. It has an average elevation of 611 meters (2004 feet). The city is 2,043 ft. above sea-level, half-way between Nagpur and Jabalpur. The water of this dam is used for irrigation and fish culture. It is a marvelous mixture of natural beauty and splendor, feasting the eyes of the onlooker! An ideal picnic spot for the locals, it is frequently visited by them for their weekend getaways. Nature lovers appreciate this water body, which also serves as a storage tank for the waters of Ghysri Nala. This water reserve fulfills the irrigation needs of the farmers of the local village nearby, Tekadi.

Fish diversity of undivided India and various Indian states has been described by Jerdon<sup>19</sup>, Dutta and Majumdar<sup>11</sup>, Tilak and Hussain<sup>40</sup>, Srivastava<sup>38</sup>, Venkateswarlu and

Rao<sup>52</sup>, Johal and Tondon<sup>22</sup>, Kaul *et al.*,<sup>24</sup>, Lipton<sup>26</sup>, Dutta and Malhotra<sup>12</sup>, Tilak and Baloni<sup>39</sup>, Dwivedi *et al.*,<sup>13</sup> Sen<sup>36</sup>, Molur and Walker<sup>30</sup>, Johal and Rawal<sup>21</sup>, Daniels<sup>5</sup>, Meshram and Meshram<sup>28</sup>, Hiware<sup>17</sup> and Rao<sup>33</sup>.

Day<sup>7</sup> described the fishes and their distribution in India including that of Madhya Pradesh. Though, the formal study of fish fauna in Madhya Pradesh starts with the work of Abreu<sup>1</sup>, Hora<sup>18</sup>, Malviya<sup>27</sup>, Dubey and Mehra<sup>9</sup>, Shukla *et al.*,<sup>37</sup> Garg *et al.*,<sup>15</sup> Chandra *et al.*,<sup>4</sup> Mohar<sup>29</sup>, Vyas *et al.*,<sup>43</sup> and Paunikar *et al.*,<sup>31</sup>. Fish fauna of Gwalior division was described by Agarwal and Saksena<sup>3</sup>. Dubey *et al.*,<sup>10</sup> Rao *et al.*,<sup>32</sup> Saxena and Srivastava<sup>35</sup>,

Rao<sup>34</sup> and Uchchariya *et al.*<sup>41</sup>. Therefore the present study deals with the biodiversity of fish their conservation status and conservation measures.

Different kind of fishes were collected from the selected sites with the help of fisherman working on the Bheemgarh dam (Fig. 1) by using different types of craft, gears and nets and after noting down color and other external features, fishes were preserved in 4% formalin, seasonal collection were made from January 2018 December 2018. Identification of fishes were performed up to species level by using standard key and literature<sup>2,8,20</sup>. The classifications of fishes were also performed by following the pro-forma given by Jhingran<sup>20</sup> and Lagler<sup>25</sup>.

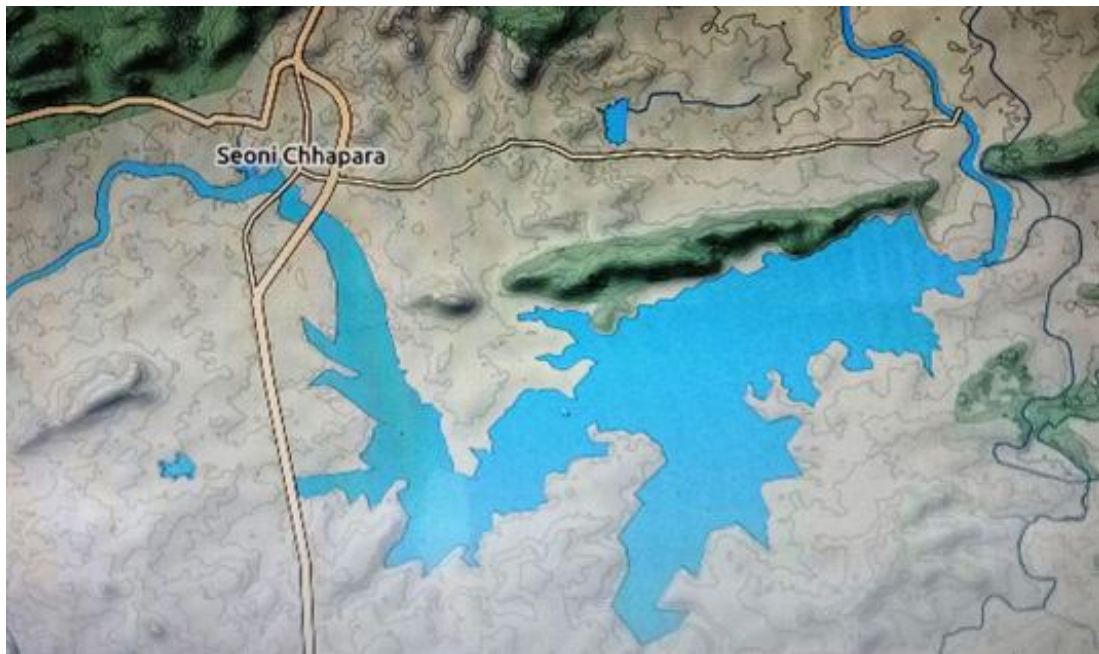


Fig. 1 map of Bheemgarh Dam

The fish fauna was reported to be abundant and found to be distributed throughout in Bheemgarh Dam. The species which were reported in the dam are *Notopterus notopterus*, *Nandus nandus*, *Catla catla*, *Cirrhinus mrigala*, *C. reba*, *Cyprinus carpio*, *Labeo rohita*, *Labeo calbasu*, *Labeo bata*, *Puntius ticto*, *Puntius amphibious*, *Mastacembus armatus*, *Channa marulius*, *Anabas testudineus*, *Mystus. Vitatus*, *Mystus seenghala*, *Clarias batrachus*, *Heteropneutes fossilis*, and *Wallago attu*. The systematic position of fish fauna of Bheemgarh dam at Chhapara Seoni of Madhya Pradesh is shown

in Table-1 and the catch structure of fish fauna throughout the sampling sites of Bheemgarh dam showed a varied number of different families as shown (Table-2). Among all the families, Cyprinidae was the most dominant with 09 (47.37%) followed by Bagridae 2 (10.53%), Channidae 1(5.26%), Siluridae 1 (5.26%), Nandidae 1 (5.26%), Clariidae 1 (5.26%) and Heteropneustidae 1(5.26%), respectively. Cyprinidae was the most dominant species on sampling site of Bheemgarh dam. The present study provides future strategies for development and conservation of fish fauna.

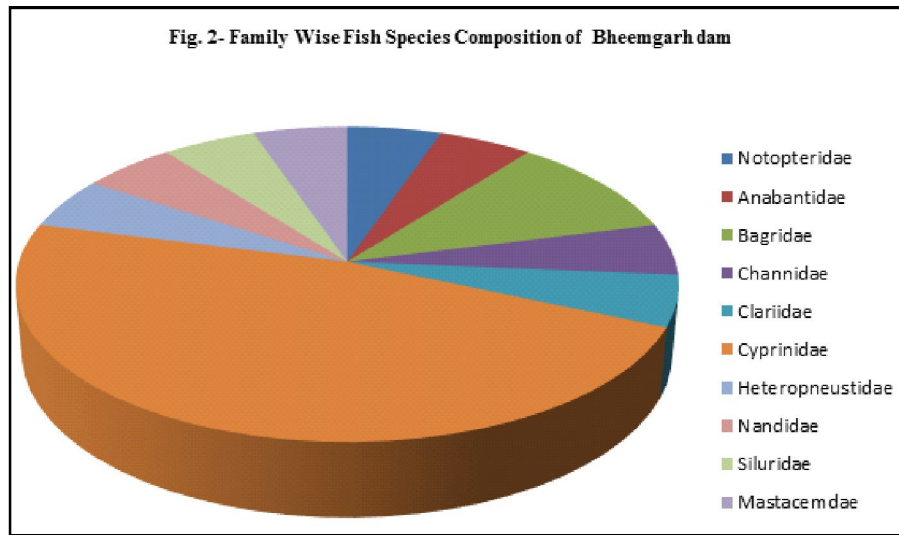
Table-1. Systematic Position of Fish Fauna of Bheemgarh dam at Chhapara Seoni of Madhya Pradesh

Order	Family	Genus Species	Local name	IUCN Category	
				CAMP (1998)	CAMP (1998)
<b>Osteoglosses</b>	<b>Notopteridae</b>	<i>Notopterusnotopterus</i>	Patola	LR-nt	EN
<b>Perciforme</b>	<b>Nandidae</b>	<i>Nandus nandus</i>	Dhebari	LR-nt	LR-nt
<b>Cypriniformes</b>	<b>Cyprinidae</b>	<i>Catla catla</i>	Catla	VU	LR-nt
		<i>Cirrhinus mrigala</i>	Mrigal	LR-nt	LR-nt
		<i>C. reba</i>	Naren	VU	VU
		<i>Cyprinus carpio</i>	Common carp	LR-nt	LR-lc
		<i>Labeo. rohita</i>	Rohu	LR-nt	LR-nt
		<i>L. calbasu</i>	Kriya	LR-nt	LR-nt
		<i>L. bata</i>	<i>Bata</i>	LR-nt	LR-nt
		<i>Puntius ticto</i>	Khadia	NE	DD
		<i>Puntius amphibious</i>	<i>Khadia</i>	NE	DD
<b>Synbranrnes</b>	<b>Mastacemdae</b>	<i>Mastacembus armatus</i>	Baam	NE	VU
<b>Peraciformes</b>	<b>Channidae</b>	<i>Channa marulius</i>	Padam Sauri	LR-nt	VU
	<b>Anabantidae</b>	<i>Anabas testudineus</i>	Kabai	LR-nt	LR-nt
<b>Siluriformes</b>	<b>Bagridae</b>	<i>Mystus. vitatus</i>	Katuwa	VU	VU
		<i>Mystus seenghala</i>	Tengara	NE	LR-nt
	<b>Clariidae</b>	<i>Clarias batrachus</i>	Mangur	VU	VU
	<b>Heteropnidae</b>	<i>Heteropneutes fossilis</i>	Singhi	VU	VU
	<b>Siluridae</b>	<i>Wallago attu</i>	Padin or Lonch	LR-nt	LR-nt

EN=Endangered, Vu (Vulnerable), LR-nt= Lower risk near threatened, LR-lc (Lower risk least concern), NE (Not evaluate), DD (Data deficient), \*Exotic fish.

Table-2. Family Wise Fish Species Composition of Bheemgarh dam  
at Chhapara, Seoni

S.No.	Fish Family	No of species	Percentage
1	Notopteridae	01	05.26
2	Anabantidae	01	05.26
3	Bagridae	02	10.53
4	Channidae	01	05.26
5	Clariidae	01	05.26
6	Cyprinidae	09	47.37
7	Heteropneustidae	01	05.26
8	Nandidae	01	05.26
9	Siluridae	01	05.26
10	Mastacemdae	01	05.26
	<b>Total</b>	<b>19</b>	<b>100</b>



Productivity of reservoir depends on physicochemical parameters and biological aspects. Fishes maintain aquatic ecosystem hence there is need for conservation strategies. Over fishing and immature fishing are main causes of loss of many fish species. Seasonal fluctuation, anthropogenic activities, climate change (extreme heat and cold), invasion of

exotic species, drought and water pollution are some causes for complete and partial loss of many fresh water fishes. Many fish species are already become extinct while some of them are endangered. To maintain fish diversity in Seoni region there is need for conservation. Total number of fresh water fish species recorded during the present study indicates rich

fish diversity in Bheemgarh dam of Seoni.

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