

Study of Freshwater fish diversity in Godavari River Flowing in Northern Western Ghats of India

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ABSTRACT

The Godavari River is the second-longest river in India, and it flows through the states of Maharashtra, Telangana, Andhra Pradesh, and Odisha. The Northern Ghats are a mountain range that runs along the western side of the Godavari River. The region is home to a wide diversity of freshwater fish, with over 10 species recorded. This study investigated the freshwater fish diversity of the Godavari River in the Northern Ghats of India. In the Godavari River the Someshwar site were selected for the study, and fish were sampled using a variety of methods, including gill nets and cast nets etc. The fish were identified to species level, and their abundance was recorded. A total of 9 fish species were recorded in the study, belonging to 06 families. The most diverse family was Cyprinidae, with 04 species. Other important families included Bagridae, Gobidae, Ambassidae, Channidae and Mastacembelidae. The fish community structure was found to be heterogeneous, with different species assemblages occurring in different parts of the river. The most diverse sites were found in the upper reaches of the river, where there was less pollution and habitat destruction. The results of the study demonstrate that the Godavari River is home to a rich diversity of freshwater fish. However, this diversity is threatened by a number of factors, including pollution, overfishing, and habitat destruction. The conservation challenges facing the Godavari River are significant. However, there are a number of things that can be done to protect the river's fish diversity. These include reducing pollution, managing fishing practices, and protecting habitats.

Key words: Godavari River, Northern Ghats, Freshwater fish diversity, Conservation challenges.

Introduction

The term "biodiversity" describes the diversity and variability of living things as well as the ecosystem complexity in which they coexist. Molecular units, individual creatures, populations, communities, ecosystems, landscapes, and the biosphere are all included in the diversity of forms. The number of species of plants, animals, and microbes in a particular area can be used to describe biodiversity in its most basic definition (Gaston and Spicer, 2004). The Conservation of Biological Diversity (UNEP-1992) contained the first definition sponsored by the UN.

The variability of living, terrestrial, marine, and other aquatic systems, as well as the ecological complex to which they belong, is referred to as biodiversity, in accordance with this definition. This includes variation within and across species. Since the human population depends on fishing resources for a number of purposes of tremendous economic value, fish have received more attention from the faunal community. Fish habitat preservation and fish diversity conservation are highly valued in the modern world. The fact that species is on the verge of extinction every minute is one of the key causes. Millions of people depend on fish since it is a great

source of protein and food for the growing population in emerging nations (Belsare, 1984). Because fish provides security for food, health, and income, it is more sustainable for the rural poor's way of life (Belsare, 1986). At all levels of biological organization, fish can be employed for ecological assessments.

Fish are another animal that can be utilized in bioassay investigations. From an ecological perspective, fish are crucial since they help to keep the aquatic ecosystem ecologically balanced. They have been trained to be effective experimental subjects, and their use has enlightened research into anatomy, physiology, behavior, genetics, ecology, and evolution. Fish assemblage, structure, and functions are also influenced by geographic changes, making it important to comprehend the pattern in order to analyze and monitor rivers effectively. Fish are crucial because they represent ecological processes and relationships between producers and consumers. Because they have been a consistent part of many people's diets, fish are one of the key components in the economies of many countries. Considering that fish is a great source of protein for humans.

A description of an estimated 27,977 legitimate species of fish and 482 families with living species make up the about 54,711 identified extant vertebrate species, or nearly half of all vertebrates (Maitland, 1995). Out of the 39,900 species of vertebrates, fish make up nearly all imaginable aquatic habitats, with 21,723 different species now known to exist (Jayaram, 1999). Of these, 11,650 are marine species and 8,411 are freshwater species. According to Mittermeier and Mittermeier (1997), India is one of the three mega biodiversity countries in the world and ranks tenth in terms of freshwater megabiodiversity. There are 2,500 different species of fish in India, 930 of which are freshwater fish and 1570 of which are marine fish (Kar, 2003a).

In order to appreciate the intrinsic value of every species on the planet, biodiversity is also crucial for maintaining ecosystem stability and safeguarding overall environmental quality (Ehrlich and Wilson, 1991). The diversity of fish species in a river is essentially represented by their profusion. Ichthyodiversity is the diversity of fish species; depending on the setting and scale, it may also apply to genotypes or alleles within a population of fish, species of life forms within a fish community, or

species or life forms across aquaregimes (Burton *et al.*, 1992). The commercial fisheries are supported by the river's wide diversity of fish species. The potential of fish culture in India has not yet been completely realized. Fish are a great source of protein and are quite nutritious. The necessity for extensive aquaculture development.

The ichthyofauna of Southern Western and Central Western Ghats and particularly of Karnataka is poorly known. The early works worthy to mention is of Blanford (1901) who presented a report on freshwater fishes of Karnataka. Hora (1942) and Muddana (1971) reported freshwater fishes of Mysore state, Jayaram *et al.* (1999) reported fishes of Cauvery. River system, Arunachalam *et al.* (1997) reported fish diversity in Rivers of Northern Karnataka, Western Ghats. Bhat (2001); Bhat and Jayaram (2003) reported some new fishspecies from Uttara Kannada district of Karnataka.

Singh and Kamble (1987) found 32 genera of fish, indicating that variety and resources are key to fisheries management in India. fishes from the M.S. district of Dhulia, according to records of 26 species from the district of Jalgaon, and Kharat *et al.* (2012). 51 species of Krishna River were reported in Wai, Western Ghats. Khan and Nagma (2013) reported 36 freshwater fish species from the western Uttar Pradesh district of Bijnor, while represents 60 fish species from the Rawanwadi Lake in the M.S. district of Bhandara. 37 species of ichthyofaunal diversity were recorded by Sheikh (2014) for the Pranhita So River in the Sironcha area of Gadchiroli (M.S.).

Materials and Methods

Godavari River: The Godavari begins in the Western Ghats of central India, 80 kilometers (50 miles) from the Arabian Sea, close to Nashik in Maharashtra. It travels for 1,465 km (910 mi), first crossing the Deccan Plateau to the east, then turning southeast to enter the Andhra Pradesh districts of Eluru and Alluri Sitharama Raju, before splitting into two distributaries that enlarge into a sizable river delta at Dhavaleshwaram Barrage in Rajamahendravaram, before flowing into the Bay of Bengal. Nearly a tenth of the territory of India is covered by the Godavari River, which has a coverage area of 312,812 km² (120,777 sq mi), which is comparable to the combined areas of the United Kingdom and the Republic of Ireland.

Collection of Fish Species

Fishes were collected from Godavari River, District Nashik, Maharashtra, India with the help of local fishermen using different type of nets namely gill nets and cast nets etc. Immediately photographs were taken with the help of digital camera.

Water samples were taken from the sampling locations and promptly transferred to the lab for additional analysis. A mercury thermometer was used to measure the water's temperature at the time of sampling. While other parameters were examined in the lab using the techniques recommended by, pH was determined using a normal pH meter. During the wet season, fish samples from these rivers were taken (2022). Gillnets, cast nets, etc, were used for sampling, and they all had different mesh sizes. Some representative and unidentified specimens were taken in and given away to the lab where the fish were identified using keys for fishes of the Indian subcontinent. Prior to formalin preservation, photographs were taken immediately for the color on the fish diminishes over time. The formalin solution was made.

Results and Discussion

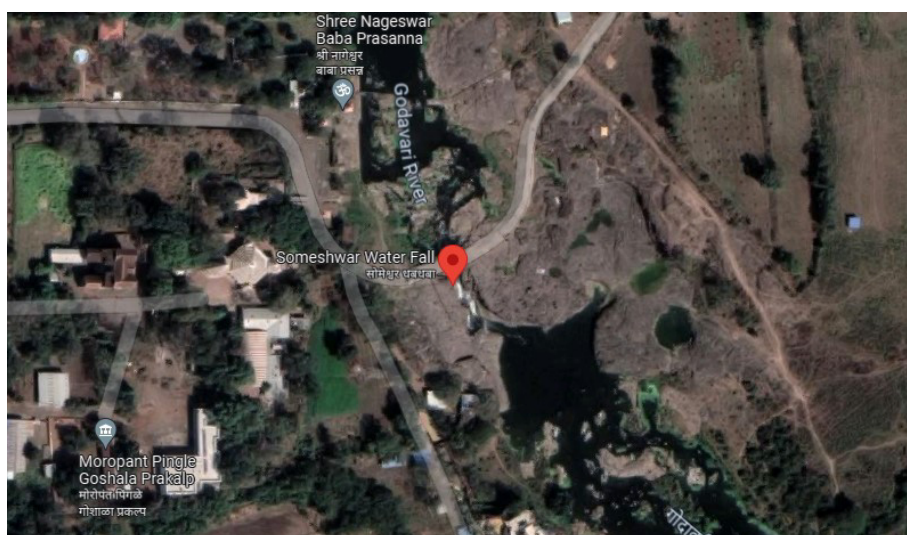
Fish are the keystone species that control the population and distribution of other organisms in the ecosystem they represent. They also serve as reliable indicators of the ecosystem's water quality and overall health. Nashik (Maharashtra) is a country of rivers and is home to a diverse and abundant fish

population, including numerous rare and endemic fish species. One of the significant hotspots for freshwater biodiversity has been recognized by the world conservation monitoring centre as the Western Ghats. As a tool for decision-making, fish diversity data bases are extremely important.

The present study on ichthyofaunal biodiversity of Godavari River in Site Someshwar was carried out from August 2022 to August to January 2023. During the study period, it was observed that the ichthyofauna belong to 06 families, 09 genus and 10 species.

In the Jawalgaon reservoir in the Maharashtra district of Solapur, Sakhare (2017) looked into the presence of 23 fish species from 7 orders. With 11 species, the order Cypriniformes of fishes was the most numerous, followed by the order Siluriformes with 4 species. The classification of fish species was based primarily on the characteristics of the two species that made up the Osteoglossiformes, Perciformes, and Channiformes orders, as well as the body surface, shape, and structure of the remaining orders. Fish were identified using the 54 species that were discovered and belonged to 15 families, according to Yazdani and Singh's (2002) study of the fish resources of the Bhima River at Indapur. Wagh (2003) reported 62 species from Mula, River in Maharashtra.

Khedkar (2005) observed 67 fish species from the Nathsagar reservoir in Paithan, District of Aurangabad that belonged to 7 orders and 19 families. The 25 fish species identified by Pawara and



Map showing sampling site

Source: <https://www.google.com/maps/place/Someshwar+Water+Fall/@20.0292958,73.7227307,495m>

Table 1. (Fishes Observed during the period August 2022 to January 2023)

Sr.No.	Scientific Name	Common Name	Family
1	<i>Puntius jerdoni</i>	Jerdoni Carp	Cyprinidae
2	<i>Labeo boggut</i>	Minor Carp	Cyprinidae
3	<i>Rasbora caverii</i>	Cauvery rasbora	Cyprinidae
4	<i>Crossocheilus latius</i>	Stone roller or Gangetic latia	Cyprinidae
5	<i>Plystus bleekeri</i>	Shingala	Bagridae
6	<i>Glossogobius giurus</i>	Tank Gobi	Gobiidae
7	<i>Parambassis ranga</i>	Indian glassy fish	Ambassidae
8	<i>Channa punctatus</i>	Spotted snakehead	Channidae
9	<i>Channa marulis</i>	Giant snakehead	Channidae
10	<i>Placognathu spuncalus</i>	Indian spiny eel	Mastacembelidae

Patel (2012) are divided into three orders, five families, and thirteen genera. Family Cyprinidae was the most dominant among the species collected, accounting for 68% of the total fish species from the Karvand dam (Shirpur) between July 2011 and February 2012. Channidae came in second with 12% of the total, Balitoridae with 8%, Bagridae with 8%, and Cobitidae with 4%. 42 fish species from 29 genera, 15 families, and 9 orders have been reported by Pawar (2014) from the Majalgaon reservoir in the Beed area. The following is the list of fishes collected from Godavari River (Someswar) in Nashik District.

Conclusion

During the study period different variety of freshwater fishes have been observed and recorded 10 species in the Godavari River of someshwar region recorded for the study of diversity status in the Northern ghat region located in Nashik district. The diversity of freshwater fishes mainly depends upon the biotic and abiotic factors and types of the ecosystem, water level fluctuations, mean depth, morphometric features and bottom have great implications. The hydro biological features of the collection site also play an effective role in fisheries output to a greater extent.

India is one of the mega diversity hot spot with respect to freshwater fish species. In freshwater fish diversity India is eighth in the world and in Asia (Kottelat and Whitten, 1996). But, recent studies show that, there is tremendous loss of freshwater fish diversity in the study area one of the important region of biodiversity hotspots of the world. On the whole, taking into consideration, freshwater fish biodiversity conservation represents another major challenge at the northern ghat region. The work has

been concluded with future strategies for development of freshwater fish fauna conservation of Northern parts of Western Ghats of India.

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Conflict of Interest

None

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