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FISH DIVERSITY CUM DISTRIBUTION WITH WATER QUALITY ASSESSMENT OF CHAMORSHI, GADCHIROLI, MAHARASHTRA

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ABSTRACT

We investigated the diversity of zooplankton fish in relation to specific physical, chemical, ionic, and biological studies conducted on the Wainganga River. Water and fish samples were collected from five different sample locations for research purposes. **Purpose:** This research article aims to study water quality testing and fish diversity in the Chamorshi tehsil of Gadchiroli, Maharashtra. **Methods:** Fish samples were rated qualitatively and quantitatively and water samples were analyzed for various physical, chemical, ionic, and biological studies by APHA. **Results:** The data showed that there were several differences in water quality with respect to physicochemical, ionic properties. The results obtained throughout the one-year of study showed that the water quality standard was normal and within the permissible limit as stated by ISI standards. **Conclusions:** The research facilities are located in remote, tribal, and natural areas. Therefore, the burden of pollution is minimal. The place is clean. The study focused on drinking, livestock, agriculture, irrigation, and fishing.

Keywords: Fish Diversity, Drinking water, Chamorshi, Gadchiroli, Physical, Chemical, Ionic Parameters

INTRODUCTION

Water is possible, people can live without food for several days. even a week, but only four days without water (Nagarnaik and Patil 2012). "Blue Planet" because 70% of its territory is covered by water resources. About 1.35 billion cubic kilometers of water in the oceans are, like salt water, about 97.1% closed. 2.1% of the ice glaciers are limited. Only 0.2% is fresh water in the country. that can be used by humans for many purposes. The remaining 0.6% is underground. Water is one of the most popular, but most valuable, resources in the world. Where the world would have no life, pollution is a serious problem as around 70% of India's water resources Much of India's water is polluted with biological, organic, and inorganic pollutants. About a third of the world's drinking water demand comes from surface water sources such as rivers, canals, and lakes. Good water quality indeed makes people healthier than the poor (Mahananda *et al*., 2010). Rapidly growing population Unplanned urban expansion ১ Unplanned industrial development along rivers ৷ Catchment areas. They suffer badly from the quality of the water resources. The voluntary discharge of industrial wastewater into rivers is common. This has led to a severe deterioration in water quality and the aquatic environment. Metal waste occurs directly in bodies of water, including rivers, without prior or partial pre-treatment. Heavy metals are therefore discharged into bodies of water and accumulated in biomarkers along the food chain (Ruby Pandey *et al*., 2014).

Maintaining a healthy aquatic ecosystem depends on its physicochemical properties and biodiversity. Today there are dynamically balanced water bodies such as rivers, lakes, and canals that affect human activity (Mehari and Mulu, 2013) Dahare Rajesh (2020) Sindewah Chandrapur District, Maharashtra. He understood this in terms of the parameters of water quality. The plankton density is quite high in September, October and November. the similar nutritional conditions come to close some Physico-chemical properties of water. Zooplankton is one of the prerequisites for assessing the ecological: fishery status of freshwater resources. Freshwater fish are of economic, nutritional, scientific, historical, and cultural importance around the world. Fishing is the most common use of wild plants in India or other countries. Fishing in India or elsewhere brings economic benefits and food to people (FAO, 2012) About 94% of freshwater fishing takes place in developing countries. Freshwater fish are animal protein for more than 6% of the world population (FAO, 2007). They feed millions of the poorest people in the

world. It also contributes to the general economic well-being of traders. Tourism Export for Leisure (World Fisheries Center, 2002).

Pool water must not contain chlorine, ammonia, phosphates, or nitrates and must be within safe limits. Natural algae and other types of debris from the rocks and plants of the pond. This is normal and is necessary to maintain the life of the pool. About 25,000 species of fish are listed. This is the largest group of vertebrates. Approximately 45-50% of vertebrate species are the major fish organisms in almost all water systems and have various adaptations to their lives. For biologists, this is a very interesting group. It can be a food source for many species. The consumption of organisms by fish is an important feature, and adjusting the nutritional structure, affects the stability, resilience, and food web dynamics of aquatic ecosystems. It changes as the fish moves from one life stage to the next. Since fish mineralize nitrogen and phosphorus through excretion and defecation, the fish di*et al*so affects the availability of nutrients and the time available to enrich the lake. Therefore, these nutrients can be used for primary production.

Fish produce several services associated with their movement patterns, including daily, seasonal, and yearly movement patterns in lakes, rivers, estuaries, and oceans. Fish communities and certain species are excellent indicators of biological and ecological integrity due to continued exposure to the aquatic environment. Fish have a variety of biological reactions, including water pollution, severe habitat degradation, eutrophication, organic matter enrichment, thermal changes in chemical toxicity, and changes in growth, distribution, and abundance associated with food supply. Indicates. Fish make up half of the world's total number of vertebrates. About 21,730 species of fish are registered in the world, of which about 11.7% live in the waters of India. Of the 2500 species, 930 live in freshwater India. Freshwater fish are used as a biological indicator for assessing water quality, river network connectivity, or area of flow. Fish is a rich source of protein and has high nutritional and economic value.

Many workers are studying the classification, biodiversity, and distribution of fish in freshwater areas of India. David (1963) recorded a school of fish on the Godavari and Krishna rivers. Yadav (2004 and 2006) reported 33 species from Pench National Park in Nagpur and 84 species from Tadoba National Park in Lancombe, Chandrapur. Mudgal, Parbhani, Gedekar, Tijare (2010 and 2012) 49 species from the Wainganga River in Gadchiroli in the Markandeshwar district. It is

natural to study the distribution and availability of freshwater fish, especially in Maharashtra, based on the economic importance and extent of fish and fisheries. Maharashtra has 6 orders, 25 families, and 166 freshwater fish stocks. Oreochromis, grass carp, carp, silver carp, and many other species invade the inland waters of Maharashtra. Fish diversity was investigated in two rivers in the Godavari basin northeast of Katani, a tributary of the Paneganga and Weinganga. Both rivers belong to the same watershed but exhibit an ecological, climatic and artificial environment.

The main river basin of the county is the Godavari River, which flows from west to east and forms the southern border of the county. The main tributaries of the Godavari River are the Indravati and Pranhita rivers. The latter is formed by the confluence of the Wainganga and Wardha rivers near the village of Chamorshi taluka. The Wainganga River is the most sacred and most important in Gadchiroli and is considered the lifeline of Gadchiroli. The Wainganga River is the main river that runs along the border between the Chandrapur and Gadchiroli districts. This water is widely used for human needs in the surrounding rivers. Population growth, unplanned urban growth, industry, and land reform, but the livelihoods of people along the river put a great deal of pressure on this natural resource, nature.

MATERIALS AND METHODS

Study Area

The study area is located in the northern city of Maharashtra in central India. It is surrounded by the Arabian Sea to the west, Gujarat to Madya Pradesh in the north, and Chhattisgarh to the east by Angola's Terbon. The Penganga River is a major part of the Maharashtra Basin. It continues through the Maharashtra-Telangana border until it returns to Maharashtra. The height of the river is about 360 miles. The height of the two banks of the river is 10 to 15 m. The Wainganga River has all its tributaries, flowing in the western part of the Baraghat region, in the eastern part of Madhya Pradesh, Chandrapur, Gachilori, Bandara, and Gondia. In the Nagpur region.

Chamorshi is a town and taluka in the district of Gadchiroli, in the Nagpur region of the central provinces. The village is located on the left bank of the Wainganga River. After joining Wardha, a tributary, known as Pranahita, finally crosses the Godavari River. It is famous for the ancient temple of the history of God Markandeshwar located in the Markanda valley. The Temple is located on the banks of the Wainganga River, which normally flows from North to South but in Markanda it takes a turn 20 miles North before returning south.

Figure 1: shows the location map of the contemporary research area of Chamorshi Tahsil

Figure 2: Showing selected sampling locations of the contemporary research area of Chamorshi

2 MATERIALS

Samples of fish were collected at five selected locations namely Ankoda Pond-1, Wainganga River-2, Wainganga river-3, Pranhita River-4, and Wainganga river-5 from Chamorshi Tehsil part of Gadchiroli, in Maharashtra with the help of local fishermen using fish. Different types of nets namely gill nets, throwing nets, drag nets, and *Bhor jal*. The fish were brought to the laboratory and stored in a 10% formalin solution and completely Alcohol in a separate sample pot

depending on the size of the animal species. Small fish were added directly to 10% formalin and total alcohol.

3 Sampling and Collection of Water Samples

The purpose of this current activity is to assess the level of water from the five selected sample locations. One is Ankoda-1, Wainganga River-2, Wainganga river-3, Pranhita River-4, and Wainganga river-5 from Chamorshi in Gadchiroli district with physio-chemical boundaries and ionic. Water samples are collected from double-barreled polythene containers with a capacity of two liters in the first week of each month once, at five selected sample locations, Ankoda, Pranhita River, and Wainganga River (sample areas 2, 3, and 5) and analyzing quality parameters of water for a period of one year.

Table 1: Collection of Samples in the different sampling sites from the research extent

Collection sites	Location	Latitude	Longitude
Ankhoda Pond (Chamorshi)	East	19°42'29" N	79.49'29" E
Wainganga River (Ashti)	South	19°41'25" N	79°47'10" E
Wainganga River (Ashti)	North	19°40'37" N	79°46'58" E
Pranhita River (Chaparral)	South	19°36'30" N	79°47'27" E
Wainganga River (Markanda)	North	19°59'37" N	79°51'51" E

4 METHODOLOGY

All water quality parameters are measured in standard terms provided by APHA (1998). The water temperature was immediately recorded at the site with a mercury thermometer. TS, TDS, and TSS water samples were measured using a gravimetric method. The EC values of the sample water being investigated are measured using a Digital Conductivity meter. The pH value of a water sample is measured using a digital pH meter. Carbon dioxide is determined in exchange for NaOH using phenolphthalein as an indicator.

Salt is usually determined by exchanging water samples against a standard solution of silver nitrate using potassium chromate as an indicator. Total weight, magnesium hardness, and magnesium of the water sample were determined by complex metric titration with EDTA using Eriochrome Black T as an indicator. The severity of calcium and calcium in the water sample was determined by complex metric titration with EDTA using Murexide as an indicator. Phenolphthalein and Total alkalinities of water samples were determined by combining H_2SO_4 using phenolphthalein and methyl orange as indicators. Fluoride is measured in the form of SPADNS. Iron, chromium, and manganese are measured in Thiocyanate, Diphenyl carbazide, and persulphate respectively. SO_{42}, PO_{42}, and NO^3 are estimated to use UV optical spectrophotometer.

RESULT & DISCUSSION

Many water quality problems facing lakes and river water and freshwater fish may not be solved by the results of laboratory water quality tests, for example, a common problem of lakes and rivers and the leading cause of low-melting dissolved fish. should be measured locally, as it changes when sent to the laboratory. Similarly, water problems such as high carbon dioxide or hydrogen, sulfide cannot be detected in samples. Water quality parameters such as pH and ammonia will be influenced and converted by naturally occurring organisms into water samples in the lake and river. Results from a water testing service do not usually help to determine the cause of the fish's death.

Most water is suitable for fish production, although tolerance of different water quality limits varies between species of fish. If water is used for other purposes such as watering livestock or irrigation, be sure to check the recommended levels of various combinations of these uses. In all cases, it is important to remember that these tests do not detect all potential water quality problems such tests can be very costly. In addition, water supply features may change, so it is important to re-evaluate from time to time. This study provides informative baseline data on water quality parameters and helps to understand the pollution of the Wainganga River and Lake Ankoda and its potential impact on the ecosystem. A wide variety of fish and their distribution in the ideal area of Ashti, Gadchiroli district of Maharashtra.

This study helped to monitor and manage water quality to improve water quality by maintaining better and more sustainable management. Water quality can be improved by raising awareness among the local community about the degrading condition of rivers by making farmers aware of the proper use of fertilizers and pesticides appreciatively and developing an application to save the river and lake from extreme pollution. In many areas, it should be noted that the water quality of the Wainganga River in Ashti and the lake in Ankoda in the Chamorshi region of Gadchiroli are suitable for domestic and drinking purposes. All of this base of research space is in a remote and national and natural environment; therefore, the amount of contamination is very small. The rural area is relatively clean.

In addition, water supply features may change, so it is important to re-evaluate from time to time. The results from the water testing service do not usually help to determine the cause of the fish deaths to some extent. This study helped to monitor and manage water quality to improve water quality by

maintaining better and more sustainable management. Water quality can be improved by raising awareness among the local community about the degrading condition of the river by making farmers aware of the proper use of fertilizers and pesticides to appreciate and implement an application to save the river and lake from extreme pollution.

Most water is suitable for fish production, although tolerance of water quality varies between species of fish. If water is used for other purposes such as watering livestock or irrigation, be sure to check the optional levels of the various combinations of these uses. In all cases, it is important to remember that these tests do not detect all potential water quality problems such tests can be very costly.

In many areas, it should be noted that the water quality of the Wainganga River in Chamorshi from the Gadchiroli region is suitable for domestic and drinking purposes. The project will provide future strategies for increasing the conservation of fish stocks in the Wainganga River. Keep the fish species very important as it is not always possible to identify a particular species that is important in stabilizing the aquatic environment.

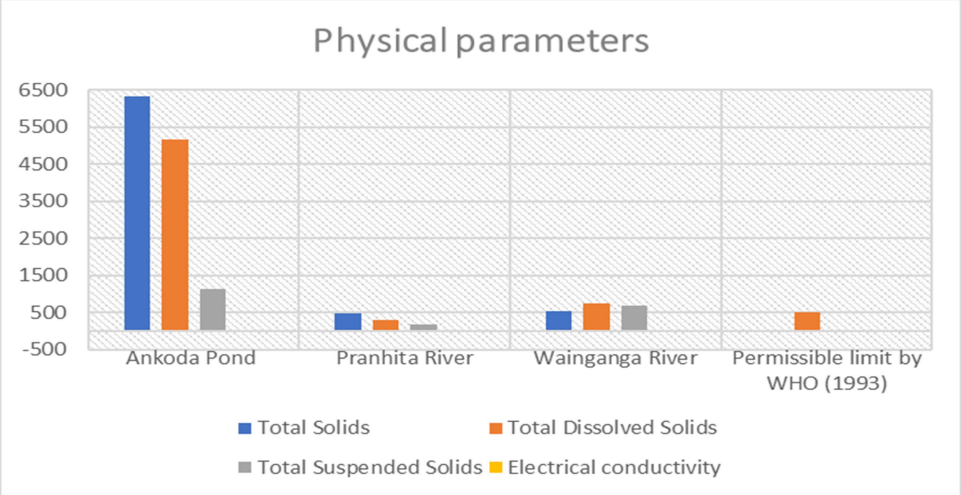

Fig. 1. Comparison of TS, TDS, TSS, EC, and WHO standard value of sampling sites

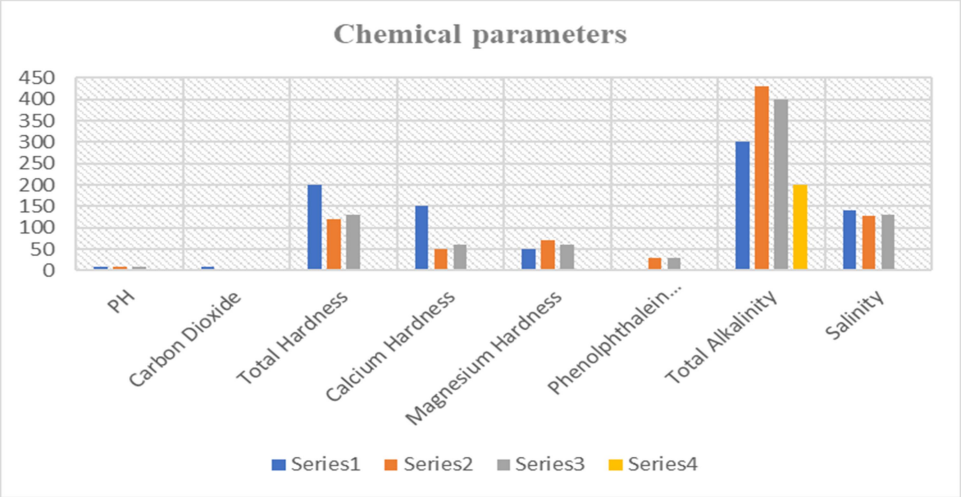

Fig. 2. Comparison of PH, CO_2, TH, CH, MH, PA, TA, and Salinity with standard values

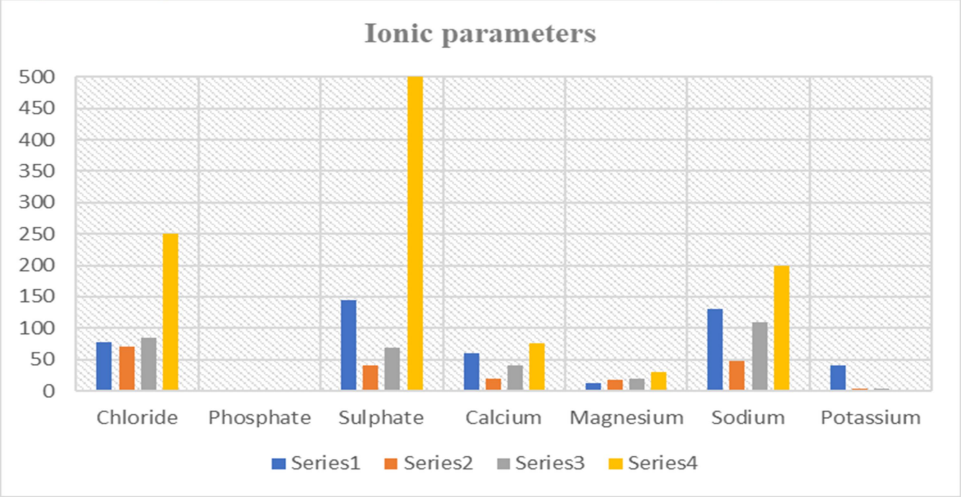

Fig. 3. The contrast of Chloride, Phosphate, Sulphate, Cal, Mag, Na, and K with standard values

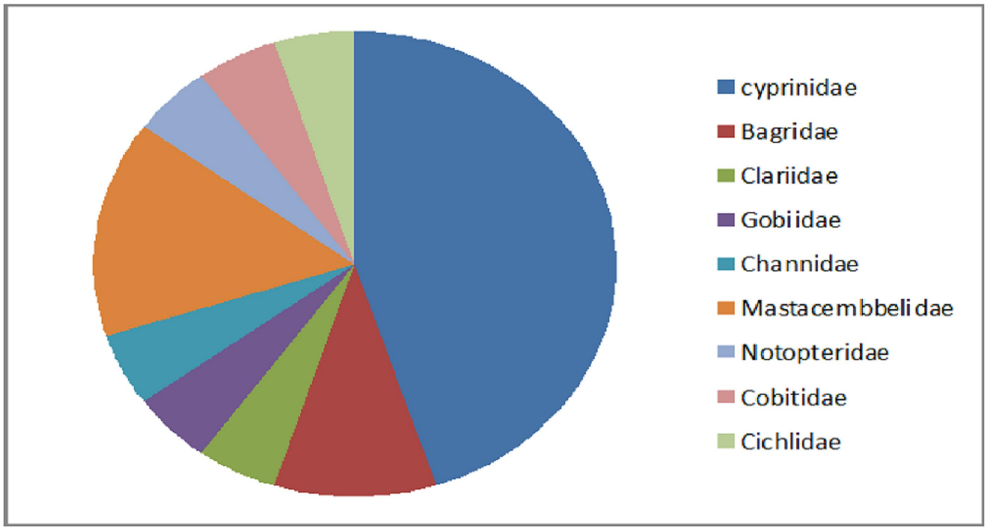

Fig. 4. Showing the ratio occurrence of fish families from Chamorshi Tahsil, Gadchiroli

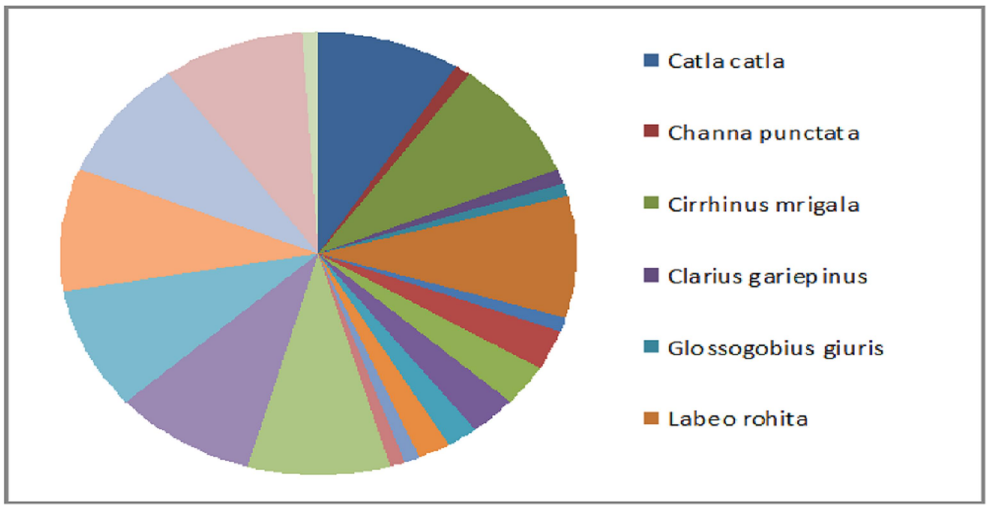

Fig. 5. Showing the portion occurrence of fish families of Wainganga River

Therefore, Ankoda pond-1, Wainganga River-2, Wainganga river-3, Pranhita River-4, and Wainganga river-5 from Chamorshi provide habitat for freshwater fish of various species. During the current investigation, 21 species of fish were found in the Wainganga River with less than 6 orders for 10 families and 15 categories. The categories and order of the fish species are given below.

Sheikh S.R. (2014) investigated the Ichthyofaunal diversity of Pranhita River, Sironcha, District of Gadchiroli; Maharashtra has noted that the Ichthyofaunal studies were conducted from June 2011 to July 2013. The current study deals with the diversity of freshwater fish in the Pranhita River. Rathod and Shinde (2012) studied the ichthyofaunal diversity of the Wainganga River in Puni revealed that 41 species of 28 different families 15 and 5 orders. Members of the Order Cypriniformes were composed of 17 species followed by Perciformes 7 followed by Siluriformes with 4 species followed by two Synbranchiformes species and one Beloniformes.

Similar results were observed by Rewatkar (2015) and colleagues during a study of Wainganga River Desaiganj (Wadsa) in the Gadchiroli District in Maharashtra. Gedekar and Tijare (2012) studied the diversity of fish in the Wainganga River in Markandeshwar and revealed that 49 species of 33 different species, 15 families, and 7 records were recorded. Parallel consequences were sawed for water quality assessment by Shaikh *et al*., (2013) at Sahastrakund Waterfall at Nanded, Maharashtra, Yannawar *et al*., (2013) at Unkeshwar Spring, Nanded in Maharashtra. And Yannawar *et.al*., (2013) also investigated the water quality at Nagzari dam of Kinwat,

Nanded and Yannawar *et al* (2013) also noticed similar activities by local pupils in the cultural eutrophication of Lonar Lake in Buldhana, Maharashtra Yannawar *et al*. (2014) Narwade et. al., (2015) and Yannawar *et al*., (2014) also entices Diversity of planktons from the Sahastrakund Waterfall in Nanded, Maharashtra, India.

CONCLUSION

The data revealed that there were a few differences in water quality in relation to their physicochemical properties, Ionic. The results obtained throughout the one-year of study showed that the water quality standard was normal and within the permissible limit as stated by ISI standards. A total of 21 species of fish are found in the Wainganga River in Ashti. 10 species are part of the carp group are economically important. The use of illegal fishing methods should be detained in this area to prevent the decline of fish stocks. Fishermen should be informed of fishing methods and scientific training methods that can help produce more fish in the Wainganga River and the Pranhita River. There is a rich diversity of fish in Maharashtra which suggests that a large part of this is threatened by human activities.

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Declaration: The authors of this manuscript do not oppose the interest.

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