

# Plankton diversity in Wardha river near Rajura in Chandrapur District of Maharashtra, India

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## Abstract

The planktons are the important source of food for the aquatic organisms. Wardha river is an important river in the Vidarbha region of Maharashtra. The study of planktons was carried out on Wardha river, near Rajura in the Chandrapur District of Maharashtra during the period of December, 2016 to February, 2017 at monthly intervals at three stations. Total 13 species of phytoplankton and 8 species of zooplankton was reported in the Wardha river, near Rajura. From this study, it may be concluded that, in Wardha river, all over the plankton diversity including phytoplanktons and zooplanktons was good. Wardha river atmosphere is favourable for the growth of planktons.

**Keywords:** Planktons diversity, Phytoplanktons, Zooplanktons, Wardha river.

## 1. Introduction

Planktons are the floating organisms in the water body. Any undesirable change in the aquatic ecosystem may affect on the diversity and biomass of the plankton community [1]. Planktons are serves as an important food item for the fishes and many other aquatic organisms. Planktons encountered in the water body reflect the existed ecological characteristics and therefore, planktons may be used as indicator of the water quality [1,2]. In hill streams, a great variation in the composition of plankton occurred not only in different regions at different depths but also at different periodically time scales and seasons. The majority of phytoplanktons are non-motile

and very sensitive to change in the environmental conditions due to water turbulence along with other ecological factors in the upper water masses and contributed alternation in the existed aquatic habitats [3]. The conditions that leads to maxima and minima as well as to minor fluctuations in the abundance of phytoplankton are complex in their physical, chemical and biological characteristics [4].

Rajura is a Tahsil place in Chandrapur District of Maharashtra, India. It lies on the bank of Wardha river and falls in the Coal belt of Central India. Due to availability of minerals and raw materials in this area, there are number of Cement factories near the Rajura City including Ambuja Cement Factory, Ultra-tech Cement Factory, Manikgarh Cement Factory, Gadchandur, etc. WCL (Western Coal-fields Limited) at Ballarpur area is another major employer in this area.

Wardha river is a biggest river in Vidarbha region of Maharashtra. It joins to Wainganga River near Chamorshi in Gadchiroli District and forms the Pranhita river at Adilabad District in Telangana State. The river is a good habitat of fishes, planktons and plants. The main objective of this study is to analyze the plankton diversity (Phytoplankton and Zooplankton) of Wardha river near Rajura in the Chandrapur District of Maharashtra.

## 2. Materials and Method

The present study was conducted at Wardha river near Rajura for a period of three months from December, 2016 to February, 2017. The plankton samples were collected from the three different sites at Wardha river in the morning hours at monthly interval basis. For the collection of Zooplanktons, the plankton net was used. For this 100L water was filtered through the plankton net and preserved in 4% formalin. For phytoplanktons, water samples was collected and preserved in the Lugal's iodine. Samples were brought in the Laboratory and analyzed them under electron microscope by using plankton key.

## 3. Results

The plankton diversity of Wardha river is shown in Table-1 (Phytoplankton) and Table-2 (Zooplankton).

Table 1 shows the Phytoplankton diversity of Wardha river. In Upstream Station, only 2 species, viz., Phormidium species and Hydrilla species was found while in Downstream Station, total 11 species were found. These are Volvox species, Chlorella species, Spirogyra species, Anacystis species, Chlorococcus species, Phormidium species, Diatoms species, Cyclotella species, Cymbella species, Hydrilla species, *Euglena acus* species. Thus, total 13 species of Phytoplanktons was reported in the Wardha river.

Table 2 shows the Zooplankton diversity of Wardha river. Total 8 species of Zooplankton was reported. In this, Cyclopes were abundant, rare species were Arcella, Bursaria, Vorticella, Branchious, Daphnia and Basmina. Only 2 species of zooplankton were common. These are Arcella and Trichocerca.

As the rivers are important systems of biodiversity and are among the most productive ecosystems on the earth because of the favourable conditions that supports the number of flora and fauna. They plays a vital role in the productivity as they are beset with varieties of flora and fauna including planktons [1]. Belkhole and Sitre [2] was studied phytoplankton diversity of Dham river in Wardha District of Maharashtra and their results shows that the river Dham is rich with phytoplankton and found 36 different species of phytoplanktons. Mithani and Dahegaonkar [5] had studied the phytoplankton diversity in Wardha river, near Ballarpur, Maharashtra. They found 51 species of phytoplanktons which includes Cynophyceae, Euglenophyceae, Bacillariophyceae and Chlorophyceae. Pandit *et al.* [6] was observed the ecology and diversity of Zooplankton of the river Ganga at Bihar in relation to its water quality.

**Table-1: Phytoplankton diversity in Wardha river.**

Sr. No.	Class and Species	Presence in Upstream Station	Presence in Downstream Station
1	<b>Chlorophyceae:</b> Volvox species, Chlorella species, Spirogyra species	- - -	+ + +
2	<b>Cyanophyceae:</b> Anacystis species, Chlorococcus species, Phormidium species	- - +	+ + -
3	<b>Bacillariophyceae:</b> Diatoms species Cyclotella species Cymbella species	- - -	+ + +
4	<b>Hydrocharitaceae:</b> Hydrilla species	+	+
5	<b>Euglenophyceae:</b> <i>Euglena acus</i>	-	+
	<b>Total species present in Wardha river water:</b>	2	11

**Table-2: Zooplankton diversity in Seasonal abundance.**

Sr. No.	Taxon	Season		
		Summer	Monsoon	Winter
1	<b>Protozoan:</b> Arcella species, Bursaria species Vorticella species	+ ++ ++	+ - -	+ + +
2	<b>Rotifera:</b> Branchionus Trichoceraca	++ +	- -	+ ++
3	<b>Cladocera:</b> Daphnia Basma	++ ++	- -	- ++
4	<b>Copepoda:</b> Cyclops	+++	-	+

[+++; Abundant; ++; Rare, +; Common; -; Absent]

Their result was indicated the zooplankton diversity from moderate to high. Singh and Goswami [7] had made studies on diversity and seasonal variations of plankton communities after major flash flood in the

river Mandakini of Garhwal, Himalaya and they found that water parameters like total alkalinity, temperature, transparency, dissolved oxygen, free carbon dioxide etc. affects on the diversity of plankton in the river. Patki [8]

reported 19 genera of phytoplankton and 6 genera of zooplankton diversity in Wardha river near Pulgaon, Maharashtra. Sarwade and Kamble [9] was studied the plankton diversity in Krishna river near Sangali, Maharashtra. In his study, they found 53 species of phytoplanktons and 25 genera of zooplanktons. Rotiferans were dominant with 9 diversified species. Kumar *et al.* [4] observed the spatial variation in phytoplankton diversity in the Sabarmati river at Ahmadabad, Gujarat. Their study revealed the occurrence of 48 species of phytoplankton in the river. Krishnamurthy and Reddy [3] was observed the phytoplankton diversity in the drift of tropical river Tunga in Western Ghats. In his study, they found that the phytoplankton in drift is dominated by the members of Chlorophyceae and Bacillariophyceae with 31 and 24 forms respectively. In the present study, total 13 species of phytoplankton and 8 species of zooplankton was reported. In Upstream Station, only two species, viz., Phormidium species and Hydrilla species of phytoplankton was found while in Downstream Station, total 11 species were found. These are Volvox species, Chlorella species, Spirogyra species, Anacystis species, Chlorococcus species, Phormidium species, Diatoms species, Cyclotella species, Cymbella species, Hydrilla species, *Euglena acus* species. Thus, total 13 species of Phytoplanktons was reported in the Wardha river. In zooplankton diversity, total 8 species was reported. In this, Cyclopes were abundant, rare species were Arcella, Bursaria, Vorticella, Branchiura, Daphnia and Basmina. Only two species of zooplankton were common. These are Arcella and Trichocerca. As per the study of Thakur *et al.* [10], the distribution of plankton species depends upon the physico-chemical parameters of the environment.

## 4. Conclusion

From this study, it may be concluded that:

1. In Wardha river, the plankton diversity was good.
2. The phytoplanktons were good in number.
3. The zooplankton analysis shows that, the total zooplankton density was more during the period of study (December, 2016 to February, 2017) due to winter

season as the low temperature is favourable for the growth of planktons.

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**Conflicts of interest:** The author stated that no conflicts of interest.

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