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### A Study of Physical Parameters of Water Samples from Bhima River, Pune City and Their TDS, Conductivity

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#### ABSTRACT

It is crucial to be aware of the drinking water resources' quality in rural areas. Hydro-geochemical studies are becoming more important for the use of groundwater because there has been a rise in the demand for water recently due to population growth and intensive agricultural operations. One of the major environmental health risks is the quality of drinking water. The use of clean drinking water is the cornerstone of controlling and preventing diseases that are transmitted by water. In this study, it has been determined whether the water quality of Bhima river is suitable for drinking purposes or not. Eight samples were collected from different Locations; each sample was examined for Physiochemical parameters. The Central Water Commission, World Health Organization, and CPCB (Central Pollution Control Board of India) protocols were followed for doing the water's Physiochemical Analysis. Water quality standards and a number of parameters, including pH, Dissolved Oxygen (DO), Chemical Oxygen Demand (COD), Temperature, Specific Conductivity, and Total Dissolved Solid, were examined. The pH ranged from being very basic to barely neutral in all of the samples. Among samples, there had been differences in TDS, temperature, pH, and conductivity. The investigation of the river water revealed that it cannot be used as potable water.

**Keywords:** *Physical Parameters, TDS, Conductivity, Bhimashankar, Bhima River.*

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#### INTRODUCTION

The Bhima River is the origin from Bhimashankar. It flows as the Bhima River in the metropolitan region. The water from river was only used for residential, agricultural, and irrigation purposes throughout their original journeys. For the villagers living along the river's edge back then, the river was their only source of drinking water. However, due to the rapid industrialization and civilization, the river's importance was transformed, and instead of being used for its original purposes of providing water, the river was made into a place for the Knowledgeable Research Vol.1, No.9, April 2023. ISSN: 2583-6633, Archana Dada Memane & Arti Dattatray Sutar.

disposal of sewage wastes and unnecessary materials. The river now resembles a canal conveying wastewater to the purification unit as a result of the mixing of undesired items into the water body; ordinarily, this type of situation was observed in the summer. Large amounts of fertilizers and pesticides are released into the river water as a result of agricultural run-off. In general, fresh water is a good resource that is necessary for human existence, agriculture, and industry. Fresh water is currently one of the key factors in healthy development. According to a literature review, the discharge of sewage and other types of effluents into the river body causes close to 70% of the surface water in our country to become contaminated. Water becomes contaminated as a result of human activity. One can gain a sense of the quality of the water by looking at its physical, chemical, and biological characteristics. Therefore, it is crucial to continuously evaluate the drinking water's purity.

### MATERIALS & METHODS

Collection of Sample Eight samples was taken from various Bhima River sample stations. American Public Health Association guidelines for additional physiochemical parameter evaluation were used to collect the water samples in triplicate in plastic containers (1995). The entire list of the criteria used for the analysis is provided in (Table 1). Water analysis for eight samples taken from different locations along the Bhima River for the month of April 2023 was done, and the results are shown in.

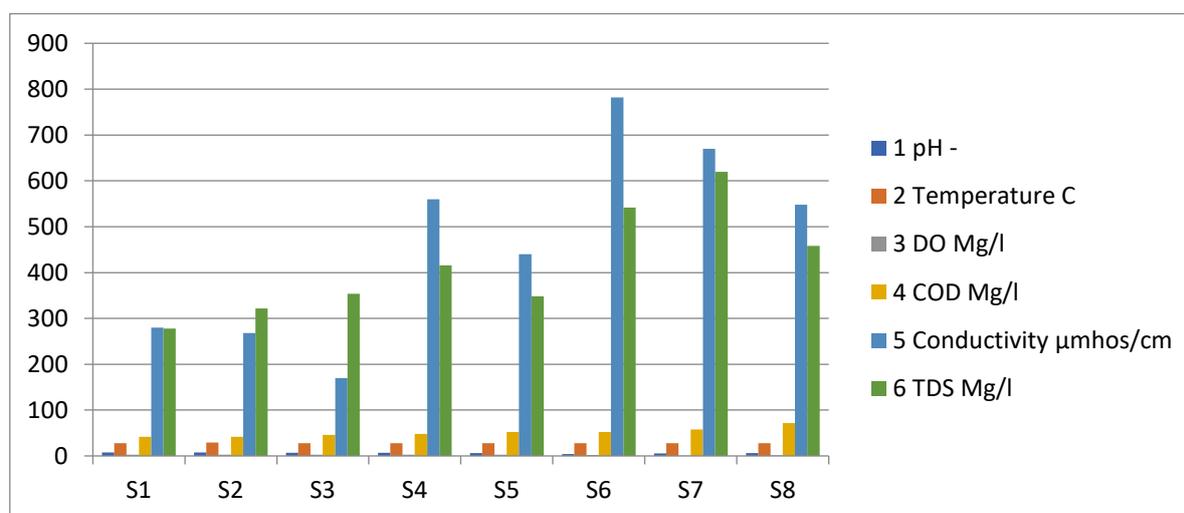
**Table 1. Chemical evaluation of water samples: parameters and methods**

Sr. No.	Parameter of water analysis	Methods
1.	pH	pH Metry
2.	DO	Azide modification
3.	COD	Dichromate reflux
4.	Temperature	Glass Thermometer
5.	Conductivity	Conductivity meter
6.	TDS	Gravimetric

**Table 2. Physicochemical Characteristics of Eight Samples in Bhima River**

Sr. No.	Parameter of water analysis	Units	S1	S2	S3	S4	S5	S6	S7	S8
1.	pH		7.54	7.42	7.10	6.84	6.40	4.22	5.50	6.10
2.	Temperature	C	28	29	28	28	28	28	28	28
3.	DO	Mg/l	2.41	2.43	2.8	2.9	2.4	2.2	0.8	1.6
4.	COD	Mg/l	42	42	46	48	52	52	58	72
5.	Conductivity	µmhos/cm	280	268	170	560	440	782	670	548
6.	TDS	Mg/l	278	322	354	416	348	542	620	458

### Result and Discussion



### Water Analysis Graphical Representation

It is discovered that the pH of the river water is in the range of 4.22 to 8.0 by examining the river water quality for these ten criteria. With the exception of S6, S7, and S8, all other pH values were somewhat basic, while S5 was neutral. It demonstrates that the river water is below Indian requirements at sampling stations S6, S7, and S8. I.e. acidic in nature. The detected pH at sampling station number 1 is 7.54, and this higher value shows that the domestic load has been mixed with the river's water body. The temperature of Water is a crucial factor that directly affects various chemical processes in aquatic ecosystems. The temperature of the water was found to be in the range between 28oC to 29oC. The observed range of DO in the presented water sample was between 0.8 mg/L and 2.4 mg/L. According to Indian standards, the acceptable DO range is 6 to 7.00 mg/L. However, in our situation, the

DO level falls short of Indian guidelines. It might be because of detergents, human waste discharged into the environment, and organic waste produced by the food, paper, and pulp industries. The research area's chemical oxygen requirement was found to be between 42 and 73 mg/l, which is higher than the 250 mg/L permissible limits prescribed by Indian guidelines. Here observed values of COD show that the pollution level is at increased. There would be 172 to 784 mhos/cm of conductivity. S6 exhibited the highest conductivity. Inorganic dissolved particles including chloride, nitrate, sulphate, and phosphate, in addition to sodium, magnesium, calcium, iron, and aluminum, have an impact on conductivity in water. The range for total dissolved solids is 280 to 620 mg/l due to Chemicals from sewage treatment, pesticides, road salts, and/or fertilizers, which can also be dissolved in water, and contaminate both drinking supplies and bodies of water. High total dissolved solids frequently have a negative impact on mobility.

### CONCLUSION

After analyzing all the parameters of Bhima river water, it is observed that some samples of river water did not exceed the maximum permissible limit given by WHO. Some of the parameters are showing higher values at some stations because the river enters the Pune city and the quality of the river water has changed as a result of the mixing of sewage water with industrial effluents and agricultural runoff. Water is therefore unfit for any residential or other applications. The first mixing of sewage water should be avoided, and river water should be regularly monitored, in order to reduce contamination levels.