

Analyze the TDS, conductivity, and other physical characteristics of water samples from Matoba Lake, Pune.

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Abstract: It is critical to be knowledgeable about the quality of drinking water resources in rural areas. Because of the recent increase in water demand brought on by population development and intensive agricultural practices, hydro-geochemical studies are becoming more significant for the usage of groundwater. The quality of drinking water is one of the main environmental health risks. Controlling and avoiding diseases that are spread by water start with using clean drinking water. This study has established whether the Matoba Lake water quality is suitable for drinking or not. Six samples were taken from various locations, and the physiochemical properties of each sample were checked. The physiochemical analysis of the water was conducted in accordance with the guidelines set forth by the Central Water Commission, the World Health Organization, and the Central Pollution Control Board of India. Standards for water quality and other variables, such as pH, Dissolved Oxygen (DO), Chemical Oxygen Demand (COD), Temperature, Specific Conductivity, and Total Dissolved Solid, were looked at. All of the samples had pH values that ranged from being extremely basic to slightly neutral. There were variations in TDS, temperature, pH, and conductivity between samples. The water in the river, according to the investigation, cannot be used to make drinking water.

Keywords: Water sample, conductometer, TDS meter, PH meter, dissolved oxygen meter.

Introduction

The Matoba Lake designed for storing surplus water from the mutha canal and reacting the track of land lying between the tank and Mutha River has an area of 470 acres and a capacity of 229 million cubic feet. The Earthworks of the dam were commenced for the employment of the people during the famine of 1876-77. For eighteen months they afforded employment for on an average 3,000 people of all ages the highest number on any one day being 8,300 the expenditure was Rs 1, 98,000 and wages and charitable relief and value do the work executed was Rs 1, 40,000. The tank was completed and open for irrigation in October 1878.

Materials & Methods:

Collection of Sample six samples was taken from various Matoba lake 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 six samples taken from different locations along the Matoba for the month of August 2023 was done, and the results are shown in.

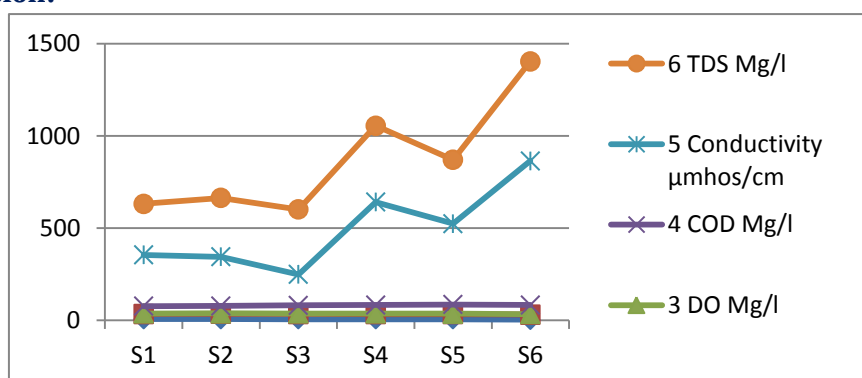
Table 1. Chemical evaluation of water samples: parameters and methods.

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 Six Samples in Matoba Lake.

Sr. No.	Parameter of water analysis	Units	S1	S2	S3	S4	S5	S6
1.	pH	-	6.54	6.42	6.10	5.84	5.40	3.22
2.	Temperature	C	28	29	28	28	28	28
3.	DO	Mg/l	2.31	2.33	2.7	2.8	2.3	2.1
4.	COD	Mg/l	40	40	44	46	50	50
5.	Conductivity	µmhos/cm	278	266	168	558	438	780
6.	TDS	Mg/l	276	320	352	414	346	540

Result and Discussion:



Water Analysis graphical representation

By looking at the river water quality for these ten parameters, it is found that the pH of the lake water is between 3.22 to 7.0. All other pH readings were relatively basic, with the exception of S6, S7, and S8, while S1 was neutral. It reveals that the lake water at sample stations S2, S3, S4, S5, and S6 is below Indian standards. I.e., naturally acidic. The lake water body has been combined with household load, as evidenced by the pH reading of 7.54 at sampling station number 1. A significant element that directly influences a number of chemical processes in aquatic habitats is water temperature. Water's temperature was discovered to be between 28 and 29 degrees Celsius. . The provided water sample's DO concentration was found to range between 0.8 mg/L and 2.4 mg/L. The allowable DO range, as per Indian norms, is between 6 and 7 mg/L. The DO level, however, falls short of Indian standards in our case. Detergents, human waste released into the environment, and organic waste created by the food, paper, and pulp industries could all be to blame. The chemical oxygen requirement for the research region was discovered to be higher—between 42 and 73 mg/l—than the 250 mg/L permitted limit set by Indian regulations. The provided water sample's DO concentration was found to range between 0.8 mg/L and 2.4 mg/L. The allowable DO range, as per Indian norms, is between 6 and 7 mg/L. Though 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 aluminium, have an impact on conductivity in water. The range for total dissolved solids is 280 to 620 mg/l it is due the Chemicals from sewage treatment,

pesticides, and road salts, and/or fertilizers, 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 matoba lake water, it is observed that some samples of lake water did not exceed the maximum permissible limit given by WHO. Some of the parameters are showing the higher values at some stations because of 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.

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