Water quality assessment of Khani lake, Ambarnath, Maharashtra

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***Abstract*: Water is an integral part of our life and has been well recognized as nectar. The physical and chemical properties of water make it a reliable source throughout the world. Demand for clean water increases continuously with world population growth. People in several areas of the world, not have fresh, potable water essential to their survival. Therefore, conservation and management of water is necessary for the general well-being of all life. Khani /Khadan lake from Ambarnath selected for study purpose, water sample collected from November 2022 to February 2023.Water samples were collected from selected sampling sites during the study period and analysed for different physicochemical parameters like color, Temperature, pH, Electrical Conductivity, Total Hardness, and Turbidity. Obtained results were compared with WHO and BIS standards. All parameters were found within the permissible limits given by BIS and WHO except for turbidity. Color, Total hardness, Turbidity in water samples indicates pollution of water by manmade activities.**

***Keywords*: nectar, conservation, physicochemical, manmade activities**

INTRODUCTION: Water is a very important resource, which is used for number of uses, like domestic use, agricultural use, industrial use etc. It is very important for sustenance of life. Water is present only on earth. This source, therefore, needs to be protected. However, in the world scenario, the picture is different. Under the name of development, this vital source gets polluted by man-made activities. According to the scientists of National Environmental Engineering Research Institute, Nagpur, India, about 70 % of the available water in India is polluted (Pani, 1986).

Man has been using water bodies around him for dumping wastes. In the early stages of human history, domestic discharges probably pose no problem as nature has the capacity to degrade waste and restore normal conditions. Nature still does, but continuous industrialization and urbanization overload the tolerance limit of nature. Man is adding different kinds of wastes into nature; which are not bio-degradable, therefore our water bodies getting polluted threaten the safety of rivers, streams and lakes (Mishra, 2005).

Pollution of water is the natural, physical and chemical change due to human activity, so that water is no longer fit for use; for which it had previously been suited. Groundwater pollution problem now a day has become a severe threat to public health (Pitchaiah, 1995).

Khani /Khadan lake situated in Kohojgaon of Ambarnath town from Maharashtra, water samples collected from November 2022 to February 2023. An attempt has been made to find out the water quality of Khani /Khadan lake.

METHODOLOGY:

Water samples were collected from selected area of Khani /Khadan lake from November 2022 to February 2023. Sample was collected in 2 lit. Capacity of clean polythene bottles. The bottle was rinsed with the water to be taken for analysis. Tightly sealed after collection and labelled in the field area. Collected sample was analysed for following parameters Temperature, pH, Electrical Conductivity, Total Hardness and Turbidity. The temperatures, pH of the water sample was determined on the spot using a Thermometer and Portable pH meter respectively. Conductivity measured by Conductivity meter. Total hardness was measured by EDTA titrimetric method using EBT indicator. Turbidity measured by Turbidometer. (APHA 2005;Trivedi and Goel1986) The quality of groundwater has been assessed by comparing each parameter with the standard desirable limits prescribed by BIS and WHO.

RESULTS & DISCUSSION:

After analysis obtained results are shown in table no.1 and further it was compared with the BIS and WHO standards from table no.2.

Table No.1 – Water sample collected from November 2022- February 2023

Month	Color	Temperature (^{0}C)	pH	Electrical Conductivity (µS/cm)	Total Hardness (mg/l)	Turbidity (NTU)
Nov	Blackish brown	22	7.5	210.5	280	8.6
Dec	Blackish brown	20	7.8	226.4	279	8.8
Jan	Blackish brown	21	7.6	218.8	286	8.2
Feb	Blackish brown	22	7.7	236.6	290	8.8

Table No.2: Drinking water standards

Sr. No.	Parameters	BIS (IS 10500-91)		WHO
		Desirable Limit	Max. permissible Limits in the absence of alternate source	
1	Temperature (^{0}C)	-	-	-
2	pH	6.5 to8.5	No relaxation	6.5 – 8.5
3	Electrical Conductivity (µS/cm)	-	300	-
4	Total hardness as $CaCO_3$(mg/l)	200	600	500
5	Turbidity (NTU)	-	5	5

Color-Water sample shown blackish brown color, which is an indication of contamination of water by manmade activities, possible reasons may include effluent discharge from nearby industrial area, sewage discharge from residential area.

Temperature-Temperature ranges from 20^{0}C to 22^{0}C during study period. Highest temperature was observed in November and February. Temperature of water changes seasonally with air temperature(Carr,2006).

pH- pH ranges from 7.5 to 7.8 during study period. All the samples were found within the desirable limit given by BIS and WHO. In the month of December highest pH was observed. Disposal of industrial wastes, acid mine drainage etc. activities show significant changes in pH. (Trivedi and Goel, 1986).

Conductance-Conductance was ranged from 210.5 to236.6 µS/cm during study period. Highest conductance was observed in the month of February 2023 i.e.236.6 All samples were found within the permissible limits given by BIS.

Completely pure water is a poor conductor of electricity. Water shows higher conductivity when dissolved salts are present. The conductivity is proportional to the amount of salts dissolved in water (Jameel, 2002).

Total Hardness- Total hardness ranges from 279 to 290 mg/l during study period. At station no.S1, highest hardness observed in the month of February. During study period all samples were found above the desirable limit given by BIS, i.e.200mg/l, but all the samples were found within the permissible limit given by BIS and WHO i.e.600 and 500 respectively. Hardness in water has no known adverse effects; still such water is not fit for domestic use. A hardness of more than about 200 mg/l causes scale deposits in the piping system, which depending on parameters such as alkalinity and pH (Van der, 2003; Khodapanah *et.al.,* 2009).

Turbidity- Turbidity in study area ranges from 8.2 to 8.8 NTU during study period . All samples were found above the permissible limit given by BIS and WHO i.e.5 NTU. Highest turbidity was observed in the month of December and February. Turbidity in water may be due to suspended particles, which imparts Turbidity to water. Leaching of organic matter, industrial, domestic wastes etc., contribute for turbidity in water samples. Inorganic nutrients such as nitrogen and phosphorus present in agricultural runoff stimulate the growth of algae, which also added to turbidity (Sawyer *et.al.,* 2000). Surface water temperature

increases because of turbidity, and it leads to thermal stratification, this problem occurs in rivers, lakes and downstream reservoir (Jameel *et.al.,* 2007).

CONCLUSION:

water samples collected from Khani/Khadan lake, Ambarnath were found within the permissible limit given by BIS and WHO for different parameters, except the turbidity. Slight season wise variations observed during study period.

blackish brown color indicates water is contaminated, not suitable for any use. Turbidity was detected above the permissible limit given by BIS and WHO. The probable reasons behind the turbidity of water are: lack of maintenance in lake area; negligence of surrounding of lake, discharge of solid waste material in lake area due to manmade activities like throwing of solid waste material around and inside lake; immersion of Idol and mixing of soil and silt particles. Turbidity is an indication of contamination of water to a certain extent. Other parameters were found within the permissible limit. Use of lake water is not suitable for any purpose.

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