

## PHYSICOCHEMICAL ANALYSIS OF TRIVENI LAKE WATER OF AMRAVATI DISTRICT IN (MS) INDIA

Rafiullah M. Khan, Milind J. Jadhav<sup>1</sup> and I. R. Ustad<sup>1</sup>

Dept. of Botany,  
Kohinoor Arts, Commerce and Science College Khuldabad, Dist. Aurangabad- 431101  
<sup>1</sup>Dept. of Botany and Zoology,  
Sir Sayyed College, Roshan Gate Area, Aurangabad- 431001 (M.S.).  
dr.mjadhav@gmail.com

### ABSTRACT

In order to understand the water quality of Triveni Lake, Physicochemical parameters were studied and analysed for the period of one year i.e. December 2010 to November 2011. Various physicochemical parameters, such as water temperature, air temperature, pH, humidity, conductivity, free Co<sub>2</sub>, total solid, dissolved oxygen, Total alkalinity, Total hardness, CaCO<sub>3</sub>, Ca<sup>++</sup>, Mg<sup>++</sup> were studied. The results revealed that there was significant seasonal variation in some physicochemical parameters and most of the parameters were in normal range and indicated better quality of lake water. It has been found that the water is best for drinking purpose in winter and summer seasons.

**Key words:** Physicochemical parameters, Triveni Lake, water quality.

### INTRODUCTION

Water is the most important in shaping the land and regulating the climate. It is one of the most important compounds that profoundly influence life. The quality of water usually described according to its physical, chemical and biological characteristics. Rapid industrialization and indiscriminate use of chemical fertilizers and pesticides in agriculture are causing heavy and varied pollution in aquatic environment leading to deterioration of water quality and depletion of aquatic biota. Due to use of contaminated water, human population suffers from water born diseases. It is therefore to check the water quality at regular interval of time.

The present investigation involves the analysis of water quality in relation to physicochemical parameters. Triveni lake of Amravati district of Maharashtra was selected for physicochemical analysis of water. The lake is source of drinking and irrigation water for 15 villages under the canal irrigation. Now a day's lake water was polluted due to domestic waste and agricultural discharges. Physicochemical parameters of Triveni lake water were studied and analyzed for the period of one year i.e. December 2010 to November 2011. In India many researchers have worked on physicochemical and biological characteristics of reservoirs and rivers (Trivedy and Goel, 1986; Jakher *et al.*, 1990; Kodarkar, 1992; Subba Rao, 1993; Patil *et al.*, 2003).

### MATERIALS AND METHODS

The surface water samples from Triveni Lake were collected from two sampling stations during 10.30 am to 12.30 pm. Samples were collected at monthly interval in plastic cans of two litres capacity. Water temperature, Air temperature, pH and Humidity recorded at sampling station. Collected water samples were brought immediately to the laboratory for the estimation of various physicochemical parameters like, Conductivity, Total solid, Dissolved oxygen, Total Alkalinity, Total hardness, CaCO<sub>3</sub>, Ca<sup>++</sup>, Mg<sup>++</sup>. Physicochemical parameters were analysed as per standard methods (Trivedy and Goel, 1986; Saxena, 1990; APHA, 1992; Diwakar, 1995 and Gupta, 2007).

### RESULTS AND DISCUSSION

The physicochemical parameters of the Triveni Lake have been given in the Table 1. The physicochemical features of Triveni lake water were influenced due to the discharge of domestic waste and agriculture at discharges. The atmosphere temperature was recorded between 22 °C to 31°C. The temperature is one of the important factors in aquatic environment since it regulates physicochemical as well as biological activities (Kumar *et al.*, 1996). The water temperature was recorded 21 °C to 30 °C. Higher temperature was recorded in May 30 °C.

The Water temperature of Pethwadaj dam was recorded by Pawar and Phulle (2005). The atmospheric humidity of Triveni lake site was ranged between 48.37% to 75.03 %. Maximum humidity was recorded in monsoon and minimum was recorded in summer season. This is in agreement with the finding of Ahmad and

Krishnamurthy (1990). They observed the Wohar reservoir. The pH of Triveni lake water was slightly alkaline. pH value being greater than 7 at both stations. Minimum pH was recorded in August (7.54) and maximum in the month of December (8.42). Significant changes in pH occur due to discharge of agricultural and domestic waste.

**Table 1: Physicochemical parameters analysis of surface water Triveni lake from December 2010 to November 2011**

Parameters	Dec.	Jan	Feb	Mar.	Apr.	May	June	July	Aug	Sept.	Oct.	Nov.
Water Temp.	21.55	22.10	23.47	24.28	26.18	29.92	28.97	27.23	27.14	24.32	22.55	24.92
Air Temp.	23.35	24.51	25.78	26.91	28.68	31.90	31.32	29.48	29.26	29.38	24.35	22.90
Humidity	72.02	71.92	69.97	61.55	52.10	48.37	51.70	68.07	75.26	63.68	49.37	60.26
Conductivity	235.73	201.86	232.00	229.80	236.00	286.76	215.30	195.40	212.13	186.83	189.83	183.76
Free CO <sub>2</sub>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
pH	8.42	8.40	8.13	7.96	7.89	7.33	7.88	7.82	7.54	7.83	7.64	7.42
Total Solid	167.70	148.75	157.03	150.40	173.58	182.17	190.80	188.40	196.42	199.18	149.75	198.18
Dissolved oxygen	8.38	8.08	7.75	7.35	7.53	7.47	7.63	7.77	7.48	7.48	7.45	7.38
Total Alk.	115.50	120.33	109.33	122.17	190.25	232.33	197.33	126.33	120.50	115.00	109.83	115.33
Total Hard	98.16	99.00	104.69	102.50	140.25	193.67	165.00	100.00	80.00	69.33	69.53	67.67
CaCO <sub>3</sub>	61.15	58.25	57.33	59.20	63.35	68.33	63.77	65.78	47.62	38.70	39.70	45.33
Ca <sup>++</sup>	24.69	23.32	22.75	23.7	25.37	27.36	25.54	26.61	19.07	15.49	17.49	23.00
Mg <sup>++</sup>	8.99	9.90	11.45	10.52	18.74	30.45	24.59	8.31	7.87	7.44	7.84	8.45

In present study conductivity values range from 186.76 to 286.76  $\mu\text{hos}/\text{cm}$ . The dissolved oxygen concentration ranged from 7.35 to 8.38 mg/lit. Dissolved oxygen was minimum in March and maximum in December. Earlier workers also observed similar trend of dissolved oxygen in fresh water lakes. (Bhatt *et al.*, 1998 Pandey, 1993). The total solids in the lake water fluctuated in the range of 148.75 to 199.18 mg/l. Musaddiq and Fokmare (2002) observed values of total solids ranged with in 45 to 152 mg/lit. of surface water in Akola city.

Total alkalinity of the lake was varied from 109.32 to 232.33 mg/lit. and maximum the minimum value was recorded in February and the maximum in May. Das and Chand (2003) recorded low alkalinity during monsoon, which might be due to dilution effect of rainfall. Katariya *et al.*, (1996) have measured maximum value of alkalinity due to confluence of industrial and domestic waste. Our results are in well agreement with the findings of above authors. Sakare and Joshi (2003) found the alkalinity values from 672 to 1023 mg/lit. in Papnas in minor wetland in Tuljapur town, in Maharashtra.

Total hardness in water is the sum of concentration of alkaline earth metal cation such as Ca<sup>++</sup>, Mg<sup>++</sup>. The total hardness is the total soluble magnesium and calcium salts present in the water expressed as its CaCO<sub>3</sub> equivalent. Total hardness also includes the sulphates, chlorides of calcium and magnesium. In most natural water the predominant ions are those of bicarbonates associated mainly with calcium to lesser degree with magnesium and still less with sodium potassium. The total hardness of Triveni Lake found the range from 69.33 to 193.67 mg/lit. In Harsal dam it was from 83.8 to 178 mg/lit (NEERI 1987), minimum values was recorded during monsoon. Mishra and Saxena, (1992) reported high values of 295 mg/ lit. in Ganga river.

## CONCLUSION

The result revealed that there was significant seasonal variation in some physicochemical parameters and most of the parameters were in the normal range and indicates better quality of lake water.

## LITERATURE CITED

- Ahmed M and Krishnamurthy R, 1990.** Hydrobiological studies of Wohar Reservoir Aurangabad (Maharashtra state). *Indian J. Environ. Biol.*, **11**(3): 335-343.
- APHA, 1998.** Standard methods for the examination of waste water. *American public Health Association*, Washington D.C 874.
- Bhatt LR, P Lacoul, HD Lekhak and PK Jha, 1999.** Physico-chemical characteristics and phytoplankton of Taudaha lake, Katmandu, *Poll. Res*, **18** (4):353-358.
- Das SK and BK Chand, 2003.** Limnology and biodiversity of Ichthyofauna in a pond of Southern Orissa. *India. J. Ecotoxicol Environ. Monit.*, **13**(2):97-102.
- Diwakar PG and Ansari AA, 1995.** Flowering plants of Lonar Lake National monument - check list. *J. Econ. Tax. Bot.*, **19**(1):1-8.
- Gupta OP, 2007.** Weedy aquatic plants and their Utility Menace and Management. *Publ. Agrobios India*: 31.
- Jakhar GR, SC Bhargava and RK Sinha, 1990.** Comparative limnology of Sambar and Didwana lakes. *Geobiology*.
- Kataria HC, SA Iqbal and AK Shandilya, 1996.** Limno-chemical. Studies of Tawa Reservoir. *IJEP*. **16**(11): 841-846.
- Kodarkar MS, 1992.** Methodology for water analysis. Physico-chemical, Biological and Microbiological Indian Association of Aquatic Biologists Hyderabad; pub, 2: pp50.
- Kumar A, HP Gupta and DK Singh, 1996.** Impact of sewage pollution on chemistry and primary productivity of two fresh water bodies in Santal Paragana (BIHAR) INDIA *J. Ecol.* **23**(2): 82-86.
- NEERI, 1987.** A laboratory manual on water analysis.
- Mishra SR and Saxena DN, 1992.** Aquatic Ecology ashish publishing house, New Delhi.
- Mohammad Musaddiq and Anil K Fokmare, 2002.** Determination of water quality index of surface water source of Akola city (M.S.), *J. of Aquatic Biology*, **18** (2):27-28.
- Pandey DK, 1993.** Water quality evaluation of lentic ecosystem of central Himalaya at bimonthly interval *Indian J. Environ protection*, **13** (1):10-14.
- Patil S and JM Patwari, 2003.** Ground water quality from Prarava area, district Ahmednagar (M.S.). *J. Aquatic Biology*, Vol. **18**(2): 85-86.
- Pawar SK and JS Pulle, 2005.** Studies of physico-chemical parameters in Pethwadaj dam, Nanded district in Maharashtra, India. *J. Aqua. Bio.*, **13**(1&2)57-59.
- Sakare and Joshi 2003.** Environmental aspects of lake water and its quality management.
- Saxena MM, 1978.** *Environmental Analysis water, soil and Air*. Agro Botanical pub. India, 1-16.
- Subba Rao, 1993.** Fresh water molluscs of Indian Recent advances in fresh water. *Anmol publications pvt. Ltd*. New Delhi pp. 47-52.
- Trivedy RK and Goel, 1986.** *Chemical and biochemical methods for water pollution studies*, Environmental Publication, Karad, Maharashtra.