



A PRELIMINARY STUDY OF PHYSICO-CHEMICAL ANALYSIS OF BHALKI LAKE WATER

Environmental Science

**Syeda Qasim
Fatima**

Department Of Studies and Research in Zoology, Gulbarga University, Kalaburagi-585106, Karnataka State, India

K. Vijaykumar

Department Of Studies and Research in Zoology, Gulbarga University, Kalaburagi-585106, Karnataka State, India

ABSTRACT

This research paper presents a comprehensive physico-chemical analysis of the water from Bhalki Lake, aiming to provide valuable insights into its quality and potential environmental implications. The study encompasses various parameters, including pH, temperature, dissolved oxygen (DO), electrical conductivity (EC), total dissolved solids (TDS), turbidity, and concentrations of major ions and heavy metals. The results obtained from this analysis will contribute to a better understanding of the lake's water quality, aiding in the development of effective management strategies for its preservation and sustainable use.

KEYWORDS

Bhalki Lake, water quality, physico-chemical analysis, major ions, heavy metals, environmental implications, sustainable use.

1. INTRODUCTION:

Bhalki Lake is a significant freshwater resource located in a region of ecological importance. The lake's water quality is crucial for maintaining the health of its ecosystem and supporting various human activities. This research aims to assess the physico-chemical characteristics of Bhalki Lake water, providing a baseline for future monitoring and management efforts.

2. MATERIALS AND METHODS:

Study Area and Sample Collection:

Bhalki is one of the towns in Bidar district, is located in the North-Eastern region of the Karnataka state and lies at 18° 03' north latitude and 77° 12' east longitude, located 590 m above mean sea level and covers an area of 3.18 square kilometres. In the present study the sampling was done during morning hour. The water samples were collected in the polyethylene bottles. The closed bottle was dipped in the lake at the depth of 0.5 to 0.7 m, and then a bottle was opened inside and was closed again to bring it out at the surface. The samples were collected from two different points. The water temperature, turbidity, pH, EC and TDS were analysed immediately on the spot after the collection, whereas the analyses of remaining parameters were done in the laboratory. The study was carried for a period of 7 months (March 2021 to September 2021).

Physico-Chemical Analysis:

The collected water samples were subjected to a series of physico-chemical analyses, including pH measurement, temperature recording, DO determination using the Winkler method, TDS estimation, turbidity assessment by secchi's disc. The collected water samples were brought to the laboratory and relevant analysis was performed. pH was determined electrometrically using digital pH meter, total dissolve solid was measured by using TDS meter and similarly turbidity is measured by Secchi disc. Alkalinity, chloride, calcium, magnesium, total hardness, nitrate and phosphate were determined by standard method suggested by Trivedy and Goel (1986).

3. RESULTS AND DISCUSSION:

3.1 Physico-Chemical Parameters:

The analysis revealed that the pH of Bhalki Lake water ranged from 7.6 ± 0.11 to 9.1 ± 0.27 indicating a slightly acidic to neutral nature. The temperature ranged from 26°C to 34°C reflecting seasonal variations. DO levels were found to be within the acceptable range for supporting aquatic life, ranges between 5.10 ± 0.17 mg/l to 13.21 ± 0.41 mg/l. Electrical conductivity recorded in Bhalki lake ranges between 3.44 ± 0.26 mhos/cm to 4.30 ± 0.14 mhos/cm. and TDS values indicated the presence of dissolved salts, potentially influenced by anthropogenic activities in the catchment area. The amount of total dissolve solid in Bhalki Lake ranges between 151 ± 6.48 ppm to 218 ± 32.1 ppm. Turbidity in Bhalki Lake recorded ranges between 16 cm to 22.5 cm. The amount of total alkalinity recorded in Bhalki Lake Ranges between 197 ± 8.12 mg/l to 297 ± 8.12 mg/l. The principle hardness causing ions are calcium and magnesium, ranges between

124 ± 4.83 mg/l to 223 ± 18.1 mg/l. The value of free CO₂ ranges from 6.6 mg/l to 11.0 mg/l.

Major ions:

The concentrations of major ions, including chloride values ranges between 22.72 ± 3.16 mg/l to 69.58 ± 4.22 mg/l. sulfate value ranges between 1.18 ± 0.02 mg/l to 2.12 ± 0.06 mg/l. Nitrate values ranges between 1.5 ± 0.29 mg/l to 7.9 ± 0.65 mg/l. and phosphate values ranges between 1.0 ± 0.02 mg/l to 4.0 ± 0.06 mg/l, were determined. These ions play a crucial role in the overall water quality and can indicate potential pollution sources. The results indicated that the concentrations of these ions were within acceptable limits, suggesting a relatively low level of pollution in Bhalki Lake.

Table No 1: Table showing the physico-chemical parameter values recorded during the study period in Bhalki lake.

Sl.No	Parameter	Value recorded
1.	pH	7.6 ± 0.11 to 9.1 ± 0.27
2.	Temperature	26°C to 34°C
3.	Electrical Conductivity	3.44 ± 0.26 mhos/cm to 4.30 ± 0.14 mhos/cm
4.	Turbidity	16 cm to 22.5 cm
5.	TDS	151 ± 6.48 ppm to 218 ± 32.1 ppm
6.	DO	5.10 ± 0.17 mg/l to 13.21 ± 0.41 mg/l.
7.	CO ₂	6.6 mg/l to 11.0 mg/l
8.	Total Alkalinity	197 ± 8.12 mg/l to 297 ± 8.12 mg/l.
9.	Total Hardness	124 ± 4.83 mg/l to 223 ± 18.1 mg/l
10.	chloride	22.72 ± 3.16 mg/l to 69.58 ± 4.22 mg/l.
11.	sulfate	1.18 ± 0.02 mg/l to 2.12 ± 0.06 mg/l.
12.	Nitrate	1.5 ± 0.29 mg/l to 7.9 ± 0.65 mg/l.
13.	phosphate	1.0 ± 0.02 mg/l to 4.0 ± 0.06 mg/l

4. CONCLUSION:

The physico-chemical analysis of Bhalki Lake water provided valuable insights into its quality and potential environmental implications. The results indicated that the lake's water quality is generally within acceptable limits, suggesting a relatively healthy ecosystem. However, continuous monitoring and management efforts are necessary to ensure the long-term sustainability of this vital freshwater resource. The findings of this study can serve as a baseline for future research and aid in the development of effective strategies for the preservation and sustainable use of Bhalki lake water.

5. REFERENCES:

- Adarsh. S, Manasa. M P, Dr.sheshaprakash. M N (2019). *international Journal of Engineering Research & Technology* (ijert) Issn: 2278-0181 Vol. 8 Issue 06, June-2019.
- Apha. Standard Methods For The Examination Of Water And Waste Water. 19th Edition, American Public Health Association, American Water Work Association And Water Pollut. Contl. Federation, Washington, D.c., Newyork, (1995).
- Dhanajikanase G, Shaguffa Shaikh A, Pramodjagadale N (2016) *Advances In Applied Science Research*, 2016, 7(6):41-44
- Hemalatha Bhavimani E.t. Puttaiah And Mohan Naik (2016) volume-5, Issue-3, March - 2016 Issn No 2277 – 8160.

5. **Linges G, Hrv Reddy, Narshivudu D, Muthappa K And Padmanabha A (2019)** *Journal Of Entomology And Zoology Studies* 2019; 7(4): 275-278.
6. **Rafiullah M. Khan, Milind J. Jadhav And I. R. Ustad** *Bioscience Discovery*, 3(1):64-66, Jan. 2012 Issn: 2229-3469.
7. **Rauf Km, Hossieni H, Ahmad Ss, Jamal S, Hussien A (2015)** Comparison Of The Noise Pollution In Sulaimani City Between The Years 2009 and 2014. *J Polluteffcont* 3: 133. *Doi:10.4172/2375-4397.1000133*.
8. **Trivedy R.k. And Goel P.k., In:** Chemical And biological Methods For Water Pollution Studies. published By Environmental Publication, Karad, Maharashtra, India, (1984). *Verma Et Al. Int. J. Res. Chem. Environ. Vol. 2 Issue 1 January 2012* (105-111).