



RESEARCH ARTICLE

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An assessment of the physico-chemical properties of a fresh water body

Vinay Kumar

Deptt. of Zoology, D.S. College, Aligarh- 202001 (U.P.)

Email: vinay_join@yahoo.com

ABSTRACT

Present study has been conducted to study the physico-chemical properties of a fresh water body in Aligarh city. Water samples collected were analyzed for some physico-chemical parameters i.e. Water temperature, pH, Total dissolved Solids, Dissolved oxygen (D.O.), Phosphate, Chloride and Alkalinity. These parameters were found in higher concentration above freshwater limits indicating highly polluted state of water body.

Keywords: *Physico-chemical characteristics, water quality, Fresh water body*

INTRODUCTION:

Fresh water bodies are an important source of water available for human consumption and other useful activities. These water bodies often get polluted due to sewage and effluents coming from urban and industrial establishments. These conditions cause nutrient enrichment which results in eutrophication of water bodies. The water quality of these eutrophic bodies gets degraded and water becomes unfit for human consumption. Fluctuation in the water quality has an influence on the biotic communities also. Their population gets diminished and they often get diseased. Study of water quality parameters (physico-chemical parameters) provides a clue about the overall health of these water bodies.

Several workers have studied the physico-chemical characteristics in India. Agarwal (1993), Das and Kalita (1990), Iqbal et al,(2002), Kataria et al., (1994), Kataria and Iqbal (1995), Pathak (1990), Prasad et al. (1985), Sharma & Capoor, (2010).

Present study has been carried out to assess the water quality of a fresh water body by studying its physico-chemical characteristics. This water body receives water from domestic discharges and rain water which accumulates during rainy season. City sewage and effluents from some small industries also accumulate in this water body.

MATERIAL AND METHODS:

The fresh water body is a small reservoir, Kalidah, (1.5-2.0 hectare) in Aligarh, U.P. (India). The Present work was carried out during Nov. 2005 to Oct. 2006. Water samples taken monthly were brought to the laboratory and some physico-chemical parameters were taken into consideration. The parameters such as Water temperature, pH, Total dissolved solids (TDS), Dissolved oxygen (D.O.), Phosphate, Chloride and alkalinity were estimated. Temperature and pH were recorded on site. Dissolved oxygen was analyzed by using Winkler's modification method.

RESULTS AND DISCUSSION:

Results of physico-chemical parameters are given in Table-1.

The data on water quality reveals that Water temperature varied from 17 °C to 33 °C. Minimum water temperature (17 °C) was recorded during January 2006 and maximum (33 °C) during May 2006. The pH varied from 7.6 to 9.1. The minimum pH (7.6) was recorded in January, 2006 and maximum pH (9.1) was on August & Sept. 2006.

Table 1: Monthly variation in Physico-chemical parameters in Pond

Months	pH	Water temp.(°C)	D.O. (mg/l)	TDS (mg/l)	Alkalinity (mg/l)	Phosphate (mg/l)	Chloride (mg/l)
Nov.05	8.4	20	8.2	810	400	0.825	39
Dec.	8.0	18	7.8	320	510	0.215	34
Jan.06	7.6	17	7.2	230	610	0.225	32
Feb.	8.1	18	6.8	196	520	0.510	35
Mar.	8.5	21	5.7	180	410	1.785	39
Apr.	8.4	28	7.1	172	430	1.585	52
May	8.3	33	11.0	540	310	1.485	64
Jun.	8.6	32	7.8	486	260	1.810	72
July	9.0	30	8.0	890	225	1.410	58
Aug.	9.1	31	8.4	160	228	0.715	24
Sept.	9.1	29	8.7	340	252	0.310	34
Oct.	8.9	25	8.5	640	400	0.885	42

This variation in pH might be due to household detergents coming into pond water from nearby houses and chemical rich effluents from local industries and also due to cattle bathing. The dissolved oxygen varied from 5.7 to 11.0. Maximum D.O. (11.0) was recorded in May, 2006 and minimum (5.7) in March, 2006. High D.O. content might be due to increased photosynthetic activity of autotrophs while low content might be due to increased respiration of organisms, low photosynthetic rate and increased organic matter decomposition. Alkalinity varied from 225 mg/l to 610mg/l. Maximum alkalinity (610 mg/l) was observed in January, 2006 and minimum (225 mg/l) in July, 2006. Total dissolved solids (TDS) varied from 172 mg/l to 890 mg/l. Maximum TDS (890 mg/l) was recorded in July 2006 and minimum (172 mg/l) in April 2006. These dissolved solids are mainly organic in nature and can pose serious problems of pollution. Phosphate values varied from 0.215 mg/l to 1.810 mg/l. The highest phosphate value (1.810 mg/l) was recorded in June 2006 while lowest value (0.215 mg/l) in Dec.2005.

Chloride content varied from 24 mg/l to 72 mg/l. Chloride content was high in summer season and low during winter and rainy season. The higher concentration of chloride is considered to be an indicator of higher pollution due to higher sewage content and also due to increased temperature and evaporation of water.

Present study indicates highly polluted state of this water body. Due to accumulation of sewage and effluents, water quality has become very poor and not fit for human consumption.

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REFERENCES:

1. Agrawal A. (1993): Studies on physico-chemical and biological characteristics of river Betwa from Nayapura to Vidisha, Ph.D. thesis (chemistry) BU, Bhopal.
2. Behura C.K. (1998): A study of Physico-chemical characteristics of a highly eutrophic temple tank, Bikaner. *J. Aqua. Biol.*, 13(1-2): 47-51.
3. Das H.B. and Kalita H. (1990): Physico-chemical quality of water, Mizoram JIWWA, 22(2): 203-204.
4. Ganapati S.V. (1960): Ecology of tropical waters, Proceedings ICAR Symposium on Algology, New delhi, 200-208.
5. Jana B.B. and Sarkar H.L. (1971): The Limnology of Swetganga: A thermal spring of Bakreswar, WB, India. *Hydrobiologia*, 37: 33-47.
6. Kataria H.C. and Iqbal S.A. (1995): *Orient. J. Chem.*, 11(3): 288-289.

7. Kaushik S. and Saksena D.N. (1999): Physico-chemical limnology of certain waterbodies of central India. In: Freshwater Ecosystem of India. Daya publishing house, New Delhi, 1-58.
8. Khan I.A. and Khan A.A. (1985): Physico-chemical conditions in Seikha jheel at Aligarh. *Environment and Ecology*, 3: 269-274.
9. Pathak A. (1990): Limnological study on Kaliasot Dam and Chunabhati lake with special reference to zooplankton, Ph.D. thesis. Barkatullah Univ. Bhopal.
10. Sharma R. and Capoor A. (2010): Water quality Assesment of lake water of Patna bird sanctuary with special reference to abiotic and biotic factors. *World Applied Sciences Journal* 10(5): 522-524.
11. Shastri Y. and Pandse D.C. (2001): Hydrobiological study of Dahikhuta reservoir, *J. Environ. Biol.*, 22: 67-70.