International Journal of Advanced Educational Research
ISSN: 2455-6157
Impact Factor: RJIF 5.12
www.educationjournal.org
Volume 3; Issue 2; March 2018; Page No. 349-351

Studies on physico-chemical parameters of Bijavara lake, Madhugiri Taluk, Tumkur Dist, India

BM Sreedhara Nayaka
Karnataka State Pollution Control Board, Bengaluru, Karnataka, India

Abstract
Assessment of Physico-Chemical parameters of Bijavara lake, Tumkur district was done during the period of January 2016 to June 2016. Fresh water is a source of drinking water used by the rural and urban population of India. It supports the life of the aquatic organisms. It is getting polluted by dumping of domestic sewage, agricultural wastes, Industrial effluents etc. The water samples were collected on the monthly basis from three sampling sites. The analysis was carried out for the parameters like Temperature, pH, Turbidity, Total Dissolved Solids (TDS), Alkalinity, Biological Oxygen Demand (BOD).

Keywords: Bijavara lake, pollution, domestic sewage, physico-chemical parameters, BOD

1. Introduction

Water is one of the important natural resource which has great significance to mankind. Fresh water bodies are very much needed for the life and hence the fresh water bodies have to be conserved everywhere in the world [1]. The water which covers about 75% of globe is saline in nature. The water found in the caps, glaciers, and ground water is fresh water and constitutes about less than 5%, and the remaining water is found in lakes, streams and soil moisture. Hence, the earth is often called as Blue planet [2]. The third world war may be occurred because of water due to which the scenario of global water is alarming [3]. The chief pollutants causing water pollution are fertilizers and pesticides. Natural water is contaminated by the weathering of rocks, leaching of soil, mining processes etc. [6]. The rapid growth of population, improvement in the field of agriculture, urbanization, industrialization and reduced the availability of drinking water which has become a great problem, causing surface water pollution The problem of scarcity of water is found in many parts of the world. Without the proper treatment, most of the waste waters are directly dumped in to the lakes, rivers and estuaries. Lakes are very important fresh water bodies. The lakes are the source of precious water and provide habitats for flora and fauna and moderate the hydrological cycles and hence the lakes are considered as the very important fresh water bodies. They also influence the microclimate, the aesthetic beauty of the earth has been increased and provide better means of recreation to mankind [4]. The main objective of this study is the assessment of Physico-Chemical parameters of Bijavara lake, Tumkur (Dist) India.

Bijavara lake is slightly under anthropogenic stress and gets heavy inputs of domestic waste. A perusal of the available literature related to this reveals that there is no scientific investigation on Bijavara lake. Hence, it is right time to formulate methods to monitor the data in order to control the indiscriminate activities of man on this lake by formulating the methods to monitor data and control permissible limits of contamination. With this strong background, an ecological investigation on Bijavara lake, has been undertaken [2].

2. Study Area

Fig 1

Bijavara lake is one of the biggest lakes in Tumkur District. It is situated between 13°39'36.00" N 77°12'36.00" E. It is located in between Tavakada halli and Madhugiri town. The tank was mainly constructed for the purpose of irrigation. Now a days it is used for various purposes like agriculture, fish culture, drinking and partially for domestic purposes.

3. Materials and Methods

Surface water samples were collected from the selected sampling sites in the early morning between 7 AM to 9 AM in two liters of polythene cans. Three sampling sites were selected which completely cover the whole area of the lake. The investigation was carried out to study the physico-chemical parameters of water during January 2016 to June 2016. The temperature was recorded at the spot using Thermometer. In addition to temperature, other physico-chemical parameters such as pH-Electrometric method, Turbidity-Nephelometric method, TDS-Gravimetric method,

Alkalinity-Titrimetric method and BOD-Winkler's method were analysed for the collected samples in the laboratory using standard methods [7]. The results were compared with standard permissible limit by BIS [8].

3. Results and Discussion

Table 1: Comparison of Physico-chemical parameters with BIS standards.

Sl. No	Parameters	Range value	BIS standard permissible limit for drinking water
1.	Water temperature	25º to 27º C	40ºC
2.	pH	7.2 to8.4	6.5-8.5
3.	Turbidity	1 to 4 NTU	10
4.	Total Dissolved solids	120 -182 mg/L	500
5.	Total Alkalinity	58mg/L to 92 mg/L	200
6.	BOD	2 to 4 mg/L	5

Table-1 shows the range of physico-chemical parameters compared with the BIS standards to know the water quality of the tank.

4.1. Temperature
Temperature plays an important role in determining the growth of the aquatic organisms. Temperature is a dominant environmental factor influencing the metabolic rate of Poikilotherms and also affects other factors like pH, growth of planktons which in turn affects fish growth. The water temperature affects the biochemical reactions occur in the body of aquatic animals. The increase in the water temperature reduces the solubility of gases. The atmospheric temperature was found to be in the range of 26 ºC to 29 ºC and the water temperature was found to be in the range of 25 ºC to 27 ºC.

4.2. Turbidity
Turbidity is recognized as one of the limiting factor in the biological productivity of the water bodies [5]. Turbidity is a measure of clarity of water which is a qualitative measure of how much light is scattered by the particles in the water samples. The suspended particles are aggregated to form colloidal solution. The extremely minute particles are settling down at the bottom and other minute particles stay as suspended which forms turbidity. In the present study the turbidity was found in the range between 1 to 4 NTU.

4.3. pH
pH is an important parameter which determines the suitability of water for various purposes. Highly acidic or alkaline waters are unsuitable for good fish production. A normal range of pH is best for inland waters. The slight alkaline level increases the growth of phytoplankton and fish. Acidic pH causes changes in the permeability of gills of fishes. pH less than 4 produces sour taste and above 8.5 is alkaline in taste. In the current study the pH was found in the ranging Between 7.2 to 8.4.

4.4. Total dissolved solids (TDS)
TDS denotes mainly various kinds of minerals present in salt water. Gas and colloids are not included in TDS. The TDS in the present study was ranged from 120 to 182 mg/L which is within the permissible limit as per BIS standards.

4.5. Alkalinity
Alkalinity depends upon location, season and population of the plankton. Heavy rain fall areas have low alkalinity. The high alkalinity increases the rate of organic decomposition, which leads to plankton blooms which may result in oxygen imbalance affecting the fishes. When the alkalinity exceeds the desirable limit the taste becomes unpleasant. It ranges between 58 mg/L to 92 mg/L.

4.6. BOD
The BOD is an indicator of organic enrichment of water bodies. High BOD is associated with high degree of decomposition of osrganic matter. High level of oxygen consumption for stabilization of organic depletes DO content and becomes a threat for a survival of fish. Hence, BOD of water body is an important parameter to be considered for fish culture. Increase in the BOD decrease the dissolved oxygen content of water and the water becomes unsuitable for fish culture. In the present study BOD ranges between 2mg/L to 4 mg/L.

5. Conclusion
It is concluded from the present study that pH, turbidity, TDS, alkalinity and BOD are in the permissible limit as recommended by BIS standard (8). Hence, the water can be used for agriculture, and also used for drinking after treatment.

6. References

1. Preeti Gupta, Sunita Agarwal, Ira Gupta. Assessment of Physico-Chemical Parameters of Various Lakes of Jaipur, Rajasthan, India, Indian Journal of Fundamental and Applied Life Sciences. 2011; 1(3):246-248.
2. Parameswara Naik T, Ajayan KV, Lokesh GH. Physico-chemical characteristics of Kunigal lake in Tumkur district, Karnataka, India; Int. J Chem. Sci. 2012; 10(2):655-663.
3. Charu Parashar, Savita Dixit and Rajnish Shrivastava1, Seasonal Variations in Physico-chemical Characteristics in Upper Lake of Bhopal, M.P., India; Asian J Exp. Sci. 2006; 20(2):297-302.
4. Ramesh N, Krishnaiah S. Scenario of Water Bodies (Lakes) In Urban Areas- A case study on Bellandur Lake of Bangalore Metropolitan city; IOSR Journal of Mechanical and Civil Engineering (IOSR-JMCE) e-ISSN: 2278-1684,p-ISSN: 2320-334X, Volume 7, Issue 3, PP 06-14, Jul. - Aug. 2013.www.iosrjournals.org www.iosrjournals.org.
5. Ramesh N, Krishnaiah S. Assessment of Physico-

chemical parameters of Bellandur Lake, Bangalore, India; International Journal of Innovative Research in Science, vol.3, Issue 3, ISSN: 2319-8753, March-2014.
6. Manjare SA, Vhanalakar SA, Muley DV. Analysis of water quality using physico- chemical parameters tamdalge tank in Kolhapur district, Maharashtra. International Journal of Advanced Biotechnology and Research. 2010; 1(2):115-119.
7. Standard methods for the examination of water and waste water, American Public Health Association, American water works Association, Water Environment Federation, Washington DC, 1998.
8. Bureau of Indian Standard (BIS): 10500; 2004 Specification for drinking water, Indian Standard Institution, (Bureau of Indian Standard), New Delhi.