ISSN: 0976-3031

Available Online at http://www.recentscientific.com

CODEN: IJRSFP (USA)

International Journal of Recent Scientific Research
Vol. 9, Issue, 7(F), pp. 28114-28116, July, 2018

International Journal of Recent Scientific Research

DOI: 10.24327/IJRSR

Research Article

STUDIES ON ANALYSIS OF LAKE WATER IN MOOKANERI LAKE AT SALEM DISTRICT TAMIL NADU

Mohana V and Jagajothi A

Department of Zoology, Government Arts College (Autonomous) Salem – 7, Tamil Nadu, India

DOI: http://dx.doi.org/10.24327/ijrsr.2018.0907.2396

ARTICLE INFO

Article History:

Received 15th April, 2018
Received in revised form 7th May, 2018
Accepted 13th June, 2018
Published online 28th July, 2018

Key Words:

Physicochemical parameter, water quality, temperature, pH, dissolved oxygen, dissolved carbon dioxide, salinity, alkalinity, carbonate, bicarbonate, nitrate, nitrite and ammonia.

ABSTRACT

This study was designed to access the quality of lake water in Mukkaneri Lake, Salem district, Tamilnadu with respect to the physicochemical parameter including temperature, pH, dissolved oxygen, dissolved carbon dioxide, salinity, alkalinity, carbonate, bicarbonate, nitrate, nitrite and ammonia. The results were calculated from the data obtained, the water quality was discussed and lake water is having good quality of physicochemical parameter and the lake water is suitable for domestic and aqua culture purpose.

INTRODUCTION

Life on the earth is never possible without water. Water is one of the most essential constituents of the environments. Less than 1% water is present in ponds, lakes, rivers, dams, etc., which is used by man for industrial, domestic and agricultural purposes. Ponds are useful in many ways and it is one of the methods of artificial infiltration of underground water. Water quality in an aquatic ecosystem is determined by many physical, chemical and biological factors (A. Sargaonkar *et al* .2003). The term water quality was developed to give an indication of how suitable the water is for human consumption (H. J. Vaux .2001).

Hydrological condition of water affects the aquaculture activities, fish productivity and species composition of aqua fauna, eutrophication and overall loss of biodiversity that results in degradation of pond ecosystem. The magnitude and dynamics of oxidation-reduction reaction by various elements present in water plays an important role in governing most of the chemical, biochemical and microbial behaviours in the pond water, and also maintaining congenial environmental condition.(aniruda *et al* 2014).

Access to safe drinking water is key to sustainable development and essential to food production, quality health and poverty reduction. Safe drinking water is essential to life and a satisfactory safe supply must be made available to consumers (Ackah M *et al*, 2012). Water is thus becoming a crucial factor for development and the quality of life in many countries. In individual arid areas it has even become a survival factor (Eddy NO, 2007). Therefore, water intended for human consumption must not contain pathogen germs or harmful chemicals; because water contaminated with microorganisms is the cause of epidemics (Balbus JM*et al* 2002). That is good drinking water is not a luxury but one of the most essential requirements of life itself (Ajewole G (2005).

Figure 1 Mookanerilake

Corresponding author:* **Mohana V
Department of Zoology, Government Arts College (Autonomous) Salem – 7, Tamil Nadu, India

The study of different physico-chemical parameters is very important for understanding the metabolic events in aquatic ecosystem. The parameters influence each other and govern the distribution and abundance of flora and fauna (Shinde *et al*, 2011).

Study area

The present study was carried out in Mookaneri lake Kananguruchi Panchayath, Salem district; Tamilnadu.physio-graphically the study area is present in coastal plains. The lake having some vegetative region scattered over the lake. Total area of lake is 45.3 acre. Depth 2.55meter,Total water capacity of water 21.18meter/dl.

MATERIAL AND METHODS

Water samples were collected in 1 litre plastic bottles from the lake between 11 am to 11.30am at a depth of 30 cm below the water surface. For dissolved oxygen determination the sample fixed at the spot of collection area with the use of chemicals alkaline iodide and mangonous sulphate. The remaining samples were brought into laboratory and were stored in room temperature.

Table 1 physico-chemical parameter of Mookaneri .

S,no	parameter	Jan-18	Feb-18	Mar-18
1.	DO (mg/l)	2.258	2.258	2.258
2.	Free co2(mg/l)	2.2	2.2	2.2
3.	Salinity(‰)	0.2219	0.286	0.286
4.	Alkalinity(mg/l)	55	48	44
5.	Carbonate(mg/l)	5	5	10
6.	Bicarbonate(mg/l)	10	10	15
7.	pH	8	8	8
8.	Ammonia(mg/l)	0	0.5	0.5
9.	Nitrite(mg/l)	0.5	0.5	0.5
10.	Nitrate(mg/l)	5	5	5

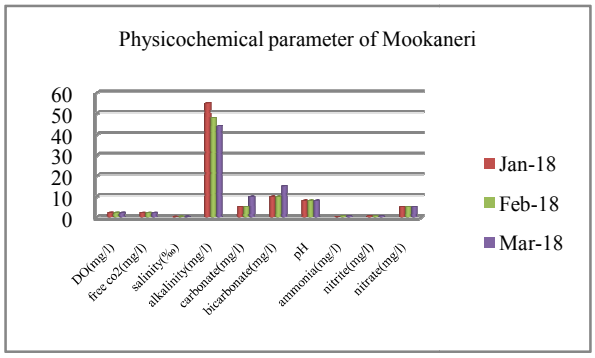

Figure 2 bar diagram showing physicochemical parameter of mookaneri

Physico chemical analysis with standard procedure. Analytical reagents, chemicals were prepared from double distilled water for the purpose of doing all experiment. The pH of sample was determined with help of pH paper. dissolved oxygen by wrinkle's method. Free carbondioxied by titrimetric method using 5% NaOH and phenol phthalein as an indicator. Salinity content determined by titrimetric method using silver nitrate and potassium chromate as an indicator. Carbonate and bicarbonate is determined by titrimetric method using HCL, phenolphthalein and methyl orange as an indicator. Total alkalinity was determined by using H2SO4, phenolphthalein and methyl orange as an indicator. Readymade laboratory kit is used for determination of nitrite, nitrate and ammonia.

RESULT AND DISCUSSION

The study was analysed and physicochemical parameters were estimated with respect to the following parameter's the results were discussed below

Dissolved oxygen

Dissolved oxygen is the most important factor for the survival of aquatic life. Dissolved oxygen regulates the metabolic processes of aquatic organisms including fish and is often considered as an indicator of environmental conditions, affecting survival and growth of organism. Oxygen is in water, is dissolved either through the diffusion from the atmosphere or evolved in the pond itself through the process of photosynthesis by primary producers mainly, phytoplankton in fish ponds. in this study area DO content is 2.258mg/l it was maintained the same level in the study period. It indicates that the lake having more vegetative content apart from that more amount of aquatic organisms.

Free carbon dioxide

The main roll of free co2 is photosynthesis. Apart from its important role in photosynthesis of primary fish food organisms, free CO2 has interdependence with pH and bicarbonate-carbonate equilibrium. However, if present in higher concentration, it may exert adverse effects on respiration and other physiological functions of aquatic life (Chattopadhyay, 1998). in present study the free co2 content is 2.2mg/l and it was comparatively low and it was maintained the same level in this study period. This shows that the lake is free from pollution of sewage and industrial waste. So the lake suitable for aqua culture purpose.

Salinity

Salinity is a measure of the amount of dissolved salts in the water. Saline water conducts electricity more readily than freshwater, so electrical conductivity (EC) is routinely used to measure salinity. As salinity increases, it may become toxic to native freshwater organisms. The salinity content of this lake very low it indicates that the lake is very effective for domestic as well as aquatic purpose.

Carbonate and bicarbonate

Carbonates and bicarbonates are largely predominant ions in most of the fresh water bodies (Hutchinson, 1957). The presence of carbonates in pond water is chiefly due to phytoplankton which remove half bound CO2 from the bicarbonates and form carbonates. This study area carbonate is ranges from 5-10mg/l and bicarbonate is ranges from 10-15mg/l.it shows that the lake having good quality of water.

Alkalinity

Alkalinity is a measure of the buffering capacity of water, or the capacity of the water to neutralize acids and resist pH change. The present study alkalinity content is ranges from 44-55mg/l. its indicates that the water is effective to pH resist and having good quality. The water is suitable for aquatic purpose.

pH

The pH (Potential Hydrogen) of a solution refers to its hydrogen ion activity and is expressed as the logarithm of the reciprocal of the hydrogen ion activity at a given temperature.

The permissible limit of pH in drinking water is within 6.5 – 8.5 according to Bureau of Indian Standard (BIS).this lake pH is 8.and its shows that water is mostly useful for all domestic purpose as well as drinking purpose.

Nitrate

Nitrate is a well-known contaminant of ground water and stream water. It is an important environmental and human health analyse, and thus its detection and quantification are considered to be essential.(Moorcroft *et al* 2001).in the present study the concentration of nitrate is 5mg/l it was maintained for three month. it shows that the lake is free from contamination.

Nitrite

Nitriteconcentration in the fish ponds plays an important role in primary production. The most important source of the nitrite and nitrate is biological oxidation of organic nitrogenous substances such as feed; manure/fertilizers/fish faces (Gopal Krishnan *et al*., 1997).The nitrite content of this lake is 0.5mg/l.it dose not having any significant role.

Ammonia

Ammonia –nitrogen occurs naturally in ground water at concentrations below 0.2 mg/l and up to 12mg/l in surface water, as a result of decomposition of organic matter. High concentrations of ammonia in surface water are toxic to aquatic life and are indicative of contamination from industrial effluents, raw sewage and agricultural runoff (kathtyn *et al* 2016). The present study area ammonia content is range from 0-0.5mg/l. so it having low ammonia and it doesn't toxic to the aquatic life. It shows that lake is suitable for aquaculture purpose.

CONCLUSIONS

From above experimentation it has been concluded that the physico chemical parameter analysis results of Mookanerilake have the good quality of water. The results shows that the lake water having suitable range of Dissolved oxygen, free co2, salinity, alkalinity, carbonate and bicarbonate, pH, nitrate, nitrite and ammonia. Therefore its indicating that the lake water is suitable for drinking, propagation of animals and fisheries, and irrigation purposes.

Reference

1. Ackah M, Anim AK, Gyamfi ET, Acquah J, Nyarko ES, *et al*. (2012) Assessment of the quality of sachet water consumed in urban townships of Ghana using physico-chemical indicators: A preliminary study. *Advances in Applied Science Research* 3: 2120-2127.
2. Ajewole G (2005) Water. An overview. Nigeria institute of food science and technology, Nigeria 2: 4-15.
3. Aniruddha Nag, Hema Gupta, (2014) Physicochemical analysis of some water ponds in and around Santiniketan, West Bengal, *India international journal of environmental sciences* Volume 4, No 5.
4. Balbus JM, Embrey MA (2002) Risk factors for waterborne enteric infections. *Curr Opin Gastroenterol* 18: 46-50.
5. Chattopadhyay, G.N. (1998), Chemical Analysis of Fish Pond Soil and Water. Daya Publishing House, Delhi-110035. pp 13-66.
6. Eddy NO, Ekop AS (2007) Assessment of the quality of water treated and distributed by the Akwa Ibom state water company. *E-Journal of Chemistry* 4: 180-186.
7. Gopal Krishnan *et al*., 1997water Quality (book review)
8. Hutchinson, 1957 water Quality (book review)
9. H. J. Vaux (2001). Water Quality (Book Review). Environment 43 (3): 39.
10. Moorcroft M J, Devis J, Compton R G(2001) detection of nitrite and nitrate: a review of talanta ,54:785.
11. Observation of physic-chemical parameters of pond water, chapter 6, estelar.
12. A. Sargaonkar and V. Deshpande (2003). Development of an Overall Index of Pollution for Surface Water Based on a General Classification Scheme in Indian Context. Environmental Monitoring and Assessment, 89: 43-67.
13. Shinde, S.E., Pathan, T.S., Raut, K.S. and Sonawane, D.L. (2011), Studies on physico-chemical parameters and correlation coefficient of Harsool-savangi Dam, District Aurangabad, India. *Middle-East Journal of Scientific Research*, 8(3), pp 544554.

How to cite this article:

Mohana V and Jagajothi A. 2018, Studies on Analysis of Lake Water in Mookaneri Lake at Salem District Tamil Nadu. *Int J Recent Sci Res.* 9(7), pp. 28114-28116. DOI: http://dx.doi.org/10.24327/ijrsr.2018.0907.2396

****