J. Chemtracks, 20 (1&2), 119-122, 2018

Indexed in
A division of the American Chemical Society
Chemical Abstract U.S.A.

ISSN 0973-239X
CODEN:JCOHF7
IMPACT FACTOR : 4.950

Dissolved oxygen profile in Ramsagar pond, Gaya

Reshma Perween* and M.S. Islam**
*Department of Botany, Mirza Ghalib College, Gaya
**P. G department of Botany, Magadh University, Bodhgaya
Email : reshmaperween99@gmail.com

Manuscript received online 30 July 2018, accepted on 10 November 2018

Abstract: Dissolved Oxygen is a potential Limnological dimension which reflects Physicochemical as well as biological health of ecosystem. Dissolved Oxygen controls metabolism of aerobic organisms present in aquatic ecosystem, it also affects the solubility. Dissolved Oxygen is contributed due to inputs from atmosphere and photosynthesis and output due to respiration, decomposition and mineralisation of organic matter and losses to the atmosphere. Dissolved Oxygen profile of Ramsagar Pond, Gaya was found to be 9.97 ± 0.255 with an inverse correlation with temperature of water and slight increase in monsoon months which may be caused due to additions of rain water in the pond.

(**Keywords:** Dissolved Oxygen, Metabolism, Winkler's Methods.).

Introduction

Dissolved Oxygen is essential to the metabolism of all aerobic organisms, oxygen distribution is important for the direct needs of many organisms, and effects the solubility and availability of aquatic ecosystem, Wetzel1 (1983). The items affecting the oxygen balance in water in water bodies are inputs due to the atmosphere and photosynthesis and output due to respiration, decomposition and mineralisation of organic matter and losses to atmosphere. Thus the oxygen balance in the water becomes poorer as the input of oxygen at the surface and photosynthesis activity decreases and as the metabolic performance of the heterotrophic organisms becomes greater. From this, a possibility of three situations may rise.

Experimental

Material and Methods

Dissolved Oxygen a potential limnology dimension reflecting on physico chemical as well as biological health of aquatic systems, was calculated by Winkler's iodometric method[2] (1989)- modified by APHA[3](1989), with the help of B. O. D bottle. B. O. D. bottle is a transparent glass bottle of known accurate volume (125cc-300cc corning) and is provided with a glass stopper.

The chemical used were sodium thiosulphate 0.025 N ($Na_2S_2O_3$), manganous sulphate ($MnSO_4.4H_2O$), alkaline potassium iodide soln. (Kl-KOH), sulphuric acid cone. (H_2SO_4. Sp. Gr. 1.84) and starch solution. Efforts were made to complete the experiment at the earliest possible, so as to minimise the experimental errors.

Calculations was done by using following formula:-

D. O. mg. L^{-1}= (ml×N) of titrant ×8×1000/V_2(V_1-V/V_1)

Where, V_1= volume of sample bottle after placing the stopper.

V_2= volume of the part of concentrated titrated.

V_3= volume of $MnSO_4$ & Kl added.

Observations

Table: Dissolved Oxygen(mg L^{-1}) profile of Ramsagar Pond during 2000.

Months	D.O.
January	7.42
February	7.10
March	5.96
April	6.26
May	4.90
June	4.55
July	9.51
August	14.40
September	11.34
October	6.36
November	6.44
December	7.59
Mean value with S. E.	9.97 ±0.255

Results and Discussion

Dissolved Oxygen (mg L-1) was observed as minimum as 4.55 in June while as maximum as 14.40 in August with an annual average 9.97 ± 0.255.

In Ramsagar Pond the oxygen maxima has been, evidence in winter months and minima is summer months except for monsoon months, where too, a state of maxima has been accounted for. This indicates a state of inverse relationship between DO and water temperature {Reid4, 1961; Welch5, 1952; Hussainy6, 1967; Gupta and Mehrotra7,1986; Yadava et al8, 1987; {Charlton and Rao9, 1983}.This may probably be due to the higher rate of trophogenic activities at the surface water and oxygen uptake at the mud water interface. Yentsch and Ryther10 (1957) have suggested a declination in chlorophyll content for such lower values in summer times. Decomposition of organic matter may be an important factor in consumption of DO, which becomes more vigorous in warm weather {Gonzalves and Joshi11, 1946,Begde & Verma, 1985}.Re-oxygenational of water in monsoon period my be due to circulation and mixing by inflow after monsoon rains {H.H Hannan et Al. 1978; H.H Hannan etal, 1979; Bagde & Verma12 1985} with a progression of winter DO increased tremendously in Ramsagar Pond to its higher values, which may be due to circulation by cooling and draw down to dissolved oxygen in water {H.H Hannan13, Hannan etal14 1979; Gordon & Nicholas15, 1970; Agrwal etal16. 1976; Rai17,1978}.

References

1. R.G Wetzel:- Primary production. In B. A. Whitton, Ed. River ecology. Oxford, *Blackwell scientific Pubels :***230** (1983)
2. L.W Winkler's :- Die loslichkeit des sauerstoffs in wasser. Ber dtsch. *Chem. Ges.* **22**:1764-1774 (1889)
3. APHA -(AWWA, WPCF.) Standard method form Examination of water and wastewater 18th Ed. American Public Health Association. American works association water pollution Control federation. Washington D. C. (1989)
4. G.K Reid,:- Ecology of inland water and estuaries. Reinhold Publishing corporations, New York :185 (1961)
5. P.S Welch,:- Lakes, their origin and diversity, in Limnology, 2nd Edition. Mc. Graw hill book Company, London, New York (1952)
6. S.U Hussany,:- Studies on limnology and primary Production of tropical lake. 1 *hydrobiologia,* **30:**335-352 (1967)
7. A.K Gupta and R.S Mehrotra - Studies on seasonal Variations in pH and dissolved Oxygen content, in Sanhit Sarover Krukshetra, *Geobios* **13**(6):276-278 (1986)
8. Y.S Yadava, R.K Singh, M. Choudhary, V. Kolchar:- Limnology and productivity of Dighali beel Assam, *tropical ecol.* **(28)**: 137-146 (1987)

9. M. N Charlaton and S.S Rao,:- Oxygen depletion in central And Eastern Lake Erie :relationship With bacteria, chlorophyll, POC, And Morphometry, *J. Great lakes*. **9**(I) :3-8 (1983)
10. C.S Yentsch and J.H Ryther,:- Short term variation in Phytoplankton chlorophyll and their Significance. Limnol. *Oceanogr*. (**2**): 140. (1957)
11. E.A Gonzalves and D.B Joshi,:- Freshwater algae near Bombay, I. The seasonal succession Of the large in a tank in Bandra. *J. Bomb. Nat Hist. Soc.* **46**(I) 154-176. (1946)
12. U.S Bagde and A.K Verma,:- Limnological studies on J. N. U. Lake, New Delhi, *India bull Bot. Soc. Sagar* **(32)**:16-32. (1985)
13. H.H Hannan,:- Chemical modification in reservoir Regulated stream. In the ecology of Regulated stream. Ward, J. W. And Stanford, *J. A. ed. Plenum corporation Publications* :75-94 (1979)
14. H.H Hannan, D.B Barrows, I.R Fuches, R.D Segura and Whitenberg :- Limnological and operational factors affecting water quality in canyon reservoir, Taxas, Driver, E.E and Wunderlich, W. O (eds.) Environmental effects of Hydraulic Engineering Works. Tenn. Valley Authority Norries, *Tennessee:* 39-48 (1978)
15. J.A Gordon and W.R Nicholas:- Effects of imponduments on water quality. Observation of Several mechanism of dissolved Oxygen depletion Div. Of environ. Plan., tenn. Valey Auth. Public E. Ep. :77-1:54. (1970)
16. D.K Agarwal, S.D Gaur, I.C Tiwari, N. Narayana Swami and S.M.Marwah:- Physico chemicals characteristic of Of Ganges in Varanasi, Indian J. Environy, Hlth 18:201-206. (1976)
17. L. C Rai :- Ecological studies of Algal Communities of the Ganges River at Varanasi, *Indian J.E col.* **5** No.(1): 1-6 (1978)

Indexed in : Chemical Abstract U.S.A.
JC- 1293/2K18 (ISSN:0973-239X), INDIA
Journal Chemtracks Vol. 20 (1&2) 119-122, January to December 2018

Indexed in : Chemical Abstract U.S.A.
JC- 1293/2K18 (ISSN:0973-239X), INDIA
Journal Chemtracks Vol. 20 (1&2) 119-122, January to December 2018