

Study of Some Physico-Chemical Parameters of Dhamapur Lake Malwan, Sindhudurga District, Maharashtra.

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Abstract

Present investigation deals with the study of physico-chemical parameters of Dhamapur lake in Malwan Sindhudurg District, Maharashtra, The lake water is used for drinking, agriculture and other domestic purpose. The samples were collected from the station during the period of June 2009 to December 2010. The parameters Selected were Temperature, P^H conductivity, BOD, Hardness, Free Co₂, Turbidity. The result reveal that the range of variation in Different parameters was Temperature 28°C to 30°C, P^H 6.81 to 7.08, conductivity 0.048 to 0.067 μmhos/cm, BOD 1.16 to 1.89 mg/L, Hardness 60.00 to 92.9 mg/L, Free Co₂ 1.11 to 4.03 mg/L, Turbidity 0.002 to 0.009 mg/L. All the parameters are within the limit of range compared with WHO and ISI and the lake water is not polluted.

Key words: Dhamapur lake, physico-chemical parameters

Introduction

Water is a vital factor in life. About one third of the water requirement of the world obtained from the fresh water sources like rivers, canals, springs and lakes. Water is extremely important as it is essential for all most all metabolic activities of living organisms. It forms about 70 percent of the weight of human body (Singh et al., 2006). Water is basis of all life forms and absolute necessity comprising domestics, agriculture and industrial activities. India's utilisation quantum of water in the surface water sources is approximately 70 million hectare meters (Tyagi et al., 2003).

Now a day due to rapid industrialization, deforestation and over population most of our natural water bodies are gradually becoming degraded to a great extent. Unplanned and excessive exploitation resulted pollution of water bodies. Hence there is need to examine the physico-chemical parameters of Dhamapur lake, Sindhudurg District Maharashtra.

Material and Methods:

The water sample of Dhamapur lake were collected from three selected stations about 100 m Away from each other monthly in pre rinsed one litre plastic cans. The parameters such as temperature and P^H were estimated at the spot along the bank of the lake. The water sample for BOD was also preserved on the spot. The samples were analysed in a laboratory as per the methods given by (Trivedi, et al;1984), (APHA, 1985). Table 1 showing mean values of some physico-chemical parameters of Dhamapur lake, Sindhudurg District Maharashtra in the year 2010-2011.

Month	Temp. O ^c	Turbidity mg/L	P ^H	FreeCo ₂ Mh/L	BOD Mg/L	Hardness mg/L	Conductivity μmho/cm	COD Mg/L
Jan	29.3	0.008	6.93	2.032	0.87	64.00	0.065	49.2
Feb.	29.2	0.007	6.90	2.13	1.24	82.5	0.067	25.6
Mar.	28.4	0.007	6.87	2.13	1.63	87.00	0.063	34.5
April.	30.0	0.007	7.05	2.03	1.89	81.4	0.062	68
May	30.4	0.007	7.06	1.91	1.72	92.3	0.060	33.3
June	30.4	0.011	6.96	1.98	1.69	88.8	0.058	5219
July	28.6	0.013	7.02	2.27	1.51	89.2	0.051	40
Aug.	28.5	0.009	6.97	2.04	1.65	73.8	0.051	49.2
Sept.	28.6	0.008	7.06	3.054	1.47	82.5	0.053	89.9
Oct.	28.4	0.008	6.98	2.54	1.56	85.0	0.054	73.2
Nov.	28.4	0.008	7.01	1.52	1.70	81.00	0.061	51.9
Dec.	29.5	0.008	7.02	1.016	1.69	81.00	0.060	61.9

Table 1: Mean values of Physico-chemical parameters of Dhamapur Lake

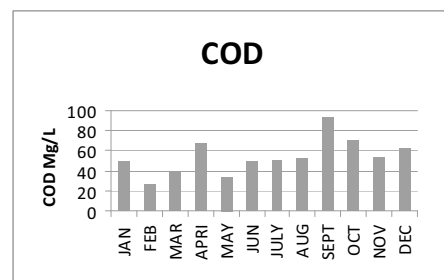
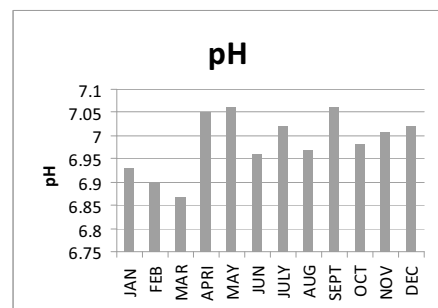
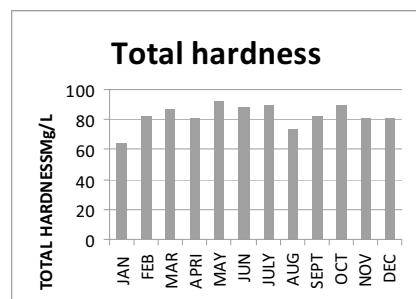
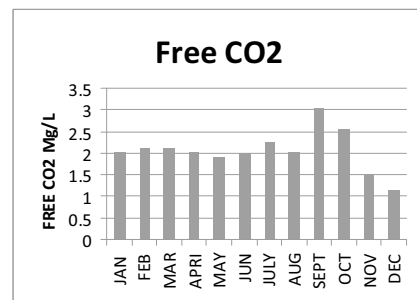
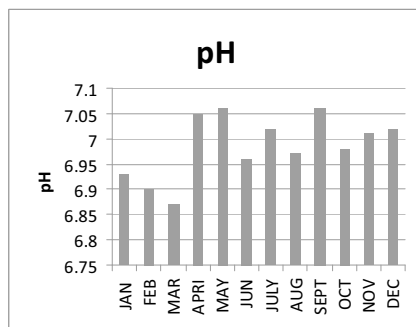
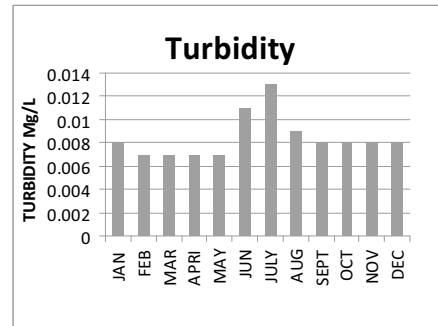
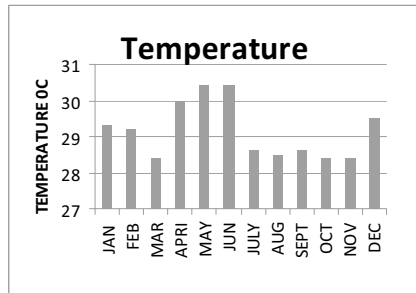
Results and Discussion:

A) Temperature: Temperature is most importance environment factor with effect on plants and animals. Water has several unique thermal properties which combine to minimized temperature change. The temperature of water varied from 28.00°C to 30.4°C. Water temperature depends on the depth of water column, climatic and topographic changes. The minimum Temperature was recorded at all the stations in July, Aug., Sept., Oct. and Nov. i.e. at Monsoon and post monsoon period. The minimum Temperature was recorded at all the stations in April (30.1°C) may (30.4°C) and June (30.4°C). The gradual increase in the temperature was observed from Dec. onwards. Similar result recorded Kale and Kutemate (2011).

B) Turbidity: The turbidity of sample water varies from 0.007 to 0.014 Mg /L in post monsoon and 0.008 to 0.014 Mg/L in monsoon throughout study. Turbidity is high it is due to suspended colloid particle similar result reported by Tiwari, et al;(2003); Sivagurunathan, et al;(2006).

at narrow range and the pattern of variation was irregular (Khere, 2002). the observed P^H values are within permissible limits of WHO and ISI. Similar result shows by Achary et al., (2011).

C) P^H: P^H indicates concentration of Hydrogen ions. P^H in present study the maximum P^H recorded in pre monsoon and minimum in post monsoon similar result also recorded by Sivakami et al;(2011) and it is fluctuated



D) Free carbon-dioxide: CO₂ is one of the important element in biological world. The sources of CO₂ are rainwater, ground water, the respiration of aquatic flora and fauna also decomposition of organic compound added CO₂ in water (Munshi, et.al;1995).In present investigation, the free CO₂ was in between 1.52 mg/L to 4.54 mg/L. The high values Of CO₂ in the month of July, Aug. and Sept.in rainy season. It is due to fishing activity and movement of water. Free CO₂ help buffering the aquatic environment against rapid fluctuation in acidity and alkalinity of water (Pejaver et al.,2008: Gupte,et.al;2009).

E) BOD: BOD is amount oxygen utilities by microorganisms in stabilizing the organic matter. It is an indicator of amount of oxygen present in a water body. It is proportional to the amount of organic waste to be degraded aerobically (Dutta and Dutta, 2000). Increase BOD value result depletion of oxygen. In present investigation, the BOD value range between 1.27 to 1.92 Mg/L. In all stations values are more than 1.00 Mg/L. Hence water cannot uses for drinking purpose.

F) COD: Chemical oxygen demand is the oxygen required by the organic substances in water to oxidize by a strong chemical oxidant. The determination of COD values are of great importance where BOD value cannot be determined accurately due to the present of toxin and other unfavourable tor growth of organisms (Kale et al., 2011; Thakur et al., 2009). COD values are used for calculation efficiency of treatment plants. In the present investigation the COD values are minimum recorded in summer season and maximum value recorded in rainy season. The same result reported by (Dhaneshar, et al.; 1970; Baruah et al., 1996).

G) Total hardness: Hardness is property of water which prevent lather formation with soap and increase boiling point of water The anion responsible for hardness are mainly bicarbonate, sulphate, chloride, nitrate etc. Other metabolic ions dissolved in water are calcium, magnesium, iron, strontium and manganese (Ravichandran et al., 2002 ; Singh 2000; kumar et al., 2002). Hardness has great effect on biodiversity. In present study the total hardness is in between 60 to 97, which is within permissible limit in all stations.

H) Conductivity: The conductivity is the major of the salt contain of water in the form of ions which are capable of conducting current. Therefore conductivity is good rapid major of the total dissolved solids. In the present investigation values minimum in winter (0.051to 0.058μmho/cm) and maximum (0.061 to 0.065μmho/cm) in summer. Similar result are reported by (Garg, et .al;2003)

Conclusion:

In present investigation an attempt was made to generate base line information about some physico-chemical parameters of Dhamapur lake water. The water of lake was found to be clean not yet to be polluted.

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