PHYSICOCHMICAL ANALYSIS OF WATER QUALITY OF KONDESHWAR LAKE IN AMRAVATI DISTRICT (M.S)

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Abstract :Water is one of the most and very important source of all natural resources available on earth. In order to understand the water quality of Kondeshwar Lake, near Amravati , Physicochemical parameters were studied and analysed for the period of one year from January 2006 to December 2006. The range of Physicochemical parameters such as Water Turbidity, Total Dissolved Solids(TDS),pH, Dissolve Oxygen (DO), Total Hardness, Chlorides, Magnesium etc were estimated. The present study showed the significant changes according to season in some physicochemical parameters. Most of the physicochemical parameters were found in normal range and indicated good quality of lake water. It has been found that the water is best for drinking purpose in winter and summer seasons.

Key words: Physicochemical parameters , Kondeshwar Lake, Water analyses.

INTRODUCTION

Water is one of the most and very important source of all natural source available on earth. It is very important for all living organisms , ecological system, human health and also the economic development of the country. The quality of water is determined by number of different contaminants from different mode of pollutant. Due to regular use of polluted water for drinking purpose human society may suffer from various water born diseases such as cholera, dysentery etc. Therefore it is very important to check the water quality regularly to avoid the complications in future.

The present investigation involves the analysis of water quality in relation to physico- chemical parameters. The Kondeshwar lake which is located near Amravati was selected for present study to analyse the water quality. The lake is good source of water used for drinking and irrigation purpose by the villagers. At present the lake is polluted due to the interference of human activities as well as domestic animals of nearby villagers. The physicochemical parameters of water of kondeshwar lake were studied and analyzed for the period of one year from January 2006 to December2006. In the recent years many researchers in India have worked on physicochemical and biological characteristics of reservoirs and rivers (Zafer.A.R, 1964, Kodarkar, 1992; Rao,S 1992).The study area of the present study is shown by using satellite image and indicated as Fig 1.

Fig.1: Satellite image of Kondeshwar Lake

MATERIALS AND METHOD

The present study was carried out on Kondeshwar lake and the water samples were collected during morning between 9.00am at monthly interval in dark black coloured polythene bottles having the capacity of 1liters. The spot parameters like pH, Humidity, Water temperature, Air temperature was recorded at sampling spot by using Thermometer and Pocket digital pH meter. The water samples were brought immediately to the laboratory for the estimation of various physicochemical parameters like Conductivity, TDS, Dissolved oxygen, Total Alkalinity, Total hardness, Calcium and Magnesium. Physicochemical parameters were estimated as per standard methods prescribed by APHA(1992), Kodarkar (1992).

RESULTS AND DISCUSSION

The physicochemical parameters of Kondeshwar Lake was estimated and the findings are given in Table No. 1. The physicochemical features of kondeshwar lake water were highly influenced by the discharge of domestic waste and man made pollution. In the physicochemical parameters the temperature is one of the most important factor in aquatic environment as it controls the seasonal and biological activities in the environment (Singhai S.G;M.A.Ramani and U.S.Gupta, 1990 and Kumar *et al.*, 1996). The temperature of surrounding area of lake was ranges between 18^0 C to 40°C. The water temperature was recorded is less than 17^0 C during mid winter and greater than 24 °C. in the month of May. It shows higher temperature in summer and relatively lower in winter. Similar observations were recorded by Jayabhaye et.al.(2006) and they stated that it is due to the evaporation and low water level of water in summer. The humidity is ranges between 42.6% to 69.2%. Maximum humidity was recorded in monsoon and minimum in summer season. The turbidity of water show fluctuations, it ranges between 2 NTU to 11.15 NTU. The maximum turbidity was recorded in the month of March and it is due to presence of suspended particulate matter in the lake. To determine the quality of water , pH plays a key role in determining the corrosive nature of water. The pH of sample water of dam found 7.6 to 8.2. The maximum pH was recorded in the month of May whereas the minimum in October. It may be due to the atmospheric temperature, low oxygen level, biochemical reactions of various zooplankton or phytoplankton reduces the CO2 and bicarbonates ,Kaushik.S and N.Sharma (1994).

The correlation of dissolved oxyge with water body gives direct and indirect information of bacterial activity, photosynthesis, availability of nutrients, stratification etc.. The presence of DO gives taste of drinking water. The DO value also indicates the degree of pollution in water bodies. In the present study the Dissolved oxygen was minimum in March and April maximum in the month of December. The concentration of dissolved oxygen is ranges from 7 to 8 mg/lit. The similar observation was observed by Rao.S (1992).The TDS of the sample water showed range of 140.5 mg/l to 190.4 mg/l. It supports the finding of Kaur, H; S.S. Dhillon and K.S.Bath(1995).

Alkalinity is important in determining a stream's ability to neutralize acidic pollution from rainfall or wastewater (Das and Chand 2003). There can be long-term changes in the alkalinity of lakes and rivers in response to human disturbances. Total alkalinity of the kondeshwar lake was varied from 100..32 to 186.07 mg/lit. and the maximum and minimum was recorded in the month of February and June respectively. Katariya *et al.*, (1996) have measured maximum value of alkalinity due to confluence of industrial and domestic waste. The present findings are well in support to the present study. Total hardness of water is caused due to the presence of Calcium and Magnesium salts in water. However, the hardness of lake water is 70.5mg/lit to 152.15 mg/lit. The maximum value of hardness in sample water was recorded 152.15mg/lit in the month of May and minimum 70.5 mg/lit in the month of November. The similar findings were recorded by NEERI (1987) and WHO(1993)and William.A.Wurts (2002)

Table.1: Physico-chemical Parameters of Kondeshwar Lake during January2006 to December 2006

Parameter/ Months	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov	Dec
Water Temp.^{0}C	16.2	17.9	18.4	21.4	24.0	23.1	22.9	22.1	21.6	20.6	18.1	17.6
AirTemp.^{0}C	18.4	22.2	26.4	36.2	40.0	38.2	36.4	30.5	32.4	28.4	24.5	20.8
Turbidity NTU	8.15	9.21	11.15	8.27	7.15	6.17	6.70	5.35	5.10	3.15	2.60	2.01
pH	7.8	7.6	7.9	8.0	8.2	8.1	7.9	7.8	7.9	7.6	7.8	8.0
TDS(mg/l)	140.6	152.4	157.1	160.8	172.1	182.6	185.4	188.7	190.4	151.7	152.4	156.0
DO(mg/l)	8.08	7.95	7.15	7.21	7.45	7.53	7.60	7.58	7.55	7.80	7.76	8.10
Total Alkalinity (mg/l)	100.90	100.32	110.6	126.9	132.5	186.7	170.1	155.4	132.5	120.7	110.2	104.6
Total Hardness (mg/l)	96.2	113.4	129.7	141.4	152.5	130.6	116.2	108.5	91.6	82.4	70.5	82.6
Calcium (mg/l)	22.2	21.6	22.4	23.4	26.8	21.9	18.4	16.6	15.4	14.6	13.9	21.6
Magnesium (mg/l)	8.9	9.6	11.9	19.9	26.4	24.5	8.2	7.6	7.1	8.6	10.4	11.2

CONCLUSION

The present study showed that the physico- chemical parameters of lake water exhibit significant seasonal variations in some parameters whereas most of the parameters were found in normal range. After physico-chemical analysis of sample water it is found that the water is good for human use and free from pollution and ecologically balanced.

REFERENCES

(1) .Zafar.A.R(1964):On the ecology of algae in certain fish pond of Hyderabad , India. I Physico-chemical complexes.Hydrobiologia,23:179-195.

(2) .NEERI (1987):A Laboratory mannual on water Analysis.

(3) .Singhai,S.G;M.A.Ramani and U.S.Gupta(1990):Seasonal variations and relationship of different physic-chemical characteristics in newly made Tawa reservoir.Limnologica, (Berlin).21(1):293-301

(4) .Kodarkar M.S(1992):Methodology for water analysis, physico-chemical, Biological and Microbiological Indian Association of Aquatic Biologist. Hyderabad;pub,2- pp.50

(5) WHO (1993): Drinking Water Standard.

(6) Rao.S(1992):An ecological study of three freshwater ponds of Hyderabad. India. The environment: Hydrobiologia;38,213-233.

(7) Kaushik,S. And N.Sharma(1994): Physico-chemical characteristics of zooplankton population of a Peremial tank, Matesya Sarover, Gwalior. Environ and Ecol.12(2):429-434.

(8) Kaur,H;S.S.Dhillon;Navkiran Kaur and K.S.Bath(1995): Physico-chemical characteristic of fresh water eco-system prevailing in and around patilala,Punjab.J.Environ and Ecol.,13(3),523-528.

(9) Kumar,A;H.P.Gupta and D.K Singh(1996):Impact of sewage pollution on chemistry and primary productivity of two fresh water bodies in Santal Paragan(Bihar)India.J.Ecol.23(2),82- 86.

(10) Kataria H.C, S.A.Iqbal and A.K.Shandilya(1996):Limno-chemical studies of Tawa Reservior.IJEP16(11);841- 846.

(11) APHA(1998):Standard methods for examination of waste water .American public Health Association, Washington D.C.874.

(12) William.A.Wurts (2002): Alkalinity and Hardness in Production Ponds. World Aquaculture, 33(1):16-17

(13) Das S.K and B.K.Chand(2003):Limnology and biodiversity of Ichthyofauna in pond of Southern Orissa. Indian.J.Ecotoxical Environ,Monit.13(2):97-102.

(14) Jayabhaye, U.M; M.S Pentewar and C.J.Hiware(2006):A study on Physico-chemical parameters on Minor Reservoir, Sawana, Hingoli District, Maharashtra.