

WATER QUALITY ASSESSMENT OF THE SAJHI LAKE AND SIRSA LAKE OF EAST CHAMPARAN ON THE BASIS OF MONTHLY FLUCTUATION IN THE VALUES OF BIOLOGICAL OXYGEN DEMAND (B.O.D)

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ABSTRACT : The estimation of Biological Oxygen Demand (B.O.D) was done from January 2011 to December 2011 for the water of two different Lake of Dhekaha Village & in these one is situated at Dhekaha named as Sajhi Lake, other is situated at the Sirsa named as Sohagman (Sirsa Lake). Sajhi Lake was rain fed perennial Lake and low amount of sewage, domestic effluent were drained in this lake from the nearby forest area of the Dhekaha Village. The Lake II is situated far from the residential areas so it was free from domestic effluent. It was treated as managed Lake. During Study period the estimated value was ranging from 2.10mg/l to 4.50 mg/l for Lake I and for Lake II its value was ranging from 1.9 mg/l to 6.5 mg/l.

KEYWORD : Limnology Dhekaha and Sirsa Villages, Biological Oxygen Demand, Pisciculture, D.O., Micro-organism.

I. INTRODUCTION

The limnological study of two lake of Dhekaha village was done on the basis of B.O.D. The B.O.D is the good indicator of water quality for the use of water for pisci culture, Irrigation and as drinking water for pet animal &cattle. So good water quality is necessary to check the water pollution. Biochemical Oxygen demand or B.O.D. is the amount of dissolved oxygen needed by aerobic biological organisms in a body of water to break down organic material present in a given water sample at certain temperature over a specific time period. The term also refers to a chemical procedure for determining this amount this is not a precise quantitative test, although it is widely used as an indication of the organic quality of water. The BOD value is most commonly expressed in milligrams of oxygen consumed per liter of sample during 5 days of incubation at 20°C and often used as the degree of organic pollution of water.

During the first investigation year (2011), the biological oxygen demand recorded to be in the range of 2.10 to 4.50 mg/l with the maximum of 4.50 mg B.O.D/L water in the month of June followed by July (4.50 mg/l). Its minimum value was recorded to be in January (2.10 mg/l) followed with February and December (2.15 and 2.25 mg/l respectively).

II. MATERIAL & METHOD

Biochemical Oxygen Demand test shows the amount of molecular oxygen required by microorganism to reduce the organic matter. It is bio-assay procedure that measure the oxygen consumed by living organisms while utilizing the organic matter. This method involves measuring the difference of the oxygen concentration between the samples and incubating it for 5 days at 20°C.

Preliminary dilution and accretion of the sample is necessary to ensure that not all the D.O. content of the original sample was very low the sample was aerated 30 minutes by bubbling compressed air in distilled water, Dilutions were prepared in a large glass by mixing the contents thoroughly. Now each diluted sample was taken in two glass bottle of 300 ml capacity with stopper and immediately the D.O. Concentration in one bottle of each dilution was determined and another bottle was placed in the dark at 200 c in a B.O.D. incubator for 5 days. After the D.O. concentration in the bottle was determined.

Initial D.O. - Final D.O Calculation

$$\text{B.O.D} = \frac{\text{Initial D.O.} - \text{Final D.O.}}{\text{Dilution Percentage}}$$

Dilution Percentage.

III. RESULT AND DISSCUTION

The value of B.O.D. was used to determine the quality of water. The B.O.D. was the result of respiration of plankton and bacteria. It was the amount of oxygen required for the oxidation of waste by bacteria present in water. The high concentration of biodegradable matter present in water may be designated pollutants which most often checked by B.O.D. value. B.O.D. was therefore direct measure of organic matter entering in a water body through different kind of effluence.

The B.O.D value was the important index for the Judging the quality of water (Saxenaet. Al 1966). A high BOD value indicates organic waste pollution (Ray and David 1966). The value of BOD was also influenced by other related factors like temperature, density of plankton etc. (Boyd etal 1978). Patil (1985) while working on the ponds of Dharwar reported well marked relationship between the light intensity and temperature with BOD. It may be mentioned that the according to Royal Commission in sewage Disposal U.K (1888) as reported by Hynes (1960) the quality of a water body may be judged by following criterion. If the maximum BOD value was 1.0 ppm, clean 4.0 ppm fairly clean 5.0 ppm as doubtful and 10 ppm for bad. Schroder (1975) reported that on an average BOD value of Lake water range between 0.48 to 7.93 mg/oxygen/l/day other important workers were Kothandraman, Thergaonkar Ganpati (1963) who detected values of BOD on three different sites of Ahmadabad sewage viz. 222 mg/l to 412 mg/l on Suburban.

During the present study it was observed that during the 1st year of study its value was ranging from 2.10 mg/l to 4.50 for Sajhi lake highest value was 4.50 mg/l recorded in the month of June 2011. Annual average value the 1st year of the were calculated as 3.33 mg/l respectively. During the 2nd year of study its value was ranging from 1.98mg/l to 4.36 mg/l. The highest value was 4.36 mg/l as recorded in the month of June 2012 and lowest value was 1.98 mg/l as recorded in the month of December 2012. Annual average value as for the 2nd year of the study were calculated as 2.95 mg/l. for Sajhilake.

During 1st year of the study the seasonal average during monsoon winter, summer, were 3.787 mg/l 2.333 ml/l, and 3.912 mg/l respectively for Sajhilake. During 2nd year of the study of seasonal averages during monsoon winter. Summer, were mg/l, 2.07 mg/l, 3.82 mg/l respectively for the same lake.

In Sirsa lake during the 1st year of study it value was ranging from 1.9mg/l to 5.5 mg/l recorded in the month of august 2011 and lowest value was 1.9 mg/l recorded in the month of February 2011. Annual average value for the 1st year of the study were calculated as. 3.54 mg/l respectively. During the 2nd year of study. Its value was ranging from 2.0 mg/l to 6.1 mg/l. highest value was 6.1 mg/l as recorded in the month of July 2012 and lowest was 2.0 mg/l as recorded in the month of February 2012. Annual average value for the 2nd year of the study were calculated as 3.86 respectively.

During the 1st year of the study of the seasonal average during monsoon, winter. Summer, were 4.7. mg/l 2.875 mg/l and 3.05 mg/l respectively and during the 2nd year of the study the seasonal value averages during monsoon winter summer. Were 5.13, mg/l, 2.50 m/l., and 395 mg/l respectively for Sirsa Lake.0

TABLE-1 : Monthly fluctuation in the values (in mg/L) of B.O.D is given below.

	Month	Sajhi Lake	Sirsa Lake
Monsoon	Jul-2011	4.15	5.2
„	Aug	3.75	5.5
„	Sep	3.10	5.3
„	Oct	2.95	2.8
	Seasonal average	3.487	4.7
Winter	Nov	2.42	4.2
„	Dec	2.25	3.1
„	Jan	2.10	2.2
„	Feb	2.15	1.9
	Seasonal average.	2.23	2.875
Summer	Mar	3.40	2.4
„	Apr	3.65	3.2
„	May	4.10	3.0
„	Jun	4.50	3.6
	Seasonal average.	3.912	3.05
	Highest value during I year	4.5	6.5
	Lowest value during I year	2.10	1.9
	Annual average for the I year	3.33	3.54
Monsoon	Jul-12	3.75	6.1
„	Aug	3.12	4.4
„	Sep	2.59	5.2
„	Oct	2.42	4.8
	Seasonal average	2.97	5.13
Winter	Nov	2.15	2
„	Dec	1.98	3.7
„	Jan	2.00	2.0
„	Feb	2.15	2.3
	Seasonal average.	2.07	2.50
Summer	Mar	3.10	3.2
„	Apr	3.78	5.0
„	May	4.05	4.1
„	Jun	4.36	3.5
	Highest value during the II year	4.36	6.1
	Lowest value during II	1.98	2.1
	Annual average for the II year	2.95	3.85

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