



RESEARCH ARTICLE

LIMNOLOGICAL STUDY OF MADDIKUNTTA LAKE , DISTRICT: GADCHIROLI (MS)

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Abstract

Present paper Study with the physico-chemical parameters of Maddikunta lake, Tahsil :-Sironcha ,Dist:-Gadchiroli. The work was carried out during the period of Sep- 2015 to Aug 2016. This lake was established for irrigation, Drinking water and fish culture purpose .It was formed 300 years ago from migrant telugu peoples from Andhra Pradesh . It was in the out of 6 km distance from Tahsil:Sironcha . In rainy season it's receiving Village sewage, fertilizers , Pesticides . This typs of water injuries to the health of human other aquatic Fauna. So there is an urgent requirement for its extent of pollution which will help us in further management of conservation. During the study period examine the physico-chemical parameters such as: atmosphere, water temperature, pH, electrical conductivity, alkalinity, total hardness, TDS, Ca, Mg, chlorides, sulphates and phosphate, following stranded methods (APHA 1998). Now this lake is becoming eutrophic in nature.

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Introduction:-

Water is the most essential requirements of life. The survival and quality of human life depends up on the availability of fresh water. The aquatic animal's life directly or indirectly depends on water quality status (A. Bajpai, 1993). (A. Mishra et.al.1993). (sayeshwara,2010). Water quality study provide the current information about the suitability of water for designated uses and to improve existing condition (Lloyl 1992).

Now a day's most of the aquatic ecosystem receives million liters of village sewage, and agricultural runoff. Its cause to nutrient enrichment cause to the eutrophication in aquatic ecosystem. (A.A. Ansari,2006). Pollution of the aquatic environment by inorganic and organic chemicals is a major factor to the survival of aquatic organisms and including fish population (Saeed and Shaker 2008). The main object of this paper to examine the physic-chemical parameters of Maddikunta Lake and to suggested to conservation methods for water for drinking and irrigation purposes.

Study area:-

The lake in Maddikunta ,Tahsil:Sironcha ,District:Gadchiroli(MS). Maddikuntha is a Village in Sironcha Taluka in Gadchiroli District of Maharashtra State, India. It belongs to Vidarbha region . It belongs to Nagpur Division . It is located 179 KM towards South from District head quarters Gadchiroli. 6 KM from Sironcha.874KM from State capital Mumbai

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Ramanjapur (vl) (2 KM) , Arda (2 KM) , Nagram (4 KM) , Sironcha (ryt) (4 KM) , Sironcha (4 KM) are the nearby Villages to Maddikuntha. .This Place is in the border of the Gadchiroli District and Karimnagar District. Karimnagar District Mahadevpur is South towards this place . It is near to the Telangana State Border.

Material And Methods:-

The investigation was carried out to study the physico- chemical and biological aspect of the lake during September 2015 to August 2016, the Maddikuntta lake situated 6 km distance from Tahsil: Sironcha, District:Gadchiroli. Figure – 1. 160ht paddy field is irrigation under this lake. Water sample were collected in morning hours at 6-30am to 8-30 am.

Physical chemical parameters such as: temperature, pH, TDS, electrical conductivity, alkalinity, total hardness, TDS, Ca. Mg, chlorides, sulphates and phosphate, following were analyzed in the laboratory by using standard methods (APHA,2005).



Results:-

The result of physico-chemical characteristics of maddikunta lake water has been submitted in table. 1 and table 2.

Temperature:-

Water Temperature is an important role plays in determine the growth of organisms ultimately the water quality. Water is a vital parameter for growth of Organism. It also influences the metabolic rate of aquatic Organism. Excess amount of nutrients, high temperature cause to the eutrophication. The maximum temperature value was recorded to be 35.5 degree Celsius in the month of may at the sampling station B and minimum 19 degree Celsius January at sampling station A. In study period i.e. Sep-2015 to Aug-2016. .

pH:-

The high variation in pH of water is an indicate the highest productivity nature of lake water. According to Hora and Pillay the pH variation is mostly due to diurnal interplay of photosynthesis and community respiration of the biota and also is one of the most important single factors, which influences the aquatic production. The pH considered an important environmental factor. The maximum value of pH was recorded 8.5 in month of May at the sampling station B and minimum 7.8 was recorded in the month of September at sampling station A. In study period i.e. Sep-2015 to Aug-2016. .

Transparence:-

Intensity of light cause to the growth of planktons, it an indicator of productivity. The maximum value of transparency was recorded 25.5 cm in month of November at the sampling station A and minimum 14.5 was recorded in the month of August at the sampling station A. In study period i.e. Sep-2015 to Aug-2016. .

Electric Conductivity:-

Electric conductivity is a numerical expression ability of an aqueous solution to carry electric current. It's the best indicator of water pollution as conductivity is the indirect measure of TDS, nutrient. Conductivity increases with increasing amount and mobility of ions. These ions come from the break down of compounds. The maximum value of conductivity 1800 μm was recorded in month of July at the sampling station B and minimum 1150 μm was recorded in the month of April at the sampling station A. In study period i.e. Sep-2015 to Aug-2016. .

Total dissolve solids:-

Total dissolved solids are composed of mainly of chlorids, Sulphates, Phosphates, Nitrates, Calcium, Magnesium, Sodium, Potassium, Iron, Magnesium carbonates, bicarbonates (H.R. Esmaeli and M.S. Joshi 2005). Total dissolved solids denote mainly the various kinds of minerals available in the water. The maximum value of TDS 1330 mg/lit was recorded in month of September at the sampling station B and minimum 970 mg/lit was recorded in the onth of May at the sampling station A. In study period i.e. Sep-2015 to Aug-2016.

Total Hardness:-

The maximum value of total hardness 152 mg/lit was recorded in month of April at sampling station A and minimum 87 mg/lit was recorded in the month of September. Salve and Hiwre (2006), S.E. shinde et. Al (2011) reported that TH high in winter low in summer and monsoon season. In study period i.e. Sep-2015 to Aug-2016.

Table No. 1:- Physico-chemical parameters of Maddikuntta lake, District :Gadchiroli during Sep-2015 to Aug-2016 at Sampling Station A

	15-Sep	Oct	Nov	Dec	16-Jan	Feb	Mar	April	May	Jun	July	16-Aug
Water Temp.	28	26.5	25.2	22	18.5	23.6	29.5	32.2	36	32.5	29.2	26
pH	7.6	8.2	8.2	8.2	8.7	8.4	8.6	8.3	8.2	8.2	8.1	7.8
Transparence	16.6	22.2	25.5	22.5	23.5	24.5	19.5	22.5	22.6	20.5	17.6	14.5
Conductivity	1520	1800	1700	1520	1430	1300	1230	1150	1610	1750	1820	1720
TDS	1320	1164	1188	1205	1155	1255	1120	990	970	1040	1185	1210
Total hardness	87	118	124	127	134	135	145	151	145	127	115	97
Ca	64	66	72	73	82	88	94	102	112	94	84	78
Mg	17	54	52	53	54	41	57	51	32	28	29	19
Alkalinity	252	304	312	324	266	180	164	194	112	104	192	233
Cl	64	70	57	55	64	68	73	74	74.5	69.5	71.5	68.5
P	1.4	1.15	0.8	0.98	1.24	0.99	1.4	2.5	3.4	1.8	1.4	1.04
S	1.9	1.8	1.05	1.3	1.4	1.45	1.9	2.3	2.9	3.3	1.8	1.7

Table No. 2:- Physico-chemical parameters of Maddikuntta lake, District :Gadchiroli during Sep-2015 to Aug-2016 at Sampling Station B.

	15-Sep	Oct	Nov	Dec	16-Jan	Feb	Mar	April	May	Jun	July	16-Aug
Water Temp.	28.2	26.6	25.4	22.5	18.3	23.5	29.7	32.4	35.5	31.5	29.4	26.6
pH	7.6	7.9	8.0	8.2	8.3	8.2	8.4	8.5	8.6	8.1	8.1	7.8
Transparence	16.6	22.2	25.5	22.5	23.5	24.5	19.5	22.5	22.6	20.5	17.6	14.5
Conductivity	1550	1800	1700	1520	1430	1340	1230	1150	1620	1750	1800	1730
TDS	1330	1164	1188	1204	1150	1250	1125	992	970	1040	1185	1220
Total hardness	86	118	124	126	134	136	145	152	146	128	115	98
Ca	64.5	66	72	74	82	88	94	101	110	94	84	78
Mg	18	54	52	53	54	41	57	51	32	28	29.5	19.4
Alkalinity	253	305	312	325	266	180	164	194	115	105	192	233
Cl	64	70	57	56	64	68	73.5	74	74.5	69.5	71.5	68.5
P	1.3	1.15	0.8	0.98	1.25	0.99	1.5	2.5	3.4	1.8	1.5	1.05
S	1.8	1.9	1.05	1.2	1.5	1.46	1.8	2.5	2.9	3.3	1.9	1.8

Calcium:-

Calcium is one of the most abundant substances present in the natural water. In aquatic environment calcium serves as one of the micronutrients for most of the organisms. The maximum value of calcium 110 mg/lit was recorded in month of May at the sampling station A and minimum 64 mg/lit was recorded in the month of September at the station B. In study period i.e. Sep-2015 to Aug-2016.

Magnesium:-

Magnesium is essential for chlorophyll bearing organism, since it goes into composition of the pigments. Decrease the value of magnesium may be due to plankton and algae. The maximum value of magnesium 57 mg/lit was recorded in month of March at the sampling station B and minimum 17 mg/lit was recorded in the month of September at the sampling station A. In study period i.e. Sep-2015 to Aug-2016.

Alkalinity:-

Separation of alkalinity soft & hard water scale is 40 mg/lit. J.B. Moyle (1949). The maximum value of 325 mg/lit was recorded in month of December and at the sampling station B and minimum 104 mg/lit was recorded in the month of June at the sampling station A. In study period i.e. Sep-2015 to Aug-2016.

Chloride:-

Large amount of chloride in freshwater is an indicator of organic pollution. The maximum value of Chlorides 74.5 mg/lit was recorded in month of May at the sampling station B and minimum 55mg/lit was recorded in the month of December at the sampling station A. Chlorides increase in summer and decrease in winter (Singh 1960, Zafer A.R. 1964) in study period i.e. Sep-2015 to Aug-2016.

Phosphates:-

The maximum value of Phosphates 3.4mg/lit was recorded in month of May at the sampling station B and minimum 0.8 mg/lit was recorded in the month of November at the sampling station A. High value of phosphate during summer may be attributed to the decrease water level and release of phosphate due to decomposition of organic matter. (Seenyya and Jafar, 1979, and Saha 1984). In study period i.e. Sep-2015 to Aug-2016.

Sulphates:-

It's a present in fertilizer they contribute to the water body from agricultural runoff. Discharge of domestic sewage in water tends to increase its concentration. The high concentration of sulphate stimulates the action of sulphur reducing bacteria, which produce hydrogen sulphide, a gas highly toxic to fish life. The maximum value of Sulphates 3.3mg/lit was recorded in month of June at the sampling station B and minimum 1.2 mg/lit was recorded in the month of December at the sampling station A. Reddy et.al (2009) high value recorded in monsoon season. In study period i.e. Sep-2015 to Aug-2016.

Conclusion:-

The present study reveal that Naspur Lake was polluted by the sewage water and domestic uses that's why the lake was polluted.

To prevent the lake pollution some measures to be take.

1. Treatment of sewage water and avoid the Village sewage connection to lake.
2. Avid the washing of cloth.
3. Bathing of cattle.
4. Dumping of Agricultural waste.
5. Water quality comparision of these two sampling station of maddikuntta lake reveals that the situation is not too worst but it is alarming .
6. It needs prper conservation and managements plans,strategies for the restoration etc.

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