WATER QUALITY OF TIGHRA FRESH WATER RESEVOIR IN RELATION TO PHYSICO-CHEMICAL CHARACTERISTICS AND PERIODICITY OF PHYTOP LANKTONS

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Water is known as life. It is vital for the survival of living organism, major ecosystem as well as for human health, food production and economics development. Water is essential for survival of human beings and other forms. It is an universal solvent and hence it is a medium for exchange of substances and information between the biotic abiotics and climatics components of an ecosystem. No one can deny the importance of water in Biological system. It constitutes about 70-90% of protoplasm and most essential for all the metabolic & chemical reaction. Physicochemical and biological characteristics characterize any water body. The physical and chemical properties of fresh water body are characterized by the climatic, geochemical, geomorphological and pollution condition. Water covers about 71% of earth surface. The utilize of Fresh water bodies for stocking of Fishes, domestic & drinking, Irrigation also. The disposal of agricultural was and untreated sewage in to water body adversely affect the life of Animal & plant.

The biota in the surface water is governed by various environmental condition. The primary production of organic matter is in the form of phytoplanktons, which are more intense in Reservoir and lakes than in rivers. The quality of aquatic life depends on the water quality and Fresh water bodies utilize successfully for Fish production, it is very important to study physico chemical factors, which influence the biological productivity of water body present investigation was carried out to study of some physico-chemical Biological parameters of Tighra fresh water reservoir. Similar attempts have also been made in different fresh water body of MP (India) Zafar, (1967), Munawar (1974) Robert, et al (1974) Philipose MT (1960) Trivedy R.K. and Goel PK (1986) Sudhira and Kumar 2000), Adoni (1985), NEERI (1988), Kataria H.C. Qureshi, H.A. Iqbal S.A. and Shandilya A.K. (1996), Nagarathna and Hosmani S.P. (2003), Shrivastava, N Agrawal M. and Tyagi A (2003), Adholia, V.N. (1991), Saxena, D.N. and S.R. mishra (1991), Sukand B.N. and Patil H.S. (2004) APHA (1985).

Description of the Fresh water Reservoir Tighra Gwalior (M.P.)

The Tighra fresh water Reservoir situated about 20 Km West of Gwalior city at an attitude of 218.58m near SADA Magnet city Tighra Reservoir was constructed by Late Maharaja Madhav Rao Sindhia in (1910-1917) Across a seasonal rainfall on sank River near village Tighra in Gwalior Tahsil. The Tighra fresh water Reservoir lies on 26-12'0" Latitude and 78-30-0" E Longitude. The Tighra Fresh Water reservoir surrounded by hills from three sides. The it is larg sized reservoir with an water spread area of 2112 hectors. The average depth of the Reservoir 24m. The reservoir is rain fed during mansoon period. The reservoir is also fed by Sank River. The water of reservoir is used to Fish culture and is also used for, Irrigation, drinking & domestic purpose. The total catchments area of the Reservoir 160 sq.km with an average annual rainfall of 600 mm.

(3) **Materials and Methods:** Surface, water sample were collected from the Fresh water reservoir at a depth of one feet using polythenes cans of two litter capacity for a period of one year (Jan 2007 – Dec 2007) at monthly intervals. pH and Temperature were measured at site of sample collection. pH was measured on the spot using systronix battery operated pH meter and temperature with help of simple, mercury filled Celsius thermometer having the accuracy of 0.1°C and range 0°C to 50°C. The chemical analysis was carried out the following the methods by Trivedy and Goel (1986) and standard methods of APHA (1995). For the enumeration of phytoplankton, two litter of sample was fixed simultaneously with 20ml of 1% Lugol solution for sedimentation. This sedimented sample was observed under microscope for algal composition and the diagram were drawn with the help of camera lucid technique. The Identification of Phytoplankton up to the level of species was made with the help of literature cited (Philips M.T. (1967) Gandhi (1995).

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Results and Discussion: The physico-chemical properties of Fresh water Reservoir Tighra Gwalior (M.P.) is situated 20 km away from west of Gwalior city in village Tighra near sada Magnet city. Shown in (Table-1)

pH value : The pH values, which varied from 7.3 Feb to 8.13 August 07 at site.

Temp. (°C) ranged from 15 in the month of Jan and 37.2 in the month of Jun 2007 Alkalinity: The Alkalinity (mg/l) varied from 81 in May and 213 in the month of March 2007

BOD: The BOD (mg/l) varied from 1.2 in April 2.7 in July

COD: The COD (mg/l) Varied from 17.3 April to 43 Oct in 07

DO: The D.O. (mg/l) varied from 5.1 in June and 8.0 in Feb'07.

Chloride: The Chloride (mg/l) varied 18.8 in April to 46.3 in Nov 07

Nitride: The nitrate (mg/l) varied 0.3 in Nov to 0.34 in April 2007.

Phytoplankton population in Tighra fresh water reservoir is composed of Four major group namely chlorophyceae, Bacillariophyceae, Myxophyceae, Englenophyceae. The density of Phytoplankton show that Bacillariophyceae dominated and constituted (40.55%) of Total Phytoplankton Population followed by Myxophyceae (27.96%), Chlorophyceae (27.08%) and Englenophyceae (4.43%) (Fig no. 3). In present investigation the maximum density of phytoplankton was recorded in April $225x10^3$/l and minimum in August $37x10^3$/l (Shwo in Fig. No.4). The density of Bacillarophyceae ranged between $10x10^3$/l in September to $115x10^3$/l in April 2007 (Table -2). The average density of Bacillarophyceae was low in winter season $171x10^3$/l and high in during summer $334x10^3$/l. The density of Myxophyceae ranged between $7x10^3$/l in August to $110x110^3$/l in Nov. The arrange density of Myxoplyceae was low in summer season $60x10^3$/l and was recorded high during winter $165x10^3$/l. The chlorophyceae range between $10x10^3$/l in January to $73x10^3$/l in April. The average density of Euglenophyceae was low in rainy season $8x10^3$/l and was recorded high during summer season $39x10^3$/l.

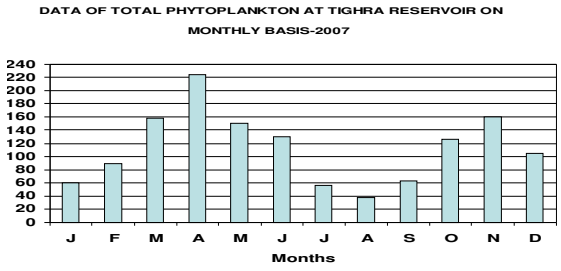
Table No. 1 PHYSICO CHEMICAL PARAMETER OF TIGHRA FRESH WATER RESERVOIR GWALIOR (M.P.)-2007

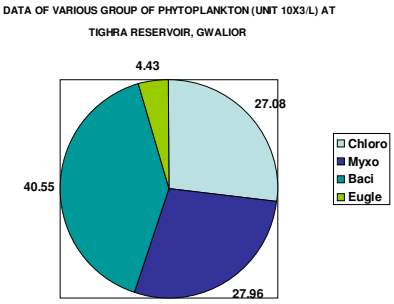
	Jan.	Feb.	March	April	May	June	July	Aug.	Sept	Oct.	Nov	Dec	Permissible limit
Temperature	15	18	26	28.5	36.9	37.2	27	28	30	27	20	19	
Conductivity	365	380	312	211	341	381	260	271	391	350	365	371	
pH	7.4	7.3	8	7.34	7.99	7.34	7.42	8.13	7.88	7.71	7.5	7.6	6.5 to 8.0
Turbidity	7.01	7.04	6.18	6.1	6.0	6.87	6	6.5	7	8	8.1	7.0	5 to 10 NTU
Carbonates bicarbonates and total alkalinity	147	205	211	213	81	124	120	81	100	101	144	145	
TDS	342	321	218	148	203	201	189	218	240	249	363	357	
DS	311	321	212	127	137	140	164	162	182	210	321	317	
S.S.	43	45	41	23	68	50	26	55	56	39	43	41	
HardnessCa++	67	81	53	50	73	63	53.74	69	71	72	81	82	
Magnesium Hardness	55.6	30	29	35	25	30	33.97	25	24	33	57	58	
Chloride	21.1	23.11	27.1	18.8	36.85	32.2	31.05	22.22	23	23.88	46.3	46.2	<250
Nitrate	0.21	0.14	0.34	0.19	0.33	0.23	0.22	0.12	0.13	0.12	0.3	0.4	
Sodium	8.0	8.1	8.2	8.5	8.4	8.3	8.2	8.4	8.2	8.5	8.4	8.1	
Potassium	0.5	0.6	0.8	0.88	0.81	0.74	0.8	0.6	0.7	0.6	0.8	0.7	
D.O.	7.9	8.0	7.14	7.2	7.0	5.1	7.6	6.8	6.4	6.2	7.7	7.8	5 to 6 PPM
BOD	1.6	1.8	1.9	1.2	2.1	2.4	2.7	2.1	2.6	2.3	2.4	2.0	
COD	25	30	31	17.3	36	19.3	19.3	32.6	32	43	26.3	26.1	

Conclusion: The analyzed parameter of sample compare to permission limits. The constitute of sample water of Fresh water Tighre reservoir are within permissible label. The phytoplanktonic community in represented by 4 class and fifty Sp. Density of the different group of phytoplankton is more in the summer season than during winter and Raining season. It is to formulate some strategies for the conservation of fresh water reservoir.

Table – 2 DATA OF TOTAL PHYTOPLANKTON AT TIGHRA RESERVOIR

S.No.	Month	Total Phytoplankton Unit SX103/l
1	January	60
2	February	89
3	March	158
4	April	225
5	May	150
6	June	130
7	July	56
8	August	37
9	September	63
10	October	126
11	November	160
12	December	105





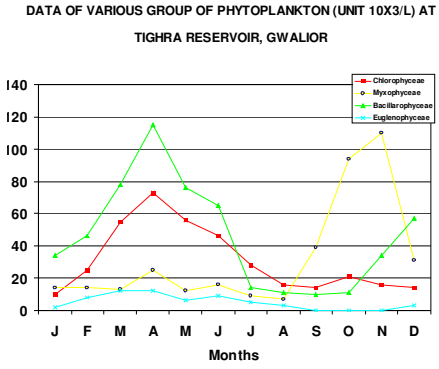


Table-3 DATA OF VARIOUS GROUP OF PHYTOPLANKTON (UNIT 10X^3/L) AT TIGHRA RESERVOIR, GWALIOR

Month	Chlorophyceae	Myxophyceae	Bacillarophyceae	Euglenophyceae	Total
January	10	14	34	2	60
February	25	10	46	8	89
March	55	13	78	12	158
April	73	25	115	12	225
May	56	12	76	6	150
June	40	16	65	9	130
July	28	9	14	5	56
August	16	7	11	3	37
September	14	39	10	-	63
October	21	94	11	-	126
November	16	110	34	-	160
December	14	31	57	3	105
TOTAL	368	380	551	60	1359
%age	27.08	27.96	40.55	4.43	

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