



A Study of Physico-Chemical Parameters of Gundaram Cheruvu, Nizamabad.

¹D.Latha, ² K. Shailaja*

¹Research Scholar Dept of Botany, ²*Associate Professor Dept of Botany

Department of Botany, University College of Science,

Osmania University, Hyderabad, T.S., India.

Abstract: Gundaram cheruvu located in Sarangapur village, Nizamabad District Telangana State. The present study was carried out period of one year 2019 to 2020 to determine various physico-chemical parameters in lake water samples. This study deals with the influence of environmental factors as well as domestic activities in the water quality in the lake water. The Lake water is majorly utilized for irrigation and is also utilized by animals to quench their throats. Some of the physico-chemical parameters are assessed in one year of study period they are pH, Temperature, Nitrates, Phosphates, Chlorides, Total Dissolved Solids, Total Hardness, Calcium, Magnesium, Carbonates, Bicarbonates, Total alkalinity, BOD and COD.

Keywords: Physico-chemical parameters, Gundaram cheruvu, Lake Water.

I. INTRODUCTION

Water is one of the most valuable asset of nature given to man and has been exploited at the higher level than any other resource for survival. Over 97% of the water on this planet is stored in oceans and icecaps. Nearly 97.3% is available in Oceans and is salty in nature. Huge amount of water is stored as polar icecaps and glaciers. Only 0.02% fresh water to satisfy our diverse needs comes from lakes, rivers and ponds. The surface fresh water in the form of lakes and rivers is hardly 0.01% of total water available on the earth.

Demand for fresh water has increased markedly in recent years. It is estimated that nearly one third of the world's inhabitants live in countries with severe water problems (Kumar et al., 2005). Physico-chemical factors play an important role in analysis of pollutant or contaminant. The chemical and biological factors are interrelated and interdependent. The main objective of the experimental work undertaken is to analyze different chemical constituents present in the natural and disturbed aquatic ecosystem, where ponds and lakes have been profoundly altered and have lost much of their value; the scientific understanding of these water bodies is being used in prescribing restoration methods (Lewis, 2000). In India many researchers have worked on physicochemical and biological characteristics of reservoirs and lakes (Jakher et al., 1990, Kodarkar, 1992; Subba Rao, 1993; Patil et al., 2003).

II. MATERIAL AND METHODS

The surface water samples from Gundaram Lake were collected from three sampling stations during 7.30 am to 8.30 am. Samples were collected at monthly interval in plastic cans of two liters capacity. Water temperature, pH recorded at sampling station. Collected water samples were brought immediately to the laboratory for the estimation of various physicochemical parameters like, Nitrates, Phosphates, Chlorides, Total Dissolved Solids, Total Hardness, Calcium, Magnesium, Carbonates, Bicarbonates, Total alkalinity, BOD and COD. Physicochemical parameters were analysed as per standard methods (Trivedy and Goel, 1986; Saxena, 1990; APHA, 1992).

Study Area: Nizamabad is located at 18°41'N 78°6'E. surrounded by Nirmal, Kamareddy, Medak and Karimnagar. Gundaram cheruvu located in Sarangapur village, Nizamabad District Telangana State.

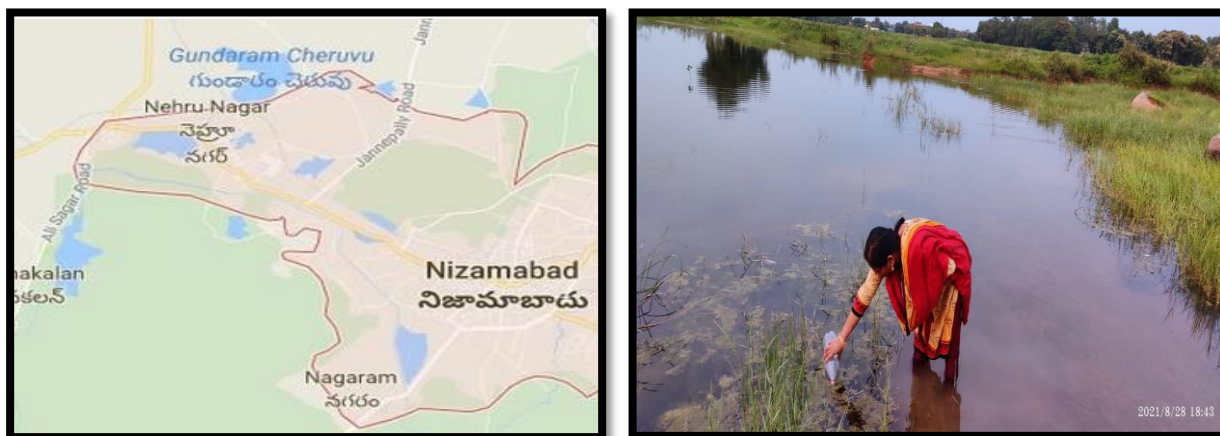


Fig 1: Showing Gundaram lake Over view and sample collection of author

III. RESULTS AND DISCUSSION

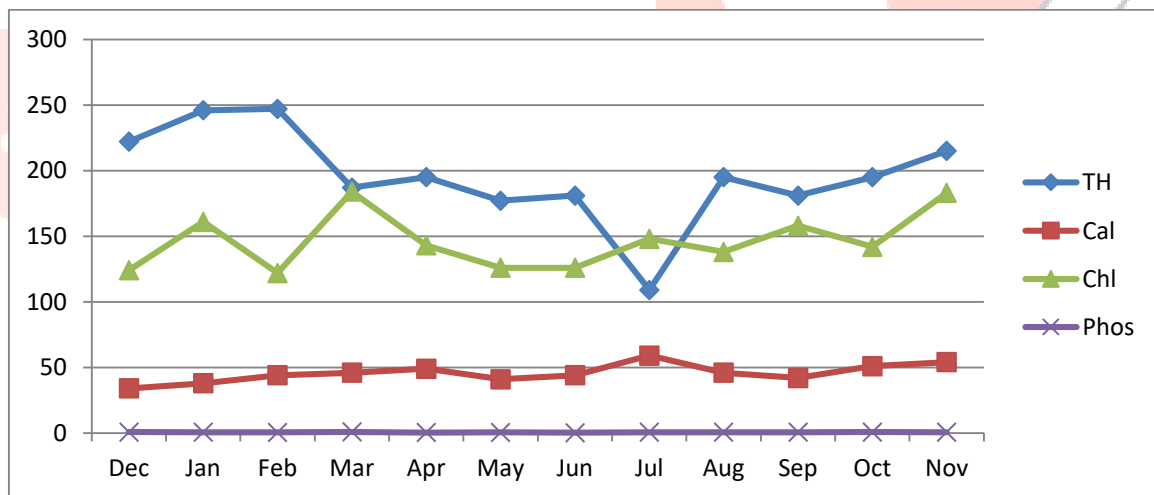
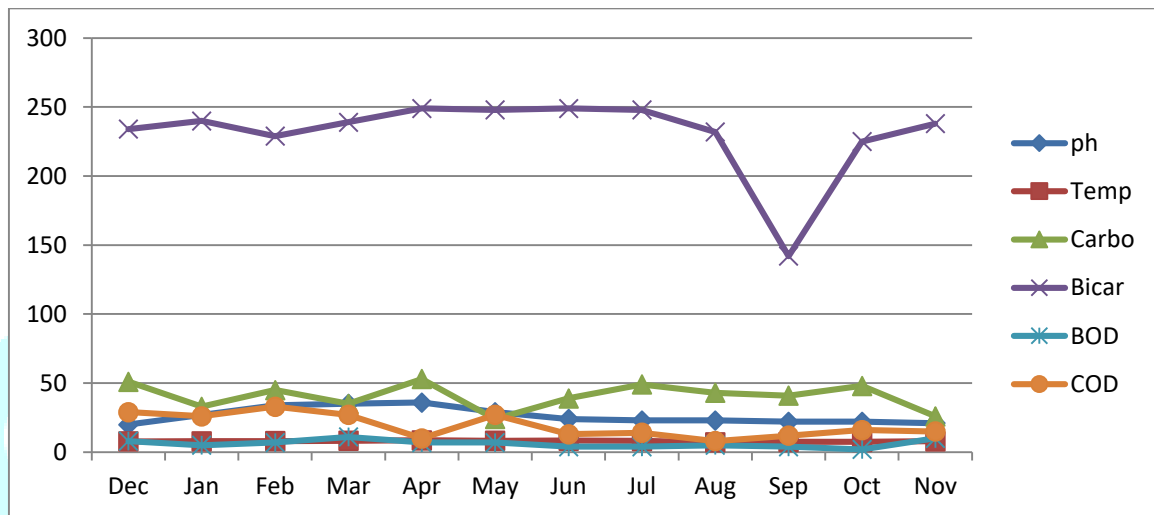
The physicochemical parameters of the Gundaram Lake have been given in the Table 1. The physicochemical features of lake water were influenced due to the discharge of domestic waste and agriculture at discharges. The atmosphere temperature was recorded between 22° C to 31° C. The temperature is one of the important factors in aquatic environment since it regulates physicochemical as well as biological activities (Kumar et al., 1996). The water temperature was recorded 21° C to 30 °C. Higher temperature was recorded in May 30° C.

Table: 1 Showing physico-chemical parameters data of Gundaram cheruvu

Parameters	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Temp(°C)	20	27.11	34.46	35.17	36.57	29.21	24.43	23.29	22.91	22.32	21.70	21.76
pH	7.8	7.9	8.0	8.2	8.6	8.3	8.4	8.1	7.1	7.4	7.4	7.9
Carbonates	51.62	33.25	45.31	35.28	53.90	24.22	39.34	49.40	43.68	41.56	48.26	26.44
Bicarbonates	234.24	240.26	229.76	239.56	249.24	248.65	249.79	248.64	232.68	142.52	225.34	238.61
BOD	8	5	7	11	7	7	4	4	5	4	2.6	10
COD	29	26	33	27	10	27	13	14	8	12	16	16
TH	222	246	247	187	195	177	181	109	195	181	195	215
Calcium	34.16	38.28	44.29	46.96	49.92	41.34	44.66	59.49	46.74	42.12	51.39	54.58
Chlorides	124	161	122	184	143	126	126	148	138	158	142	183
Phosphates	0.87	0.64	0.53	0.96	0.44	0.56	0.33	0.77	0.76	0.62	0.89	0.65
Nitrates	0.83	0.85	0.60	0.66	0.98	1.19	1.08	0.98	0.97	0.67	0.74	0.94
Organic Matter	1.8	0.9	1.4	1.8	1.8	0.6	0.5	0.6	2.9	1.9	1.6	1.8
Magnesium	0.04	0.06	0.02	0.06	0.03	0.04	0.08	0.02	0.04	0.04	0.02	0.05
TDS	378	360	330	320	370	410	340	370	320	355	360	385

The variation in physico-chemical parameters of Gundaram lake are presented in Table no 1. p^H is an important parameter which influence the survival and nourishment of biological life. pH was found 7.1 and 8.6 its showing alkaline nature of water.

Temperature ranged between 20°C January, 36.57 oC May noticed. Nitrates ranged between 0.60 mg/l in March, 1.19 mg/l June months. While Phosphates 0.33 mg/l July, 0.89 mg/l High amount in November month. Chlorides reached maximum in April 184 mg/l, minimum 122 mg/l noted in March month. Total Dissolved Solids in Gundaram lake Maximum value 410 mg/l, minimum 320 mg/l, noted in April as well as same value noted in September also. Total Hardness noted 109mg/l in August, 247 mg/l maximum in March month. Calcium assessed as minimum 34.16 mg/l in January, 59.49 mg/l maximum values are noted.



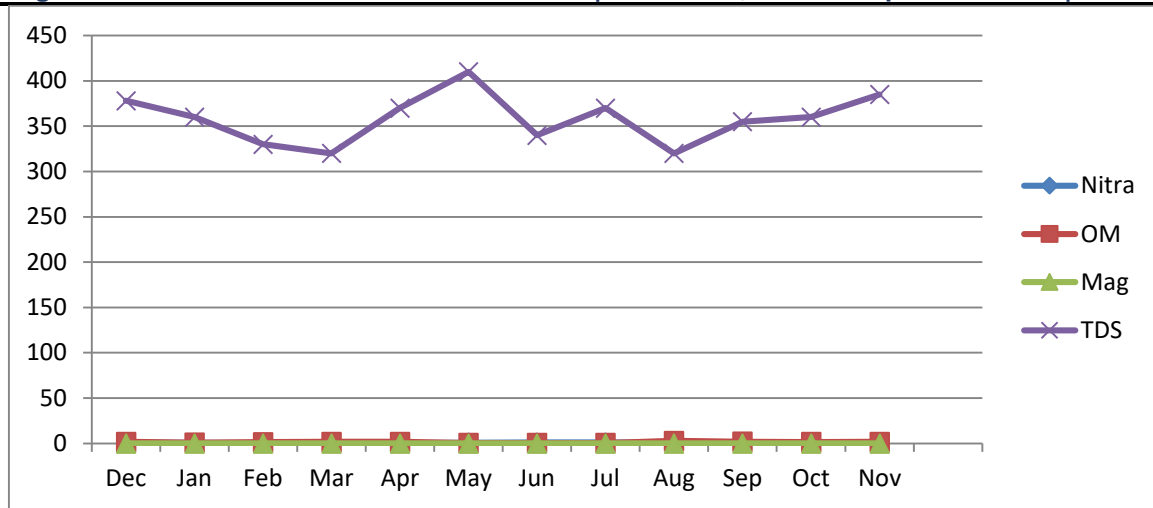


Fig 2: Showing graphical data on physico-chemical parameters

Magnesium minimum values 0.02 mg/l, in March month and same range also, maximum value 0.008 mg/l in July. The physico-chemical parameters exhibited certain inter-relationships. pH and carbonates are directly related and both are inversely proportional to bicarbonates. Carbonates are noted 24.22 mg/l minimum value, maximum 53.90 mg/l in May month. While Bicarbonates maximum value 249.79 mg/l in July month, minimum 142.52mg/l in October month. Total alkalinity 109 mg/l as minimum in August month, 247 mg/l in March month. Biological Oxygen Demand minimum 2.6 mg/l in November month, Minimum 11 mg/l as maximum noted in April. Chemical Oxygen Demand minimum value 8mg/l in September , 33 m g/l In March month recorded. The lake water is well aerated. High concentration of dissolved oxygen was noticed in summer month.

IV. CONCLUSION

The average values of the important physico-chemical parameters variables of lake studied along with the standards stipulated by APHA (2017), from the comparison it is clear that the water in Gundaram lake can be termed less contaminated because all the chemical factors are within the tolerance limits.

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