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Water Quality Analysis of Rampally Lake near Ecil, Hyderabad

K. Jayanthi[1], Prof. Nirmala Babu Rao[2], Prof. P.V. Murali[1]

1. Department of Botany, Annamalai University, Chidambaram, Tamil Nadu, India.
2. Department of Botany, University College of Science, Osmania University, Hyderabad, Telangana, India.

Abstract:

The present study focuses on determining physical-chemical parameters of water samples from various sample points such as temperature, pH, DO, BOD, COD, and sulphate. Increased pollution levels indicate an increase in pollution pollution due to domestic wastewater, industrial effluents and anthropogenic activities and waste dumping in Erode District. The current study included water samples from the entire city for well-organized sampling and interpretation in four regions. The results showed that the average pH was analysed at 7.86, the electrical conductivity was 920 µS/cm-1, with total solids 1580 mg/l and total solids 1004 mg/l with total suspension of 690 mg/l, a total hardening of 340 mg/l and chloride 380 mg/l, an averages for dissolved oxygen at 5.59 mg/l, COD 38 mg/l, phosphate at 6.0 mg/l, a sulphate at 60 mg/l and an r-l of dissolved oxygen. This study shows how waste from markets and household waste is polluted by effluents of the small industry in the Cauvery River. So, management of water quality is urgently necessary to comply with WHO-defined water quality standards.

Key words: pollution, Rampally lake, parameters, Physico-chemical analysis

Introduction:

Life cannot live on Earth without water. Due to its high solvent power, water is constantly threatened by easy pollution. The water needs for every kind of life from micro-organisms to human beings are a grave problem today because all water resources have been reached at a point of crisis because of unplanned urbanization and industrialization. Rampally Lake One of the most important factors is the temperature in the aquatic environment. In natural water systems, the majority of biological and chemical processes are usually heat dependent.

Water is the most important factor in the formation of the landscape and the regulation of the climate. It is one of the most important compounds in the world, having a profound impact on human life. The physical, chemical, and biological characteristics of water are commonly used to describe its quality. Rapid industrialization and the indiscriminate application of chemical fertilizers and pesticides in agriculture are resulting in widespread and diverse pollution of the aquatic environment, resulting in deterioration of water quality and depletion of aquatic biota, among other consequences(Singh J and Singh AP). The use of contaminated water has resulted in the spread of water-borne diseases among the general public. Checking the water quality at regular intervals of time [M. P.Lilly Florence] is therefore necessary [ICMR, 1975]. By incorporating urban waste from ECIL,Hyderabad city into the Rampally Lake, the current study is an attempt to determine whether or not there has been an improvement in the quality of the water. An attempt has been made to determine the extent to which water quality has deteriorated

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in comparison to World Health Organization water quality standards, and the results have been published (WHO, 1984).

MATERIALSANDMETHODS:

During the sampling process, three sampling stations collected water samples (March to February 2019-2020). Monitor the range of physical and chemical parameters The following were concluded Temperature, pH, BOD, COD, DO, Total hardness, total dissolved solids, and sulphates. In this lake, we found that mainly two pollutants come from two sources Rampally Lake For this work, the introduction in the estuaries and seas of different waste products, in particular in industrial and population centers, leads to a substantial increase in pollutant pollution levels, which is better at first.

RESULTS AND DISCUSSION:

Some parameters such as temperature, pH, BOD,COD, DO, TSS, TDS, and sulphate have been evaluated in the water samples. All results are analyzed in Table 1 standard drinking water values are presented. The current research identifies the Physico-chemical characteristics of Rampally lake water in Hyderabad at ECIL. The results of water quality in ECIL Hyderabad are given below.

Table no.1 Physico-Chemical analysis at station-I

S.NO	MONTH	WT	pH	BOD	COD	DO	TSS	TDS	SO_4
1	Mar-19	34	8.1	3.6	290	11.9	650	360	20.3
2	Apr-19	38	8.3	4	270	8	520	371	19.2
3	May-19	33	8.2	3.8	260	11.8	440	120	13.2
4	Jun-19	39	8.8	2.4	150	9.2	330	124	18.3
5	Jul-19	25	8.3	2.9	110	8.8	251	189	18.2
6	Aug-19	28	8.4	2.3	100	8.2	200	236	17.9
7	Sep-19	21	8.4	2.1	123	10.2	202	251	16.2
8	Oct-19	20	9	3.6	156	10.8	621	161	15.3
9	Nov-19	39	9.1	3.2	141	9.3	582	154	14.2
10	Dec-19	33	7.2	3.7	120	9.7	498	196	13.1
11	Jan-20	31	8	3	121	8.5	365	175	12
12	Feb-20	24	8.6	2.1	198	8.8	220	152	12.8
13	Average.	30.41	8.366	3.58	169.91	9.6	406.58	207.41	15.89

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Table n.o-2 Physico-Chemical analysis at station-II

S.NO	MONTH	WT	pH	BOD	COD	DO	TSS	TDS	SO_4
1	Mar-19	30	8.7	3.2	220	10.9	601	3	19.6
2	Apr-19	34	9	4	280	11.3	202	151	13.1
3	May-19	21	8.2	3.8	250	9	563	131	18.2
4	Jun-19	28	8.5	3.9	110	10.4	531	141	17.2
5	Jul-19	27	8.2	3.7	105	8.2	520	140	15.9
6	Aug-19	33	8	3.6	115	8.4	452	132	14.8
7	Sep-19	33	8.3	3	200	9	412	138	13.2
8	Oct-19	28	8.9	3.7	195	9.5	321	152	13.8
9	Nov-19	25	8.8	3.6	185	9.3	369	158	18.4
10	Dec-19	26	8	3	175	8.6	285	160	16.8
11	Jan-20	23	8.3	3.1	162	10.9	274	184	16.1
12	Feb-20	30	8.6	3.8	148	8	260	174	15.2
13	Average.	28.16	8.45	3.53	178.75	9.45	399.16	131.15	16.02

Table n.o-3 Physico-Chemical analysis at station -III

S.NO	MONTH	WT	pH	BOD	COD	DO	TSS	TDS	SO_4
1.	Mar-2019	35	9.5	5.0	100	11.9	590	360	19.0
2.	Apr-2019	33	8.8	4.6	123	10.6	480	320	19.9
3.	May-2019	30	8.3	3.2	153	10.1	220	330	18.3
4.	Jun-2019	28	8.3	2.8	145	11.1	245	250	12.9
5.	Jul-2019	26	9.0	2.0	182	9.3	369	240	14.2
6.	Aug-2019	34	8.3	4.9	220	9.5	449	198	15.3
7.	Sep-	20	8.0	4.0	242	9.2	465	132	12.2

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	2019								
8.	Oct-2019	22	8.7	3.0	283	9.7	458	154	11.0
9.	Nov-2019	21	8.6	3.6	201	9.0	601	160	13.0
10.	Dec-2019	24	8.5	2.9	220	8.6	300	130	12.8
11.	Jan-2020	38	8.4	2.0	198	8.9	210	120	11.8
12.	Feb-2020	30	8.0	3.8	174	8.0	200	340	18.5
13.	Average.	28.41	8.53	3.48	186.75	9.65	382.25	227.83	14.90

1.WATER TEMPRATURE:

Temperature is an important factor regulating Physico-chemical operations in the aquatic environment. Rampally Lake water temperature range from 20°C to 38°C with an average of 30.41°C at Place-1. Water samples from Rampally Lake at Place-2 found the temperature to be varied, From 21°C to 34°C with an average of 28.16°C. The maximum temperature at Place-3 was 38°C and the minimum temperature 20°Cwith an average of 28.11°C at Rampally Lake water (Tripathi et al.2016) Surface physicochemical features. The water temperature has changed seasonally. A similar comment has been made (Jayaraman et al., 2003).Water temprature value at place -1,2,3 are given in(Table -1,2,3).

2.pH (APHA 1998):

The pH values ranged from 5.0 to 9.0, where most samples were found to be within the permissible pH range of values, which were recommended by various health and pollution control agencies, such as WHO, CPCB, BIS i.e 6.5 to 8.5, at different locations, tested in the study. During the study period the pH of the water was alkaline in all three sites. In most raw watersourcesthe pH of Rampally lake(2019) is between 9.5 to 8.0pH value at place n.o-1 ranges from 8.0 to 9. 0 average 8.36 (Table n.o-1), place n.o-2 ranges from 8.0to 9.0 average8.45(Table n.o-2),place-3 ranges from 8.0 to 9.5 average 8.53(Table n.o-3).

3.**Biological Oxygen Demand (BOD):**

A measure of the amount of oxygen in water required by aerobic organisms is known as the Biological Oxygen Demand (BOD) measurement. The biodegradation of organic materials results in an increase in oxygen tension in the water, as well as an increase in the biochemical oxygen requirement (Abida, 2008). The biological oxygen demand (BOD5) is the amount of

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oxygen required by living organisms engaged in the utilization, destruction, or stabilization of organic water at the end of the process (Hawkes 1993). BOD value at place n.o-1 ranges from 3.0 to 4.0 average 3.58, place n.o-2 ranges from 3.0 to 4.0 average 3.53,place-3 ranges from 2.0 to 5.0 average 3.48.(Table n.o-1,2,3)

4.Chemical oxygen demand (COD):

Chemical oxygendemand the measuring of the oxidation of the reduced chemical in water. Chemical oxygen demand (COD). Theamount of biological compounds in water is commonly measured indirectly. The COD measurement determines the amount of organic matter found in water. This makes COD an indicator of organic surface water pollution useful (King et al., 2003 and Faith, 2006). COD value at place n.o-1 ranges from 100 to 198 average 169.1, place n.o-2 ranges from105 to 280 average 178.5, place-3 ranges from 100 to 283 average 186.75.(Table n.o-1,2,3)

5.Dissolved oxygen (DO):

Dissolved oxygen is a major contributor to the health of the stream. Due to bioaccumulation and biomagnification, this failure affects the river ecosystem directly. The oxygen content of water samples depends on various processes of physics, chemistry, biology and microbiology. The lateral, spatial and seasonal changes in DO values are also shown in accordance with industrial, human and thermal activity. Bhattaraj et al also discovered similar results (2008).DO value at place n.o-1 ranges from 8.0 to 11.9 average 9.6, place n.o-2 ranges from 8.0 to 11.3 average 9.45,place-3 ranges from 8.0 to 11.9average 9.65.(Table n.o-1,2,3)

6.TOTAL SUSPENDED SOLIDS (TSS):

The total suspended water solids are directly related to water turbidity depending on theamount of suspended particles, soil. TSS: The average value of the TSS varies between 200 and 650 mg/l in this study. The current study is based on TSS value at place n.o-1 ranges from 200 to 650 average 406.58, place n.o-2 ranges from202 to 601average 399.16, place-3 ranges from 200 to 601 average 382.25.(Table n.o-1,2,3)

7.TOTAL DISSOLVED SOLIDS (TDS):

The concentration of dissolved oxygen in water indicates the presence of physical and biological processes, and it is an important factor in determining whether aerobic or anaerobic organisms are responsible for biological changes (Gangwar RK). Photosynthetic organisms (Kumar A and Bahadur Y) can produce water oxygen by dissolving oxygen from the air. The author (S. Mishra). In this study, the results indicate that organic pollution is of a mild nature. Low summer DOs values may be caused by a combination of factors including low water levels, organic waste discharge, and anthropogenic waste discharge.

The natural water consists primarily of carbonate, bicarbonate, chloride, sulphate, phosphate, nitrate, Ca, Mg, Na, K, Fe, Mn, etc., total dissolved solid (TDS) (Esmaeili and Johal,2005). Samples of lake water with high total dissolved solids showed a higher ionic concentration,

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which is less potable and can cause adverse physical chemical effects in the consumer. TDS was found in 120to 360 mg/l in this study. TDS value at place n.o-1 ranges from 120 to 371 average 207.41,place n.o-2 ranges from 131 to 341average 131.15, place-3 ranges from 120 to 360 average 227.83.(Table n.o-1,2,3)

8.Sulphate:

It is a naturally occurring substance in potable water. The health concerns concerning drinking-water sulphate were highlighted as the use of water containing high levels of sulphate may be associated with diarrhea. If it reaches a concentration of 250 mg/L, sulphate gives the water a bitter or medicinal taste. It can make drinking water unpleasant. In determining its suitability for public and industrial supplies, the sulphate content of natural water is an important consideration. As illustrated inHigh sulphate levels can cause breathing problems in humans (Sujitha et al., 2011).Sulphate value at place n.o-1 ranges from 12.0 to 20.3mg/L average 15.89 mg/L,place n.o-2 ranges from13.1 to 19.6mg/L average 16.02 mg/L, place-3 ranges from 11.0 to 19.9 mg/L average 14.90 mg/L (Table n.o-1,2,3).

CONCLUSION

In the current study, the physical and chemical properties of the Rampally lake from the sampling sites selected were analyzed. The following parameters have been determined by the samples Water Temperature,pH, BOD, COD, DO, TSS, TDS, and Sulphate. Temperature values between 20°C and 38°C, pH8.0 to 9.5, BOD values 2.0 to 5.0,COD values 100 to 283, DO values 8 to 11.9, TSS values from 200 to 650, TDS 120 to 371 mg/l,Sulfate 12.0 to 19.9 mg/l. The same samples of alkalinity, total dissolve solid and total hardness were found beyond the allowable WHO limit (1984). The temperature, pH, sulphate of all samples have been identified below WHO's allowable limit. The conclusion is that the water of the river is not polluted.

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