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STUDY ON THE PHYSICO-CHEMICAL PARAMETERS OF KURUCHI POND AT COIMBATORE DISTRICT, TAMILNADU.

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ABSTRACT

Pollution of pond is an ecological problem which is posing a great threat on international scale, as a result of rapid industrialization and urbanization. Temporary ponds that are dry for parts of the year and especially interesting and support a unique community. The availability of water varies from place to place and from season to season. The availability of water is high during rainy season and low during summer. The fluctuation in fauna and flora of pond, lake, river etc., depends mainly upon the nature of the water and the climatic conditions. Samples of pond water was collected and analysed for physico-chemical characteristics to assess the water quality during the period of six months of pre-monsoon and monsoon season (July – December 2012).

KEYWORDS: Pond water, Physical parameters, Chemical parameters, Nutrients and irrigation.

I.INTRODUCTION

Ponds and lakes are stored water bodies being used as water resources. The life span of ponds range from a few weeks or months in the case of small seasonal ponds to several hundred years for larger ponds. A certain quality of water can be used for industrial purposes but may not be suitable for agricultural uses and vice versa, depending on the industrial products being manufactured and the crops being grown. Dispersal of toxic chemicals and heavy metals to the ecosystem through the medium of water became a serious cause for concern complex dispersal mechanisms meant that evidence of toxic substances appeared in areas for away from the points of application. Temporary ponds that are dry for parts of the year are

especially interesting and support a unique community. Increased awareness of environmental problems in last decade has emphasized the important of water pollution as the unique physical and chemical properties of water have allowed evolve in it.

II. MATERIALS AND METHODS

For the present study Kuruchi pond was choosen and its physico-chemical characteristics were analysed for the period of six months from (July 2012 to December 2012). The pond is situated in Kuruchi village near Kuniyamuthur in the east of Coimbatore city, Tamilnadu. Samples were collected from Kuruchi pond during pre monsoon and monsoon seasons and analysed using the standard methods (APHA, 2005).

III. RESULT AND DISCUSSION

Physico-chemical characters of the Kuruchi pond was analysed for the period of six months (July 2012 to December 2012). The various physico-chemical characteristics determined for the kuruchi pond are given in Tables 1 and 2.

Maximum temperature was observed during August (25^{o}C) and minimum in December (20^{o}C). Similar results were obtained by Venkata Ramana Solanki *et al.* (2006). The pH value of water is an important indication of its water quality. In natural, pH ranges from 6.0 to 7.6. In the present study, during most of the months the pH values registered was alkaline. Significant changes in pH occur due to disposal of domestic wastes. According to Sunkad and Patil, (2003) low pH value may be due to incoming of rain water.

In the present study, the dissolved oxygen level of pond water recorded was high during December (5.0 mg/l), probably due to heavy rain and higher photosynthetic action. The low level of dissolved oxygen in July (3.2 mg/l) is due to low solubility of oxygen, high temperature and decomposition of organic matter (Parivateesam and Gupta, 1994).

The high value of CO_2 (6.2 mg/l) during July was due to high rate of decomposition of organic materials. Hosetti, (1996) have reported inverse relationship between dissolved oxygen and dissolved carbon dioxide. The present observations showed that the dissolved solids, the suspended solids and total solids remained higher in (November) and lower during (July). This may be due to heavy rain during monsoon period and highly concentrated during pre-monsoon (July). Surface run-off from nearby areas increased the levels of TDS, indirectly

affecting turbidity of the water similar observations were observed by Thirumathal and Sivakumar, (2003).

High values of phosphorus will encourage the growth of certain algae and eutrophication. In the study high concentration of phosphate was recorded in November (3.12 mg/l) and low concentration in July (2.12 mg/l). Similar observations were reported by Saradhamani (2001) and Swain *et al*. (2005).

Phosphates and nitrates are the growth limiting factors for plankton. In the present investigation, maximum nitrate was noted during November (5.4 mg/l) and minimum (2.42 mg/l) during August.

The main source for the formation of nitrate is the decomposition and biodegradation of organic matters. High nitrates were indicative of high pollution load. Masom, (1991) observed the increased leads of nitrate by the intrusion of sewage into the natural water.

In the present study, the amount of Ca and Mg was found to be more during November (67, 82 mg/l) and less in September (46, 32 mg/l). The higher concentration was due to the addition of run-off from the nearby domestic areas. The values of Mg were found to be higher than the tolerable limits. Similar results were observed in Ganga waters due to the sewage discharge by Mishra and Tripathi, (2003).

It can be concluded that the deterioration of water quality of Kuruchi pond is due to indiscriminate disposal of domestic sewage, hospital waste and dumping of agricultural wastes from nearby areas. In order to maintain the quality of pond water proper step should be taken by the government to avoid dumping these wastes.

Table.1. Analysis of physico-chemical parameters of Kuruchi Pond during the period of six months (July 2012 to December 2012).

Seasonal	Temperature (^{o}C)	Colour	pH	Dissolved oxygen	Dissolved Carbon dioxide	Dissolved solids	Suspended solids	Total solids
July	**23**	**Greenish**	**7.2**	**3.2**	**6.2**	**190**	**197**	**395**
August	**25**	**Greenish**	**6.0**	**4.1**	**5.0**	**260**	**195**	**493**
September	**24**	**Greenish**	**7.1**	**4.2**	**4.1**	**170**	**198**	**360**
October	**23**	**Greenish**	**7.6**	**4.4**	**3.0**	**220**	**220**	**500**
November	**21**	**Greenish**	**7.0**	**4.5**	**2.0**	**360**	**190**	**550**
December	**20**	**Greenish**	**7.2**	**5.0**	**2.0**	**180**	**195**	**390**
Mean	**22.6**		**7.0**	**4.2**	**3.7**	**230**	**199.1**	**448**

Median	**24**		**7.5**	**4.6**	**3.8**	**250**	**200**	**475**
Standard Deviation	**1.7**		**0.45**	**0.45**	**1.61**	**74.54**	**18.63**	**80.365**

All the values are expressed in mgl^{-1} except pH

Table.2. Analysis of Nutrient in Kuruchi Pond during the period of six months (July 2012 to December 2012).

Seasonal	Phosphate	Nitrate	Sulphate	Calcium	Magnesium	Chlorides
July	2.12	3.60	22.0	50	45	61.5
Augest	2.30	2.42	25.6	55	47	42.6
September	2.42	5.0	25.0	46	32	60.4
October	3.0	6.1	26.10	52	74	72.3
November	3.12	5.4	29.00	67	82	60.5
December	2.69	3.0	31.00	61	86	53.4
Mean	2.60	4.25	26.45	55.1	61	58.4
Median	2.61	4.45	28.51	60	67.5	63.9
Standard Deviation	0.36	1.36	2.04	6.45	22.1	7.92

All the values are expressed in mgl^{-1}

V. CONCLUSION

It is concluded that the pond is protected from pollution and to reduce environmental risk, it could be recommended that treatment of the sewage water and industrial effluents showed be carried out before their discharge into the pond.

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