



Variability of Physicochemical Properties of Water of Ramkund Pond of Raipur Chhattishgarh, India

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ABSTRACT

Water is indispensable to life on earth. It is a precious gift of nature which is essential for the survival of plants, animals and human beings. Physicochemical factors are very important in estimating the constituents of water and the level of contaminants present in it. Physico chemical study of Ramkund pond includes water quality parameters at surface and bottom level of Mowa pond during 2013-2014. Water sample collected were analyzed for their Limnological characters viz. Temperature, pH, conductivity, Total hardness, Total dissolved solids, Dissolved Oxygen, BOD, COD, Total alkalinity, Chloride, Sulphate, Nitrate, Nitrite, orthophosphate, data obtained from these analysis were statistically analyzed to determine the correlation between various water quality parameters.

KEYWORDS

Physicochemical factors Ph, BOD

INTRODUCTION

The quality of water depends on the composition of water, which in turn is affected by natural events and human activities, expressed in terms of measurable quantities and is related to its intended use. With time and development, freshwater ecosystems of the region are being modified by human influence. Recent conservation assessment at global and regional levels shows that, freshwater ecosystems are most threatened throughout the world. The slums are developing very rapidly around these ponds. These slums area become the major source of water pollution. Physico chemical characteristics are interlinked and interdependent. For example, additions of an organic waste will not only influence the chemical characteristics but also the color, odour and biological properties simultaneously. Surface waters may be polluted by substances originating from anthropogenic sources [Bojakowska et al. 2010, Húska et al. 2013] and due to natural processes occurring in the environment [Moniewski and Stolarska 2007]. The present study involves the analysis of water quality in terms of physico-chemical parameters of Ramkund pond water.

METHODOLOGY

Study area

In Raipur approximately 120 ponds were present but when this city became capital of Chhattisgarh state, only 92 ponds exists now and the condition of these ponds is very pathetic. For the assessment of water quality Ramkund pond, of Raipur city was selected.

Sample collection

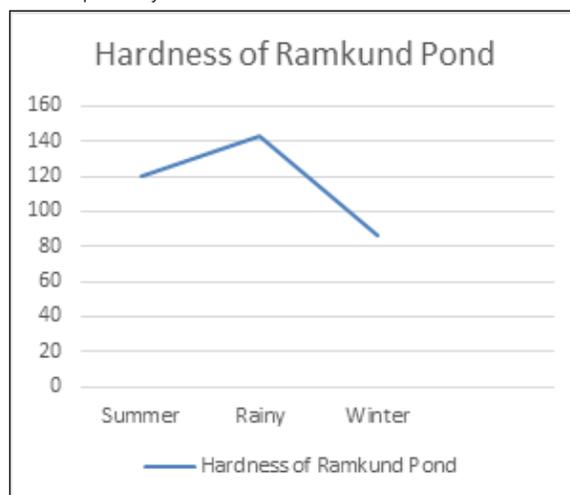
Water samples were collected from Ramkund pond over a depth of about 10 cm below the water surface in the upper layers of the pond water using polyethene containers, because maximum photosynthetic activity of primary fish food organisms were observed in these layers and hence this zone should be given more attention for the purpose of dissolved oxygen (DO) estimation. Each sample collection was carried out in the early morning hours because DO and free CO values are likely to remain in critical concentrations.

Physico-Chemical Analysis:

The collected samples were analyzed for different physico-chemical parameters such Temperature, pH, Electrical conductivity, TDS, Alkalinity, Free Co₂, Chloride, DO, BOD, COD, Total hardness, Ca hardness, Calcium, Magnesium, as per the standard methods APHA.

RESULT AND DISCUSSION

The water was found colorless to light green. Air temperature and surface water temperature ranged from 21-32°C and 19-31°C respectively.



From the figure above, the pH value of the pond is found to be maximum in winter season and minimum in Rainy season. ORP is in the acceptable range that can support aquaculture. However, the ORP value for winter season is close to what is found in swimming pools, which might indicate the presence of impurities. In Rainy season above pond has lowest conductivity (0.41 mS). It was also observed that TDS is lowest during rainy season and little highest during summer season in Ramkund pond. The salinity is minimum in Rainy season while almost similar for summer and winter season in Ramkund pond.

From the figure above, the hardness value is minimum in winter season and maximum in the rainy season. The maximum DO was recorded during winter season at selecting site. Ramkund pond shows the results of BOD between 220-245 mg/L in all seasons. The results of COD show that organic compounds load is highest in Ramkund pond (summer -360, rainy - 320 and winter - 361 mg/L). The similar workers investigated by like Ganeshalingam (2012) Rajappa (2011) Smitha (2007).



From the above satellite image it was observed that the deep green color of the water indicates presence of nitrogen. Near-by open toilets results in run off of excreta into the water which thus results in the increasing carbon and nitrogen content in the water of pond.

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