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Study of Some Physicochemical Water Quality Parameters of Chakki talab, Bodhan, Telangana

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ABSTRACT

Chakki talab is one of the lakes in Bodhan, Telangana., India. The objective of this study is to reveal the current situation and find any major problem with the lake. The abiotic components play key role to decide the trophic status of the water bodies. Physicochemical study of Chakki talab, Bodhan was carried out on monthly basis for one year October 2015 to September 2016. Physico-chemical analysis of the lake water revealed high values of alkalinity, hardness, chlorides, Calcium, Magnesium and Total dissolved solids showing that water of this lake is polluted.

Key words: Water quality, Eutrophication, Chakki talab, Bodhan,

INTRODUCTION

Surface water quality is an essential component of the natural environment and a matter of serious concern today (Jeyaraj et al., 2016). Water resources are in a serious problem due to encroachment, unplanned urbanization and industrialization (Manderia et al., 2014). India is facing a serious problem of natural resource scarcity, especially that of water in view of population growth and economic development (Solanki et al., 2015). It is well established that domestic sewage and industrial effluents falling into natural water bodies change the water quality and lead to eutrophication (Srivastava et al., 2009).

Accurate and timely information on the quality of water is necessary to shape a sound public policy and to implement the water quality improvement programmes efficiently. Water quality and suitability for use are determined by its taste, odour, colour, and concentration of organic and inorganic matter (Dissmeyer, 2000). Monitoring and assessment provide the basic information on the condition of a water body. In this regard an attempt has been made to assess the water quality of Chakki talab, Bodhan. The water quality parameters

considered for the examination in this study are total alkalinity, total hardness, calcium, magnesium, chlorides and total dissolved solids.

METHODOLOGY

Bodhan town is spread 21.36 km2. The town Bodhan is located at latitude 18⁰39 36 N and longitude 77°52 47 E. The present Chakki talab is a lake located on the south side of Bodhan town near residential localities. Sampling and physicochemical investigation was carried out according to standard methods APHA (1989).

RESULTS AND DISCUSSION

Alkalinity of a water body is mainly due to carbonates, bicarbonates and hydroxide ions. The total alkalinity ranged from 138 to 184 mg/l (Fig. 1), the lowest value noted during August 2016 and maximum during May 2016. High alkalinity values are indicative of the eutrophic nature of this water body. Higher values of total alkalinity might be due to presence of excess of CO_2 product as a result of decomposition processes coupled with mixing of domestic sewage.

The total hardness varied between 90 to 184 mg/l (Fig. 1). The high values of hardness of the water body may be due to evaporation of water, regular addition of large quantities of sewage and detergents into the lake from nearby residential localities besides leaching of rocks. According to Kannan (1991), water with hardness value more than 180 mg/l is very hard. Excess hardness may cause scale deposition in the water distribution system and more soap consumption (Shobha et al, 2015, Phul Kunwar Singh Rana, 2016).

Calcium is linked with the Carbon dioxide and is an important constituent of the skeletal structure of organisms. Calcium forms the most abundant ions in fresh water. (Thilaga et al. 2005). The analysis of calcium revealed a range between 29.4 to 64.7 mg/l (Fig. 1). The highest amount of calcium was recorded during the month of May. The lowest amount of calcium in water was recorded during October.

Magnesium is essential for chlorophyll bearing plant for photosynthesis and act as a limiting factor for the growth of phytoplankton. The amount of magnesium recorded in the water ranged between 44.07 to 96.94 mg/l (Fig. 1). The highest amount of magnesium in the water samples was recorded during May and the lowest during October.

In the present study the chloride content of water was too high. Monthly values of chlorides in surface water varied from 141.82 to 198.55 mg/l (Fig. 1). High chloride concentration may be due to addition of domestic sewage. This anthropogenic pressure is leading to eutrophication of the water body. According to Solanki and Pandit (2006), the concentration of chlorides can be related to purity or impurity of water.

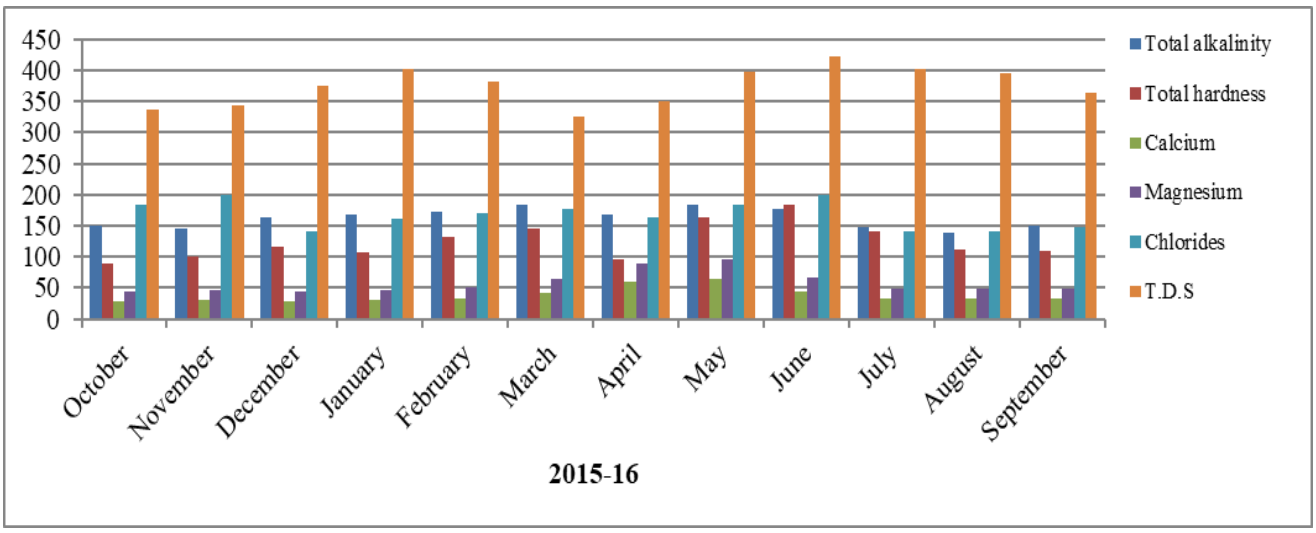

Fig. 1. Monthly Variations of physicochemical parameters (mg/l) of Chakki talab

Chloride concentration is considered as an index of eutrophication (Kumar et. al. 2006) and also pollution caused by sewage and other waste outlets (Manderia Sushil *et al*.,2014).

Total dissolved solids ranged from 336 to 423mg/l (Fig. 1). Highest value of total dissolved solids was observed in the month of June and lowest in October. The excess amount might principally have organoleptic implications, disturb ecological balance and cause suffocation to aquatic fauna (Pandey et al, 2012).

CONCLUSION

The high values of physicochemical parameters may be due to untreated domestic sewage runoff and urban settlement around the water body. These anthropogenic pressures are resulting in severe reduction of water quality making the water unfit for irrigation and domestic usage. Hence the water body requires regular monitoring and management as this water is supplied to agriculture.

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