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ZOOLOGY

MONITORING OF RIVER RAM GANGA: PHYSICO-CHEMICAL CHARACTERISTIC AT BAREILLY

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Abstract

Ranganga is an important river in U.P., it originates from the hills of Garhwal and traverses through Kalagarh, Moradabad and Bareilly and finally merges into Ganga at Farukhabad, covering a distance of about 480 km. An attempt has therefore been made to study the magnitudes of pollution because it was observed that the sewage disposal and large number of industries of river Ramganga .There is significant difference in temperature (46%) in the winter and summer season. The water was colorless at upstream side but becomes blackish at downstream at the junction of Sankha River. pH of river ranged from a minimum 7.28 at station No.I to a maximum 8.6 at station No.II. Dissolved oxygen ranged from 3.8 ppm at station No. II in summer season to 5.4 ppm. There was no significant change in total alkalinity at station No. I in different season. However, there was a marked difference when the values are compared at station I and II. The maximum difference of 32.7% was observed in the summer season at station I and II. The hardness of water is not a pollution parameter, but indicates the water quality mainly in terms of Ca++ and Mg++ ions. The values range from 182.1 mg/l to maximum 203 mg/l at station No. II.

Keywords: Ramganga, Water quality, Total Alkalinity, Total Hardness

Introduction

Recently great concern has been universally voiced regarding environmental pollution arising as a side effect of rapid industrialization and subsequent urbanization. Today, the main concern with environmental pollution is with its impact on the health of the present generation and the future ones.Our culture is completely river oriented most of our important towns and urban areas are located on the bank of Major River. Untreated domestic way into the rivers through sewage, outfalls drains act. There are no facilities of sewage treatment in any town of Uttar Pradesh.

Ranganga is an important river in U.P., it originates from the hills of Garhwal and traverses through Kalagarh, Moradabad and Bareilly and finally merges into Ganga at Farukhabad, covering a distance of about 480 km.Studies related to water pollution of river like Godavari, Krishna and Tungabhadra (Mitra,1982),Jhelum (Rain,1984),Kosi (Bhatt and Negi,1985),Gana (Panday,1985),Alaknanda (Tiwari et al.,1999) , Godavri (rao et al.,1993) have received greater attention during recent years.

An attempt has therefore been made to study the magnitudes of pollution because it was observed that the sewage disposal and large number of industries of river Ramganga .

Material and Methods

Water samples were collected for physico-chemical analysis form two sampling stations. One liter polythene wide mouthed bottles are used for collecting the samples. These are analyzed using standard methods for physic-chemical examination of water and waste water (APHA 1992, Trivedy and Goel 1984).

Sample were collected in a routine manner form both sampling sites i.e. station on the No.I (Ramganga river bank prior merging of a important tributary Sankha river) and the station No.II (Merging point of Sankha into Ramganga) during winter, summer and rainy season.

Temperature, pH and dissolved oxygen (DO) were measured on the sampling spot. Colour was identifying by visual comparison method, Odour was observed by threshold odour test. Temperature and pH were measured by water analysis kit, dissolved oxygen by Winkler's method, total alkalinity by simple titration method and total hardness by EDTA titration method.

Results and Discussion

From the physico-chemical observation of table I. It is revealed that the temperature of river Ramganga water varied from a lowest 23.2°C at station No.I in winter to highest 30.3°C in summer season. However, the temperature increases upto 35.2°C in the summer

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season at station No.II (Polluted Sankha tributary merges in Ramganga). There is significant difference (46%) in the winter and summer season at station No.II.

Sampling Stations / Parameters	Ramganga river bank prior to merging of Sankha (Station- I)			Merging point of Sankha and Ramganga (Station- II)			I.C.M.R standard
	Winter	Rainy	Summer	Winter	Rainy	Summer	
Colour	Colorless	Colorless	Colorless	Blackish	Blackish	Blackish	
Odour	Odourless	Odourless	Odourless	Foul smelling	Foul smelling	Foul smelling	
Temperature	23.2	27.9	30.3	24.1	28.7	35.2	
pH	7.28	7.61	7.63	7.36	7.70	8.61	7.0-8.5
Dissolved Oxygen	5.42	5.33	5.30	5.25	4.7	3.8	5.0
Total Alkalinity	79.3	80.8	81.2	89.5	91.1	107.8	120.0
Total Hardness	183.6	182.1	187.2	192.0	189.0	203.0	300.0

Table1; Physico-Chemical analysis of River Ramganga at Bareilly U.P. India during Different seasons

The water was colorless at upstream side but becomes blackish at downstream at the junction of Sankha River. It may be due to discharge of domestic sewage and industrial effluents into Sankha River. The water was giving a foul smell at station No.II.

The pH of river ranged from a minimum 7.28 at station No.I to a maximum 8.6 at station No.II in summer seasons. There was a marked difference in pH in summer season at station No.I and II and it was observed that the pollutant water directly influenced the pH of river.

The dissolved oxygen ranged from 3.8 ppm at station No. II in summer season to 5.4 ppm at station No.I in winter season. Higher DO suggesting the abundant growth of phytoplankton (De *et al*., 1991) and related to plankton leading to higher biological activity in winter season. DO showed significant inverse relationship with the temperature. Such relationship has also been recorded by Olson and Sommerfield (1977). Lower DO was reported for a No. of polluted river viz. Narmada River at Hosanabad in U.P. (Palharya and Malvaya, 1988) and river Rapti at Gorakhpur (Srivastva *et al*., 1986). The higher DO recorded during mansoon season may be due to the impact of rain water resulting in aeration (Methew Kosi and Nayer, 1999) and the lowest DO during summer seasons at station No. II may be as a result of accumulation of oxygen demanding effluents form the industrial waste a similar observation in reported by Abassi et al., (1997) in the case of Kutliadi river.

Alkalinity is influenced with the carbonate and bicarbonate and other ions. The minimum value of alkalinity was 79.3 mg/l at station No. I and maximum 107.8 mg/l at station No. II during summer season. There was no significant change in total alkalinity at station No. I in different season. However, there was a marked difference when the values are compared at station I and II. The maximum difference of 32.7% was observed in the summer season at station I and II according to Maruthi *et al*. , (2000) the water of Sharda have high alkalinity on account of mixing of effluent water containing bicarbonate and chlorides. The high concentration of sewage and industrial waste may be the cause of high alkalinity in our findings which confirm the finding of Robert (1997).

The hardness of water is not a pollution parameter, but indicates the water quality mainly in terms of Ca++ and Mg++ ions. The values range from 182.1 mg/l to maximum 203 mg/l at station No. II during summer Season. These findings are in agreement with previous finding of Trivedi and Goel (1984).

The above studies are conclusive of the fact that the water after the merging of polluted water is potentially hazardous for human health and proper cautions should be taken before the polluted water is allowed to merge with fresh water in order to save the biota dwelling there in form adverse effects.

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