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PHYSICO-CHEMICAL PARAMETERS OF RAM GANGA RIVER IN PITHORAGARH, UTTARAKHAND (INDIA)

C. P. SINGH^{1*}

¹Department of Zoology, Government College, Churiyala, Haridwar, Uttarakhand, India.

AUTHOR'S CONTRIBUTION

The sole author designed, analysed, interpreted and prepared the manuscript.

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Short Research Article

ABSTRACT

Present investigation has been carried out on the various physico-chemical parameters such as temperature, pH, dissolved oxygen, free co_2 and BOD of Ram Ganga River district Pithoragarh Uttarakhand (India). The pH was recorded in the range of 7.0 - 8.2. The water temperature was recorded range 14C - 26C. Free CO_2 of water sample range 1.2 to 2.5 mg/l. Chloride range between 13.5 - 21.6 mg/l. Turbidity range between 1 to 3.5 mg/l. The BOD range 2.1 to 4.6 mg/l. Present study these Physico-chemical parameters are necessary for judging the suitable for water or attributed to growth death and decay of phytoplankton.

Keywords: Turbidity; phytoplankton; dissolved oxygen; ecological balance.

1. INTRODUCTION

Physico-chemical parameters is the prime consideration to assess the quality of water for its best utilization like drinking, irrigation purpose and fishing. According to Alam and Pathak [1] and Mandal and Das [2], proposed due to rapid industrialization, urbanization and other development activities most of the Indian rivers are grossly polluted. The fluctuations in various physico-chemical characters may help to growth, death and decay of phytoplankton in these ponds [3].

Fresh water availability decreasing at greater rate with increasing pollution untreated domestic waste flows in river through sewage and outfall drain, which increase pollution [4]. The organism cannot exist without the environment of only organism, population or species lives at the expense of its environment, without this interaction it ceases to exist [5]. The physico-chemical and biological properties of water stated by [6,7,8,9,10, 11,12].

2. MATERIALS AND METHODS

Ram Ganga River originates from Namik glacier in Pithoragarh district of Uttarakhand and flow towards south-east. The river is fed by numerous small and big rivers and finally join river Saryoo at Rameshwar near ghat of Pithoragarh. The water samples were collected during morning hours. The selected parameters viz, pH, temperature FCo₂, DO, Cl, turbidity and BOD were analyzed using the standard methods of APHA [13].

3. RESULTS AND DISCUSSION

The physico-chemical analysis of study area on parameters viz, pH, temperature FCo₂, DO, Cl, turbidity and BOD During study period has been presented in Table 1.

The water temperature was recorded in the range of 14C - 26C with its maximum value (26C) during June and August. The minimum value (14C) in month of January. Present study observe that there was not

^{*}Corresponding author: Email: cpsingh26feb@gmail.com;

Months	Temp.	рН	DO	FCO ₂	Chlorinity	Turbidity	BOD
June	26C	8.0	8.1mg/l	2.1 mg/l	18.9 mg/l	2.6NTU	4.6 mg/l
July	25C	8.2	8.3 mg/l	2.5 mg/l	21.6 mg/l	3.5 NTU	4.3 mg/l
August	26C	8.1	8.5 mg/l	1.2 mg/l	20.5 mg/l	3.2 NTU	4.2 mg/l
Sept.	21C	7.0	8.5 mg/l	1.2 mg/l	16.1 mg/l	3.5 NTU	4.1 mg/l
Oct.	22C	7.0	8.3 mg/l	1.6 mg/l	24.0 mg/l	1.5 NTU	4.5 mg/l
Nov.	19C	7.3	8.9 mg/l	1.2 mg/l	34.1 mg/l	1.0 NTU	3.6 mg/l
Dec.	15C	7.2	9.5 mg/l	1.2 mg/l	42.1 mg/l	1.0 NTU	2.1 mg/l
Jan.	14C	7.5	9.6 mg/l	1.3 mg/l	43.2 mg/	1.0 NTU	2.8 mg/l
Feb.	16C	7.5	9.4 mg/l	1.5 mg/l	42.8 mg/l	00 NTU	3.2 mg/l
March	19C	7.8	9.3 mg/l	1.3 mg/l	34.5 mg/l	1.5 NTU	3.1 mg/l
April	20C	8.1	8.8 mg/l	1.5 mg/l	15.5 mg/l	2.1 NTU	3.8 mg/l
May	25C	8.0	8.0 mg/l	1.8 mg/l	13.5 mg/l	1.8 NTU	4.2 mg/l

Table 1. Showing values of selected parameters (Temperature, pH, turbidity, chlorinity, dissolved oxygen, free CO₂ and BOD) of water samples at Ram Ganga River (Pithoragarh) during June 2013 to May 2014

much variation in temperature of water [14] did not recommended any definite value of temperature. Roy and Nandi [15] reported the temperature range 19 – 35C in some wet land of west Bengal.

pH was recorded in range of 7.0 to 7.3 in winter season and maximum in summer season (8.0 - 8.2). In natural water pH also change seasonally due to variation in photosynthetic activities. Tak et al. [16] show pH range was 7.0 - 8.5 but slightly difference our study range was 7.0 - 8.2.

Dissolved oxygen were recorded as 9.6 mg/l in winter season and 8.0 mg/l in summer season. Dissolved oxygen is one of the most important parameter in water quality assessment and reflect the physical and biological process prevailing in the water. High dissolved oxygen content is an indication of a healthy system [17,16] reported the DO ranged in between 8.2 – 12.0 mg/l. Pathani and Upadhyay [18] reported similar observation as maximum value of DO 9.8 mg/l at Chakhutia of Kumaon during the study of zooplankton. Present study similar observation maximum value found of DO 9.5 mg/l at Ram Ganga River.

The maximum and minimum value of free co_2 was reported 1.2 - 2.5 mg/l during the present study. Similar finding were reported by [16,19,12].

Chlorides occurs naturally in all type of water. In the present study chloride concentration is between 13.52 - 43.2 mg/l.

Turbidity maximum value was 3.5 NTU in month of July and minimum Value was 0.0 in Feb month. In the present study it was observed that the BOD values of water samples altered season to season and site to site. During the whole study period it was ranged as its minimum and maximum values of 2.1 - 4.6 mg/l. The

maximum value of BOD was higher than standard limit recommended by WHO [14].

4. CONCLUSION

The physico-chemical parameters has a great bearing in the elucidation of any aquatic ecosystem and is essential to bring out various aspect of pollution and also for the complete understanding of biological phenomenon. It may be attributed to growth, death and decay of phytoplankton which could be as a result of human activities particularly of the tourist.

COMPETING INTERESTS

Author has declared that no competing interests exist.

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