

Water Quality Assessment of Baba Ghat of Bihar River Rewa (M.P.) India

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Abstract- All life on earth depends on water. Fresh water is a critical, finite, vulnerable, renewable natural resource on the earth and plays an important role in our living environment without it life is impossible. In this paper we are analyzed to monthly variation and comparative physio-chemical study of Baba Ghat of Bihar river of Rewa city (M. P.) in March, April and May 2012. Monthly variation in physical and chemical parameters like Temperature, pH, total solids, total dissolved solids, total hardness, chlorides, calcium, magnesium, biological oxygen demand and chemical oxygen demand etc.

Index Terms- Baba ghat, Physico-chemical parameters, Variation.

I. INTRODUCTION

Water is essential for all socioeconomic development and for maintaining healthy ecosystems. Natural surface water bodies like rivers and streams are subjected to pollution comprising of organic and inorganic constituent. As pollution increases and development call for increase allocations of groundwater and surface water for the domestic agriculture and industrial sectors the pressure on water resources intensifies leading to tensions conflicts among user and excessive pressure on the environment. [1]

Water is most indispensable requirement for all living organisms and any alterations in water may lead to the issue of survival for these organisms. Good quality of water is essential for living organisms. The quality of water can be assessed by studying its physical and chemical characteristics as well as by plankton growing in it. Because of vast population and negligence of human being the quality of water is being deteriorated day by day. [2]

The present study was compared the physio-chemical parameters of water in Baba Ghat of Bihar river in Rewa.

II. MATERIALS AND METHODS

The present study was carried out at Baba Ghat of river Bihar near Badi Pool in Rewa district (M.P.) India. The study was conducted between the months March to May 2012. For water collection acid cleaned plastic containers were utilized. Parameters like pH and temperature were detected at sampling sites while remaining parameters were analyzed immediately after reaching in laboratory. The procedure prescribed by APHA (1999) [3].

III. RESULTS AND DISCUSSION

Water like other components (air and soil) is equally important for sustenance of life and to maintain ecological progress of the bio-system. But relentless increases in the demand of water for multipurpose brought about by the two interdependent and parallel line of forces *i.e.* industrialization and urbanization, which in one hand usually reflects the all around development and progress but on the other hand poses strong concern about the fate of fresh water habitats. The requirement of water in all lives, from microorganisms to human beings, is increased day-by-day but it is a serious problem to provide a safe drinking water because all water resources have reached to a point of crisis due to unplanned urbanization and industrialization. [4]

The data on physio-chemical analysis of Baba Ghat have been given in table no. 1, 2 and 3.

Temperature:-

Temperature is one of the most important factors. The water temperature followed the change in solar radiation and ambient air temperature. The temperature of surface water during March, April and May are 22-25 °C, 25-30 °C and 35-40 °C respectively. Temperature has been considered as an important factor in aquatic environment. [5]

pH Values:-

pH is also an essential parameter of water quality which is governed by the carbon dioxide, bicarbonate equilibrium. The pH during March, April and May are 6.7, 7.3 and 8.2 respectively. High water values of pH during summer months may be due to utilization of bicarbonates and carbonates buffer system. [4]

Total Solid (TS):-

Total solid values during March, April and May are 620 mg/l, 635 mg/l and 710 mg/l respectively.

Dissolved solid (DS):-

Dissolved solid values during March, April and May are 525 mg/l, 570 mg/l and 620 mg/l respectively.

Total Suspended Solid (TSS):-

Suspended solid denote to impurities present in the water. According to tragedies all total suspended solid can be calculated by this relation.

Total hardness:-

It has specified the total hardness of water to be within 300 mg/l of CaCO₃. Total hardness values observed of Bihar River of ranges from 124 mg in March, and 115 in April and 105 in May. Calcium (Ca) and Magnesium (Mg) hardness are also calculated.

The ranges of Ca hardness are 76 mg/l in March, 70 mg/l in April and 60 mg/l in May. The ranges of Mg hardness are 48 mg/l in March, 40 mg/l in April and 30 mg/l in May.

Chloride:-

The Chloride is present in all natural waters; mostly at low concentrations. It is highly soluble in water and more freely desirable limit of chloride with water through soil and rock. In ground water the chloride content is mostly below 205 mg/l except in cases where inland salinity is content is mostly below 250 mg/l except in cases where inland salinity is prevalent in coastal areas. In water is 250mg/l except in cases where inland salinity is prevalent in coastal areas. In water in 250mg/l and maximum permissible in 1000mg/l as suggested by IBS and ISI, chlorides are important in detecting the contamination of ground water by waste, water. The value of Chloride obtained 30 mg/l in March and 35 mg/l in April and 40-45 in May. The presence of Chloride in higher amounts may be due to natural process such as passage of water through natural salt formation in the earth or it may be and indicator of pollution from domestic use.

Biological Oxygen Demand (BOD):-

The B.O.D. Value of Water Sample under present investigation varied between 3.0 mg/l to 3.8 mg/l and 4.1 mg/l during March, April and May. Significantly the value of B.O.D. exceeded the permissible limit (2.0mg/l) through the study which in due to the intense human activities. Regular addition of organic of organic matter ion the surface water might have offered intense bacterial growth which consequently resulted in increased BOD level. BOD indicates the amount of Oxygen required for stabilizing biological decomposable organic matter in waste under aerobic condition by micro organism. The reason of high content of BOD in summer months could be due to the fact that several microbes accelerated their metabolic activities with concentrated amount of organic matter discharged due to human activities, and hence required more amount of oxygen. [6]

Chemical Oxygen Demand (COD):-

The COD values of studied water sample were found in the range 15 mg/l, 20 mg/l and 30 mg/l during March, April and May respectively. Chemical oxygen is measure of Oxygen demand consumed for oxidation of Oxidizable organic matter present in water sample by strong oxidising agent, thus it is an indicator of pollution strength of water. The sources of COD in Baba Ghat may be due to input of domestic drains and the use of soap and detergents for washing and bathing by common man, as suggested by Mathur *et al.* 2008. [7]

Table 1- Physico-chemical analysis of surface water Quality Assessment of Bihar River in March

S. No.	Parameters	Values
1	Temperature	22-25 ⁰ C
2	pH	7.8
3	T. S. (mg/l)	620
4	D. S. (mg/l)	525
5	T. S. S. (mg/l)	95
6	Total hardness(mg/l)	124
7	Calcium hardness (mg/l)	76
8	Magnesium hardness (mg/l)	48

9	Chlorides hardness (mg/l)	30
10	C. O. D. (mg/l)	15
11	B. O. D. (mg/l)	3.0

Table 2- Physico-chemical analysis of surface water Quality Assessment of Bihar River in April

S. No.	Parameters	Values
1	Temperature	25-30 ⁰ C
2	pH	8.2
3	T. S. (mg/l)	635
4	D. S. (mg/l)	570
5	T. S. S. (mg/l)	65
6	Total hardness(mg/l)	115
7	Calcium hardness (mg/l)	70
8	Magnesium hardness (mg/l)	40
9	Chlorides hardness (mg/l)	35
10	C. O. D. (mg/l)	20
11	B. O. D. (mg/l)	3.8

Table 2- Physico-chemical analysis of surface water Quality Assessment of Bihar River in May

S. No.	Parameters	Values
1	Temperature	35-40 ⁰ C
2	pH	9.2
3	T. S. (mg/l)	710
4	D. S. (mg/l)	620
5	T. S. S. (mg/l)	90
6	Total hardness(mg/l)	105
7	Calcium hardness (mg/l)	60
8	Magnesium hardness (mg/l)	30
9	Chlorides hardness (mg/l)	40-45
10	C. O. D. (mg/l)	30
11	B. O. D. (mg/l)	4.1

IV. CONCLUSION

This study provides an informative data and helps to understand water characteristics and indicate that the water of Bihar River can serve as a good habitat. The pH value indicates the alkaline water of in the month of May might be due to high temperature that indicates the solubility of CO₂. The analysis of the quality parameters of water from Baba Ghat of Bihar River shows that pH, alkalinity, chloride ion, total hardness, BOD and COD etc. are well within the permissible limit.

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