Asian Journal of Agriculture & Life Sciences Vol. 3(2), April 2018: 52-54

Website: www.crsdindia.com/ajals.html e-ISSN: 2455-6149

ORIGINAL ARTICLE

Assessment of Water Quality of Chambal River in Relation to Turbidity and pH at Dholpur District

Pratap Singh Tiwari
Department of Zoology, Kamla P.G. College, Dholpur
Email: pratapsinghtiwari1@gmail.com

Received: 18th Dec. 2017, Revised: 19th Feb. 2018, Accepted: 23rd Feb. 2018

ABSTRACT

Water pollution is an emerging problem for both developed and developing countries because todays mechanical system to exploit ground and River water increase wastage of usable water for society. Secondly, he Rivers which are major source of potable water in developing countries are facing serious pollution problem in every city. In dholpur district of Madhya Pradesh, River Chambal is also facing such problem. This attracts the researchers to work on water quality of River Chambal in this region. Keeping these points in view, present study is designed to measure turbidity and pH of water in dholpur.

Key words: *physicochemical parameter, Turbidity, pH, Dholpur district.*

INTRODUCTION

Now a days fresh water ecosystem, due to urbanization, population density explosion as well as industrialization have become polluted. Sewage and domestic waste from cities also discharge in to River, not only cause pollution but drastically disturb the fauna and flora of ecosystem. water pollution now-a-days is considered not only in term of public health but also in term of conservation, aesthetics and preservation of natural beauty and resources. The same is true to Chambal River, flowing through dholpur distt. it there fore must to assess water quality of Chambal at down stream site d and up stream site a selected the water quality in dholpur distt. it was the beginning of 1970's when in india environmental pollution became a serious problem. as Chambal River flows from different industrial cites it is pointed out that population growth is responsible to increase the quantity of waste water due to addition of the large quantities of sewage as sewage consist of degradable organic matter and oxygen demand on the receiving water. due to pollution, B.O.D. in Chambal River rises to 10 to 15 mg/l against a permissible limit of 3 mg/l. approximate 700 mld of sewage discharge in Chambal River from different areas which situated on the bank of Chambal in raj. and m.p. dholpur is a developing city so continues small scale industrialization and urbanization is responsible for increasing the pollution in Chambal River from up stream site a to down stream site d of dholpur areas.

MATERIALS AND METHODS

TURBIDITY:

It is caused by the substances which not present in the form of true solution. True solutions consist of 10^{-2} metre particle size. Any substance which have more than this size will produce turbidity. Turbidity of water is actually the expression of optical property (Tyndal effect) in which the light is scattered in the particles present in water. For measuring turbidity when light passed through a sample having suspended particles, some light rays not refract but scattered by the particles, this scattering of the light is directly proposals to the turbidity.

Process:

Stock turbidity suspension

Solution A

Dissolved 1000 gm Hydraziesvlfate (NH_2) H_2SO_4 in 100 ml distilled water.

Solution B

Dissolved 1000 mg Hexa methylene tetramine $(CH_2)_6N_4$ in 100 ml distilled water.

Mixed 5.0 ml solution A and 5.0 ml solution B in a 100 ml volumetric flask allow to stand for 24 hours 25+3 degree centigrade and diluted to mark and mixed. The turbidity of this suspension is 400 NTU.

STANDARD TURBIDITY:

Suspension

Diluted 10 ml stock turbidity suspension to 100 ml with turbidity free water. The turbidity of this suspension is 40 NTU.

Process: Standarized the Nephelon tubidimetre by standard turbidity suspension. Then taken sample in Nephelon tube and immersed in vlzrasonic both for 1 to 2 sec. when bubble were released read Turbidity directly from Turbidimeter in Turbidity Unit.

Calculation: NTU=Nephlonturbidimeter radding X 0.4 dilution factor.

pH:

It is the property of a substance present in water to conduct electric current. Conductivity is calculated to the inversely proportional resistance. Most of the ionic form of the salt, present in water are capable of conducting electric current, therefore conductivity can measured the amount of total dissolved solid. The measuring unit of conductivity is mho. But now a days its unit of measurement is (siemens). The conductivity of distilled water ranges between 1-5 s.

Process: Standardized the conductivity meter with the 0.01 N KCl solution and adjust the temperature at 25±0.1 degree centigrade. Then rinsed the cell with distilled water, followed by portion of pH (potential hydrogenil). It is measured as presence of concentration of hydrogen in water. It does not measure total acidity or alkalinity. It measure the intensity of acidity or alkalinity. pH generally measured on a log scale which explain by following equation.

$$pH = -\log_{10}[H^+]$$

$$= \log_{10} \frac{1}{[H^+]}$$

Neutral solution will have $1X10^{-7}$ ions of H^+ and OH^- each. pH scale ranges from 0 to 14 with 7 as neutral, below 7 is acidic & above 7 is alkaline. Standardization of the pH metre (systronic - 335) with the electrodes emurges in buffer solution of known pH 4.0 & 7.0 before taking reading. Check the temperature by adjustment knob. Wash the electrodes with distilled water & dried with tissue paper. Sample take in clean beaker and emerge the electrodes and adjust the temperature, then read the value of pH.

RESULTS AND DISCUSSION

TURBIDITY:

The turbidity of Chambal water at four different sampling station has no significant variation. However, the turbidity of Chambal water varies after each three months intervals.

Table 1: Average Turbidity

Month	Turbidity			
	Site A	Site B	Site C	Site D
Oct-04	29	31	31	36
Jan-05	24	27	23	26
April-05	18	16	15	19
July-05	24	30	24	26

Site A= High way, Site B= Shamshan Ghat, Site C= Shergarh Fort, Site D= Near railway bridge

pH:

In Chambal River water the significant variation of pH was negligible at all four sampling stations. However the pH of Chambal water varies significantly after each three months interval.

Table 2: Average pH value

Month	pH			
	Site A	Site B	Site C	Site D
Oct-04	7.10	7.27	7.32	7.82
Jan-05	7.19	7.25	7.46	7.91
April-05	7.21	7.32	7.49	7.96
July-05	7.20	7.21	7.59	7.96

Site A= High way, Site B= Shamshan Ghat, Site C= Shergarh Fort, Site D= Near railway bridge

The present investigation a non significant turbidity value has been observed between upstream and down stream sites during oct. 2004 to July 2005. Maximum turbidity recorded in the month of oct. 2004 which may be due to highly silted condition. An increasing rate of turbidity is recorded from April 2005 to July 2005 at up stream site A against down stream site D. Most probably such higher values of turbity are due to higher concentration of suspended solid particles, coming through sewage system, drains as well as due to Foundary waste water. In winter season oct 2004 to April 2005 turbidity has been recorded maximum due to deficiency of proper running water in River as well as due to suspended solid particle which decrease the water flow velocity. During summer season rate of turbidity increased, may be associated with the velocity of water flow and also due to waste pollutants of city areas. The above finding clearly indicate that the turbidity is directly proportional to the different kinds of pollutants. The present investigation supported by Mathur, *et. al*. (1987), Singh, *et al,* (1989), Tarzwell, C.M., (1971) and Saxena and Chauhan, (1993) who earlier recorded the rate of turbidity in River.

pH:

The pH value reveals non significant increase from Oct (2004) April (2005). But in rainy season July 2005 the River contain more water. It reveals alkalinity but of lesser magnited. The water samples at down stream site D reveals greater alkalinity as compared to up stream site A. such variation in pH value indicate that the level of pollution is higher and the quantity of water in Chambol River is going to decline. It is the probability that the increasing of pH value may by due to outcome of mixing of sewage and other effluents in Chambol River. It is supported by Mathur *et al.* (1987) and M. Manimegali (1990) and Sunkand *et al.* 2004 to signified the pollutants which are responsible for such variations.

REFERENCES

1. Manimagalia M., Sivakumar and M Aruchami (1990): physico-chemical character of the River Manimagalia M., A.A. Sivakumar and M. Aruchami (1990): Physico-chemical character of the River Bhawani (coimbator district Tamil Nadu) with Special reference to water pollution ad. of environ soil 289-9.
2. Mathur A, Sharma Y.C., Ruprainwar D.C., Murthy R.C. and Chandra S.V.(1987): Poll Resi, 6: 37-44.
3. Saxena K.K. and Chauhan R.R.S. (1993): Physiochemical aspects of Pollution in River Yamuna at Agra. Poll. Res. 12(2): 101-104.
4. Singh J.P., Yadav P.K. and Singh L. (1989): Mass bathing effect on water quality of sangam during Maha Kumbh mela at Allahabad I.T.E.P. a(3): 189-193.
5. Sunkand B.N. and. Patil H.S (2004): water quality assessment of Fort lake of Belgaum (Karnataka) with special reference of Zooplankton. J. of Environmental Biology. 25(1).
6. Tarzwell C.M. (1971): Bioassay to determine allowable waste concentrations in the aquatic environment. I. Measurement of pollution effects on living organisms. Proc. Royal. Soc. London. B. 177. 279.
7. Verma R.K., Suman Kapoor, Kripa Sankara and G.S. Tomar (2005): Physico chemical characteristics of sewage drainage evolution for crop irrigation on the bank of Chambal River at Dholpur. (Raj). Accepted National journal of Life Science Volume (2) No (2).