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ORIGINAL ARTICLE

Physico-Chemical Studies of Water in Karvan River at Sadabad District Hathras

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ABSTRACT

Water pollution of river is said to be polluted when the water in it is altered in composition directly or indirectly as a result of man's activities. During recent years it has also been estimated that river Karvan water quality has also degraded by dumping of flowers, ashes, bones of dead bodies after cremation, bathing the cattles and washing the clothes due to which oxygen supply in water is reduced. Pollution of water is responsible for a very large number of mortalities and incapacitation in the world polluted state of the water resources has led to water without which vital activities are not possible on this planet, has also been adversely affected by all kinds of activities of human beings. In the present investigation the water quality of river Karvan at Sadabad, district Hathras has been observed to be of substandard quality because various untreated industrial effluents, domestic sewage etc. merged inside the river.

Key words: *Physico-Chemical Studies, Karvan River, Water Pollution*

INTRODUCTION

Water is most vital resource for all kinds of life on the planet because without water in living beings mechanical and physic-chemical activities can not sustain. Water is also the resource adversely affected both qualitatively and quantitatively by all kinds of human activities on land, in air or in water. Though, the defilement of water as a result of human activities is a phenomenon as old as hills, the increasing industrialization, urbanization and development activities and consequent pollution of water has brought a variable crisis. Pollution of water is responsible for a very large number of mortalities and incapacitation in the world polluted state of the water resources has led to water without which vital activities are not possible on this planet, has also been adversely affected by all kinds of activities of human beings. It was since the beginning of 1970 that environmental pollution becomes a serious problem in India, because the rapid industrialization and urbanization have aggregated this problem. The improper disposal of industrial effluents from water off along with raw sewage, create environmental problems altering the chemical composition of the aquatic resources and this cause heavy damage of the faunal and floral composition of aquatic habitat. Broad spectrum and pesticides were currently used for pest control in many ways to the soil, water bodies, crops and to the stored grains in the form of liquid, dust, sprayers, granules and metals contained in industrial effluents constitute a major source of metallic pollution of hydrosphere when discharge in Karvan river this will lead to increase in concentration of toxic element within food chain in river Karvan ecosystem. This may seriously affect the lifes of aquatic fauna in river Karvan, therefore entire food chain is disturbed. Water pollution of river is said to be polluted when the water in it is altered in composition directly or indirectly as a result of man's activities. During recent years it has also been estimated that river Karvan water quality has also degraded by dumping of flowers, ashes, bones of dead bodies after cremation, bathing the cattles and washing the clothes due to which oxygen supply in water is reduced. In the present investigation the water quality of river Karvan at Sadabad, District Hathras has been observed to be of substandard quality because various untreated industrial effluents, domestic sewage etc. merged inside the river. The socio-economic activities have severely damaged the quality of the river. This river which provides life to humanity has now become a dangerous to human as well as aquatic lifes. Therefore, it has become necessary to assess the water quality of river Karvan at Sadabad district Hathras and its impact of aquatic fauna.

MATERIALS AND METHODS

The water samples were collected fortnightly from the selected experimental sites and from each site samples of water were collected for the study of physicochemical analysis of water. After collection water flow measurement, turbidity and conductivity were estimated in water samples with standard methods.

Water Flow Measurement:

A number of methods may be used for measuring flow of river but the choice of methods depend largely on the affordability but the type of local effluents also influences. For this surface float method is used for measurement of water flow of the river. It is a simple approach in which a float (Plastic ball) is thrown on the surface. The time required for a float to travel (t), a known distance (d) is observed and the average velocity is obtained by

$$[\bar{V}] = \frac{d}{1.2t}$$

The factor 1.2 accounts for the fact that surface velocity are normally about 1.2 time higher.

Turbidity (Nephlometric Methods):

When light is passed through a sample having suspended turbidity, some of the light is scattered by the particles, the scattering of the light is generally proportional to the turbidity. The turbidity of a sample is the measured from the amount of light scattered by the sample taking a reference with standard turbidity suspension.

Process (Preparation of turbidity standards):

***Solution A*:** Dissolved 1.00 mg. Hydraziesulfate $(NH_2)H_2SO_4$ in 100 ml. of distilled water.

***Solution B*:** Dissolved 1.00 mg. Hezamethylene tetramine $(CH_2)_6N_4$ in 100 ml. in 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 at 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. turbidity free water. The turbidity of this suspension is 40 NTU. Standardized the Nephelon turbidimeter by standard turbidity suspension. Then taken sample in Nephelon tube and immersed in ultrasonic bath for 1-2 sec. When air bubbles were released then read turbidity directly from turbidimeter in turbidity unit.

Turbidity (NTU) = Nepholon turbidimeter reading x 0.4 dilution factor

Conductivity:

The unit of conductivity measurement siemens (s) cm^{-1}. The older unit mho cm^{-1} is now rarely used. The conductivity of most waters is generally low so the unit µs cm^{-1} shall be much appropriate. As the ionization of the solutes depends on the temperature conventional the results are reported at 25^0C.

Process:

Standardized the conductivity meter with 0.01N KCl solution and adjust the temperature at 25±0.1 degree centigrade. Then rinsed the cell with distilled water followed by portion of sample to be tested. Adjust the temperature of sample to 25+0.1 degree centigrade. Then measured the conductivity in sm^{-1} (milli sieams per meter).

Conductivity (mho) = Observed Conductivity x Cell Constant
x Temperature factor at 25^0C

RESULTS AND DISCUSSION

Water Flow Measurement:

Water flow measurement was maximum in Apr 09 at up stream (A) sampling station which was minimum in Jul 09 at up stream (A) sampling station, while it was maximum in July 09 at down stream (D) sampling station which was minimum in Jan. 09 at down stream (D) sampling station at river Karvan. It is due to hardness and turbidity of water. Turbidity is very much responsible for

the disturbed speed of water flow and also on weather condition. Such facts are described by Kodarkar (1998) and Dasgupta, *et al*. (2002) at Ganga River and water quality of village Timjore respectively.

Table 1: Average Water Flow Measurement

Month	Water Flow Measurement (m/s)			
	Site A	Site B	Site C	Site D
Oct 08	1.78	1.76	1.71	1.70
Jan 09	1.89	1.81	1.76	1.74
Apr 09	1.91	1.79	1.78	1.71
July 09	1.72	1.74	1.77	1.73

Table 2: Average Turbidity

Month	Turbidity (NTU)			
	Site A	Site B	Site C	Site D
Oct 08	16.6	21.8	22.3	22.9
Jan 09	15.4	16.3	19.6	19.9
Apr 09	13.2	14.1	17.5	18.2
July 09	16.3	17.6	18.7	19.4

Table 3: Average Electrical Conductivity

Month	Electrical Conductivity (mmho/m)			
	Site A	Site B	Site C	Site D
Oct 08	0.712	0.916	0.829	0.836
Jan 09	0.784	0.848	0.846	0.876
Apr 09	0.735	0.856	0.837	0.892
July 09	0.746	0.894	0.816	0.879

Turbidity:

In the present studied a non significant increase turbidity value has been observed between up stream (A) and down stream (D) sampling station at river Karvan during Oct 08 to July 09. Maximum turbidity is recorded in the month of Oct. 08 which may be due to highly silted condition in the river Karvan. An increasing rate of turbidity is recorded from Apr 09 to July 09 at up stream (A) sampling station against down stream (D) sampling station of river Karvan. Most probably such higher values of turbidity are due to higher concentration of suspended solid particles, coming through sewage system, drains as well as due to small scale industries wastes which are directly discharging in the water of river Karvan. During summer season increasing values of turbidity further may be associated with the velocity of river water which probably affect the turbidity and also by increased pollutant level through city drains carrying industrial and urban wastes. The above findings clearly indicate that the turbidity is directly proportional to the different kinds of pollutants which are directly discharging in the river water by different sources. The present investigation supported by Joy, *et al*. (1990), Khanna, *et al*. (1997), Trivedi and Rekhakumari (2002) and Nandan, *et al*. (2003) who earlier recorded the rate of turbidity in different river.

Conductivity:

Conductivity is a numerical expression of the ability of an aqueous solution to carry an electric current. This ability depends on the presence of ions, their total concentration, mobility, valence and relative concentrations and on the temperature of measurement. The conductivity reveals an increase throughout the investigation both at up stream (A) and down stream (D) sampling stations of river Karvan. However, this increase has been non significant from July 09 on account of dilution factor, resulting because of rise in water level of river Karvan. Further a significant conductivity rise from Oct 08 to Apr 09 is suggested of low level of river Karvan. The following reasons further supplicate in enhancement conductivity.

1. Million litres of sewage and other effluents are being discharged in Sadabad city from domestic and industrial areas respectively, may be considered responsible for enchanced conductivity.

2. On account of mitigation of sand particles from construction works due to urbanization are drained out in river Karvan water all along with domestic sewage.

Conductivity being the manifestations of dissolved solids can be considered a marker of water pollution. It is evident from the present studies that the conductivity of water increases at down stream (D) as compaired to up stream (A) sampling station. Similar increase in conductivity values have also been reported by Vijay, *et al*. (1996), , Kaushal, *et al*. (2001), Das Gupta, *et al*. (2002), Taradevi, *et al*. (2005) in river Krishna, Godavari, Ganga respectively.

REFERENCES

1. Das Gupta H., Adak S. and Purohit K.M. (2002): Studies on water quality of village Timjore Orissa IJEP, 22(9): 1040-1046.
2. Jayjeet K., Roy B.P. and Sinha R.P. (2007): Role of physico-chemical parameters of water in Wetland diversity of Kureshwarsthan., Int. J. Mendel., 24(3-4): 105-106.
3. Kaushal D.K., Joshi N.C. and Kumar S. (2001): Limnological features of Pandoh reservoir (H.P.) Indian J. Fish, 48(2): 217-220.
4. Khanna D.R., Malik D.S. and Badola S.P. (1997): Population of green algae in relation to physico chemical factors of river Ganga at Laljiwala (Haridwar) U.P. J. of Zool., 17: 237-240.
5. Kodarkar M.S. (1998): Methodology for water analysis (Physical, Chemical, Biological and Microbiological) Jr. IAAB Pub. Hyderabad.
6. Nandan S.N. and Kumawat M.R. (2003): Ecological study of algal of Aner Dam of Maharashtra India. Jour. Env. and Eco., 7(1): 163-166.
7. Taradevi G., Natragen P., Arabaske F. and Nariana V. (2005): Physico-chemical characteristics of man-made rock pond in Kanyakumari, Distt. Tamilnadu. Proc. Zool. Soc., 4(1): 9-15.
8. Trivedi R.N. and Rekha Kumari (2002): Surveillance on the quality of municipal supply water in different localities of Patna. Ind. Jour. of Env. and Hlth., 44(1): 30-35.
9. Vijay K. and Paul R. (1996): Physico-chemical studies on the Bhosga reservoir in Gulberga (Karnataka). Eco. Biol., 2: 332-335.