Annals of Natural Sciences
Vol. 5(1), March 2019: 1-5
Journal's URL: http://www.crsdindia.com/ans.html
Email: crsdindia@gmail.com

e-ISSN: 2455-667X

Annals of Natural Sciences

ORIGINAL ARTICLE

Evaluation of Hydrobiological Parameters in River Asan in Murena District with Reference to Dissolved and Non-Dissolved Impurities

A.K. Deshpande
Department of Zoology, R.B.S. College, Agra
Email: ananddeshpande158@gmail.com

ABSTRACT

In the tweenteeth centuary vast industrilization and urbanization has been occured. In this process a significant negligence has been observed towards environmental issues like safe water, pure air and clean environment. Now every city is facing the problem of pollution in its surroundings. In district murena River Asan is flowing with high amount of pollutants including inorganic, organic, heavy metal waste which in turn reach human body. With this reason, present study is to determine dissolved and non-dissolved impurities in River Asan at murena district has been designed. A significant alteration in water quality has been observed which has to be managed to serve safe drinking water.

Key words: *Hydrobiological Parameters, Dissolved and Non-Dissolved Impurities*

Received: 8th January 2019, Revised: 14st January 2019, Accepted: 21st January 2019

How to cite this article:
Deshpande A.K. (2019): Evaluation of Hydrobiological Parameters in River Asan in Murena District with Reference to Dissolved and Non-Dissolved Impurities. Annals of Natural Sciences, Vol. 5[1]: March, 2019: 1-5.

INTRODUCTION

Industrialization, urbanization, population explosion and green revolution have deteriorated the various sources of water. The industrial effluents, sewage and polluted water from other sources when discharged into any stream or River not only cause pollution but drastically disturb the fauna & flora. Water pollution is a serious threat to life. A 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. The discharge of solid or liquid waste products grouped under sewage, industrial and agricultural caused water pollution.

The effluents containing inorganic and organic chemicals which are toxic to plants, animals and human beings. The toxins are absorbed into the tissue from the polluted water and the affect produced various with the type of chemical and the metabolism of the organism. The same is true to Asan River flowing in Madhya Pradesh. It therefore becomes must to assess water quality of Asan at down stream site (D) and Up stream site (A) throughout its entire length in Murena district. It was since the beginning of 1970's that the environmental pollution became a serious problem in India.

The increasing population, galloping technology and economic development have created awareness of environment crisis and need for balancing the nature. It is must that man must start to think in harmony with the nature seems to be a dream. The main object is to safe guard air, water and land without which life is not sustaining. Because of rapid increase of population and concentration of factories around the costal region of Asan, significant alteration in hydrobiologcical parameters were observed.

MATERIALS AND METHODS

EXPERIMENTAL PROTOCOL:

Water sampling sites from River Asan at Murena. After each 3 months sample were collected at the each sampling stations at different times for the analysis of different parameters. Samples were collected in the middle of streams and at mid-depth in the direction of flow. Samples storage a low temperature (4 degree centigrade).

The study will be deal under the following head :-

1. Murena will be marked out of the inlets of the pollutants.

2. Monitoring and analysis of the River water at following sampling stations:

A. Chanda Gaon
B. Jaroni Gaon
C. Karua Gaon
D. Girgoni Gaon

WATER SAMPLING COLLECTION:

Sampling was done significantly after each three months intervals for 1 year. The water samples of River Asan were collected. From all the sampling points October 2010 to July 2011 for the study of water quality. Samples from the River water were collected in five litres precleaned plastic bottles for physico-chemical analysis. One glass bottle (DO. bottle capacity 300 ml.) was filled with water at every sample point for the estimation of dissolved oxygen as referred by APHA (1992). Sample for MPN (Coliform and Faecal bacteria or Coliform) detection were collected in sterilized glass bottle and preserved in ice (APHA, 1992) water temperature was determined at the sampling point while other parameters were analysed in the laboratory.

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):

(a) Stock Turbidity Suspension:

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 standing for 24 hours at 25$\pm$3 degree centigrade and diluted to mark and mixed. The turbidity of this suspension is 400 NTU.

(b) Standard Turbidity Suspension:

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

PROCEDURE:

Standardized the Nephelon turbidimeter by standard turbidity suspension. Then taken sample in Nephelon tube and immersed in ultrasonic bath for 1-2 sec. When buddle were released then read turbidity directly from turbidimeter in turbidity unit.

NTU = Nepholon turbidimeter reading x 0.4 dilution factor

HARDNESS:

Hardness was determined by EDTA (APHA-1992). Taken 25 ml. sample in conical flask then add 1 ml. buffer solution followed by 1ml. inhibitor. Then add a pinch of Eriochrome black-T-indicator and titrated against standard 0.01M EDTA till the wine red colour changes to blue.

$$\text{Total Hardness (mg/l) } CaCO_3 = \frac{\text{Titrant used x N x 1000}}{\text{ml. of sample}}$$

Where N = Volume of EDTA used

CHLORIDE (ARGENTOMETRIC METHOD):

Silver nitrate ($AgNO_3$) reacts with chloride to form very slightly soluble white precipitate of AgCl. At the end point when all the chlorides get precipitated. Free silver ions reacts with chromate to form silver chromate of reddish brown colour. Taken 100 ml. sample in conical flask then add 5 drops of well mixed potassium chromate indicator then titrated against 0.0141N $AgNO_3$ till the first appearance of slightest reddish colour.

Calculation:

$$\text{Chloride (mg/l)} = \frac{\text{Titrant used x N x 35450}}{\text{ml. of sample}}$$

Where N = Normality of Silver nitrate

RESULTS AND DISCUSSION

Table 1: Average Turbidity

Month	Turbidity			
	Site A	Site B	Site C	Site D
Oct-10	29	31	31	36
Jan-11	24	27	23	26
April-11	18	16	15	19
July-11	24	30	24	26

Table 2: Average Hardness

Month	Hardness (mg/l)			
	Site A	Site B	Site C	Site D
Oct-10	83.0	112.0	163.0	117.0
Jan-11	86.0	109.0	172.0	190.0
April-11	90.0	108.0	176.0	178.0
July-11	96.0	100.0	161.0	179.0

Table 3: Average Chloride

Month	Chloride (mg/l)			
	Site A	Site B	Site C	Site D
Oct-10	47.0	59.0	62.0	69.0
Jan-11	51.0	61.0	68.0	73.0
April-11	58.0	62.6	65.0	70.0
July-11	57.0	71.0	73.0	75.0

Site A= Chanda Gaon Site B= Jaroni Gaon Site C= Karua Gaon Site D= Girgoni Gaon

In the present investigation a non significant turbidity value has been observed between upstream and down stream sites during Oct. 2010 to July 2011. Maximum turbidity recorded in the month of Oct. 2010 which may be due to highly silted condition. An increasing rate of turbidity is recorded from April 2011 to July 2011 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 2011 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.* (1998), Singh, *et al,* (1989), Tarzwell, C.M., (1971) and Saxena and Chauhan, (1993) who earlier recorded the rate of turbidity in River.

In the present investigation the values of hardness shows an increase throughout study period. However, this increase has been observed to be non significant from July (2011) to against the probably due to the dilution of Asan River water, resulting on account of rainy season which increase the water level. Further, a significant increase in hardness has been noted from October (2010) to January (2011) may be account for reduced availability of Asan water and mingling of untreated sewage and industrial wastes in the River. The ground water of Murena that contains high value calcium and magnesium is being used in domestic purposes, is discharged on routine basis in the River water through municipal drains which affect the hardness values of River. Further, high values of hardness could be possible due to human activities including bathing, washing of clothes that incorporates use of detergents powder. In the present investigation the values of chloride has been observed significantly increased at down stream site (D) as compared to Up stream site (A). However, this significant increase in chloride values are negligible during July (2011). This may probably be due to rainy season. Significant increase in chloride values from October (2010) to January (2011) may be an indication of pollution through domestic sewage. Further, increase of chloride content is perhaps due to the release of industrial, domestic, sewage and other kinds of effluents which are mixed up in the River and are probably responsible for increase in chloride values. There was significant variation in the total hardness of Water of Asan River at different four sampling stations. However the total hardness of Water of Asan River varies significantly after each three months intervals.

REFERENCES

1. Basak P.K. and Konar S.K. (1976): Pollution of water by pesticides and protection of fishes parathion. Proc. Nat. Acad. Sci. India 46B: 382-392.
2. Benoit D.N. (1975): Chromic effects of copper on survival, growth and reproduction of blue gill (*Lepismimacro cherus*). Trans. Amer. Fish Scocity, 104: 353.
3. Brown M.E. ed., (1957): The physiology of fishes metabolism. Academic Press Inc. New York., N.K
4. Burdick G.E. (1965): Some problem in the determination of cause of fish kills in biological problems in water pollution. UPHS.PUBL. No.999-W.P.-25.
5. Chakrabarty Gouri and Konar S.K. (1974): Chronic effects of sublethal levels of pesticides on fish. Proc. Nat. Acad. Sci. India. 448, 241-246.
6. Chakrabarty N.M. (1987): Macrobenthic fauna of a sewage fed fish pond. Environ. Ecol., 5(1): 149-153.
7. Das H.B., Kalita L.B., Sackia K. Borah and Knnur S.B. (1992): Physicochemical characteristics of Brahmputra water of Tezpur. Poll. Res., 11(3): 169-172.
8. Das S.K., Parvin Kumar, Singh R.A. and Roy J.N. (2003): Ionic composition of mehadiganj lake of Bihar. Int. J. Mendel, 20(1-2): 9-10.
9. Dinesh Verma and Kanhere R.R. (2008): Study of Feacal contamination of water of River. Ind. Res. Comm. 2(1): 57-61.
10. Dinesh Verma and Kanhere R.R. (2009): Studies of water quality of River Narmada in western zone. Life science bulletin, 6(1): (27-349).
11. Dobbs R.A. and Williams R.T. (1963): Elimination of chloride interference in the chemical oxygen demand test. Anal. Chem. 35: 1064.
12. Doudoroff P., *et al.*, (1951): Bioassay methods for the evaluations of acute toxicity of industrial wastes to fish sewage. Ind. Wastes. 23: 1380.
13. Ellis M.M. (1937): Detection and measurement of stream pollution. Bull. U.S. Bull. Fisheries 48 page. 365-437.
14. Govind B.V. (1978): Bottom fauna and macrovegetation in Tungabhadra reservoir and their role in the food chain of fish communities. *Proc. Sem. Ecol. Fish, Fresh Wat.* Riversvoirs, pp. 99-128.
15. Hoffman G.L. and Mayer F.P. (1974): Parasites of fresh water fishes. A review of their control and treatment T.H.F. publications Inc. Ltd. Nepture, city N.J.

16. Mathur A.K., Khan M.A., Panwar R.S. and Jetly R. (1998): Studies on plankton communities and primary production in middle stretch of River Ganga in context of cultural eutrophication. J. Inland Fish. Sco. India, 30(1): 47-68.
17. Rai J.P.N. and Sharma H.C. (1990): Impact of industries on the quality of surface and ground water in the north-west region of Uttar Pradesh". National symposium on protection of environment of city water fronts New Delhi.
18. Sarita Sharma and Alka Mishra (2005): Study of physico-chemical parameters of the Send-River. Int. J. Mendal 22(3-4): 117-118.
19. Saxena K.K. and Chauhan R.R.S. (1993): Physico-chemical aspects of pollution in River Yamuna at Agra. Poll. Res., 12(2): 101-104.
20. Shanker U. and Prasad G. (1983): Mycoflora of Ganga water Rishikesh (India). Kanpur Univ. Res. J. (Sci.), 4: 65-68.
21. Sinha Lalit K. (1981): Water quality modeling in a small stream problems, considerations and results. Paper presented in international symposium on and ecological modeling. Louisville, Ketucky, U.S.A.
22. Tarzwell CM. (1971): Bioassay to determine allowable waste concentrations in the aquatic environment. Measurement of pollution effects on living organisms. Proc. Roya1. Soc. London B., 177-279.
23. Thakur D.N., Binod Kuma and Ahmad Faiz (2007): Physico-chemical analysis of effluent water obtained from industrial belt of Bihar. Int. J. Mendel, 24(3-4): 123-124.