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WATER QUALITY ANALYSIS OF NARMADA RIVER AT HOSHANGABAD WITH SPECIAL REFERENCE TO ITS POLLUTION STATUS

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ABSTRACT

Water quality analysis of Narmada river at Hoshangabad was carried out during the period from April 2002 to March 2003. Study of parameters like COD, DO, BOD and Hardness etc. indicates minor pollution, chemically as well as biologically. Attempt should be made to minimize pollution sources in order to make it suitable for drinking purpose.

Key words: Water quality, Narmada river, pollution and Hoshangabad.

INTRODUCTION

Narmada river originates from Amarkantak in Shahdol distril and falls into the Gulf of Cambey below Bharoach. The total river covers 144 lakh acres agricultural land in M.P. The river plays a significant role in the human life of Hoshangabad area. It has become polluted in some places of Hosghanabad due to confluence of sewage, domestic wastes and industrial effluent from Security Paper Mill. Some researchers have studied the physico-chemical characteristics of the river. The present study was undertaken to ascertain the quality of Narmada water at Hoshangabad, in light of the pollution in rivers.

MATERIAL AND METHODS

Location of the sampling points

First sampling point was Bandraban village, which is upstream of Narmada river at Hosghangabad city, while the second sampling point is near Dongarwara village, which is downstream point. Apart from industrial pollution, agricultural run off from the catchments area, sewage and domestic wastes of the river after the increase, the extent of pollution of the river after the upstream sampling point and before the downstream sampling point.

Water sample was collected from each of the two sites once in a month (From April 2002 to March 2003) between 9 am to 12 noon at regular intervals of 30 days. Grab sample method was followed for collections of samples. Samples were kept in precleaned polyethylene plastic made Jeri cans (2.5 lit. capacity) for pH, Chloride, total hardness (TH), Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD) estimation and one borosil glass made bottle (300 ml capacity) for DO testing. Samples were kept in refrigerator until tested within 6 hrs of collection. The analysis of water was carried out as per APHA (1992).

RESULTS AND DISCUSSION

The results are given in Table -1 and 2. The pH of river water ranged from 7.5 to 8.9, which shows that it always remains alkaline. The

Table -1 : The results of physico-chemical observations of Narmda river upstream Hoshangabad

	Temp. (°C)	pH	Cl (mg/L)	TH (mg/L)	DO (mg/L)	BOD (mg/L)	COD (mg/L)
April '02	29.0	8.5	49	75	9.5	2.6	11.0
May '02	32.5	8.0	31	80	7.5	2.7	14.6
June '02	35.1	8.4	40	43	7.0	1.9	13.9
July '02	30.5	7.2	45	55	8.5	1.7	12.5
Aug. '02	27.2	7.5	15	58	8.9	1.5	7.2
Sept. '02	29.5	8.0	30	60	9.4	2.0	14.2
Oct. '02	28.4	8.2	46	79	9.9	2.3	19.0
Nov. '02	25.8	8.9	70	65	11.0	2.8	25.0
Dec. '02	22.1	8.1	65	155	11.8	3.0	12.5
Jan. '03	20.2	8.0	50	98	11.5	3.9	17.3
Feb. '03	21.5	8.1	60	103	10.2	2.1	13.0
Mar. '03	25.7	8.2	46	95	10.0	2.3	10.9

Table -2 : The results of physico-chemical observations of Narmda river downstream Hoshangabad

	Temp. (°C)	pH	Cl (mg/l)	TH (mg/l)	DO (mg/l)	BOD (mg/l)	COD (mg/l)
April '02	29.0	8.5	59	65	8.5	1.9	15.0
May '02	32.5	8.0	31	74	7.5	2.7	15.6
June '02	35.1	8.4	40	45	7.0	1.9	13.9
July '02	31.5	7.2	45	55	8.5	1.5	12.5
Aug. '02	24.2	7.5	15	55	8.9	1.5	7.2
Sept. '02	29.5	8.3	30	60	9.4	2.0	15.2
Oct. '02	27.4	8.2	45	79	9.0	2.6	19.0
Nov. '02	25.8	8.9	70	65	11.0	2.4	25.0
Dec. '02	22.1	8.1	65	155	11.8	3.0	13.5
Jan. '03	20.2	8.0	50	98	11.5	3.9	17.3
Feb. '03	21.3	8.1	60	104	10.8	1.9	13.0
Mar. '03	25.7	8.2	46	95	11.0	2.3	10.9

temperature values found from 22.2°C to 35.1°C, the minimum being in winter and maximum in summer. The values of chloride ranged between 15.5-70.9 mg/l. The range of total hardness (TH) was 55.0-154.1 mg/l. The values of DO ranged between 7.12-11.30 mg/l. The values of BOD ranged between 1.5-3.9 mg/l, which is mostly higher than the permissible limit at downstream sampling point and in turn affects the Dissoled Oxygen.

The COD values were found to be 7.2-27.3 mg/L indicating about organic pollution in river water. Higher values of pH, Cl, total hardness, BOD, COD and lesser value of DO were noticed in summer season, which creates a problem for the survival of aquatic life. DO content of water was very low in summer because of its enhanced utilization by microbes in the decomposition of organic matter (Sangu and Sharma).

The high value of BOD and COD may be because of high pollution load and reduced water flow, while the low values in September may be due to dilution of water (Agarwal, 1993).

Conclusion

The river quality was found good generally at u/s, except in the month of November due to Kartik Poornima fair. River gets polluted at d/s due to impact of industrial effluent of SPM. Comparing the observations with permissible limits, BIS, it was found that the water of the river Narmda is not fit for direct human consumption. If this limit is extended the river will be severely polluted.

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